



NDT PRODUCT CATALOG



NONDESTRUCTIVE TESTING EQUIPMENT

Dear Customer,

Enclosed you will find all of the necessary forms and information we feel you should have available to you as a DETEK customer, as well as an application for an open account.

Since 1972, we at DETEK have worked towards one goal, to be the best nondestructive testing distributor in the industry. It is our intent to always provide you with exceptional technical support, competitive pricing, and outstanding customer service.

It is with great delight, that we welcome you as a new customer to the DETEK family. That is what we consider you company, our suppliers, and our fellow associates here at DETEK. Please read our policies in order that we have a good understanding from the beginning of our association. It is our hope that our relationship may be both long lasting and mutually beneficial. If you ever feel that we are not doing our very best for you, please call me personally.

Sincerely,

A handwritten signature in black ink, appearing to read "Tim Flaherty".

Tim Flaherty
Sales Manager

6805 COOLRIDGE DR ■ TEMPLE HILLS MD 20748
301-449-7300 ■ 800-638-0554 ■ FAX 301-449-7011
EMAIL: sales@detek.com



NONDESTRUCTIVE TESTING EQUIPMENT

GEIT

KRAUTKRAMER ULTRASONICS

- thickness gauges
- flaw detectors
- phased array detectors
- hardness testers
- inspection systems
- transducers & phased array probes
- test blocks
- training

SEIFERT X-RAY EQUIPMENT

- portable & stationary systems
- real time systems
- x-ray film and chemistry
- darkroom equipment
- automatic film processors
- x-ray cabinets
- radiation safety devices
- complete line of accessories

DIGITAL RADIOGRAPHY

- CR and DR filmless radiography
- film digitization & archiving
- digital imaging software

HOCKING EDDY CURRENT

- portable phase display instruments
- single & multifrequency instruments
- crack detectors
- standard and custom probes
- in-line inspection systems
- ferro-magnetic tubing instruments
- conductivity instruments and standards
- bondtesters

RAYCHECK

Ultrasonic and Radiographic

- ultrasonic test blocks
- pennies, blocks, and shims

ITI

REMOTE VISUAL INSPECTION

- flexible fiberoptic borescopes
- focusing rigid borescopes
- ccd camera systems
- crawlers and rovers
- retrieval tools

SHERWIN

DUBL CHEK DYE PENETRANTS

- visible and fluorescent dyes
- water washable/solvent removable
- self and post emulsifiable
- removers and cleaners
- developers - wet and dry

GOULD-BASS

MT / PT SYSTEMS

- transportable MPI units
- power packs
- wet horizontal units
- modular penetrant process systems

PARKER RESEARCH

MAGNETIC PARTICLE

- "contour probe"
- yokes, prods, coils
- portables (450-2000 amps)
- powders and concentrates
- black lights and meters

DEFELSKO

POSITECTOR COATING GAUGES

- ferrous and non-ferrous substrates
- conductive and non-conductive coatings
- micro-processor based

LOGOS IMAGING

DIGITAL IMAGING SYSTEM

- portable CR imaging system
- pulsed x-ray equipment

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NONDESTRUCTIVE TESTING EQUIPMENT SALES POLICIES

DETEK appreciates that you have considered making us your NDT supplier. We are dedicated to supplying you with quality service. Below is a summary of our basic sales policies.

FOR YOUR RECORDS

DETEK is a woman owned small business. Our Federal ID # is 81-5407777, DUNS# 08-056-6683. We collect sales taxes in NJ, PA, MD, VA, and NC.

C.O.D. POLICIES

For those who prefer to purchase on a C.O.D. basis, rather than an open account, our policies are as follows: There are charges for shipping and handling as well as a C.O.D. charge. Refusal of a C.O.D. package will result in suspension of C.O.D. service to the customer. Subsequent orders will have to be prepaid. We also accept all major credit cards. Cards are not charged until goods are actually shipped.

OPEN ACCOUNT

Customers completing the credit application and providing the proper credit references may be granted open account status. Please allow 3 days to process your request for credit terms. Billing is by invoice. Payment is due in 30 days from date of invoice. Past due accounts are subject to late charges and/or credit hold. **It is our policy to require a written Purchase Order from all new accounts on the first order.** This allows us to insure your billing, shipping and taxable status is entered correctly in our computer. Please supply a written tax certificate with your order if you are tax exempt. Our minimum order is \$50.00. Complete terms are described on the attached Terms and Conditions of Sale (CT-726).

SHIPPING CHARGES

UPS charges for shipping, insurance, hazardous materials (penetrant and x-ray chemistry) will be prepaid and added to your invoice. Motor Freight and Air Freight (other than UPS) we prefer to ship "freight collect". If we must ship prepaid we ask that the freight invoice be paid within 10 days.

INSURANCE

As a courtesy, we normally insure all UPS and FEDEX shipments for value, even though our terms are FOB shipping point. Charges are prepaid and added to your invoice, please advise us if you do not want your shipment insured. If you receive a damaged shipment please follow the procedures on our "Damaged Goods Policy" which accompanies each shipment.

RETURN AUTHORIZATION

When you need to return a purchase, please send a copy of the invoice or packing list and an explanation in writing to Lisa Barony. You will be sent a return authorization. If you receive a defective part please call for a replacement. We will not accept parts returned without a return authorization.

ORDER LINES

Our order lines are open from 8:30 a.m. to 5:00 p.m. Monday through Friday, toll free (orders only) at 1-800-638-0554. For billing/credit inquiries call Lisa Barony at (301) 449-7300. For pricing, availability, or research call (301) 449-7300. Our FAX number is (301) 449-7011 or email us at sales@detek.com

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*******DETEK**
Temple Hills, MD 20748

TERMS AND CONDITIONS OF SALE

1. **Exclusion of Other Terms** DETEK (the "Company") sells goods exclusively on the terms and conditions stated on this Form. The terms and conditions stated herein may not be varied by Buyer, and no additional or different terms or conditions, whether stated in Buyer's purchase order form or elsewhere, shall be applicable to the transaction unless specifically agreed to in a separately signed, written instrument by an officer of the Company. All transactions for the sale of goods are subject to acceptance or rejection by the Company when received at its headquarters in Temple Hills, MD.

2. **Prices.** All prices are F.O.B. - Shipping Point, exclusive of freight, insurance and local delivery charges, if any. Shipping Point will normally be Temple Hills, MD. However, if an item is not in stock we may elect to drop ship directly from the manufacturer to the buyer. In such cases, the manufacturer's facility will be the Shipping Point.

3. **Taxes.** All applicable sales, use, excise, gross receipts and other similar taxes (excluding only taxes on the net income of the Company) are the responsibility of the Buyer, and Buyer shall promptly pay or reimburse the Company for payment of any such taxes on demand. If Buyer claims an exemption from such taxes, a written exemption certificate must be furnished to the Company for the State into which the goods are to be shipped or delivered.

4. **Payment** - Orders are invoiced at the time of shipment and payment in full is due within 30 days of the date of the Company's invoice. Amounts unpaid thirty (30) days from the date of invoice shall be considered delinquent and shall be subject to a delinquent payment charge in the amount of one and one-half percent (1 ½ %) per month (or the highest rate permitted by law) for each month, or part thereof, that the amount remains delinquent.

5. **Shipment** - The Company shall not incur any liability of any kind whatsoever for failure to ship on any particular date, unless a firm shipping date has been expressly agreed to by an officer of the Company in a written instrument. Risk of loss shall pass to Buyer when the goods are placed in the possession of a common carrier. Claims against the carrier shall be the responsibility of the Buyer, and claims against the Company for patent defects, errors, or shortages must be made in writing to the Company within fifteen (15) days of receipt of the goods, or such claims shall be deemed to have been waived.

6. **Warranty Matters** - DETEK acts as a manufacturer's representative and manufacturer's authorized reseller. Resale products are goods, which are sold with Company's goods, which are not manufactured by the Company and are supplied as an accommodation to the Buyer. Company's responsibility for resale products is limited to reasonable commercial effort to arrange for procurement and shipping. Unless otherwise agreed, all prices are FOB resale product manufacturer's factory. Standard documentation such as material certification, MSDS, etc. shall be only as supplied by the resale product manufacturer. Company makes no warranty for resale products, either express or implied including warranties of merchantability and fitness for a particular purpose. The only warranties made with regard to resale products are those made by the resale product manufacturer to buyer, if any. Buyer agrees that Company has no liability for resale products beyond the services within Company's direct control necessary to reasonably discharge the above stated responsibility and that Company shall not be liable for delays caused by resale product manufacturer. Buyer further agrees that Buyers Sole and Exclusive Remedy for the Company's breach of the stated responsibility shall be limited to the difference between the resale product manufacturer's price to the Company and the Company's price to the buyer for the resale products involved in such breach. Buyer agrees that in no event shall Company's liability for resale products extend to include incidental, or consequential damages including, but not limited to, loss of anticipated profits, loss of use, loss of business, lost opportunities, loss of revenue, and the like. In no event, shall Company be liable for

property damage, and or third party claims covered by umbrella insurance and/or indemnity coverage provided to buyer, its assigns and each successor in interest to the goods provided against the above referenced order. Buyer agrees, that as such, any and all indemnity clauses contained in either buyer or Company's standard terms are null and void for resale products on all orders governed by these Terms and Conditions.

7. **Damage Limitation.** Under no circumstances, shall the Company be liable for any lost profits, or other incidental or consequential damages of any kind for any reason whatsoever with respect to it's products or the transactions by which it's products are sold.

8 **Cancellations** - Orders accepted by the Company may be cancelled by the Buyer prior to shipment only with the Company's consent. Cancellation may be subject to payment of a cancellation charge equal to ten percent (10%.) for orders cancelled less than thirty (30) days prior to shipment.

9 **Returned Goods.** The buyer may return goods only with the Company's consent and may be subject to payment of a twenty percent (20%) restocking charge. Goods must be in new condition and in original shipping containers.

10 **Software** - Any software or embodied within Products shall be governed by separate license agreement(s) which will be furnished to the Buyer at the time of delivery. Notwithstanding any other terms or conditions neither title to the software, not proprietary rights associated with the software, shall be transferred to the Buyer. The software comprises proprietary information and technology of the Company, and the Buyer may be required to adhere to certain nondisclosure obligations set forth in the aforementioned license agreement(s).

11. **Excuse** - In no event shall the Company be liable for any loss or damage resulting from any delay or failure in shipment or other failure to perform with respect to the sale of goods where such delay, failure, loss or damage is the proximate result of any act of any governmental authority, revolution, riot, civil disorder or disturbance, act of enemies, delay or default in transportation, strike, dispute among or between labor unions or other labor disputes, inability to obtain materials or facilities from normal sources, fire, flood, act of God, or any other cause not within the reasonable control of the Company, whether of the class of causes enumerated or otherwise. Without limiting the generality of the foregoing, the Company may, without causing a breach or incurring liability, allocate goods which are in short supply irrespective of the reasons therefor, among customers in any manner which the Company in its sole discretion deems advisable.

12. **Governing Law** - the transaction with respect to the sale of goods shall be governed by and interpreted and construed in accordance with the laws of the State of Maryland, and any action arising out of such transaction shall be brought exclusively in courts seated in Prince George's County Maryland. Buyer agreement to such exclusive jurisdiction and venue is a condition of sale.

13. **ENTIRE AGREEMENT** - This instrument constitutes the entire and only agreement between the parties hereto concerning the subject matters covered herein and any representation affirmation of fact and course of prior dealings promise or condition in connection herewith or us age of the trade not incorporated herein shall not be binding on either party. No waiver alteration or modification of any of the provisions hereof shall be binding unless in writing and signed by a specifically authorized representative of DETEK.

NDT Training Programs



GE Inspection Technologies is a global technology-driven organization committed to delivering innovative and reliable training solutions that consistently bring value to our customers.



Convenient and Enhanced NDT Training Options

Why Choose GE Inspection Technologies NDT Academies?

Expertise

Expertise speaks to the very foundation of GE Inspection Technologies' NDT Training Academies. Our facilities have decades of industrial application experience in NDT, and are positioned to draw ongoing knowledge from the talented professionals who develop NDT technologies, troubleshoot customer problems, and operate inspection equipment in production environments around the globe.

Credibility

Training received from GE Inspection Technologies is recognized around the world by customers and quality auditors. GE Inspection Technologies Level 1 and Level 2 courses go beyond the general examination requirements of SNT-TC-1A, MIL-STD-410E, NAS410 and ATA105. GE Inspection Technologies has earned an international reputation for providing the theory and practical skills needed to safely and properly operate inspection devices.

Convenience

Courses are regularly conducted at our well equipped Training Academies in North America, Europe, and the Middle East.

- Cincinnati, OH, USA
- Lewistown, PA, USA
- Boston, MA, USA
- Huerth, Germany
- Hechingen, Germany
- Saudi Arabia
- Abu Dhabi

Training partners throughout North America, UK, and Norway.

Standard or customized courses can also be conducted at your facility offering a cost-effective way to meet your specific training needs.



Heritage

Decades of strong history in NDT excellence. Pioneering, applying, building and leading with industry proven brands:

- AGFA NDT
- Everest VIT
- Hocking
- Krautkramer
- Seifert

Instructor Passion

"We train our students with the same care as if we were going to hire them ourselves", states the motto of the NDT Training Academy.

Our ASNT certified instructors are well prepared to provide the best training available. Each is a proven NDT professional who effectively ties classroom lessons to actual inspection practices.



How We Operate

Hands-On Training

On average 50%-60% of class time is devoted to hands-on training (30%-50% for VT/RVI). Courses are carefully designed to give inspectors the skills needed to excel.

Detailed class-work and proven "hands-on" exercises quickly bring the student to a thorough understanding of the theory and inspection concepts which leads to a higher level of competence.

Each student has access to a vast array of NDT instruments, systems, and documented inspection samples to use under the direct supervision of our experienced staff.



Course Content

The presentation of theory is easy. The development of a top performing technician or supervisor is not. That step requires a thorough knowledge of the industry and an understanding of the problems faced by the people who make the industry work.

That's the kind of knowledge and understanding that goes into the development of GE Inspection Technologies course curriculums, making it the most valued and respected in the industry.

Up-to-date Methods & Solutions

GE Inspection Technologies NDT courses are maintained current with the latest inspection methods and technology, much of which we've developed. Students are always encouraged to bring practical problems to class to discuss and find testing solutions. With access to support from our worldwide network of application centers, no problem is too complex.

Application Center Support

The problem-solving experts are our engineers, technicians and specialists in our Application Centers. With 11 global centers, we have quick access to the highly-skilled people who possess the know-how to assist with the most complicated situations.

Our students come from a wide range of industries including (but not limited to):

- Aerospace
- Automotive
- Oil & Gas
- Power Generation

Course offerings and descriptions

Ultrasonic

Level 1 ⁽¹⁾

- UT theory, calibration, thickness testing, inspection parameters.
- Straight, dual element, delay-line, and shear wave transducer calibration

Level 2 ⁽¹⁾

- Building from the level 1 course; angle beam, flaw location, evaluation and sizing.
- Quality control, flaws and ultrasonic inspection procedures

Advanced

- C-Scan and B-Scan, Spot-weld, DGS, TOFD and Phased Array

Eddy Current

Level 1 ⁽¹⁾

- Theory, advantages, limitations and applications, meter/impedance plane displays...
- Types of coils, surface probes, flaw evaluation, conductivity, crack detection...

Level 2 ⁽¹⁾

- Advanced theory, calibration and inspection procedures. Categories of discontinuities.
- Single/multi-frequency, applications, plating, coating, wall thickness, conductivity...

Pulsed Eddy Current (PEC)

- Principle of Pulsed Eddy Current
- Technology and familiarization with GE PEC equipment.

Radiography

Digital Overview ⁽²⁾

- An overview of the technology, designed for anyone interested in digital applications... business leaders, supervisors, technicians, educators...
- Computed Radiography (CR), Direct Radiography (DR), Radioscopy and Film Digitization.

Level 1 ^{(1) (2)}

- Theory, generation, safety. Darkroom procedures and general safety.
- Intro to theory and applications of Radiographic inspection.

Level 2 ^{(1) (2)}

- Greater depth of study, procedures and techniques. Supervised practical exercises.
- Safety, darkroom procedures and radiographic interpretation.

Digital Radiography ⁽²⁾

- A new course meeting the requirements of ANSI/ASNT CP105-2006 limit certificate in digital radiography. Includes section on Rhythm® software.

Remote Visual

Visual Testing

- Principle of examining and evaluating results through direct visual examination.
- Basic principles of optics, light, material conditions and discontinuities.
- Familiarity with standards, codes, procedures, and reports.

Remote Visual Inspection (RVI)

- Principles of examining and evaluating through video and digital imaging technology.
- Technology and familiarization with GE RVI equipment.
- Familiarization with basic operation of RVI equipment – including defect measurement, data capture, annotation, and file management capabilities.

Specialized Courses

Basic Ultrasonic Inspection of Advanced Composite Materials

- Theory, equipment and transducers.
- Delamination, measurement, detection and flaw sizing.

Weld Inspection

- Welding flaw signatures, identification and sizing techniques, shear wave.
- DAC curve, AWS, documentation and data storage

Resistance weld inspection

- Principles, theory applied to spot weld inspection
- Inspection plan prep and usage. USLT 2000.

Thickness Gauge use and application

- UT theory, thickness equipment and transducers, insp parameters, data collection, and documentation

Level III Exam preparation (Ultrasonic)

- Philosophy, theory, mathematics, equipment, transducers.
- Quality control, UT procedure familiarization, and study recommendations.

Phased Array

- Phased Array principles and imaging concepts.
- Brief introduction to equipment, benefits, etc.

Rhythm Software

- Comprehensive course designed specifically for the users of GE Rhythm Software Solution Suite.

RVI Application Software

- Training to help implement RVI workflows for use in Menu Directed Inspection (MDI) and Rhythm Visual Software. Covers entire RVI inspection process, data management, and automated report generation.



⁽¹⁾ A 40 hour (5 day) course that meets or exceeds ANSI/ASNT CP105-2006, NAS-410, ATA-105, MIL-STD-410 and ISO-9712 requirements for general examination

⁽²⁾ Combination of distance learning and instructor led training courses available

More training options

Custom Training

Custom courses can be tailored to meet your specific needs. Our goal is to teach the training you want your employees to have. Courses may be scheduled at your site to reduce training cost and scheduling complications.

Blended Training

Blended training combines classroom practical training with online CD-based training thus reducing travel costs and time away from work.

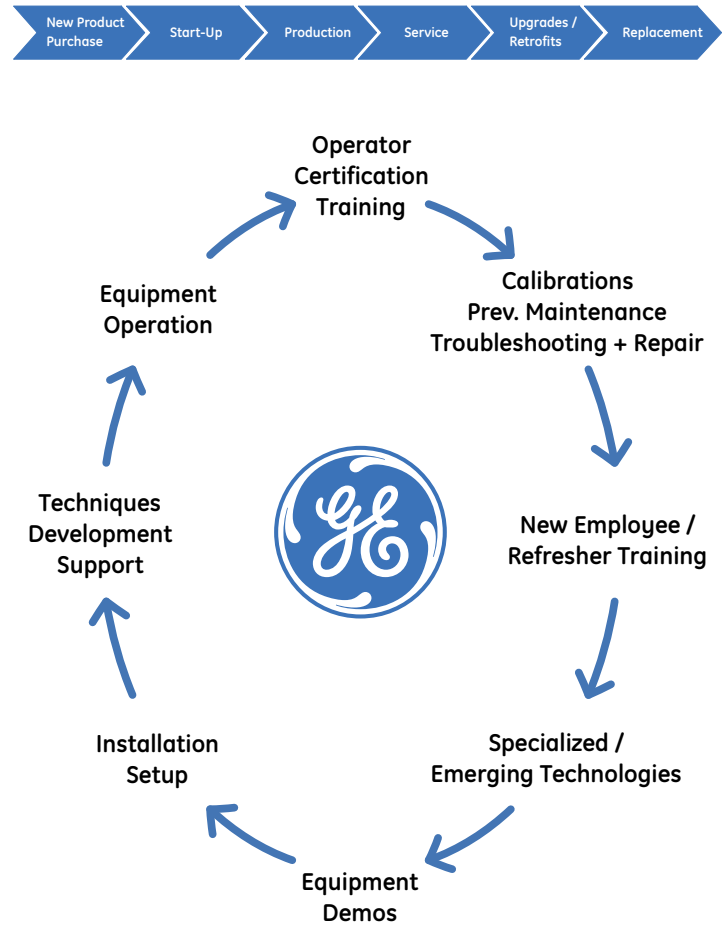
Online Training

Online course meeting ANSI/ASNT CP105-2006 for limited certification in both A-SCAN and Digital Thickness Gauging.

Training Partners

GE Inspection Technologies has training partners worldwide. We are continuously adding new partners. Please visit the website to learn more about our training partners in your area.

Total life cycle NDT training



Contact information and registration information

Contact Information

North America: + (1) 866-243-2638 (US toll free)
Europe: + (49) 2233-601-0
Middle East: + (971) 4 313828
E-mail: geit-info@ge.com
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GE Inspection Technologies: productivity through inspection solutions

GE Inspection Technologies provides technology-driven inspection solutions that deliver productivity, quality and safety. We design, manufacture and service ultrasonic, remote visual, radiographic and eddy current equipment and systems. We offer specialized solutions that will help you improve productivity in your applications in the aerospace, power generation, oil & gas, automotive or metals Industries.

www.ge.com/inspectiontechnologies

DMS Go+

The ultra-portable,
ultra-powerful
thickness gauge.



Featuring intuitive, easy-to-use arrow-keypad control, powerful data management and the latest industrial electronics to provide accurate, reliable and comprehensive thickness inspection data. The DMS Go+ thickness gauge that can be easily converted into a comprehensive flaw detector with a simple software upgrade.



DMS Go+

Designed and developed with the user in mind

Operational excellence

The DMS Go+ offers a comprehensive, hand-held solution to thickness measurement, data recording and data management in a wide range of applications and environments.



→ High performance thickness measurement

- Zero cross measurement technique for high measurement stability and reliability
- Automatic gain control for excellent repeatability and corrosion monitoring.
- Built-in temperature compensation for accurate measurement up to 540°C (1000°F)
- Multiple calibration and zeroing modes for repeatable accuracy.
- Multiple measurement modes, including thickness, A-scan, B-scan, Min/max and differential.

→ High capacity data recorder and compatibility with powerful data management systems

- On-board data recorder, with capacity of hundreds of thousands of thickness readings, with storage of A-scan, B-scan and MicroGrid attachments
- Data can be organized in pre-set, custom or advanced file structures.
- Data transfer is by SD card or via USB port to PC. Data can be transferred in various file formats to allow easy integration with user data management systems.
- Compatible with UltraMate and UltraMate Lite data management programs to allow for comprehensive data analysis and documentation.

→ Ease of use

- Intuitive arrow-keypad for positive digital control of parameters
- One hand operation and one-hand, menu-directed calibration process
- A "Flip" function allows use by both left-handed and right-handed operatives.
- A large, 800x480 pixel, display screen, ergonomically sized to reduce eye-strain, which can be adjusted to provide optimum visibility in various ambient light conditions.
- Small size, lightweight (870g, 1.9lb), robust construction to IP67 for operation in harsh environments.
- Battery allows up to 10 hours operation and can be re-charged on- or off-board.



A wide range of applications

The DMS Go+ is suitable for thickness measurement in a wide variety of applications throughout the industrial and process spectrum. It is especially applicable for corrosion measurement and monitoring, even on coated components and structures and at high temperatures.

Typical applications include:

Oil & Gas

- Inspection and monitoring of corrosion in tubes, vessels and tanks
- Measurement of remaining wall thickness through paint coatings

Power Generation

- Inspection of complex geometry tubes
- Monitoring of boiler efficiency by measuring oxide scale in boiler tubes with special probe OSS-10

Aerospace

- Maintenance checks

Metals Industry

- Thickness measurement of austenitic materials

Optional applications software such as TopCOAT technology, also allows measurement of coating thickness as well as metal thickness, while Auto-V measurement enables thickness to be measured on components with unknown sound velocities, without the need for a calibration block.

A simple software upgrade adds a comprehensive and versatile flaw detector to the DMS Go+

The DMS Go+ uses the same operating platform and hardware as the state-of-the-art USM Go+ portable flaw detector. This offers high Near Surface Resolution to detect flaws near to the surface, as well as a wide Pulse Repetition Frequency range, allowing it to be used for inspecting forged parts as well as welds.

An up-graded DMS Go+ means that personnel now need to carry only one instrument to perform accurate and reliable thickness measurement and flaw detection.



Technical Specifications of DSM Go+

Display	5 inch, 800 x 480 pixels, 108 x 65 mm (W x H), >200 cd/m ²
Size (W x H x D)	175 x 111 x 50 mm (W x H x D)
Weight	850 g with battery
Protection class	IP 67
Operating temperature	0 – 55 °C
Battery	Li-Ion, rechargeable, > 8 hours operation time
Power adapter / charger	100 – 240 V AC, 50/60 Hz
Probe connector	Dual Lemo-00 (T/R)
PC interface	Micro USB
Memory card	SD-Card 16 GB max
Daterecorder	100.000 readings per file. Multiple files can be stored on SD card 8 file formats, Attachment of A-Scan, B-Scan and micro grid
Pulser	120 – 250 V, Spike wave, Automatically matched to probe
Puls Repetition Frequency	4, 8 or 16 Hz selectable
Receiver	110 dB dynamic, automatic gain control, Manual -high, -low, -auto
Measurement range	0,4 – 14.000 m/s (0.01 – 551 ")
Units	mm, inch, µs
Digital Display resolution	0,01 mm or 0,1 mm (0.001" or 0.01") selectable
Measurement techniques	Zero crossing, IP to 1st echo, multi echo, TopCoat, Auto-V
Calibration	One-point, Two-point Auto or Manual On-block and Off-block Zero Automatic V-Path correction
Display mode	Thickness and A-Scan, Temperature corrected thickness, B-Scan, Min/Max capture, Differential
Compliance	EN 61010, EN 61326-1, EN 12668 ASTM E 1324, E317, ANSI/NCSL Z 540-1-1994 MIL-STD 45662A, MIL-STD 2154, EN 15317



www.ge-mcs.com

GEIT-20219EN (06/14)

GE
Sensing & Inspection Technologies

The DM5E Family of Corrosion Thickness Gauges

A Range of High Performance, Reliable and
Easy-to-Use Instruments



The DM5E family allows you to choose the functionality to suit you at a price to suit you.



GE imagination at work



New Range of High Performance Probes

A new set of ultrasonic probes has been developed for the DM5E family to provide the instruments with optimized performance, even at very high temperatures. The DA5xx series includes a 5 MHz standard probe for general purpose applications, a 2MHz version, for high penetration as well as a 7.5MHz fingertip probe. A newly developed 5MHz high temperature probe offers an operating range from -10°C up to +204°C. (Standard probes operate to 70°C)

Thickness Measurement Under Coating

Both the DM5E and the DM5E DL offer Dual Multi Measurement. Virtually all components and structures subjected to thickness measurement will have some kind of protective coating. Such coatings, including paint, contribute significant error to thickness measurements of underlying metal walls when using conventional methods. In addition, the removal of coatings, and their subsequent reapplication, involves considerable cost and time. With the field proven Dual Multi feature there is no need to remove any protective coating. It is only necessary to select Dual Multi mode, place the probe in position and take the measurement.

Flexible Data Processing

The DM5E DL has a built-in datalogger, with a capacity to store up a massive 50,000 reading in grid and linear files. This makes the measurement data available for further processing. Using our UltraMATE software. Measurement data files can be transferred from the instrument to a PC, where they can be stored and, if required, printed out in different fixed format reports. Typically, these can be colour histograms, where ranges of measured values are colour-coded, or colour can be used to highlight the distribution of minimum/maximum limit values exceeded. Data can also be pasted into Windows Clipboard for easy transfer into spreadsheet and word processing applications.

A Range of Measurement Displays

All versions of the DM5E offer a range of measurement displays.

These include:

- **Normal:** the thickness value appears as large digits in the centre of the display.
- **MIN Scan:** a minimum thickness scan that allows the user to run the probe over the wall surface. After the evaluation period, the minimum material thickness measured is displayed.
- **MAX Scan:** a maximum thickness scan which is exactly the same as a MIN Scan apart from the fact that the maximum thickness measured is displayed.
- **DIFF/RR%:** compares the measured thickness with a user-specified nominal thickness. The dimensional difference between the two values is displayed, as is the percentage difference.
- **B-Scan:** displays a graphic representation of a B-Scan showing minimum thickness values. The graph is derived by measuring and recording at 1 point per second.

Technical Specifications - DM5E Family

Instrument Specifications	
Operating Principle	Ultrasonic, Pulse Echo Measurement Method
Measuring Range	Depends on Probe and Material, 0.60 mm to 508 mm (0.025" to 20.00") in IP to 1st BW Measurement Mode, 2.00 mm to 127.0 mm (0.079" to 5.00") in Dual-Multi Measurement Mode, the Coating Thickness Range Shall be 0.3 mm to 2.50 mm (0" to 0.098").
Measuring Resolution	0.01 mm Default - Selectable 0.01, 0.1 mm (0.001" Default - Selectable 0.001, 0.01")
Material Velocity Range	0.508 to 18.699 mm/msec (0.0200 to 0.7362"/msec)
Material Velocity Resolution	1 m/s (0.0001"/msec)
Units	Inch or Millimeter
Calibration	One-Point Cal, On-Block and Off-Block, Two-Point Cal
Pulser	Excitation Pulse Spike Pulser
	Voltage 120 V into 50 ohm Load, Using 20 MHz Oscilloscope
Receiver	Bandwidth 500KHz to 12 MHz @ -3 dB
	Gain Automatic Gain Control
Display Type	High-Resolution Graphical LCD, 64 x 128 Pixels, 53.0 mm x 27.0 mm with Backlight and Adjustable Contrast
Update Rate	4 Hz or 8 Hz, User Selectable, 24 Hz Scan Mode Capture Rate
Thickness Value Display	NORMAL View Mode 5 Digit, 10.6 mm (0.4") High B-SCAN View Mode 5 Digit, 2.55 mm (0.1") High
Display of Last Reading	Solid Filled or Hollow Digits Indicate Coupled or Uncoupled Condition
Setups	9 Standard Setups for Probes
Alarm Settings	Minimum and Maximum Alarms, Range of 0.25 mm to 508 mm, 0. (0.010" to 20.00") Reading Alternates Between Solid and Hollow When Alarms Are Enabled and Violated
Power Requirements	2 "AA" Size Batteries
Battery Life/Operating Time	Approximately 60 Hours
Instrument Shut-Off	Selectable ALWAYS ON or AUTO OFF After 5, 10, 15, 30 Minutes of Inactivity
Language	Selectable English, German, French, Spanish, Italian, Russian, Japanese and Chinese
I/O Connectors	Transducer Dual Lemo 00 (coax) Mini-USB Mini-USB to PC
Temperature	Operating -10°C to +50°C (+10°F to +120°F) Storage -20°C to +60°C (-10°F to +140°F)
Weight	223 g (0.597 lb) Including Batteries
Size	138 mm x 32 mm x 75 mm
Shock	IEC 68-2-27 Ea, as per Mil Std 810C Method 516.2 Procedure I with a 15g 11ms Impulse Half Sinusoidal Wave Applied 6 Times per Axis
Sealing	IEC529 / IP54, Dust Proof/Dripping Water Proof as per IEC 529 Specifications for IP54 Classification

Data Recorder Option Features	
Capacity	50,000 Readings
File Structures	Grid File
Number of Rows	1 to 50,000
Number of Columns	1 to 223
File Naming	Up to 24 Character Alphanumeric Name
Optional Software	UltraMATE and UltraMATE Lite

DM5E Probe/Transducer Specifications				
	Model DA501	Model DA503	Model DA512	Model DA590
Frequency	5 MHz	2 MHz	7.5 MHz	5 MHz
Probe Style	Standard	Standard	Fingertip	High-Temperature
Operating Temperature Range (continuous)	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 204°C
Contact Diameter	15 mm (0.590")	20 mm (0.787")	7.5 mm (0.300")	12.7 mm (0.500")
IP to First Measurement Range	1.0 to 200 mm (0.040 to 8")	5 to 300 mm (0.200 to 12")	0.6 to 60 mm (0.020 to 2.4")	1 to 125 mm @20°C (0.040 to 5" @68°F) 1.3 to 25.4 mm @204°C (0.050 to 1" @400°F)
Minimum Multi-Echo Measurement Range	3.0 to 100 mm (0.118 to 3.936")	10 to 150 mm (0.393 to 5.905")	3.0 to 25 mm (0.118 to 0.984")	N/A

Note: Instrument specifications are subject to change without prior notice.



www.gesensinginspection.com

GEIT-20210

GE
Sensing & Inspection Technologies

Thickness Probes

Ultrasonic Testing





TC-560



DM-401/DM-411



FH2E-D



FH2E-WR



DA-303



DP-104



HT-400/400A



DA-312



DA312B29 and DA312B16

Application and Description	Model	Probe Cable
TopCOAT and AUTO-V with DMS 2 TC only	TC-560	KBA-531A/531TC
General purpose/side mount connector	DM-401-GP*	KBA-533/533A
General purpose/same as DM-401 only with remote send key on top of probe	DM-401-GP-REM*	KBA-533/533A
General purpose/same as DM-401 only with connectors on top	DM-411-GP*	DA-233
Pit detection and limited access/small diameter fingertip	FH2E-M	Potted
PIT detection and limited access/fingertip	FH2E	Potted
PIT detection and limited access/fingertip	FH2E-D*	Potted
Same as FH2E only with remote send key on top of probe	FH2E-D-REM*	Potted
Wear resistant case/same as FH2E	FH2E-WR	Potted
Wear resistant case/same as FH2E-D	FH2E-D-WR*	Potted
Limited access/fingertip/right angle x-talk barrier	FH2E-RA	Potted
Limited access/fingertip/right angle x-talk barrier	FH2E-D-RA*	Potted
Penetration/side mount connector	DA-303	KBA-533/533A
High penetration side mount connector	DP-104	KBA-532
High temp/for use with DM4 family of instruments	HT-400***	KBA-535/536
High temp/for use with DMS family of instruments	HT-400A***	KBA-535/536
Thin wall and small radius/square fingertip case/with removable cable	DA-312	KBA-532
Thin wall external pitting access/small diameter fingertip	KBA-525	Potted
Thin wall external pitting access/small diameter fingertip	DA-312B16**	Potted
External pitting access/small tip pencil style body	DA-312B29**	Potted
4-inch extension tube for HT-400	ET-103	
7-inch extension tube for HT-400	ET-104	
Steel bell housing for HT-400	BH-342	

*DIALOG Intelligent Probes when used with DM4E, DM4, DM4 DL or DMS 2

**2-PT calibration required on DM4E, DM4, and DM4 DL

***Temp cycled per GE instruction/limited measurement range

Contact Diameter	Frequency	Measuring Range in Steel	Temperature Range
.625 in (15.9 mm)	5	Metal : .060-8.00 in (1.5-200 mm) Coating: .002-0.80 in (0.5-2 mm)	<130°F (< 54°C)
.700 in (17.8 mm)	5	.060-8.0 in (1.5-200 mm) DM4 Dual-Multi 0.120-0.800 in (3-20 mm)	<300°F (<148°C)
.700 in (17.8 mm)	5	.060-8.0 in (1.5-200 mm) DM4 Dual-Multi 0.120-0.800 in (3-20 mm)	<300°F (<148°C)
.700 in (17.8 mm)	5	.060-8.0 in (1.5-200 mm) DM4 Dual-Multi 0.120-0.800 in (3-20 mm)	<300°F (<148°C)
.280 in (7.1 mm)	7.5	.030-1.0 in (.75-25 mm)	<130°F (<54°C)
.380 in (9.6 mm)	7.5	.030-2.0 in (.75-50 mm)	<130°F (<54°C)
.380 in (9.6 mm)	7.5	.030-2.0 in (.75-50 mm)	<130°F (<54°C)
.380 in (9.6 mm)	7.5	.030-2.0 in (.75-50 mm)	<130°F (<54°C)
.550 in (14 mm)	7.5	.030-2.0 in (.75-50 mm)	<130°F (<54°C)
.550 in (14 mm)	7.5	.030-2.0 in (.75-50 mm)	<130°F (<54°C)
.380 in (9.6 mm)	7.5	.030-2.0 in (.75-50 mm)	<130°F (<54°C)
.380 in (9.6 mm)	7.5	.030-2.0 in (.75-50 mm)	<130°F (<54°C)
.650 in (16 mm)	2	.200-12.00 in (5-300 mm)	<140°F (<54°C)
1.25 in (31.8 mm)	1	.200 in (5 mm) minimum	<130°F (<54°C)
.550 in (12.7 mm)	5	.040-10.0 in (1.0-25 mm)	<1000°F (<540°C)
.550 in (12.7 mm)	5	.040-10.0 in (1.0-25 mm)	<1000°F (<540°C)
.300 in (7.5 mm)	10	.025-2.0 in (.6-50 mm) DM4 Dual-Multi .080-0.500 in (2-12 mm)	<140°F (<60°C)
.200 in (5 mm)	10	.025-1.0 in (.6-25 mm)	<130°F (<54°C)
.120 in (3 mm)	10	.030-0.500 in (.7-12 mm)	<140°F (<60°C)
.120 in (3 mm)	10	.030-0.500 in (.7-12 mm)	<140°F (<60°C)

Specifications are subject to change without notice.

Probes to Meet all Demanding Applications

GE offers a complete line of dual element probes compatible with its D-Meter line of ultrasonic thickness gauges (DMS and DM4 family). Standard probes are readily available to satisfy a wide range of remaining wall thickness applications, including high-temperature, throughcoating, erosion/corrosion, thin materials, areas of limited access, tough-to-penetrade materials (coarse grained/non-metals), external pitting, wear-resistance, boiler tubing, small diameter piping/tubing, and most all general purpose applications.

DIALOG Intelligent Probes are automatically recognized by the DM4 or DMS 2 family of instruments for quick setup, best performance and test documentation.

If standard probes will not satisfy your requirements, our applications lab is fully equipped and staffed to offer practical solutions to your special application needs. Special probes are quoted, developed and delivered on a timely basis directly through the applications lab.

Cables and Connections



Cable	Code	Length
KBA-533	A --- A	1.2 m (4 ft)
KBA-534	A --- C	1.2 m (4 ft)
DA 233	A --- B	1.2 m (4 ft)
KBA 535	A --- E	1.2 m (4 ft)
KBA 536	A --- D	1.2 m (4 ft)
KBA 531A	A --- F	1.2 m (4 ft)

Couplants and Calibration Blocks

Name	Type	Descriptions
Exosen	General Purpose Fluid	Water soluble, non-toxic and non-flammable, Exosen is available in five standard viscosities: Exosen 10, 14, 20, 30 and 40.
Hitempco	Ambient to High Temp	Medium viscosity paste in 2 oz tube. Temperature range up to 500°F (260°C).
ZGM	High-temperature coupling paste	High viscosity paste, with solid filling, specially made for wall thickness measurements on hot parts; temperature range: +200°C to +600°C (+392°F to +1112°F); in 100g tubes.
SLC-70	Thick, Irregular Surface	Highly attenuative paste (honey consistency) in 4 oz jar.
B-320	4-Step Carbon Steel Step Block	Steps at .25 in, .50 in, .75 in and 1.0 in
B-310	5-Step Carbon Steel Step Block	Steps at .100 in, .200 in, .300 in, .400 in and .500 in
B-004	2-Step Check Block	0.100 and 1.00 Block (303 stainless steel—not certified)



www.geinspectiontechnologies.com/en

GEIT-20056EN (08/08)



With a thickness gauge in one hand and your ultrasonic transducer in the other, did you ever wish you had an extra hand?

Introducing the **StressTel PocketMIKE™** general purpose thickness gauge. The **PocketMIKE™**'s integrated product design combines the instrument and transducer into a single package not much larger than a traditional cabled probe allowing for true single hand operation.

The **PocketMIKE™** thickness gauge is packaged in a machined stainless steel housing environmentally sealed to IP67.

Four button operation and Automatic On-Block Probe Zero further support StressTel's goal of providing very capable yet simple to use instruments.

The high contrast backlit display can be mechanically and electronically rotated for ease of reading in any orientation.



Single hand operation
Waterproof to IP67/IEAC529

It's That Simple!

PocketMIKE™ SPECIFICATIONS

Kit Includes

Instrument
 Wrist Lanyard
 One 1.5V AA Alkaline Battery
 Hard Shell Carry Case
 Integrated Transducer
 Couplant
 Operating Manual
 Certificate of Calibration



- 1 Power Key
- 2 Increase value within CAL or SETUP
- 3 Decrease value within CAL or SETUP
- 4 SETUP key to change operating modes
- 5 Initiates CAL function
- 6 Backlight Status indicator
- 7 Coupling indicator
- 8 Thickness Mode indicator
- 9 Velocity Mode indicator
- 10 CAL Mode indicator
- 11 Metric or Imperial Units
- 12 Battery Control

Special Features

Integrated Transducer, 5 MHz
 True Single Hand Operation
 Machined Stainless Steel Housing
 Environmentally Sealed to IP67/IEC529
 Automatic On-Block Probe Zero
 Automatic Timed Shutoff
 Auto Backlight Mode
 Known Thickness Calibration
 Known Velocity Calibration
 4 Button Sealed Membrane Keypad
 User Selectable Measurement Units
 Exchangeable Probes



* Material and application dependent
 Specifications subject to change without notice

Physical Size

100 mm High (4 inches)
 35 mm Nominal Diameter (1.38 inches)
 12 mm (0.5 inch) Probe Diameter

Weight

200 grams with Battery

Power Source

One 1.5V AA Alkaline Battery

Measuring Range*

1.0 mm to 250 mm
 (0.040 inches to 9.999 inches)

Displayed Resolution

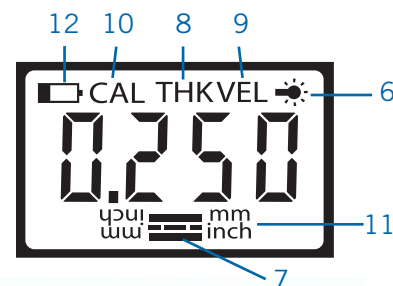
0,01 up to 99,99 mm, 0,1 above
 (0.001 up to 9.999 inches, 0.01 above)

Operating Temperature

-10° C to +50° C
 (14° F to 122° F)

Probe Surface Temperature

-10° C to +100° C
 (14° F to 212° F)



DETEK, Inc

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STRESSTEL
 part of GE Inspection Technologies

DANATRONICS

AFFORDABLE EHC-03 ULTRASONIC THICKNESS GAGE



With more than 75 years of world-wide experience in ultrasonic design, Danatronics is pleased to welcome our EHC-03 to our corrosion thickness gage family. The EHC-03 is designed to accurately and non-destructively measure metal structures subject to corrosion.

The EHC-03 is packaged in our field proven IP54 case used in our popular EHC-09 series.

The EHC-03 represents a quality, ultrasonic thickness gage designed to provide years of

unprecedented measurements all at an entry level price. With the new Q-bar, even the most inexperienced operators can quickly determine if a thickness reading is stable. The EHC-03 offers a wide measurement range, two point calibration and even multiple on-screen languages. The EHC-03 is proudly made in the U.S.A. and has a 2 year warranty. Contact Danatronics for more details.

Specifications for EHC-03:

Size: 5" (127 mm) (L) x 3" (76.2 mm) (W) x 1.25" (31.75 mm) (H)

Weight: 8 OZ (.23 kg)

Thickness range: .040"-20" (1mm-508mm) in steel

Material Velocity Calibration Range: 0.0200 - 0.7362 in/ μ S (0.508 - 18.699 mm/ μ S).

Temperature: Gage Operating: -4° F to 122° F (-20° C to 50° C)

Battery life: Up to 50 hours (20 hours with backlight on)

Battery type: 2 "AA" Alkaline

Display: 128 X 64 Graphics LCD monochrome, sunlight readable

Language support: multi language of English, French, Spanish, Italian, Czech, German, Chinese Portuguese, Slovak, Finnish, and Hungarian

Q-Bar: graphic display that confirms measurement stability

Package: IP54 rated custom, splash-proof, high impact plastic with rubber keypad

Bandwidth: 0.5-20 MHz (-3dB)

Units: English/Metric/Microseconds

Backlight: Auto on with valid reading or keypress for 10 seconds

Optional Protective pouch: Custom molded pouch with wrist strap and belt clip

Transport case: Hard plastic with high density molded foam cut out for gage and most accessories

Freeze mode: Freezes display

Hold mode: Holds display to retain last thickness reading

Standard EHC-03 includes: Ultrasonic thickness gage, DKS-537 5MHz 0.375 inch diameter potted cable, operational manual, NIST traceable calibration certificate

Note: The EHC-03 is only available with the DKS-537 and is not field upgradeable

Warranty: Limited 2 year warranty on parts and labor for gage only under normal use

Typical Applications:

- Boiler Tubes
- Pressure Vessels
- Storage Tanks
- Ship Hulls
- Containers Home
- Oil Tanks
- Pipes
- Steam Lines
- Compressor Shafts

EHC-03 Additional Features:

- Affordable hand held ultrasonic thickness gage
- Measures .040"-20" of steel
- Simple to operate
- 2 point calibration
- Q-bar to confirm measurement stability
- On screen display of multiple languages
- IP54 rated case
- Made in USA



AS EASY AS A-B-C:

EHC-09

Wave

A IS FOR A-SCAN

B IS FOR B-SCAN

AND C IS FOR COLOR DISPLAY...

IP54 RATED

- LIVE SIMULTANEOUS COLOR WAVEFORM AND THICKNESS DISPLAY
- DYNAMIC WAVEFORM COLOR CHANGE ON ALARM
- CONTROL OF GAIN, BLANKING, RANGE, RF AND RECTIFY MODES
- AVAILABLE IN MULTIPLE MODELS



With more than 75 years of world-wide experience in Ultrasonic designs, Danatronic is proud to pioneer the world's first hand held ultrasonic thickness gage with color display; our EHC09 color wave series. Unique features include live **COLOR** A-Scan, B-Scan, 100K thickness reading (3500 waveforms) datalogger with interface program, vibration and **COLOR** change of waveform on alarm.

Auto range centers echoes in the middle of the screen independent of material thickness. The blanking and gain adjustments are ideal for complete waveform adjustment and control. The echo to echo feature can ignore the paint or coating thickness. The waveform option can even be added to our popular EHC-09 gages.

TYPICAL APPLICATIONS:

- Boiler Tubes
- Pressure Vessels
- Storage Tanks
- Ship Hulls
- Containers
- Home Oil Tanks
- Pipes
- Steam lines
- Compressors
- Shafts
- Bridge Pins
- Bond Inspection

Software options are field upgradeable, there is no need to plug in a USB cable or return the unit to our factory.



6805 COOLRIDGE DR ■ TEMPLE HILLS MD 20748
301-449-7300 ■ 800-638-0554 ■ FAX 301-449-7011
EMAIL: sales@detek.com

EHC-09 Wave

Size: 5" (127 mm) (L) x 3" (76.2 mm) (W) x 1.25" (31.75 mm) (H)

Weight: 8 OZ (.23 kg)

Thickness range: 0.020 - 20 inches (.50 mm - 508 mm) in steel, depending on material, temperature and transducer selection

Material Velocity Calibration Range: 0.0200 - 0.7362 in/ μ S (0.508 - 18.699 mm/ μ S)

Temperature: Gage Operating: -4° F to 122° F (-20° C to 50° C)
High temperature transducers available for material temperatures from -5° F to 950° F (-20° C to 510° C)

Battery life: 8 -14 hours (depends on operating conditions)

Battery type: 2 "AA" Alkaline

Color Display: 170 X 220 pixels, high resolution TFT color display, sunlight readable

Language support: multi language of English, French, Spanish, Italian, Czech, German, Portuguese, Slovak, Finnish, and Hungarian

Information displays: Loss of signal (LOS), min, max, large reading while displaying min at the same time, velocity, zero, calibration, units, freeze, unfreeze, % battery life remaining, gain - low, std, high, echo to echo symbol

Resolution: .001" (.01 mm), .01" (.1 mm)

Probe Recognition: Via pick list from a menu

Delay line zero measurement: Auto at power up with listed numeric value. Ideal for correcting delay line wear/curvature and for transducer acoustic drift at elevated temperatures

Package: IP54 Rated, Custom, splash-proof, high impact plastic with illuminating rubber keypad for go/no-go testing

Bandwidth: 0.5-20 MHz (-3dB)

Units: English/Metric/Microseconds

Gain: Low, Standard and High for varying test conditions (for gages without a waveform) or 1 dB steps from 20-90 dB or Automatic Gain Control (AGC) for gages with a waveform

Differential Mode: Displays the difference from the actual thickness measurement in absolute or percentage of a user entered reference value

Alarms: Minimum/Maximum depth, vibrates, beeps and display flashes as well as keypad illumination

Illuminating keypad: F1 = Red, F2 = Yellow and F3 = Green for easy, go/no-go testing

Ergonomics: User selectable lefty or righty display changes via keypad

Backlight: Light Emitting Diode (LED), On/Off or Auto On based on valid readings or last key press

Shut off: Auto, user programmable time out (1-31 minutes), after no reading/key press or never shut off

Protective Pouch: Custom molded pouch with belt clip and wrist strap for either lefty or righty operators (optional, standard with DLC and DLCW).

Transport case: Hard Plastic with high density molded foam cut out for gage and most accessories

Freeze mode: Freezes display (ideal for high temperature applications)

Hold mode: Holds display to retain last thickness reading

Standard EHC-09 Wave Series includes: Ultrasonic thickness gage, DKS-537, 5 MHz 0.375 inch diameter potted cable, operational manual, Data XL interface program, couplant, and transport case. See chart below for standard inclusions for each gage

Warranty: Limited 2 year warranty on parts and labor for gage only under normal use

Transducers: A wide variety of dual transducers from 1-10 mhz, high temperature duals, delay lines and pencil probes

Item	Specification	EHC-09DLCW	EHC-09DLC	EHC-09CW	EHC-09C
Thickness range:	0.020 - 20 inches (.50 mm - 508 mm) in steel	✓	✓	✓	✓
Delay line zero measurement:	Auto at power up with listed numeric value. Ideal for correcting delay line wear/curvature and for transducer acoustic drift at elevated temperatures	✓	✓	✓	✓
Scan mode:	Simultaneously displays minimum or maximum and actual thickness value at 20 measurements per second	✓	✓	✓	✓
Differential Mode:	Displays the difference from the actual thickness measurement and a user entered reference value	✓	✓	✓	✓
Alarms:	Minimum/Maximum depth, vibrates, beeps and display flashes as well as keypad illumination and vibration	✓	✓	✓	✓
Illuminating keypad:	F1 = Red, F2 = Yellow and F3 = Green for easy, go/no-go testing	✓	✓	✓	✓
Velocity Mode:	Displays acoustic sound speed	✓	✓	✓	✓
Echo to Echo:	Measures the metal thickness only (ignore paint and coatings)	✓	✓	✓	✓
Range:	Adjustment of manual range control or auto zoom tracking to center echoes independent of selected range	✓	○	✓	○
Rectification Modes:	RF, Half Wave Positive, Half Wave Negative and Full Wave Rectification	✓	○	✓	○
Live Waveform (A-scan):	Full adjustments, for gain in 1db step or AGC, main bang blank, blank after first received echo, range including zoom auto tracking to center echoes independent of material and rectification	✓	○	✓	○
B-Scan (Encoded or Non-Encoded)	Displays a cross section of the test piece with optional encoder and factory upgrade	✓	✓	○	○
Datalogger:	Upgrade to Data Logger Version, 100,000 readings in linear, 2D, 3D grid or boiler alphanumeric files, 20 character file name, file compare, grid review and export to excel via Data XL interface program, also compatible with Ultrapipe	✓	✓	○	○

○ = Software options that are field upgradeable, no need to return the unit to the factory

ECHO Series

Hand-Held Ultrasonic Thickness Gages
for Corrosion and Precision Applications



- Simple to Operate
- Hand Held
- Field Upgradeable Options
- Corrosion and Precision Modes
- Live A-scan
- Made in the USA

A Totally New Platform of Ultrasonic Thickness Gages

Our new ECHO series represents a totally new platform of ultrasonic thickness gages combining corrosion and precision gaging into one tough, small package... The perfect size of fit and function! Hold the ECHO in your hand and you will agree no detail has been overlooked and the ergonomics are unmatched by any thickness gage in the industry! The new ECHO series comes in 3 configurations; ECHO 9, ECHO 8 and ECHO 7. ECHO 9 is our corrosion gage using dual transducers, ECHO 7 is our precision gage with 1 micron resolution using single element transducers and ECHO 8 is the ultimate unit combining both dual and single element transducers.

The new ECHO series can non-destructively measure essentially any engineering material thickness. In its most popular configuration, the ECHO 9 series is an extremely capable, hand held ultrasonic thickness gage for measuring the wall thickness of primarily metal structures subject to corrosion. ECHO can easily be upgraded to precision mode to utilize single element transducers.

The ECHO series has a remarkable sunlight readable 3.5" color display, up to 32 Gb of micro SD memory, built-in rechargeable high capacity Li Ion battery all packaged in a custom case designed for IP67 rating. Not sure which model to choose? Don't worry, the ECHO series is fully capable of field upgrades directly from the keypad so you will never be stuck with an obsolete product or experience any downtime. ECHO Series can measure from .020" to 23" in steel in corrosion mode or as thin as .006" in steel when configured as a precision gage.



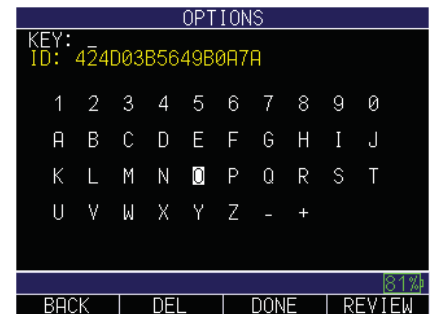
ECHO Series Standard Features

- Compatible with a wide variety of Danatronics and common competitor dual and single element transducers
- Change color and VIBRATE on alarm (ideal for inspections in loud environments)
- 27 Hour battery life with hi-capacity re-chargeable battery pack via the USB port
- Wide thickness range (.006" to 23" depending on gage type, material and transducer)
- Inches, mm or μ Sec
- Multiple languages
- Velocity mode
- Fast Min/Max mode to display actual thickness and minimum and maximum at the same time
- Gain, range, rectification, blank adjustments with live waveform
- Datalogger 2 Gb micro SD card standard expandable to 32 Gb
- Datalogger interfaces with Microsoft Excel
- Designed for IP67
- Made in the USA
- Simple one hand operation
- Field upgradeable software options

ECHO Series Standard Inclusions

Includes transducer (DKS537, dual 5.0 Mhz, .375" with potted 3 foot cable for corrosion gages; for precision gages, a probe up to 10 Mhz with a lemo to microdot cable are included), 2 Gb micro SD card, Li-ion battery, battery charger, transport case, manual with data XL, USB cable, echo-to-echo to ignore coatings. Our most advanced models include custom rubber boot.

Call with your ID and payment to unlock any additional features.



ECHO Series Software Options

Software options are all field upgradeable with many advantages:

- Options are activated via the keypad...no need to plug into a computer
- Only takes less than one minute
- No shipping cost
- No downtime
- Never worry about buying an obsolete unit
- Less initial outlay of capital

Datalogger

(includes B-scan) internally store millions of thickness readings with ID location and send readings to Microsoft Excel via our Data XL interface program.

Oxide Scale

Simultaneously displays the wall thickness of the boiler tube thickness as well as the internal oxide scale at their independent velocities. Knowing the thickness of the boiler tube can greatly improve the efficiency and extended life of the tube.

Live Waveform

Displays the live A-scan for echo verification and real time control of range, gain, rectification and blanks.

Corrosion Mode

Uses dual transducers to measure remaining wall thickness on primarily steel structures subject to corrosion.

Angle Beam Software

Available on ECHO 8 and ECHO 9, displays trig functions of detected echo for angular distance, surface and depth.

NOTE: Not meant to be a code compliant ultrasonic flaw detector due to vertical linearity and display update rate.

Precision Mode

Allows for the use of single element transducers along with up to 2,700 stored application setups with 1 micron resolution (.0001" or .001mm).

ECHO 9 Corrosion Thickness Gage

Our ECHO 9 is our premier corrosion thickness gage with a wide thickness range, able to be used with a variety of dual transducers as well as a selection of single element and angle beam probes. Similar to our precision thickness gages, ECHO 9 can save and store custom setups.

Typical Applications

- Boiler tubes
- Pressure vessels
- Storage tanks
- Ship hulls
- Pipes
- Steel beams on bridges

Standard Features

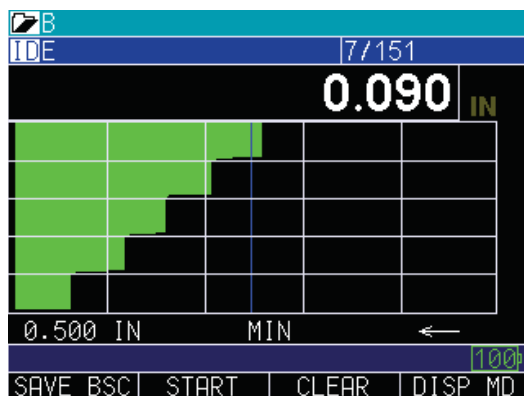
- Compatible with a wide variety of Danatronics dual and single element transducers
- Wide thickness range (.020" to 23" depending on gage type, material and transducer)
- Coating Thickness and substrate thickness displayed simultaneously on gage with live waveform
- High temperature probes available up to 950F/509C (intermittent use)
- Temperature correction
- File compare features shows old readings along with new readings for datalogger versions (real-time corrosion monitor)
- Available angle beam option



ECHO 9 – Base model includes Echo to Echo



ECHO 9W – Includes Waveform, Coating Thickness



ECHO 9DL – Includes Datalogger, B-scan, Temperature Correction



ECHO 9DLW – Includes Waveform, Datalogger, B-scan, Coating Thickness, Temperature Correction

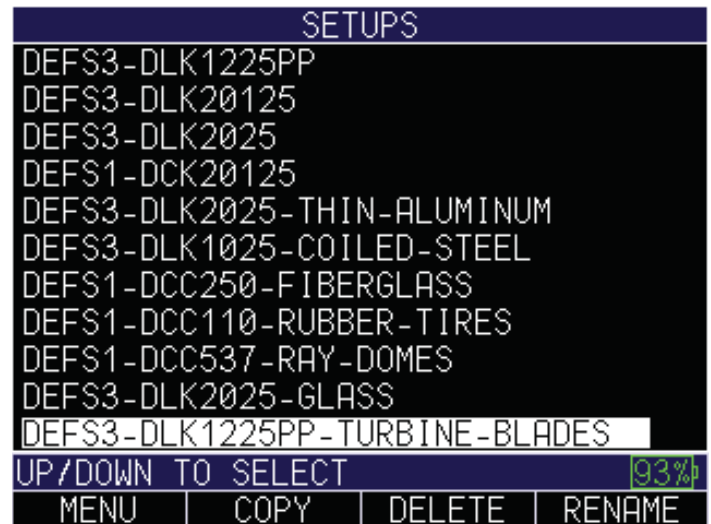
ECHO 7 Precision Thickness Gage

ECHO 7 hand-held ultrasonic thickness gages are designed for use with single element contact, delay line and immersion transducers to provide the maximum thickness range and up to 1 micron resolution. ECHO 7 can save up to 2,700 custom applications setups allowing the operator to quickly and easily switch transducers and setups on the fly for unique and separate tasks.



Standard Features

- .006-20" range in steel
- 1 micron resolution (0.0001" or 0.001 mm)
- single element, contact, delay line and immersion transducers (1-25 MHz)
- Store and recall up to 2,700 setups
- Multiple modes for challenging applications
- 30 Mhz bandwidth
- Squarewave Pulser
- Zoom Auto Tracking



Typical Applications

- Castings
- Turbine blades
- Plastic parts including bottles, pipes, trays and toys
- Coil steel and automotive body panels
- Fiberglass and gel coatings
- Velocity verification for ductile and gray iron (Velocimeter)
- Aluminum, glass, ceramics, zinc and more



ECHO 8 Corrosion and Precision Thickness Gage

ECHO 8 represents our most capable ultrasonic thickness gage combining both dual and single element probes into one small instrument. Quickly switch transducers and “gage type” to essentially non-destructively measure any engineered material. The ECHO series can keep track of up to 2,700 stored setups, so switching from materials with different thicknesses and alarm values is simple.

Typical Applications

- Inspection Companies—all-purpose gage for measuring any engineered material thickness
- Airplane Inspection (thin aluminum, plastic windows, and rubber tires)
- Marine Surveyors (fiberglass & steel)



ECHO series in A and B-Scan with EZ Scan magnetic wheel encoder

Standard Features

- Includes all features from the ECHO 7 and ECHO 9
- Switch from dual to single element transducers
- Switch resolution from .01” to .001” to .0001”
- Store and recall up to 2,700 applications setups
- Rechargeable batteries good for more than 24 hr.
- ECHO 8DLW includes custom rubber boot with stand



Environmentally Tough, Ergonomically Superior!



Environmentally Tough!

The ECHO series was designed from the ground up. With more than 85 combined years in designing, manufacturing and using hand held ultrasonic thickness gages, Danatronics left no detail uncovered. From its new case designed for IP67, to its easy to read sunlight readable 3.5" color display, you will find the ECHO series combines practical features with a simple, clean design built for years of field service and durability.

Ergonomically Superior!

With its new 3.5" sunlight readable display, The ECHO series offers many display formats to suit any age operator and reduce fatigue. So whether you want to view the largest possible numbers or would prefer more text on screen, ECHO has you covered.

ECHO is also perfectly balanced and makes holding it in one hand possible and simple... no clumsy joy sticks or second functions



Easy to hold and operate in one hand

needed. There is even a world's first vibrate on alarm to inform the operator any pre-set thickness threshold has been tripped which is great for tired operators and testing in loud environments.

Hardware Options

- Rubber boot with chest harness with built-in finger strap and bail (stand)
- Magnetic wheel encoder
- Footswitch
- Remote power bank
- Magnetic pipe stand

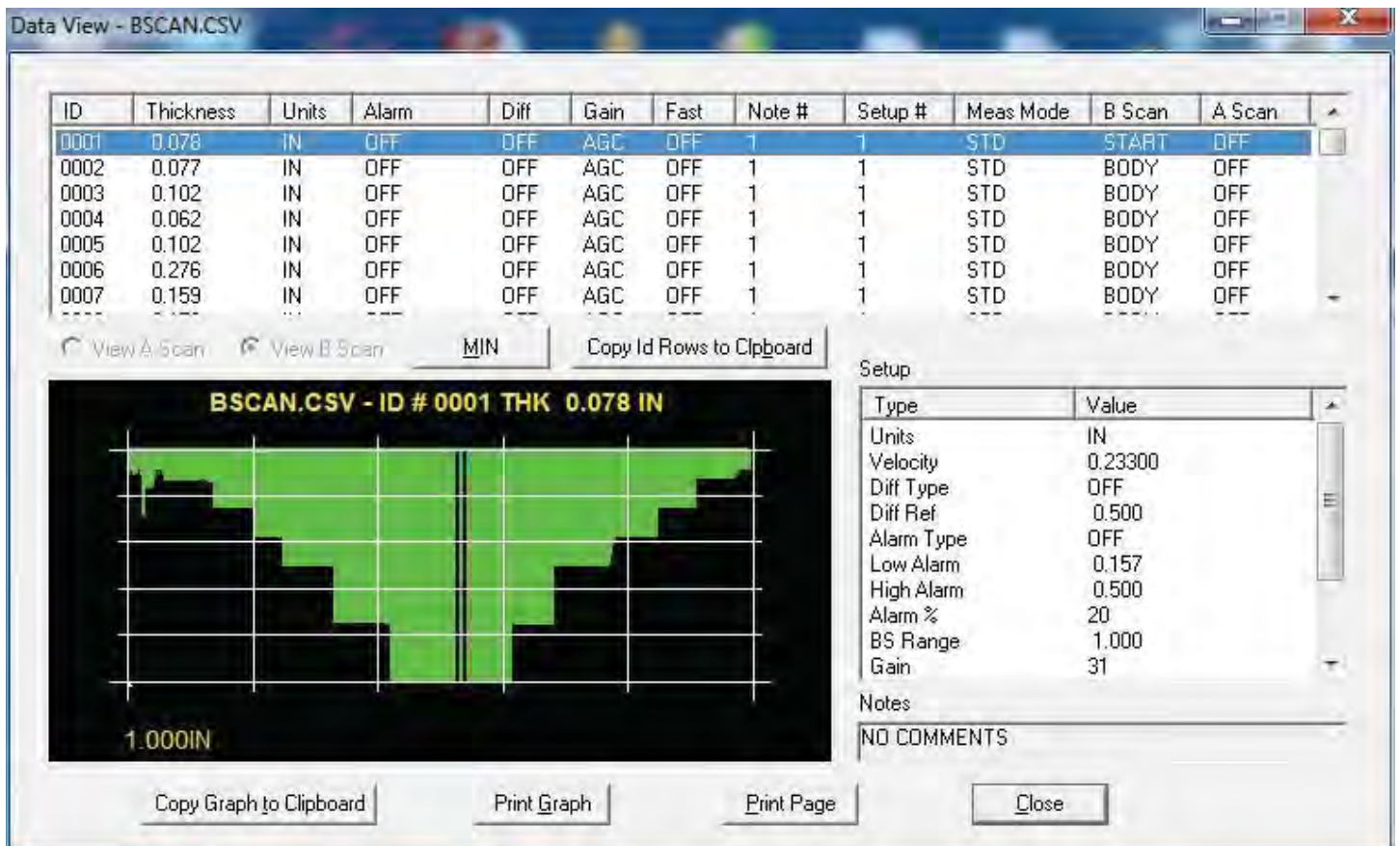
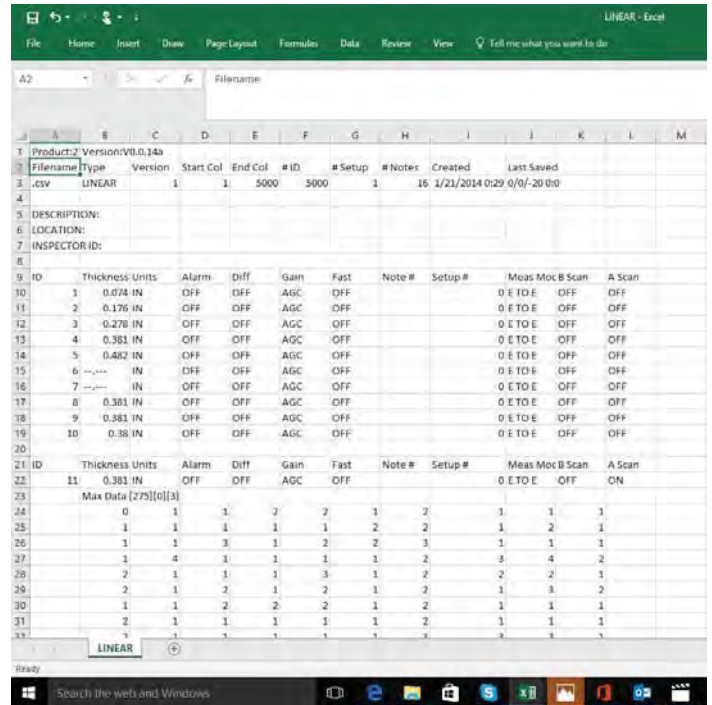


Data XL and Data XL PRO

At Danatronics we believe managing your saved data should be simple. As such, we include with every thickness gage a free interface program we call Data XL. Data XL saves readings to .csv files that can be used in any spreadsheet program such as Microsoft Excel or Google Sheets.

Here are some advantages:

- Write custom batch programs
- Simple double click the file to be transfer and Microsoft Excel with all i.d.'s and readings are displayed
- Create file and send them to the ECHO
- Merge files using Data XL
- Saved stored application setuups can be sent to the ECHO or multiple ECHO units to ensure reliability and repeatability
- Update firmware (latest version of operating software is available on the support tab of www.danatronics.com)
- Send Bit Maps (screen shots) to further document your inspections



The optional Data XL Pro does all of the above plus allows the transfer of A-scan and B-scan for the ultimate in computer software reporting.

Danatronics Transducers

The ECHO series comes loaded with a default list of probes to solve a vast variety of applications for any non-destructive testing wall thickness of most engineering materials.

So, if you are measuring, boiler tubes, pressure vessels, ship hulls, bridges, coil steel, aluminum, plastic bottles, toys, trays and anything in between...we have the probe for you..

Dual Transducers

Standard Dual Transducers

ECHO Model	Part No.	Range in Steel	Echo to Echo Range in Steel	Freq.	Diameter	Temperature Range	Connector Type
8, 9	DK-250	0.100"-20" (2.5mm-508mm)	0.200"-2" (5.08mm-50.8mm)	2.25 MHz	0.500"/12.7mm	32-392F/0-200C	Right Angle Potted - Lemo 00
8, 9	DK-525	0.040"-20" (1mm-508mm)	0.080"-2" (2mm-50.8mm)	5.0 MHz	0.250"/6.35mm	32-392F/0-200C	Right Angle Potted - Lemo 00
8, 9	DK-537	0.040"-20" (1mm-508mm)	0.080"-2" (2mm-50.8mm)	5.0 MHz	0.375"/9.52mm	32-392F/0-200C	Right Angle Potted - Lemo 00
8, 9	DKS-537	0.040"-20" (1mm-508mm)	0.100"-0.750" (2.54mm-19.05mm)	5.0 MHz	0.375"/9.52mm	32-100F/0-38C	Right Angle Potted - Lemo 00
8, 9	DK-550	0.040"-20" (0.76mm-508mm)	0.080"-2" (2mm-50.8mm)	5.0 MHz	0.500"/12.7mm	32-392F/0-200C	Right Angle Potted - Lemo 00
8, 9	DK-718	0.030"-2" (0.76mm-50.8mm)	0.060"-1" (1.52mm-25.4mm)	7.5 MHz	0.187"/4.75mm	32-392F/0-200C	Right Angle Potted - Lemo 00
8, 9	DK-718LPM*	0.050"-2" (1.25mm-50.8mm)	N/A	7.5 MHz	0.187"/4.75mm	32-392F/0-200C	Right Angle Potted - Lemo 00
8, 9	DK-1025	0.020"-2" (0.5mm-50.8mm)	0.060"-1" (1.52mm-25.4mm)	10.0 MHz	0.250"/6.35mm	32-392F/0-200C	Right Angle Potted - Lemo 00

*LPM = Low Profile Mini; probe height 16mm, top dia. 12mm

Composite Dual Transducers

ECHO Model	Part No.	Range in Steel	Echo to Echo Range in Steel	Freq.	Diameter	Temperature Range	Connector Type
8, 9	DC-110	0.200"-20" (5.08mm-508mm)	Not Recommended	1.0 MHz	1"/25.4mm	10-160F/-12-70C	Right Angle Potted - Lemo 00
8, 9	DC-175	0.150"-20" (3.81mm-508mm)	Not Recommended	1.0 MHz	0.750"/19.05mm	10-160F/-12-70C	Right Angle Potted - Lemo 00
8, 9	DC-250	0.100"-20" (2.5mm-508mm)	0.200"-2" (5.08mm-50.8mm)	2.25 MHz	0.500"/12.7mm	10-160F/-12-70C	Right Angle Potted - Lemo 00
8, 9	DC-525	0.030"-20" (0.76mm-508mm)	0.080"-2" (2mm-50.8mm)	5.0 MHz	0.250"/6.35mm	10-160F/-12-70C	Right Angle Potted - Lemo 00
8, 9	DC-537	0.040"-20" (1mm-508mm)	0.080"-2" (2mm-50.8mm)	5.0 MHz	0.375"/9.52mm	10-160F/-12-70C	Right Angle Potted - Lemo 00
8, 9	DC-550	0.030"-20" (0.76mm-508mm)	0.080"-2" (2mm-50.8mm)	5.0 MHz	0.500"/12.7mm	10-160F/-12-70C	Right Angle Potted - Lemo 00

Dual Echo To Echo Transducers

ECHO Model	Part No.	Range in Steel	Echo to Echo Range in Steel	Freq.	Diameter	Temperature Range	Connector Type
8, 9	DK537EE	0.040"-20" (1mm-508mm)	0.080"-1.5" (2mm-38.1mm)	5.0 MHz	0.375"/9.52mm	31-392F/0-200C	Right Angle Potted - Lemo 00
8, 9	DK-718EE	0.030"-1.5" (0.76mm-38.1mm)	0.060"-1.0" (1.5mm-25.4mm)	7.5 MHz	0.187"/4.75mm	31-392F/0-200C	Right Angle Potted - Lemo 00

Dual High Temp Transducers

ECHO Model	Part No.	Range in Steel	Echo to Echo Range in Steel	Freq.	Diameter	Temperature Range	Connector Type
8, 9	DHT-537	0.040"-20" (1mm-508mm)	0.080"-2" (2mm-50.8mm)	5.0 MHz	0.375"/9.52mm	-5 to 950F -20 to 509C	Straight Microdot requires detachable cable
8, 9	DHT-537RM	0.040"-20" (1mm-508mm)	0.080"-2" (2mm-50.8mm)	5.0 MHz	0.375"/9.52mm	-5 to 950F -20 to 509C	Right Angle Microdot requires detachable cable

Quick Change Composite Element Angle Beam Transducers

Available in: Diameter: 1/4", 3/8" & 1/2"; Frequencies: 1.0, 2.25, 3.5, 5.0, 7.5 & 10.0 MHz; Standard Wedges: 30°, 45°, 60°, 70°



Danatronics Transducers

Contact Transducers

Standard Contact

ECHO Model	Part No.	Range in Steel Class 1	Range in Steel Class 2	Range in Steel Class 3	Range in Plastic	Freq.	Diameter	Temperature Range	Connector Type*
7, 8	DCK-250	0.100"-20" (2.54mm-508mm)	n/a	n/a	n/a	2.25 MHz	0.500" 12.7mm	32-392F 0-200C	Right Angle Microdot
7, 8	DCK-525	0.040"-20" (1mm-508mm)	n/a	n/a	n/a	5.0 MHz	0.250" 6.35mm	32-392F 0-200C	Right Angle Microdot
7, 8	DCK-537	0.040"-20" (1mm-508mm)	n/a	n/a	n/a	5.0 MHz	0.375" 9.52mm	32-392F 0-200C	Right Angle Microdot
7, 8	DCK-550	0.080"-20" (2mm - 508mm)	n/a	n/a	n/a	5.0 MHz	0.500" 12.7mm	32-392F 0-200C	Right Angle Microdot
7, 8	DCK-718	0.030"-10" (.76mm - 254mm)	n/a	n/a	n/a	7.5 MHz	0.187" 4.75mm	32-392F 0-200C	Right Angle Microdot
7, 8	DCK-1025	0.020"-2" (.5mm - 50.8mm)	n/a	n/a	n/a	10.0 MHz	0.25" 6.35mm	32-392F 0-200C	Right Angle Microdot
7, 8	DCK-1025HR	0.020"-1" (.5mm - 25.4mm)	n/a	n/a	n/a	10.0 MHz	0.25" 6.35mm	32-392F 0-200C	Right Angle Microdot
7, 8	DCK-20125	0.016"-1" (.4mm - 25.4mm)	n/a	n/a	n/a	20.0 MHz	0.125" 3.175mm	32-392F 0-200C	Right Angle Microdot

Contact Composite

ECHO Model	Part No.	Range in Steel Class 1	Range in Steel Class 2	Range in Steel Class 3	Range in Plastic	Freq.	Diameter	Temperature Range	Connector Type*
7, 8	DCC-110	0.300"-20" (7.62mm - 508mm)	n/a	n/a	n/a	1.0 MHz	1" 25.4mm	10-160F -12-70C	Right Angle Microdot
7, 8	DCC-175	0.300"-20" (7.62mm - 508mm)	n/a	n/a	n/a	1.0 MHz	0.750" 19.05mm	10-160F -12-70C	Right Angle Microdot
7, 8	DCC-250	0.100"-20" (2.54 - 508mm)	n/a	n/a	n/a	2.25.0 MHz	0.500" 12.7mm	10-160F -12-70C	Right Angle Microdot
7, 8	DCC-537	0.040"-20" (1mm-508mm)	n/a	n/a	n/a	5.0 MHz	0.375" 9.52mm	10-160F -12-70C	Right Angle Microdot

Delay Line Transducers

Delay Line Standard

ECHO Model	Part No.	Range in Steel Corrosion Mode	Range in Steel Class 2	Range in Steel Class 3	Echo to Echo Range in Steel	Range in Plastic	Freq.	Diameter	Temperature Range	Connector Type*
7, 8, 9	DLK-525	0.080"-0.750" (2mm-19mm)	0.025-0.500" (6.35mm - 12.7mm)	0.020"-0.375" (0.5mm - 9.5mm)	0.025" - 0.400" (0.635mm-10.16mm)	0.010"- 0.150" (0.254mm - 3.81mm)	5.0 MHz	0.25" 6.35mm	32-122F 0-50C	Right Angle Microdot
7, 8, 9	DLK-1025	0.080"-0.750" (2mm-19mm)	0.020"-0.500" (0.5mm - 12.7mm)	0.015"-0.375" (0.38mm - 9.5mm)	0.025" - 0.400" (0.635mm-10.16mm)	0.010"-0.150" (0.254mm - 3.81mm)	10.0 MHz	0.25" 6.35mm	32-122F 0-50C	Right Angle Microdot
7, 8, 9	DLK-1225PP-SM	0.080"-0.300" (2mm-7.62mm)	0.020"-0.200" (0.5mm - 5.08mm)	0.015"-0.125" (0.38mm - 5.08mm)	0.020" - 0.200" (0.508mm-5.08mm)	0.015"-0.060" (0.15mm - 1.52mm)	12.0 MHz	0.080" 2mm (tip dia)	32-122F 0-50C	Right Angle Microdot
7, 8, 9	DLK-1225PP-RM	0.080"-0.300" (2mm-7.62mm)	0.020"-0.200" (0.5mm - 5.08mm)	0.015"-.125" (0.38mm - 5.08mm)	0.020" - 0.200" (0.508mm-5.08mm)	0.015"-0.060" (0.15mm - 1.52mm)	12.0 MHz	0.080" 2mm (tip dia)	32-122F 0-50C	Right Angle Microdot
7, 8	DLK-2025	n/a	0.015"-0.300" (3.81mm - 7.62mm)	0.006"-0.200" (0.152mm- 7.62mm)	n/a	0.003"-0.100" (0.076mm - 2.54mm)	20 MHz	0.25" 6.35mm	32-122F 0-50C	Right Angle Microdot
7, 8	DLK-20125	n/a	0.015"-0.200" (3.81mm - 7.62mm)	0.006"-0.200" (0.152mm- 7.62mm)	n/a	0.003"-0.100" (0.076mm - 2.54mm)	20 MHz	0.125" 3.175mm	32-122F 0-50C	Right Angle Microdot

Delay Line Composite

ECHO Model	Part No.	Range in Steel Class 1	Range in Steel Class 2	Range in Steel Class 3	Range in Plastic	Freq.	Diameter	Temperature Range	Connector Type*
7, 8	DLC-525	n/a	0.040"-0.500" (1mm - 12.7mm)	0.030"-0.375" (0.762mm-9.5mm)	0.020"-0.200" (0.5mm - 5.08mm)	5.0 MHz	0.375" 9.52mm	32-122F 0-50C	Right Angle Microdot



*Right Angle Microdot - requires additional cable

Specifications

GENERAL

Size: Length 7.25" x Width 4.00" x Height 2.00" (184mm x 101.6mm x 50.8mm)

Weight: 1.15 lbs (.52 kg) with internal Li-Ion battery, 1.0 lb. (.45 kg) with optional Alkaline tray including 3 AA batteries

Temperature (gage operating): -4 to 122F (-20 to 50C)

Package: Designed for IP67 rating, custom, splash-proof, high impact plastic with illuminating rubber keypad for go/no-go testing

Transducer Connector Type: Lemo 00 (2 qty)

Bandwidth: 0.5-30 Mhz (-3dB)

Measurement Rate: 4 Hz or 25 Hz.

Pulser: 150V, Square Wave

Range: Thickness range depends on gage type, probe selection and material conditions. Typical range in corrosion mode, .020 - 23" (.076 - 584 mm). Typical range in precision mode, .006-23" (.152 -584 mm) in steel, as low as .003" (.076 mm) in plastic

Calibration: Cal zero, Cal velocity, Two-point calibration or Auto Calibration performs a two-point calibration using a 5-step test block

Material Velocity Range: .0200 in/usec-.7362 in/ μ S (0.508-18.699 mm/ μ S)

Languages: English, French, German, Spanish, Italian, Russian, Czech, Finnish, Chinese, Japanese, Hungarian

Batteries: Standard 3.7 V Li Ion internally rechargeable battery (11-27 hours; Standard mode of 4Hz and 74% brightness: 27 hour continuous operation, Fast mode at 25Hz, continuous measurements in echo to echo mode: 11 hours) or optional alkaline tray for 3 AA batteries

Shut off: selectable auto shut off 1-31 min. or never shut off

Transport case: Hard Plastic with high density molded foam cut out for gage and most accessories

Certifications: CE certified, RHOS compliant, designed for IP67

Standard Inclusions: ECHO series ultrasonic thickness gage, a transducer (ECHO 9 - DKS-537, ECHO 7,8 - choice of transducer up to 10mhz), transducer cable, 2oz bottle of couplant, operation manual, Data XL interface program, USB cable, Charger Adapter, Transport Case *A transducer is included with each model. Contact Danatronics for details based on exact inclusion per model

Warranty: Limited 2 year warranty under normal use on parts and labor for gage. Optional Dan-A-Care to add up to 3 more years

DISPLAY

Display: 3.5" high resolution color TFT display, 320 x 240 pixels (1/4 VGA), sunlight readable, including multiple color pallets

Backlight: Light Emitting Diode (LED) backlight. Includes variable light intensity.

DATALOGGER

Memory: Internal memory for stored setups standard on all models. For Datalogger models 2GB micro SD card standard and expandable up to 32GB

Stored Application Setups: Storage and recall of 2,700 calibration and set up files

Data XL: Interface program to send and receive stored readings, latest firmware and application set up files as two way communication from ECHO to computer (excel). Saved readings are .csv files and directly interfaces with Microsoft Excel.

USB: USB 2.0

MEASUREMENTS

Gain: Low, Standard, High, and Automatic Gain Control (AGC). 20-94 db in 1 db increments for gages with waveform.

Zoom: Automatically centers echos in the center of the display independent of material thickness

Units: English, Metric, Microseconds

Fast Min/Max: Displays minimum and maximum simultaneously with actual thickness at 25 Hz.

Alarms: Gage beeps and display changes color based on alarm condition

Vibrate: Gage can be set to vibrate on alarm (ideal for loud environments)

Transducers: Single, dual, delay lines, contact, immersion (depends on gage type)

ECHO 9 Measurement Types: ECHO 9 corrosion gage: Main bang to first backwall echo, echo to echo and velocity mode (displays acoustic sound speed based on entered thickness)

ECHO 7 & 8 Measurement Types: A precision gage: Class 1, Main bang to first back wall echo, Class 2, Interface echo to first backwall and Class 3, echo to echo after interface echo... Class 2 and 3 use high frequency single element delay lines or immersion probes, velocity mode (displays acoustic sound speed based on entered thickness)

Freeze Mode: Direct access to freeze display (ideal for high temperature applications)

Hold Mode: Holds display to retain last thickness reading

Differential Mode: Displays the difference from actual thickness measurement in absolute or percentage of a user entered reference value

Resolution: .001" or .010" (.01mm or .1mm) as corrosion gage and .0001" or .001" (.001mm or .01mm) as a precision gage

ACCESSORIES

ECHO-MBH: Magnetic ball head/pipe stand for ECHO series (attaches to 1/4x20 standard connection point on the back of the unit)

ECHO RB: Rubber boot available with padded wrist strap, 4 point chest harness, chest harness, built in bail (stand) with locking position and finger strap for easy one hand operation. ECHO RB is included with ECHO 7,8 or 9 as DLW models

ECHO-ABP: Alkaline Battery Pack (3- AA) for ECHO series. Battery life 3 Hours

ECHO-RPP: Remote Power Pack plugs into USB port to provide power/recharge to ECHO series

HARDWARE/SOFTWARE

Hardware Options: EZ Scan B-Scan encoder, Bluetooth, foot switch

Field Upgradeable Software Options: Datalogger with B-scan, Live waveform, Precision mode, Corrosion mode, Oxide scale, Angle Beam

Data XL Pro Software: allows sending of A and B-scan images to computer for advanced reporting

Item	SpecificatiOn	ECHO 9 Corrosion Gage				ECHO 7 Precision Gage				ECHO 8 Corrosion and Precision Gage			
		ECHO 9	9W	9 DL	9 DLW	ECHO 7	7W	7 DL	7 DLW	ECHO 8	8W	8 DL	8 DLW
Scan Mode	4 or 25 Hz. displays actual and min or max at same time	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Memory	2 Gb micro SD included, expandable to 32 Gb	○	○	✓	✓	○	○	✓	✓	○	○	✓	✓
Alarms	Display color changes and can vibrate on alarm	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Illuminating Keypad	Translucent F keys, red, yellow, green for alarm, blue for charging	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Velocity Mode	Displays material sound speed after entered known thickness	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Echo To Echo	Ignores coatings	✓	✓	✓	✓	*	*	*	*	✓	✓	✓	✓
Range	Can adjust range from zoom, 0.5, 1, 2.5, 10, 23"	○	✓	○	✓	○	✓	○	✓	○	✓	○	✓
Rectification	Half +, half -, full rf	○	○	○	✓	○	○	○	✓	○	○	○	✓
Live Waveform (A-Scan)	Displays live waveform	○	✓	○	✓	○	✓	○	✓	○	✓	○	✓
Datalogger	Alpha numeric 20 character ID, 32 character file, linear, 2d, 3d and boiler	○	○	✓	✓	○	○	✓	✓	○	○	✓	✓
B-Scan	Displays time based cross section of material under test	○	○	✓	✓	○	○	✓	✓	○	○	✓	✓
B-Scan Encoder	Displays encoded cross section of material under test	○	○	○	○	*	*	*	*	○	○	○	○
Dual Probe Use	Wide variety of dual transducers from 1 to 10 Mhz.	✓	✓	✓	✓	*	*	*	*	✓	✓	✓	✓
Single Element Probe	Wide variety of single element transducers from 1 to 20 Mhz	LTD	LTD	LTD	LTD	✓	✓	✓	✓	✓	✓	✓	✓
Stored Setups	Store up to 2,700 custom applications with file naming	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Coating Thickness	Displays substrate and coating thickness simultaneously	○	✓	○	✓	○	✓	○	✓	○	✓	○	✓
Temperature Correction	Corrects for sound speed difference at elevated temperatures	○	✓	✓	✓	○	✓	✓	✓	○	✓	✓	✓
Alkaline Battery Tray	Ability to swap in 3 AA batteries	○	○	○	○	○	○	○	○	○	○	○	○
Rubber Boot	Custom rubber boot with built-in bail and 4 point chest harness	○	○	○	✓	○	○	○	✓	○	○	○	✓

*available with software upgrade to ECHO 8

○ = Software Options that are field upgradeable. Encoded B-Scan requires additional hardware modifications.

LTD = Limited, see transducer chart



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CL5

Ultrasonic Precision Thickness Gauge



Micrometer Precision in a Rugged Package

The CL5 is an easy-to-use precision thickness measuring solution for components used in the automotive and aerospace industries, such as:

- Cast and stamped metal components made of aluminum, steel, copper, bronze
- Machined workpieces
- Chemically milled components
- Metal strips, metal plates
- Plastics and composites
- Glass

The instrument can be held in one hand or placed on flat workpieces, making the CL5 a compact way to test your material for the required thickness or checking for sheet corrosion.



Compact Solution With a Full Range of Functionality

The CL5 precision thickness gauge offers a full range of functionality in an easy to use, compact and rugged package. Three soft keys directly under the display activate the functions shown on the display menus. Four directional keys help make menu changes and navigation of the text entry screen simple and efficient.

The graphical display presents the user with seven different operation modes. The user can select Normal, Minimum Scan, Maximum Scan, Differential/Rate of Reduction, Thk+A-Scan (option), Velocity (option) or Quality View. The CL5 uses a programmable data recorder for easy set up of data files from the PC. The SD Card memory system places all the data recording and set-up information on a removable SD memory card. The files are formatted allowing drag and drop files when plugged directly into the PC. Other data such as digital photographs can also be stored on the same SD card. The CL5 allows direct connection to the PC, using a serial or USB port (with optional cable).

Simple Operation

The CL5 is a very straightforward instrument to operate. The MODE key progresses the user through a series of selection and set-up menus and back to the measurement mode. One press of the MODE key displays a table of standard probes and up to five special set-ups. Another press of the MODE key displays a set-up menu where the user can easily scroll through the menu, see the current settings and make fast changes to any of the displayed settings.

A supervisor lock-out function enables a knowledgeable user to set up all the specific measuring functions and settings of the CL5 and lock the settings so critical settings cannot be changed by a subordinate user.

Additional advantages offered by this compact, multifunctional instrument include:

- Enhanced measurement performance produces stable and repeatable thickness values
- Seven measurement and display modes: Normal, Minimum Capture, Maximum Capture, Differential and Rate of Reduction, Velocity (with CL5 VL option), Thickness+A-Scan (with Live A-Scan Option) and Quality View Mode (with Data Recorder option).
- Snapshot A-Scan on all models
- Hollow/Fill thickness digits showing coupling or non-coupling status
- Visual LED alarm to alert user when measurements are exceeding the user selectable limit values
- Customer parameter set-ups for special configurations and quick instrument set-up
- Flexible power system via standard AA batteries or rechargeable battery pack system (standard)
- Multi-language user interface
- Automatic ultrasonic performance (gain and gate controls)
- Wide variety of standard probes (sold separately)

CL5—Simply reliable, reliably simple

The Velocity Option: Performance and Flexibility

The CL5 Velocity option gives the user an added measurement mode used for determining the velocity of a known thickness of material. Material thickness can be entered manually via the CL5 keyboard or a digital caliper can be connected, allowing the thickness value to be sent electronically from the caliper to the CL5. The user simply places the probe on the part, and the CL5 displays the material velocity of the test object. Both the thickness and the velocity value can be stored in the Data Recorder and downloaded to the PC.

The Live A-Scan Option

The optional Live A-Scan feature gives the user a real time view of the echoes being digitally measured by the CL5.

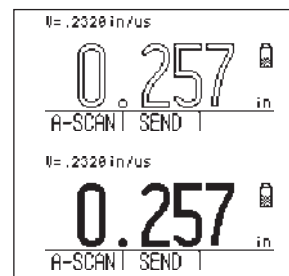
Viewing the Live A-Scan can aid users when attempting to properly align the probe and the test object to achieve the best measurement values. Viewing the Live A-Scan enables the user to ensure the proper echoes are being measured and the digital value is correct.

The Data Recorder Option

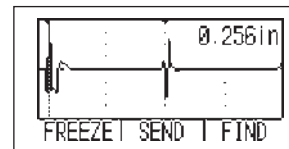
The Data Recorder option permits the quick and easy storage of thickness values in file form. Fully user-programmable, it stores up to 10,000 measured values or as many as 500 values with attached A-Scan.

The programmable data recorder allows creation of data recorder files directly from the CL5 keypad, or from the PC using the flexible UltraMATE® or UltraMATE® Lite software program. The Data Recorder supports the use of alphanumeric file names, standard linear and grid files and custom linear files.

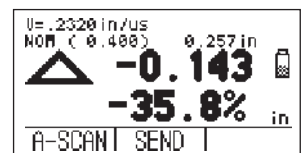
Extended file types store the thickness values, velocity settings and other critical data for each measurement point, making the CL5 and UltraMATE® ideal for test data management.



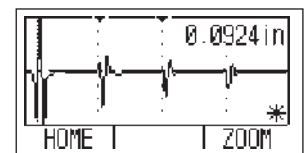
Filled digits indicate successful coupling



Live A-Scan for more precise evaluations



Rate of reduction



Snapshot A-Scan

PANEL 3579			
	A	B	C
1	0.0258	0.0248	0.0226
2	0.0217	0.0217	EMPTY
3	EMPTY	EMPTY	EMPTY

HOME | SEND |

Data recorder

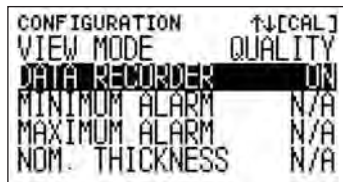
Achieve More Precision With Quality View

Quality View Mode permits Data Recorder-driven control and capture of thickness measurements. It is ideal for singular parts or structures with numerous measurement points that have different target thicknesses and/or varying upper and lower limits or tolerances.

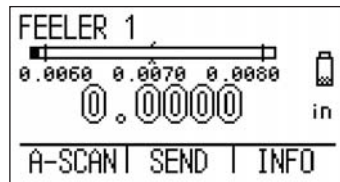
Uses of Quality View Mode include:

1. Fast collection of thickness measurement data for statistical analysis during variation control and quality assurance.
2. Digitally capturing thickness measurement data for quality records and traceability.
3. Variation control of work in progress on the manufacturing or workshop floor.

Quality View Mode displays the current measurement location name, a bar graphic of the thickness measurement that shows the lower specified limit value, the nominal/target value, the upper specified limit and a numerical readout of the measurement.

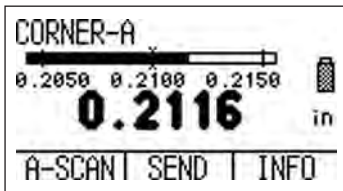


Selection of Quality View Mode displays

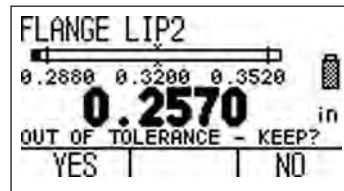


Numerical value of thickness is filled when probe is coupled to the location of measurement

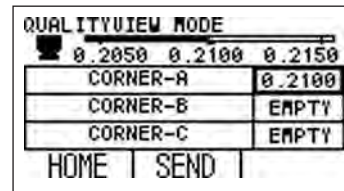
To work in Quality View Mode, custom four-point linear files are created in either Microsoft® Excel or UltraMate® software applications on a PC and downloaded to the CL5 using the optional serial or USB cable. Measurements can also be uploaded into a PC for processing and analysis using Microsoft® Excel, UltraMate® or a third party statistics and/or quality software application.



Quality View Mode



Out of tolerance dialogue



Measurement Review Mode

Technical Data

Measuring Range	.005 in to 20.00 in (0.13 mm to 500 mm); depends on material, probe, surface condition and temperature
Units and Measuring Resolution	Inch – 0.0001, 0.001, 0.01 Millimeter – 0.001, 0.01, 0.1
Material Velocity Range	0.03937 to 0.78736 in/ μ s 1000 to 19999 m/s
Receiver	Bandwidth of 1.0 to 16 MHz at –6 dB
Update Rate	User selectable 4 or 8 Hz, up to 32 Hz in Min Cap or Max Cap mode
Display Type	Graphical LCD 64 x 128 pixels 2.25 in x 2.56 in (40 mm x 57 mm) with backlight and adjustable contrast
Thickness Display	Five-digit display with 0.75 in (19.5 mm) height digits in standard mode and 0.25 in (6.35 mm) height digits in Thickness + A-Scan mode, solid or hollow digits coupling indicator, A-Scan view – R.F. mode only
Display Modes	Thickness (includes Snapshot A-Scan), Thickness + Live A-Scan (optional), Minimum Capture, Maximum Capture, Differential and Rate of Reduction, Velocity Mode (optional), Quality View Mode (optional)
Supervisor Lockout	Alphanumeric password lockout for calibrations, set-up and Data Recorder
I/O Port	Bi-directional serial RS-232: baud rate 1200, 9600, 57600 and 115200
Data Recorder	Programmable Data Recorder, 120 files max. on each 64 MB SD card
File Formats	Grid created from instrument keypad. Grid and Custom Linear files accepted from UltraMATE [®] software.
Power Supply	Three AA batteries (Alkaline, NiMH or NiCad) or custom rechargeable battery pack

Environmental Sealing	Impact resistant, dust and splash proof, gasket-sealed, case-tested to IP54
Weight	0.92 lb (420 g) with batteries
Size	7.1 in H x 3.7 in W x 1.8 in D (180 mm x 94 mm x 46 mm)
Temperature Range	Operating: –10 °C to +60 °C Storage: –20 °C to +70 °C
Operating Languages	English, German, French, Spanish, Italian, Russian, Japanese, Chinese
Application Software	UltraMATE [®] Lite and UltraMATE [®]
Base Instrument Package	CL5 precision thickness gauge Lithium poly battery pack AC power supply Plastic carry case Wire stand XL couplant sample, 4 oz Firmware upgrade CD-ROM Operating manual Operating instruction card Certificate of Conformity
Options	CL5 AS OPT – Live A-Scan option CL5 DR OPT – Data Recorder option CL5 VL – Velocity option
Accessories	PCCBL-690 USB PC cable PCCBL-419 serial PC cable Li-135 lithium poly battery pack AC-296 AC power supply UltraMATE [®] Lite or UltraMATE [®] Data Management software

CL5 Compatible Transducer Specifications

Model	Probe Type	Nominal Frequency	Contact Diameter	Measuring Range (in Mild Steel Unless Noted)
Alpha 2 DFR/CLF4	Standard Delay Line	15 MHz	0.30 in (7.6 mm)	0.007 to 1.0 in (0.18 to 25.4 mm)
Alpha 2 F/CLF5	Fingertip Contact	10 MHz	0.38 in (9.5 mm)	0.060 to 10.0 in (1.52 to 254 mm)
Mini DFR	Thin Range Delay Line	20 MHz	0.19 in (4.8 mm)	0.006 to 0.2 in (0.16 to 5.1 mm)
Alpha DFR-P	Delay Line for Plastic Materials	22 MHz	0.30 in (7.6 mm)	0.005 to 0.15 in (0.13 to 3.8 mm) in plastic materials
K-Pen	Delay Line Pencil Probe	20 MHz	0.065 or 0.090 in (1.7 or 2.3 mm)	0.008 to 0.175 in (0.20 to 4.4 mm)
CA211A	Standard Contact	5 MHz	0.75 in (19.1 mm)	0.060 to 20.0 in (1.52 to 508 mm)



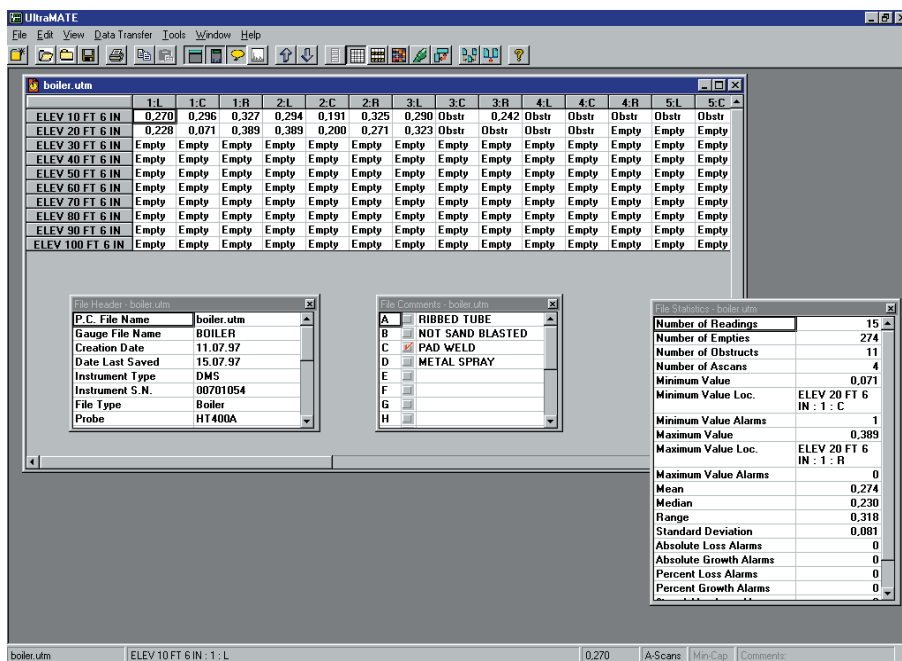
GE Inspection Technologies: productivity through inspection solutions

GE Inspection Technologies provides technology-driven inspection solutions that deliver productivity, quality and safety. We design, manufacture and service ultrasonic, remote visual, radiographic and eddy current equipment and systems. We offer specialized solutions that will help you improve productivity in your applications in the aerospace, power generation, oil & gas, automotive or metals Industries.

www.ge.com/inspectiontechnologies

Krautkramer UltraMATE / UltraMATE lite

Documentation programs for the wall thickness measurement



Features of UltraMATE

Generation of color reports including various possibilities for analyses:

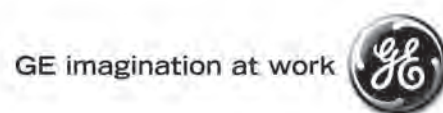
- for example, color histograms: measured values are divided into ranges which have certain colors assigned to them for the range evaluation. The number of readings in each one of the defined value ranges is indicated - either as an absolute number or as percentage of total.
- color assignments also clearly show the distribution of minimum/maximum limit values exceeded or not reached for individual or several measurement series over a certain time period
- comparison of several measurement data sets on the screen
- merging of up to five different measurement data sets into one single file
- data compatibility with UltraPIPE and older DMS MATE files
- Viewing of attached A-Scan, B-Scan and Microgrids (when supported by the instrument)

UltraMATE is an easy-to-use program for the management of thickness measurement data. It ensures transfer, storage, analysis and documentation of the data, and it makes extensive user-friendly functions available - for example for professional test report layouts.

UltraMATE lite is the simplified program version enabling to transfer data from the gauge to the PC, store them there, and to print them out in different fixed-format reports.

Features of UltraMATE lite

- automatic communication setup
- data exchange via Windows Clipboard for an easy transfer of measurement data to spreadsheet and word processing applications
- File creation wizard supporting 6 different file types (8 file types in UltraMATE)
- Parameter Set transfer to and from DMS, DMS 2, CL 400 and CL 5 instruments



USM Go+

Small but tall.
All you expect from
an ultrasonic flaw
detector, packed in
a handheld.

Introducing the new USM Go+ that takes field inspection NDT to the next level. Light, handy and controlled by an intuitive arrow-keypad, it has the latest industrial electronics under the hood and offers a host of Surface Resolution which allows for reliable detection of defects located just below the surface of the test piece.



USM Go+ When design and technology shake hands

Built for practice

The USM Go+ ultrasonic flaw detector offers you the best of both worlds: the performance and features of a tabletop ultrasound detector in a small, ultra-portable handheld instrument that is outstandingly equipped for ultrasound detection in the field. Its ergonomic design, useful features and big performance are the result of carefully listening to the experience of the people in the field who, through their everyday practice, know best what it takes to do a good job.



What a field NDT operator needs is:

→ An instrument you can use with one hand

The USM Go+ is the ideal device for ambulant ultrasonic testing. It is light (about 800 g) and so small it fits in your hand. It's the perfect tool for operation in confined spaces, areas with difficult access or other difficult environments.

Actually, you operate it with one hand, thanks to the arrow-keypad, which allows for intuitive navigation and fast and precise adjustments. That comes in handy, when you need your other hand to adjust the probe or just hold on to a ladder. Are you left-handed? No problem, use the 'flip' function to adapt the instrument to your hand.

→ A robust, heavy duty device

Its molded rubber casing makes the USM Go+ the sturdy instrument you need in the sometimes harsh conditions 'in the field'. It is dust- and waterproof to IP67 and has been tested according to the military standards.

→ The biggest and brightest screen in its class

The 108mm x 64,8 mm screen with an outstanding resolution of 800 x 480 pixels offers you best-in-class readability. Moreover, it is exceptionally bright so you can still discern the image even in full sunlight. On the other hand, when working in the dark, you can reduce the brightness in order not to get blinded. An integrated stand allows you to optimize the viewing angle, when the instrument is desk or bench mounted.

→ Outstanding UT performance

Equipped with state-of-the-art technology, the USM Go+ takes UT performance in handheld instruments a step further. The high Near Surface Resolution enables you to detect flaws located just under the surface of the test piece, with a high degree of reliability. A wide Pulse Repetition Frequency range allows you to use the USM Go+ at low PRF to inspect forged parts without any "ghost" echoes and to inspect welds at high PRF when fast and regular scanning movement is required.

→ A tool that boosts your productivity

Ultra-portable, easy-to-handle, intuitive operation, high performance - the USM Go+ is your plug & play tool that will give your productivity a boost the moment you start using it.



Other key features & benefits

- Very long life battery (> 6 hours).
- A standard USB connection allows for data to be downloaded from the flaw detector for further analysis or storage.
- The instrument's 2 GB memory can be easily exchanged by SD cards up to 16 GB.
- Reports are produced in jpeg format so there is no need for special reading software.
- Backwall Echo Attenuator (BEA) helps to find very small defects, improving detectability.
- Automatic Gate Threshold for the 2 gates ensuring accurate measurements made under the same conditions.
- A-Scan video recording up to 8 minutes allows live reporting.

A wide range of applications

The USM Go+ has been designed to provide flaw detection capability in inspection situations throughout the industrial and process spectrum, from aerospace to power generation and from the automotive sector to the oil and gas industry.

Weld Inspection:

- Trigonometric projections
- AWS
- DAC
- DGS

Inspection of Forgings and Castings:

- Manual PRF adjustment
- Phantom echo indicator
- DGS
- Backwall Echo Attenuator (BEA)

Inspection of rails:

- High PRF (up to 2000 Hz)
- Lightweight: 850 g (1.87 lb.)
- Small size and ergonomics

Inspection of Composites:

- RF Display
- 2 gates with B-start triggered with echo in gate A
- TCG correction with high slope 120 dB/ μ s
- Reflector depth indicated in layer

For more demanding applications:

- Narrow band filters
- Low noise digital amplifier
- Square wave pulser



Technical Specifications of USM Go+

Display	5 inch, 800 x 400 pixels, 108 x 65 mm (W x H), >200 cd/m ²
Size (W x H x D)	175 x 111 x 50 mm
Weight	850 g with battery
Protection class	IP 67
Operating temperature	0 – 55 °C
Battery	Li-Ion, rechargeable, 6 hours operation time
Power adapter / charger	100 – 240 V AC, 50/60 Hz
Probe connector	2 x Lemo-00 (T/R)
PC interface	Micro USB
Memory card	SD-Card 16 GB max
Reporting	Test report and A-Scan screen shot on SD-Card, Video recording of A-Scan
Pulser	120 – 300 V, 30 – 500 ns, flank < 10 ns, Spike, Square wave option
Puls Repetition Frequency	15 – 2000 Hz
Damping	50 and 1000 Ohm
Receiver	110 dB dynamic, 0,9 – 20 MHz analog bandwidth
Filter	BB 1 – 5 MHz, 2,25 MHz, 4 MHz, 5 MHz, 10 MHz, 13 MHz, 15 MHz
Gates	A and B independent, B triggered by A, C option
Units	mm, inch, µs
Options	AWS calibration tool (AWS D1.1), DAC 16 points according to EN 1712, EN 1713, EN 1714, ASTM E164, TCG 120dB dynamic, DGS cal. tool according to EN 1712, EN 1713, EN 1714, ASTM E164, Data Logger, 3rd gate C, Square Wave Pulser
Compliance	EN 55011, EN 61000-6-2: 2011, EN 12668, ASTM E 1324, E317, ANSI/NCSS Z 540-1-1994, MIL-STD 45662A, MIL-STD 2154



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GEIT-XXXXXEN (03/14)

GE
Measurement & Control

More than You've Ever Seen.



Inspection Technologies: Krautkramer USM 36

The new universal portable ultrasonic flaw detector from GE, combining ergonomic and robust design and the biggest display screen of its class with state-of-the-art UT performance.



GE imagination at work



Krautkramer USM 36: a proven reliable and robust ultrasonic flaw detector performer

The Krautkramer USM 36 is the latest development in GE's USM range of flaw detectors. It combines the 21st century operating platform with the reliable and robust hardware of GE's well-established Krautkramer portable flaw detection instruments. It incorporates a range of innovative features to ensure that this new instrument is adopted as the everyday workhorse of flaw detectors by NDT inspectors globally.



Largest Viewable A-Scan Display in its Class

1

- An important improvement in the Krautkramer USM 36 is its large 7 inch screen, with an 800x480 pixel resolution. The entire area is available to display crispy A-scans, making it the best in its class. Signals can be easily viewed and accurately interpreted, even in bright sunlight, with tired eyes at the end of a long working day.



2

Simple and Efficient Operation

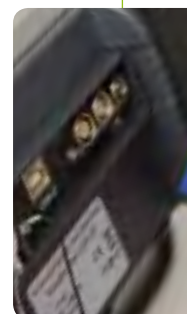
- The Krautkramer USM 36 uses the familiar rotary knobs of previous models but the function keys have now been minimized into a simple, intuitive 6-key keyboard, allowing simple and efficient operation;
- Inspection set-up is also easy. Not only for technicians who have used USM Go or USM Go+ for previous inspections, as set-up data is transferable directly from these instruments, which share the same user interface. This commonality of interface also ensures a rapid learning curve for technicians familiar with the USM Go instruments.



3

Flexible Data Reporting and Storage

- As well as easy-to-interpret the crispy A-scans, data reporting on the Krautkramer USM 36 can also include screen shots and A-scan videos, where A-scans can be recorded for subsequent analysis or to provide proof of inspection. All data is stored on a removable SD-card and reports can be in jpeg or BMP format.



6

Available in Three Versions

- The versatile instrument is offered in three versions to meet the most standard inspection codes. The most advanced version can operate in DAC, AWS and DGS modes, features a powerful square wave pulser for excellent material penetration and can accommodate GE's patented *trueDGS* probe technology, which offers unrivalled accuracy in sizing of flaws using the DGS method, as well the patented Phantom Echo Detection technology.

5

Can be Used in the Harshest of Environments

- The Krautkramer USM 36 is fully protected against dust and water ingress to IP66 and can be operated in ambient temperatures from -10°C to +55°C. It can be used in sandy deserts, frozen wastes and in the humid tropics.
- The new flaw detector weighs just 2.2 kg and is battery- or mains-operated. Its Li-ion battery has an operating life of more than 13 hours, with an integrated battery charger for those longer shifts.

4

Comprehensive Connectivity

- Connectivity is a major feature of the Krautkramer USM 36. Data can be stored on removable SD-card or USB memory stick, either for record purposes or to allow data sharing. A VGA connection allows the instrument's display to be shown on an external monitor or on a projector screen for training purposes.

Applications

The Krautkramer USM 36 has been developed for day-to-day use throughout the industrial spectrum, from weld inspection and corrosion measurement in the power generation and petrochemical industries, to castings and forgings inspection and thickness measurement in the automotive, metals and aerospace sectors to the inspection of special materials.

Weld Inspection in the Power Generation and Petrochemical Industries

Intuitive tools facilitate analysis and the use of color on the ultra-bright, 7 inch screen allows significant display benefits during weld inspection:

- Monitor gates and curves are displayed in various colors;
- Messages and alarms are displayed in red;
- A-scans can be displayed in different colors to assist comparison;
- Color display of all parameters involved in flaw location, including sound path, surface distance, depth position and leg number;
- GE's patented color coded display of legs for angle beam inspection.



Precise Thickness Measurement in the Automobile Industry

The Krautkramer USM 36 provides precise thickness measurement, as the sound path differences are measured very accurately at the peaks of an echo sequence.

Corrosion Measurement in the Power Generation and Petrochemical Industries

Corrosion measurement can be carried out using dual element probes, where the screen displays both the thickness measurement and the A-scan, ensuring maximum reliability. A minimum capture mode provides the thinnest measured reading at the end of a continuous scan. An auto-freeze function, which minimizes the probe's surface contact time, is used for measuring structures and components with hot surfaces.

Inspection of Forgings

The instrument's Phantom Echo Detection technology is used in the inspection of fine grained and long work pieces to ensure accurate detection of flaws but not Ghost Echoes.

Inspection of Special Materials

The powerful square wave pulser which is an available option for the Krautkramer USM 36 provides excellent penetration of difficult materials, such as those sometimes used in the aerospace and automobile industries.



Technical Specifications of Krautkramer USM 36

Display screen

Size Diagonal	7"
Active range (W x H)	152.4 x 91.44 mm ²
Resolution (W x H)	800 x 480 pixels
Range	4 ... 14,108 mm (555") for longitudinal wave

Display

Display shift (delay)	-15 ... 3,500 μs
Probe delay	0 ... 1,000 μs
Velocity	250 ... 16,000 m/s
PRF	Automatically optimized 15 ... 2,000 Hz, 3 automatic setting modes: Auto Low, Auto Med, Auto High, Manual

Connectors

Probe connectors	2 x LEMO-1 or 2 x BNC
USB interface	USB type B connector
Service interface	LEMO-1B, 8 pin

Pulser

Pulser mode	Spike pulser, optionally: Square-wave pulser
Pulser voltage (SQ mode)	120 ... 300 V, in steps of 10 V with a tolerance of 10%
Pulser falling/rising time	max. 10 ns
Pulser width (SQ mode)	30 ... 500 ns, in steps of 10 ns
Pulser amplitude (Spike mode)	low: 120 V, high: 300 V
Pulser energy (Spike mode)	low: 30 nS, high: 100 nS
Damping	50 ohms, 1000 ohms

Receiver

Digital gain	Dynamic range 110 dB, adjustable in steps of 0.2 dB
Analog bandwidth	0.5 ... 20 MHz
Equivalent input noise	<80 nV/√Hz
Filters	Broadband: 1-5 MHz / 2, 2.25 MHz / 4, 5 MHz / 10 MHz / 13, 15 MHz
Rectification	Positive half-wave, negative half-wave, full wave, RF signal

Gates

Independent gates	Gates A and B (triggering by gate A), Gate C (option, triggering by gate A or B)
Measurement mode	Peak, Flank, J-FLANK, FIRST PEAK

Memory

Card slot	SD-card slot for all standard SD-cards
Capacity	8 GB, SD-card
Datasets	UGO data structure in ASCII
Reports	JPG or BMP format

General

Battery	Li-Ion, operating time: 13 hours with full charge Charging method (standard): internal with power adapter Charging method (optional): external charger Charge level: proportional charge level indicator
Power adapter	Universal power supply unit 100 ... 240 VAC, 50/60 Hz
Size (W x H x D)	255 x 177 x 100 mm (10" x 7.0" x 3.9")
Weight	2.2 kg incl. battery
Languages	Bulgarian, Chinese, Czech, Dutch, English, Finnish, French, German, Hungarian, Italian, Japanese, Norwegian, Polish, Portuguese, Romanian, Russian, Spanish, Swedish
Damp heat and humidity (storage)	EN 60068 Part 2-30 6 cycles: 9 hrs at +25°C up in 3 hrs to +55°C, 9 hrs at +55°C then down to +25°C in 3 hrs, at 93% humidity
Vibration	EN 60068 Part 2-6 2g per axis, 5 ... 150 Hz, 1 oct/min, 25 cycles
Shocks	EN 60068 Part 2-27 1000 cycles per axis, 15 g, 11 ms, half-sine
Enclosure	IP66 according to IEC 60529
Operating temperature	-10 ... 55°C
Cold operation	-10°C for 16 hrs, 502.5 Procedure II
Heat operation	+55°C for 16 hrs, 501.5 Procedure II
Storage temperature	-20 ... +60°C, without battery
Cold storage	-20°C for 72 hrs, 502.5 Procedure I
Heat storage	+70°C for 48 hrs, 501.5 Procedure I

Options

AWS	AWS calibration tool, according to AWS D1.1 Structural Welding Code
DAC/JISDAC/CNDAC	DAC calibration tool, 16 points, according to EN 1712, EN 1713, EN 1714, ASTM E164, ASME, ASME III, JIS Z3060, GB11345 TCG: 120 dB dynamic, 110 dB/μs slope
DGS	DGS calibration tool, according to: EN 1712, EN 1713, EN 1714, ASTM E164
Data logger	Grid file creation
3G	Gate C
SWP	For pulser parameter optimization, voltage setting 120 ... 300 V in steps of 10 V, pulse width setting 30 ... 500 ns in steps of 10 ns
Phantom-PRF	Phantom-PRF for the identification of erroneous echoes caused by multiple reflections in low-attenuation materials
BEA	Blackwall Echo Attenuation

Specifications according to EN 12668

You will find the specifications according to EN 12668 for your instrument on the product CD included in the standard package.



www.ge-mcs.com

GEIT-20067EN (10/13)

Krautkramer USN 60/60L

Portable Ultrasonic Flaw Detectors



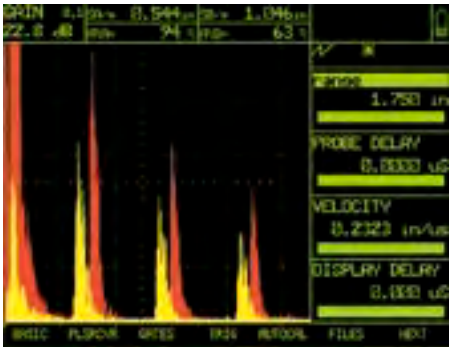
GE Inspection Technologies has optimized its USN 60 series for use in direct sunlight and operation at extreme temperatures. These new characteristics make the instruments ideally suited for outdoor use with its increased long battery operation time.

Depending on the applications challenges, you have the choice between the USN 60 and the USN 60L version.



The USN 60 series: outstanding ultrasonic performance

The combination of the rugged USN durability, 11 hours of battery operation, fast rotary knob operation, outstanding ultrasonic performance, and the “square wave pulser” form a powerful portable ultrasonic inspection tool.



Optimized outdoor use design

The USN 60 / USN60L flaw detectors are especially designed to be used outdoors:

- Extreme temperature use (-20°C to +55°C / -4°F to 130°F)
- Easy to view in direct sunlight
- 11 hours battery operation

Vibrant colors

- Hi-resolution color LCD display produces “Analog Look and Performance” echo dynamics.
- 4 selectable vibrant display color schemes to match lighting conditions.
- Gates and gate functions are color coded for easy identification and fast adjustment.

User preferred features

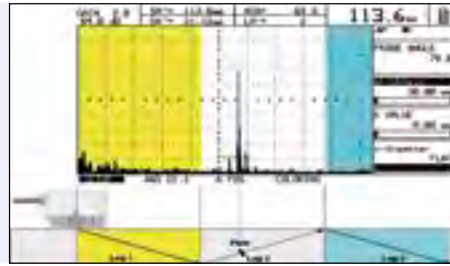
- Simple operation with fast rotary knob adjustments; gain is always directly accessible with the left-hand rotary knob and lockable.
- Auto CAL makes calibration fast & easy.
- 15 Hz to 6 kHz (spike mode) PRF and 15 Hz to 2 kHz (square mode) PRF (pulse repetition frequency).
- 2 independent gates monitor amplitude and soundpath distance for both flaw detection and thickness measurement applications.
- 250 KHz to 25 MHz frequency range.
- RF display mode enhances signal evaluation and bond inspection of dissimilar materials.
- 4 selectable damping settings (50, 75, 150, 500 ohms) for optimum probe performance.
- 1 mm to 28 m (0.040” to 1100”) range (in steel) covers thin to lengthy acoustically clean materials.
- dB REF key evaluates subsequent echoes gain value and amplitude against the highest echo in Gate A (reference echo) when activated.
- IF (Interface) Gate Option for automatic start of the display, Gate A, Gate B, and / or DAC / TCG for immersion testing applications.
- VGA Output Option provides an easy way to connect to a PC monitor or PC projector for viewing by large audiences or training purposes.
- RF Output Option outputs the raw RF waveform via a standard Lemo connector for further analysis.
- BEA (Backwall Echo Attenuator) Option allows independent gain control of the region under Gate B for backwall echo monitoring.
- 19” Rack Mount Model.

Wide range of applications

A 6 kHz pulse repetition frequency, real-time analog and TTL outputs makes the USN 60 flaw detectors series ideal for a wide range of automated systems testing applications. The exclusive SmartView feature displays even the shortest echoes for critical scanning and rotating part inspections.

The quality, durability, dependability and ease of use that you have come to expect of Krautkramer’s popular USN Series of instruments remains. From rugged field inspections to

high resolution thin measurements, long acoustically clean materials, and immersion systems, the USN 60 flaw detector family extends the range of applications that a portable instrument can perform. Furthermore the selectable 450V Square Wave Pulser satisfies a wide range of tough-to-penetrate applications, such as difficult to penetrate metallic applications and especially non-metals inspection like composite materials.



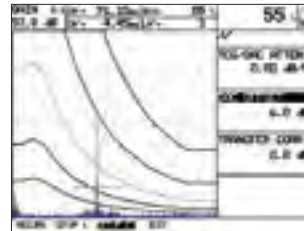
"Color Leg" indicator displays the legs of the angle beam inspection in different colors

Tools for easy weld inspection

- Color Leg allows easy identification of leg and skip distances for weld inspection.
 - GRID mode dynamically changes bands of display background colors for each leg.
 - A-SCAN mode dynamically changes the color for each leg of the "live" A-Scan
- Weld Rating Calculation simplifies the rating of weld indications according to AWS Specification D1.1. (Formula $D = A - B - C$).
- Trigonometric flaw location function with curvature correction automatically calculates depth, surface distance, and sound path to flaw along with the leg of the inspection when using angle beam probes. All TOF measurements can be displayed in mm, inches or μs .
- SmartView function along with variable persistence freeze modes displays the most important information (relevant shot) for a test.
- Real time (single shot) analog and TTL outputs handle a wide range of automated systems applications.
- Choose from Four Freeze Modes: ALL, Peak Std, Compare or Envelope for optimum waveform evaluation and comparison.
- Three Variable Persistence Modes are selectable in Freeze Envelope to visually assist flaw detection & evaluation for scanning and moving part inspections.
- Compare frozen reference wave-forms to live A-Scans in different colors to easily interpret test results.

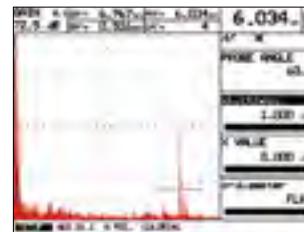
Tools for easy defect sizing

- 40 dB dynamic DAC/TCG Option corrects for distance/amplitude variations from material loss and beam spread with ability to edit or insert recorded echoes individually. Up to four DAC curves can be drawn on the screen at one time to show +/- dB curves in addition to the originally recorded DAC curve.



Tools for easy defect sizing
Multiple curve DAC shows recorded DAC curve in magenta with 4 additional curves based upon dB Offset feature for added flaw sizing assistance. TCG Attenuation and Transfer Correction features make it very versatile for use on other materials and surface conditions.

- DGS (Distance Gain Size) Option displays a curve for a particular equivalent reflector size. The ERS (Equivalent reflector size) function automatically calculates the corresponding equivalent reflector diameter in mm or inches for any echo in the measurement gate.



Four digital reading boxes at top display trigonometric calculations for weld inspection. (SA soundpath to flaw in gate A, PA projection distance to flaw in gate A, DA depth to flaw in Gate A & LA leg of inspection that flaw occurs in gate A)



Square wave pulser with tunable pulse width solves composite testing applications.

Options

DAC / TCG Option

Multiple Curve DAC (Distance Amplitude Curve)/ TCG (Time Corrected Gain) for echo amplitude adjustment and evaluation, 40 dB dynamic range, 12 dB/ μ s slope, record up to 16 points, recorded points are individually editable, new points can be inserted. Display four additional curves based upon dB offset feature from originally recorded DAC curve. TCG attenuation and transfer correction features enable use on other materials and surface conditions.

IF (Interface) Gate Option

For automatic start of the display, Gate A, Gate B, and / or DAC / TCG for immersion testing applications.

DGS Option

Displays a curve for a particular equivalent reflector size as a function of the distance from the probe to the reflector for 25 narrowbanded probes. The ERS (Equivalent reflector size) function automatically calculates the corresponding equivalent reflector diameter in mm or inches for any echo in the measurement gate.

BEA Backwall Echo Attenuator Option

Allows independent gain control of the region under Gate B for backwall echo monitoring.

VGA Output Option*

Provides an easy way to connect to a PC monitor or PC projector for viewing by large audiences or training purposes.

RF Output Option*

Outputs the raw RF waveform via a standard Lemo #00 connector for further analysis.

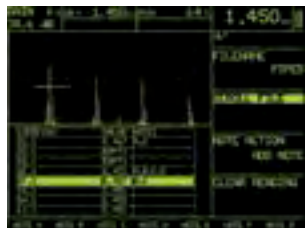
HiSPD High Speed Digital Output Option

Outputs amplitude or thickness values 20 times faster than RS 232 port.

* Order with new instrument only. Later upgrade not possible.

Documentation and recording

- Store & preview a minimum of 200 user-named data sets with A-Scans for quick recall and instrument setup.
- UltraDOC 4 software program for bi-directional communication with a PC for easy storage of data sets with A-scan and documentation of test results.
- UltraMATE™ software program simplifies the transfer, storage, analysis, and documentation of thickness data.
- Reports with A-Scans are output directly to a variety of printers.
- Alphanumeric Thickness Datalogger for flexible, convenient storage of thickness readings in Linear, Grid, or Custom-Linear file structures with user-input filenames, location I.D.'s, notes, memo, & header fields.



www.ge-mcs.com



Technical Specifications USN 60 / USN 60L

Range USN 60	0.040" to 1100" (1 mm to 28 m) at steel velocity; range selectable in fixed steps or continuously variable
Range USN 60L	range is 0.040" to 480" (1 mm to 12 m)
Material Velocity	Continuously adjustable from 0.0098 to 0.6299 inches/ μ s (250 to 16,000 m/s); 65 selectable material velocities
Display Delay	-20 to 3498 μ s in steel (dependent on range)
Probe Delay/Zero Offset	0 to 999.9 μ s
Damping	50, 75, 150, 500 ohms
Gain	0 to 110 dB adjustable in selectable steps 0.1, 0.5, 1.0, 2.0, 6.0, user definable, and locked
Test Modes	Pulse echo, dual, and thru-transmission
Pulser	Square wave excitation pulse
Pulse Voltage (Square wave pulser mode)	50 to 450 V scrollable in 10 V adjustments
Pulse Width (Square wave pulser mode)	Tunable from 50 to 1000 ns in 10 ns adjustments
Pulse Energy (Spike mode)	Low, High
Pulse Repetition Frequency USN 60	Autolow, autohigh, manually adjustable from 15 to 6000 Hz (spike mode) and 15 to 2000 Hz in square wave mode, in 5 Hz increments, external trigger (spike mode only)
Pulse Repetition Frequency USN 60L	Limited to 2000 Hz in both spike and square wave mode
Bandwidth (amplifier bandpass)	0.25 to 25 MHz with 10 selectable settings including broadband
Gate Monitors	Two independent flaw gates controllable over entire sweep range
Measurement Modes	Zero-to-first, multi-echo with selectable flank or peak detection
Rectification	Positive halfwave, negative halfwave, fullwave, RF
Reject (suppression)	0 to 80% linear
Units	Inch, millimeter, or microsecond selectable
Operating Temperature	-20° to 55°C (-4° to 130°F); -25° to 70°C (-13° to 158 ° F) storable
Languages	Selectable English, German, French, Spanish, Italian, Portuguese, Norwegian, Swedish, Finnish, Danish, Dutch, Russian, Czech, Romanian, Slovakian
Probe Connectors	BNC or Lemo selectable at order
Keypad	International symbols
Battery Power	Lithium Ion battery pack; NiMH, NiCad or alkaline cells substitutable
Battery Life	11 hours on Li-Ion battery pack
Size	11.1" W x 6.75" H x 6.25" D (282 x 171 x 159 mm)
Display	640 x 480 pixels Color LCD 132.48 x 99.36 mm
Weight	6.6 lbs. (3.0 kg) Li-Ion battery; 3.5 lbs.(1.6 kg) without battery
Color Leg	Easy identification of leg and skip distances for angle beam inspection in A-scan or grid background colors
Weld Rating Calculation	Simplifies the rating of weld indications according to AWS specification D1.1, (formula D=A-B-C)
Warranty	2 year conditional warranty on parts and labor; free 2nd year contingent upon return of unit within 13 months of purchase for recertification
Dust Proof/ Dripping Water Proof	As per IEC 529 specification for IP54 classification
Compliance	EMC/EMI: EN 55011:2007, EN 61000-6-2:2005 Ultrasound: EN 12668, ASTM E317

GEIT-20040EN (11/12)

Krautkramer USM 35X

Universal Ultrasonic Flaw Detector
with Bright Color Display and protected according to IP 66



A new design provides an improved environmental protection for everyday outdoor use.

Protection according to IP 66

A very sturdy housing has been designed for the USM 35X. We achieve a higher environmental protection and have improved the durability of this flaw detector for harsh use. The IP level corresponds to the degree of protection provided by the housing according to the IEC 529:1989.

IP 66 means that the instrument is totally protected, i.e. dust and water cannot penetrate into the instrument, even with heavy rain, sea spray and powerful jets of water coming from any direction.



Harsh field and industrial environments

- Extended temperature range from 0° C/32° F to 60° C/140° F (-10° C/14° F to 60° C/140° F after individual climatic testing)
- Weighs only 2.2 kg
- Extended battery life to 14 hours under real test conditions

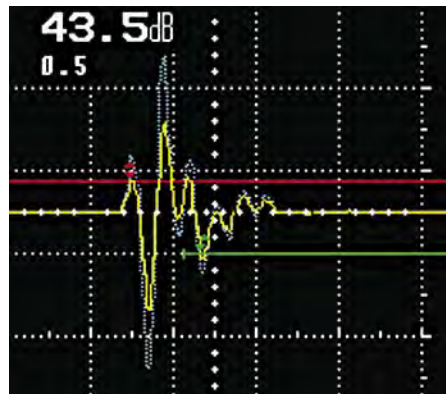
Intuitive tools to help analysis

- The Color-Leg function displays coded information on the leg in color about angle beam inspection.
- 2 new carats (colorized triangles pointing at the echo for each gate).
- One carat ▽ pointing to the gate bar indicates the sound path measurement point at the echo
- The other carat ▲ pointing up indicates the amplitude measurement point at the echo in the gate.

Fast and bright color screen

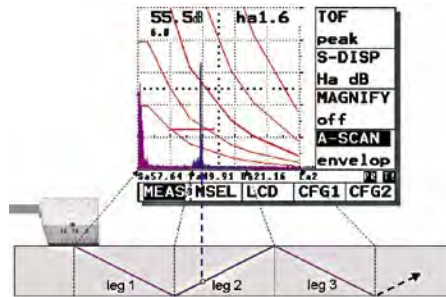
Color brings you many additional benefits in your daily inspection job:

- Color display of monitor gates and curves (DAC, TCG, DGS) for direct recognition
- Messages and alarms in red characters for increased attention
- Use of color to display references (A-scan) to make comparisons easy



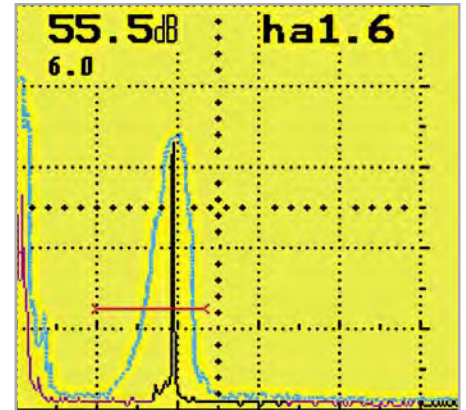
A-scan comparison

- Patented color coded display of legs for angle beam inspection of welds



Color-coded display of legs in tests using angle-beam probes

- Colorized envelope curve display for echo dynamic analysis
- Multicolor screen combinations for operator preferences and to select best suitable color scheme according to the working environment.
- VGA output to connect the instrument to an external monitor or video projector



Envelope curve

New readings

Three new additional readings can be displayed for measurements taken with gates:

- dB-difference to reference gain with DAC / TCG (in the USM 35X DAC and USM 35X S)
- DGS reference gain (in the USM 35X S)
- Flaw classification according to JIS Z3060 (in the USM 35X DAC and USM 35X S)

Other benefits

We have also implemented innovations from the computer industry in the battery concept to make your daily work easier: the rechargeable lithium-ion battery pack enables you to carry out your inspections for at least 14 hours. Charging is easily carried out internally within the instrument over night just by connecting the power pack/battery charger to the USM 35X. You can also insert 6 normal C-cells should the battery pack be drained and if no A/C power connection is available.

The optimum combination of innovation and proven performance

It's a tradition

Every worthwhile feature that has been of advantage to industry has been kept. For example the popular intuitive spin'n'set operating concept working on the basis of the two rotary knobs that give an „analog feeling“. The instrument gain and the required functions are always directly accessible. A lot of attention was paid to clarity when arranging functions and menus:

- Simple to use, quick to operate, from basic to challenging inspection requirements.
- From high frequency inspections for thin materials up to low frequency for attenuative materials
- From automotive, power generation, oil and gas to aerospace applications

Additional DAC functions

Recording reference echoes in DAC mode will be simplified by automatic gain adjustment. The echo to be recorded will be set automatically at 80 % and stored. The dB-difference to the first reference echo can be displayed, if needed. The new JIS-DAC meets the latest JIS Z3060-2002 specifications.

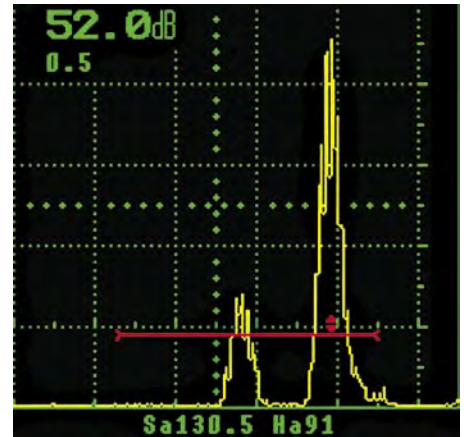
Data reporting

800 datasets enable a great number of calibration settings and test results to be stored. Each report can be documented with a memo field containing 6 dedicated areas with up the 24 characters and 3 numerical fields (flaw coordinates) for inspection reports and settings. The report or setting can be printed directly via a RS-232 or up/downloaded to a computer using an RS-232 or USB (with USB-RS accessory).

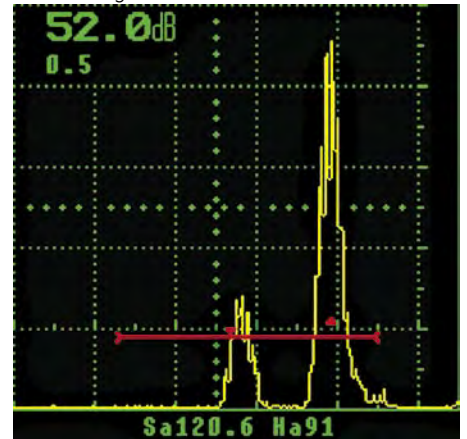
All three versions may be additionally extended by the Data Logger option: this enables you to use the USM 35X for recording and documentation of 5,000 readings (sound path, amplitude, etc.) and 500 A-scans at the same time. Moreover, you have a third gate, a tolerance monitor and a minimum reading capture at your disposal.

Three different time of flight measurements

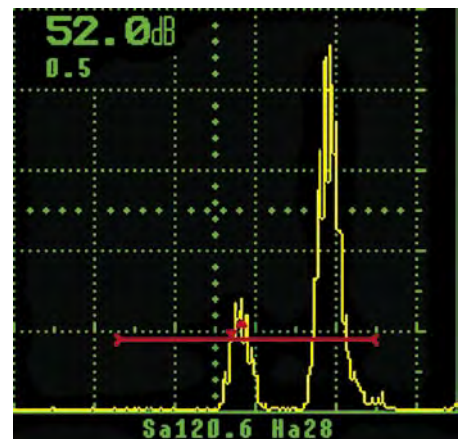
Depending on the time of flight mode selected, the distances (measurement carat ▽ red triangle) and amplitudes (carat Δ) will be measured and displayed for the echo in each gate. The measurement points are indicated by the color coded carats for each gate.



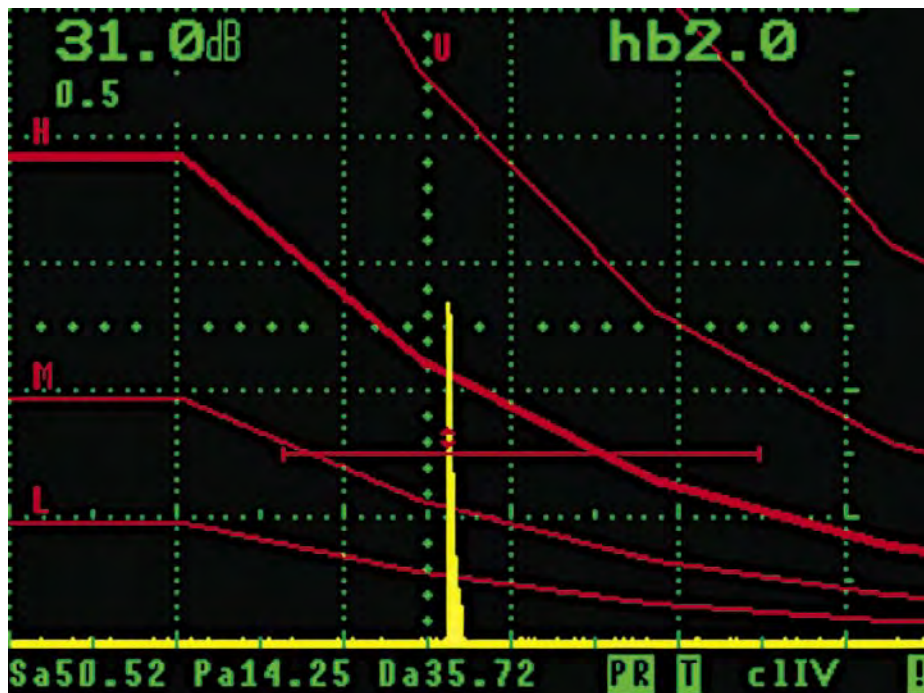
Peak: sound path and amplitude at the highest echo in the gate



Flank: sound path at the intersection of the first echo with the gate threshold; amplitude at the highest echo in the gate



JFlank: sound path at the intersection of the first echo with the gate threshold; amplitude at the first echo in the gate



New DAC function according to the latest JIS Z3060-2002 specifications

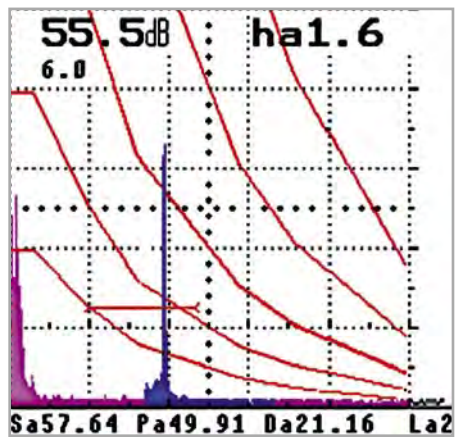
Examples for the various applications of the high performance and light Krautkramer USM 35X.

Weld inspection in the power generation and petrochemical industries

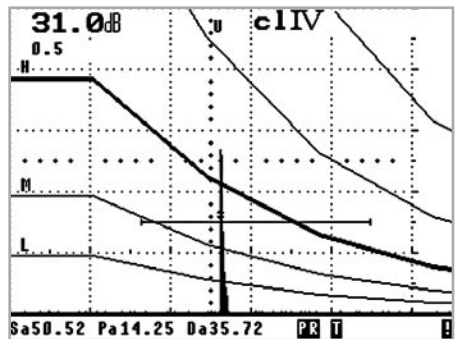
- Flaw location with display of **all coordinates**, sound path, (reduced) surface distance, depth position and leg number

Sa57.64 Pa49.91 Da21.16 La2

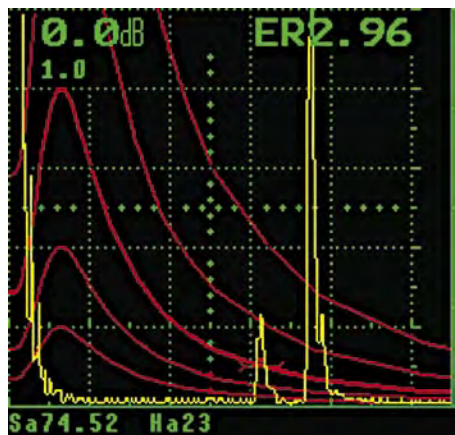
- Display of every sound beam reflection (number of half skip distances or legs) and identification of **leg color** on the "live" A-scan



- New powerful DAC/TCG with JIS DAC module according to JIS Z 3060-2002



- DGS evaluation with direct digital ERS readout (USM 35X)

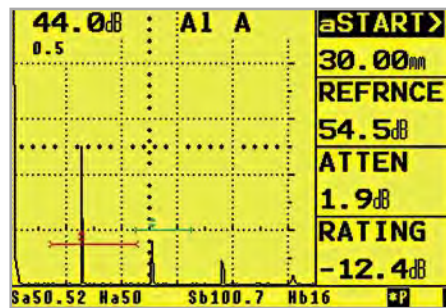


GEInspectionTechnologies.com



Inspection of a weld

- Amplitude evaluation in dB referring to a previously recorded reference echo or according to **AWS D1.1**



Precise thickness measurement for the automobile industry

You can measure the sound path difference precisely at the peaks of an echo sequence with a resolution of 0.01 mm / 0.001 inch. In doing this, trigger the gates at the 1st backwall echo: this automatically positions gates correctly for the measurement.

Corrosion wall thickness in the power generation and petrochemical sectors

During wall thickness measurement on corroded parts using dual element

probes, you simultaneously check the reading together with the A-scan, thus receiving the maximum reliability for the measurement. On hot surfaces you use the auto-freeze function, minimizing the probe's contact time. The minimum capture mode gives you the thinnest measured reading at the end of a continuous scan.

Inspection of forgings in the power generation and aerospace sectors

The manual setting of the pulse repetition frequency down to 4 Hz eliminates phantom echoes while inspecting fine grain and large work pieces. Defects from an equivalent reflector size 0.3 mm onwards will be detected.

Inspection of special materials in the aerospace and automobile industry

Use probes down to 250 kHz in order to penetrate highly attenuative or composite materials. Our composite probes on the USM 35X will drastically improve the signal-to-noise ratio on sound scattering materials (glass or carbon reinforced plastics, composites or alloys).

Krautkramer USM 35X

Universal Ultrasonic Flaw Detector with Bright Color Display and protected according to IP 66

Specifications:

Calibration ranges

Min.: 0 to 0.5 mm +10 % (steel),
0 to 0.02" +10 % (steel)
Max.: 0 to 9,999 mm +10 % (steel),
0 to 390" +10 % (steel) within
the frequency range from 0.2
to 1 MHz / 0.5 to 4 MHz
0 to 1,420 mm +10% (steel),
0 to 56" +10 % (steel) within
the frequency range from 0.8
to 8 MHz / 2 to 20 MHz

Sound velocity

1,000 to 15,000 m/s, 40 to 600 inch/ms variable
in steps of 1 m/s, 0.1 inch/ms
and fixed programmed values

Display delay

From -10 to 1,000 mm, -0.3 to 40" (340 μ s)

Probe delay

0 to 200 μ s

Auto calibration

Measurement and setting of sound velocity and
probe delay using two known calibration echoes
(2-point calibration)

Pulse intensity

220 pF, 1 nF

Damping

50 ohms, 500 ohms (1,000 ohms in TR mode)

Pulse repetition frequency

4 to 1,000 Hz, variable in 10 steps

Frequency ranges (-3 dB)

0.2 to 1 MHz / 0.5 to 4 MHz / 0.8 to 8 MHz /
2 to 20 MHz

Gain

0 to 110 dB, variable in steps

Gain steps

0.5 / 1 / 2 / 6 / 12 dB (or user-adjustable),
step 0 is locked

Fine gain

4 dB, continuously variable in 40 steps

Rectification

Full-wave, negative and positive half-wave,
RF mode

Reject

Linear, 0 to 80 % screen height
Variable in steps of 1 %

Monitor gates

2 independent gates in color bar mode, start and
width variable over the entire calibration range,
response threshold of 10 to 90 % screen height
variable in steps of 1 % (coincidence and anti-co-
incidence), alarm signal via LED and connectable
internal horn, Gate A switchable as interface gate
for Gate B, gate magnifier (zooming of gate range
over the entire display range)

Sound path measurement

Digital display of sound path (projection distance,
depth) between initial pulse and the first echo in
the gate, or between the echoes in the two gates,
measurement always at the intersection point
with the echo flank or echo peak

Measurement resolution

0.01 mm within a range up to 99.99 mm/
0.1 mm within a range from 100 to 999.9 mm/
1 mm above 1,000 mm,
0.001" within a range up to 9.999"/
0.01" above 10"
With evaluation in the frozen A-scan: 0.5 % of the
calibration range setting

Amplitude display

In % screen height
USM 35X DAC: additionally in dB above DAC or TCG
USM 35X S: additionally in dB above DGS curve
or ERS

Displayed reading

Sound path, (reduced) projection distance, depth,
amplitude for every gate, user-
configurable at four positions of measurement
line and of the zoomed display in the A-scan

A-scan functions

Manual or automatic A-scan freeze,
A-scan comparison, echo dynamics
(envelope), peak echo storage

Color functions

Patented color-coded display of legs in angle
testing, adaptation of background color to the
light conditions of test environment, color display
of monitor gates and of registration curves (DAC,
TCG, DGS) for direct recognition, messages and
alarms in red characters



DAC / TCG (Option)

Only USM 35X DAC and USM 35X S: Distance-Amplitude Curves (DAC) or TCG line (TCG) with a maximum of 10 reference echoes, 4 other curves or lines can be displayed with variable dB intervals. JIS DAC can be selected in order to allow inspection according to JIS Z3060-2002 (Japanese Inspection Standard). Automatic gain control during DAC recording.

DGS (Option)

Only USM 35X S: DGS curves for single-element and dual-element probes (B1S, B2S, B4S, MB2S, MB4S, MB5S, WB...-1, WB...-2, SWB...-2, SWB...-5, MWB...-2, MWB...-4, SEB and MSEB) and for all materials, sound attenuation and transfer loss correction, 4 other curves can be displayed with variable dB intervals

Display size / resolution

116 mm x 87 mm, 4.6" x 3.4" (W x H)
320 x 240 pixels

A-scan size / resolution

116 mm x 80 mm, 4.6" x 3.2"
320 x 220 pixels (zoom)

Units of measurement

mm, inch

Data memory

800 instrument setups or reports, including A-Scans can be stored, recalled, printed or exported to a computer.

Direct documentation

Display screen contents, report including A-scan, reading, function list (parameter dump)

Printer driver

HP DeskJet, HP LaserJet, HP DJ 1200 (DeskJet)
HP LJ 1012 (LaserJet), EPSON FX/LX, SEIKO DPU

RS 232 interface

9-pin DSUB, bi-directional, 300 - 57,600 baud
An USB adaptor cable can be provided to connect the USM 35X to a computer that does not have RS 232 port

Input/Output

8-way Lemo-1 socket (trigger output, gate alarm, test data release)
Additional analog output for amplitude or sound path in selected gate

VGA output

10-way Lemo-1 socket for the connection of an external display screen or beamer

Probe connections

2 x Lemo 1 or BNC

Dialog languages

German, English, French, Italian, Portuguese, Spanish, Danish, Swedish, Norwegian, Finnish, Czech, Slovenian, Romanian, Dutch, Croatian, Hungarian, Russian, Polish, Slovakian, Japanese

Battery operation

Li-ion battery or 6 C-cells (NiCad, NiMH or AlMn), operating time: 14 hours with Li-ion battery (6.6 Ah), approx. 3 hours with NiMH cells (3 Ah), battery charge check by an icon in the measurement line

Power pack/ battery charger operation

Via an external power supply (85 to 265 VAC);
Operating voltage: 6 to 12 VDC
Current consumption: max. 9 W, depending on the setting

Weight

2.2 kg, 4.9 lbs., including batteries

Size

177 mm x 255 mm x 100 mm,
7.0" x 10" x 3.9" (H x W x D)

Environmental

Protection class: IP 66
Shock proof acc. to DIN IEC 68: 6 ms, 60 g,
3 shocks per orientation
Vibration proof acc. to DIN IEC 68: 0 - 150 Hz, 2 g,
20 cycles per orientation
Operating temperature: 0° to 60°C; 32° to 140°F
(-10°C; 14°F on special request)
Storage temperature: -20° to 60°C; 4° to 140°F

Data Logger Option

Memory capacity

5,000 readings, 500 A-scans for the readings,
100 jobs, 10 comment texts per job

Storable readings

Sound paths and sound path differences of all gates, amplitudes (% SH, dB-to-threshold, dB-to-curve, %-to-curve, ERS), alarms of all gates or tolerance monitor

Lines / columns

Number of lines: maximum 5,000 (Linear file with one column), numerical indexing
Number of columns: maximum 26,
indexing: A, ..., Z

Tolerance monitor

Lower and upper acceptance level with monitor function

Minimum reading capture

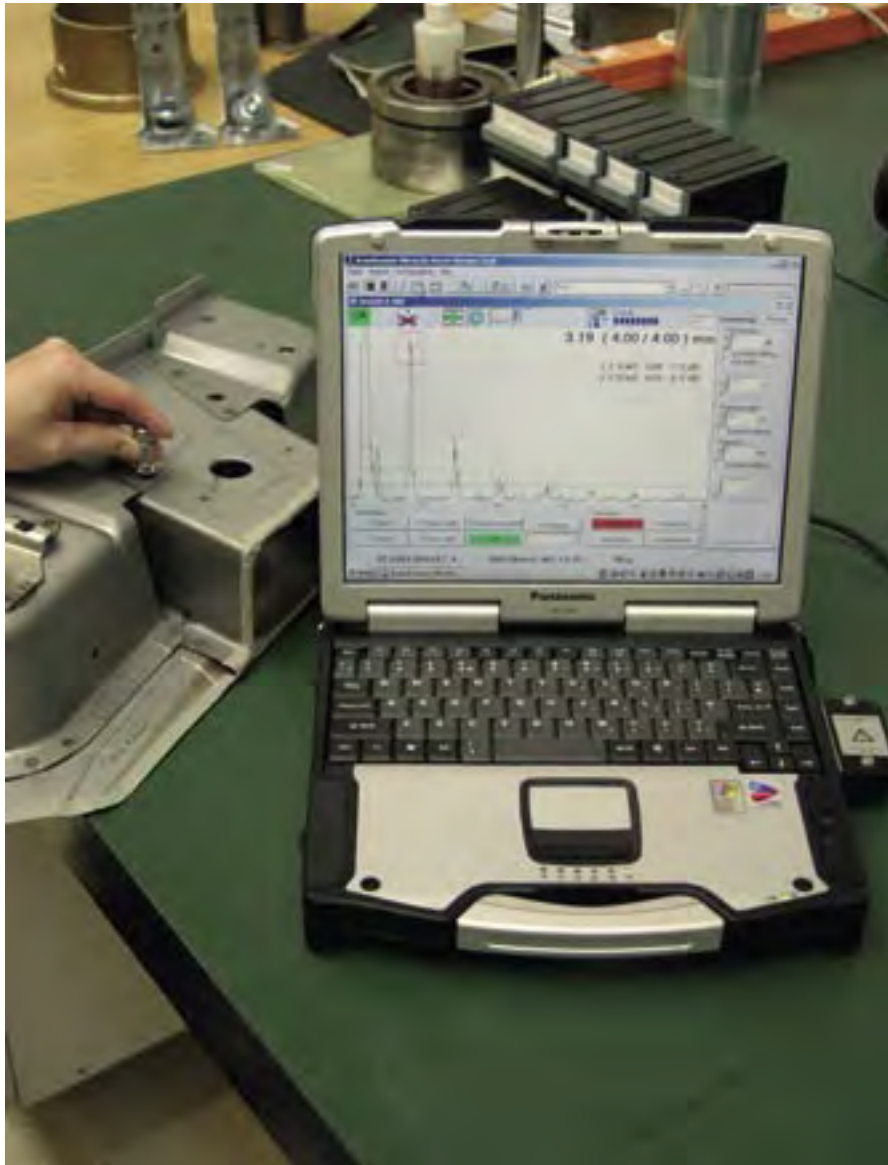
Storage of the minimum value measured in continuous scanning, display of the value 3 seconds after uncoupling the probe

Monitor gate

1 additional independent gate in color bar mode

Krautkramer USLT 2000

The Ultrasonic Test System
in a Notebook for Today and Tomorrow



GE imagination at work



For mobile test use, first-rate documented ultrasonic performance

The demands on ultrasonic tests are changing - and with them also the technical prerequisites for fulfilling new needs and requirements. We keep pace with the development: our USLT 2000 provides you with state-of-the-art technology that multiplies the application possibilities in everyday testing - and maintains a perfect ease of use. The advantages for the Quality Management are also obvious: the USLT 2000 solves all your problems with the management, evaluation and exchange of test-relevant data.

For everyday testing ...

Ultrasonic testing with a notebook means: high-tech ultrasonics *plus* modern data management *plus* mobility.

The USLT 2000 stands for excellent ultrasonic performance to accomplish even the most demanding test tasks. It stands for the openness toward the EDP world because the complete Windows functionality is utilized. In the end, the USLT 2000 stands for a truly mobile use: a PC weighing just about 3 kg (6.6 lbs.) becomes a universal ultrasonic instrument able to withstand - as an industrial-type notebook - even adverse ambient conditions.

For the Quality Management ...

Ultrasonic testing using a mobile notebook also means: undreamt-of possibilities for data processing.

Documentation of ultrasonic tests and test results, Export to Microsoft Excel, forwarding of data to company databases and networking of test systems - the USLT 2000 paves the way in today's and tomorrow's world of data.

... Krautkramer technology

This advancement was made possible by the cheque card-sized PCMCIA card especially developed by Krautkramer and taking care of the complete digitization of the test system.



Test technology for special demands

The pick of ultrasonics

Extreme miniaturization of the electronics and maximization of performance - that's USLT 2000.

The system is not only characterized by a high measuring accuracy and a large frequency range but also by extensive matching features enabling you to tailor the USLT 2000 to your individual application needs.

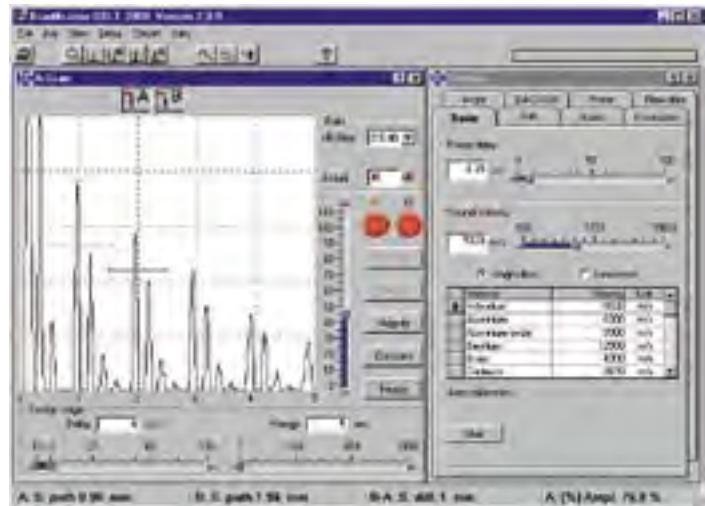
This includes for example the choice of the echo display mode that helps you with the evaluation: you can superimpose a stored display of test findings on the currently active A-scan in order to compare the test results. You can alternatively record the echo dynamics and simultaneously display the real-time signals. Even the possibility of an adjustable signal averaging is available to you in this connection.

The USLT 2000 offers universal evaluation options for detected indications to meet both national and international test specifications: DGS curves, user-friendly recording of a DAC and TCG for both methods.

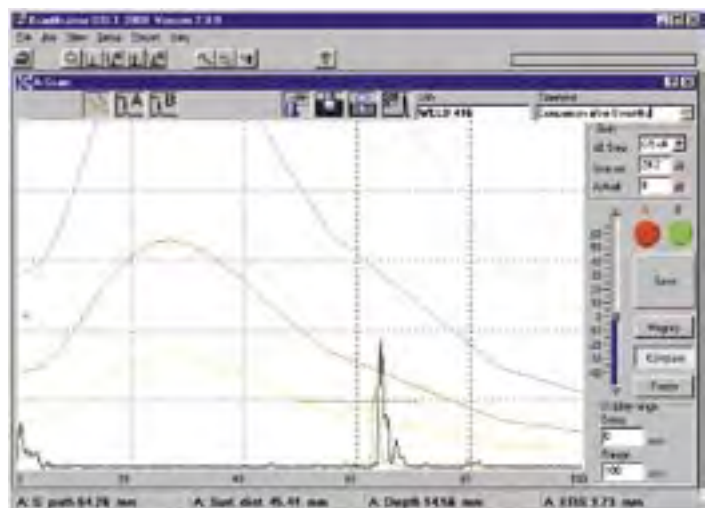
A highlight: the A-scan

With the USLT 2000, the days when you missed the analog screens of the usual test instruments in some test jobs are gone because the SVGA screen achieves a maximum A-scan resolution of 635 x 400 pixels thus enabling an almost analog display. Added to this are the large color display and the fast echo display.

The Windows operator interface with A-scan and setup menu. Dialog language and units can be easily changed.



The operator interface with A-scan in zoom mode, echo comparison, multiple DAC and display evaluation



This makes the USLT 2000 even suitable for applications in which an excellent resolution is important: for example, bonding tests and flaw detection on thin work-pieces, or in particular the inspection of spot-welded joints, for instance within the automotive industry.

An operator-interface, especially tailored to this application, automatically carries out spot weld evaluation and stores all the results in the database.

The probe solution

The pulser and receiver electronics is accommodated in a small aluminium box. Just select the probe required for your test task and connect it.

The intelligent Krautkramer dialog probes provide a special ease of use because they are automatically recognized by the system. All important probe data are automatically transferred to the USLT 2000.

EDP technology to make life easy for you

The Windows interface

With the clear and well-arranged graphical Windows interface, in four languages, you will have no problem with the system handling. The system is operated via keyboard, an integrated touchpad, an optionally connected mouse or via a remote control having eight assignable instrument functions.

The Windows world

As the USLT 2000 is a standard PC, you can of course also install other Windows applications and use them for your individual applications parallel to the ultrasonic functionality. This means that if you're not using the USLT 2000 as an ultrasonic instrument, you can, for example, also work with word processing and spreadsheet programs.

You will learn to appreciate the advantages made available by the Windows world with its entire functionality even more. The so-called "multitasking" - that means simultaneous application of several programs and exchange of all sorts of data - offers great ease of use in this regard. In view of working with the USLT 2000, this means: you generate your test report forms in MS Excel. After this, you determine the fields into which the parameters and readings from the test results of the USLT 2000 are to be transferred. All you then have to do is select the test jobs and results which you wish to file and the forms are automatically filled out and ready to be printed.

Database

The storage of test data is indispensable not only for repetitive in-service tests. The importance of documentation also ranks enormously high today.

Instrument settings for different applications as well as countless test results, including the A-scans, must be permanently filed or statistically evaluated in many ultrasonic tests for reasons of product liability.

The method best suited to accomplish this task is a well-structured database: in the USLT 2000, all settings and findings are stored and managed in a MS ACCESS database.

Application software

The openness of the Microsoft concept offers all the possibilities of an individual postprocessing of data here as well because the most different programs have access to the filed data: analyzing programs, programs for test job management, and not forgetting - the tailored Krautkramer application software.

All USLT 2000 utilities (functions, function values and readings) are freely available to the user and can be applied for development of own test and control programs, together with the UltraWorks program.



Excel export of inspection results

Krautkramer USLT 2000

The Ultrasonic Test System in a Notebook for Today and Tomorrow

Specifications

Calibration ranges

min.: 0 - 2.5 mm; 0 - 0.1" (steel)
max.: 0 - 9700 mm; 0 - 381" (steel)

Sound velocity range

500 - 15000 m/s; 0.02 - 0.59 "/ms
integrated, editable material table

Pulse shift

-10 - 1500 mm; -0.39 - 50" (steel)

Probe delay

0 - 100 μ s

Damping

50 ohms / 500 ohms; 1000 ohms with Dual or
Through-Transmission modes

Intensity

220 pF / 1 nF

Frequency range

0.5 - 20 MHz (-3 dB); 4 filter ranges

Pulse repetition frequency

1-1000 Hz, automatically or manually adjustable

Gain

110 dB, adjustable in steps of 0.5 / 1 / 2 / 6 dB

Operating modes

Pulse-Echo, Dual, Through-Transmission

Rectification

full-wave, positive half-wave, negative half-wave, RF
display (up to 150 mm/5.9" steel)

Suppression

0 - 90 % linear

DAC/TCG

DAC with up to 16 curve points (reference reflectors),
dynamic range 37 dB, maximum slope 6 dB/ms;
3 additional curves at adjustable dB distances, can
be changed to TCG (Time-Corrected Gain) mode
(horizontal recording threshold); meets national and
international test specifications

DGS

recording curves for all valid equivalent reflector sizes
and probes with DGS capability; setting as DAC or TCG;
evaluation in dB related to curve, ERS or class (JIS);
sound attenuation and transfer correction; reference
reflectors used: backwall, circular disk reflector and
side-drilled hole

Monitor gates

2 independent monitor gates, adjustable over the entire
maximum calibration range; evaluation on the basis of
A-scan at display refresh rate; gate alarm: off, coinci-
dence, anticoincidence; visual and/or acoustic alarm

Distance measurement

individually selectable for each gate at the echo flank
or peak, in the RF mode addition-ally at the zero
transition of the increasing or decreasing echo flank

- initial pulse and measurement point in
gate A or B
- measuring points: gate B - gate A
(differential measurement)

Measurement resolution

sound path/time of flight: up to 12.6 mm: 0.01 mm;
otherwise 0.2 % of display width

Amplitude

0.5 % screen height or 0.2 dB

A-scan digitization

1024 x 1024 pixels

Display freeze

static A-scan freeze, dynamic A-scan freeze (peak
value, echo dynamics + real-time signal), average
freeze via 2 to 32 ultrasonic pulse cycles

Echo comparison

simultaneous display of the currently active signal and
a stored A-scan

Outputs

documentation via standard interfaces of the notebook

Inputs

2 analog inputs, e.g. for probe coordinates,
digitization with 10 bits each

Dialog languages

German, English, French, Spanish and Italian

Units

mm, inch, μ s

Probes

standard and dialog probes (automatic recognition)
can be connected

Data storage

database for storing and managing instrument
settings, test jobs and test results, including A-scan,
DAC and alphanumeric comments, Export to
Microsoft Excel; limited only by the hard disk size

Software

operating system: Windows2000/XP; Client-Server
interface OLE 2.0; options: UltraWORKS (design tool),
FFT (Frequency analyses)
EHT (hardening depth), RTM (resonance thickness
measurement with 1 μ s resolution), UltraLOG
(evaluation program for spot weld testing)

Notebook versions (trademarked units)

standard or industrial version (IP 52)

Mains and battery operation

approx. 5 h, depending on the processor workload

Operating temperature

5 °C - 45 °C; 41 °F - 113 °F (standard)
0 °C - 50 °C; 32 °F - 122 °F (industrial)

Dimensions (H x W x D)

63 mm x 300 mm x 230 mm;
2.5" x 12" x 9" (standard)
64 mm x 302 mm x 273 mm;
2.5" x 11.9" x 10.7" (industrial)

GE imagination at work



KRAUTKRAMER USLT 2000B

The proven and tested ultrasonic notebook as a PC-based instrument



USLT 2000B ultrasonic instrument

GE Inspection Technologies is constantly advancing its products and testing solutions, and has developed the new USLT 2000B portable ultrasonic instrument for testing welding spots with ultrasound, in particular for meeting the requirements of the automotive industry. The key features comprise:

Mobile use:

This light, battery-driven ultrasonic test system is recommended for local application, e.g. in production plants. The large TFT screen allows test data to be read easily from significant distances.

Easy handling:

The USLT 2000B distinguishes itself by an ergonomic user interface. The built-in touch screen and the 14 programmable function keys considerably simplify the operation.

A variety of outputs:

The standard interfaces, such as LAN, USB and VGA, allow the instrument to be connected with all known tools from the office world.

From one source you will receive software packages for ultrasonic testing instruments for easy monitoring of joins.

Constant readiness for the future by virtue of productivity, quality and security is and remains a special characteristic of our technology for testing solutions.

Test your joins non-destructively with ultrasound!

The variety of jointing methods used in automotive welding and assembly lines has significantly increased in the last few years. While a few years ago resistance-welding and MIG/MAG welds were the favoured joining methods, nowadays laser welding/soldering, bonding, etc. are preferred.

Since all of these procedures are more and more used complementarily (best fit), a lot of great demands have been made on the test engineering.

Instead of destructive testing of welding spots, for instance with a hammer and chisel, in recent years non-destructive testing with ultrasound has become more and more prominent. The continually increased acceptance of this procedure is last but not least due to the fact that GE Inspection Technologies, co-operating with industry, has made substantial contributions to the technical progress.

All well-known car manufacturers already work successfully with these innovative systems.



Creation of inspection plans with the Database Manager

The Database Manager contains an entire database system for the creation and administration of the testing records. You can plan, control and document your testing, for instance by

distributing world-wide via E-mail testing records tuned to the structure of your manufacturing process.

Test with the UltraLOG program

With our application software the evaluation of the welding spots is automated to a large extent. During the

testing, which follows an individual test plan, the program delivers a proposal for evaluation.

UltraLOG carries on with testing when the operator has accepted the result. The results are automatically documented, too.

Technical data

Adjustment ranges

min.: 0 - 2.5 mm (steel)
max.: 0 - 9,700 mm (steel)

Range of sound velocity

500 - 15,000 m/s
integrated editable table of materials

Pulse shifting

-10 mm - 1500 mm (steel)

Probe delay

0 - 100 ms

Damping attenuation

50 Ohms / 500 Ohms; 1000 Ohms when used as double transducer probe or in transmission

Pulse strength

220 pF / 1 nF

Frequency range

0.5 - 20 MHz (-3 dB); 4 filter ranges

Pulse repetition frequency

1-1000 Hz, adjustable automatically or manually

Amplification range

110 dB, adjustable in steps of 0.5 / 1 / 2 / 6 dB

Modes of operation

Pulse Echo, as double transducer probe, transmission alignment, one way positive, one way negative, R.F. representation (up to 150 mm steel)

Suppression

0 - 90 % linear

Depth compensation

DAC with up to 16 reference reflectors, dynamic range of 37 dB, maximum slope of 6 dB/ms; Three additional curves with adjustable dB-intervals, convertible as depth compensation (horizontal recording level); satisfies national and international testing regulations

DGS

Recording curves for all valid replacement reflector sizes and probes suitable for DGS; adjustment to DAC or depth compensation; evaluation in dB to the curve, ERG or class (JIS); sound attenuation

and transfer correction; applicable reference reflectors: back wall, disc-shaped reflectors and cross holes

Monitor gates

Two independent gates, adjustable across the whole adjustment range; evaluation from the A-scan with frame repetition rate; gate alarm: off, coincidence, anticoincidence; - optic and/or acoustic alarm

Range finding

Individually selectable for each gate at the echo edge or peak in R.F. presentation, and additionally at the zero crossing of the leading and trailing edges of an echo

- Original pulse indication and check point in gate A or B

- Check points: gate B - gate A (differential measurement)

Measurement resolution

Sound path / delay up to 12.6 mm: 0.01 mm; or 0.2 % of the screen width

Amplitude display

0.5 % of screen height or 0.2 dB

A-scan digitising

1024 x 1024 pixels

Image storage

A-scan freeze static, A-scan freeze dynamic (peak value, echo dynamics and real-time signal), average from 2 to 32 ultrasonic shots

Echo comparison

Simultaneous display of the current signal with a saved A-scan

Outputs

Documentation on the existing standard interfaces of the ultrasonic instrument

Conventional languages

German, English, French, Spanish and Italian

Measurement units

mm, inches, μ s

Probes

Connection of standard and dialogue probes (automatic recognition)

Interfaces with PC

4 x USB 1.1
Ethernet TCP/IP 10 MBd
Monitor SUB-D 15 pol.

Data storage

Database for the storage and administration of instrument settings, test jobs and test results with A-scan, DAC and alphanumeric commentary, export to Microsoft Excel; limited only by size of hard drive

Software

Operating system: client-server interface OLE 2.0; optional: UltraWORKS (development tool), FFT (Fast Fourier Transformation), EHT (Effective Hardening Testing), RTM (Resonance Thickness Measurement 1 μ s resolution), UltraLOG (evaluation program for welding spot testing), UDB Manager (creation of inspection and test schedules) 12,1", TFT, SVGA touch-screen

Display

12.1" TFT, SVAG touchscreen

Battery operation

Approx. 4 h, depending on load on the processor

Operating temperature

0 °C to 40 °C

Dimensions (H x W x T)

390 mm x 374 mm x 155 mm

Weight (incl. 1 battery)

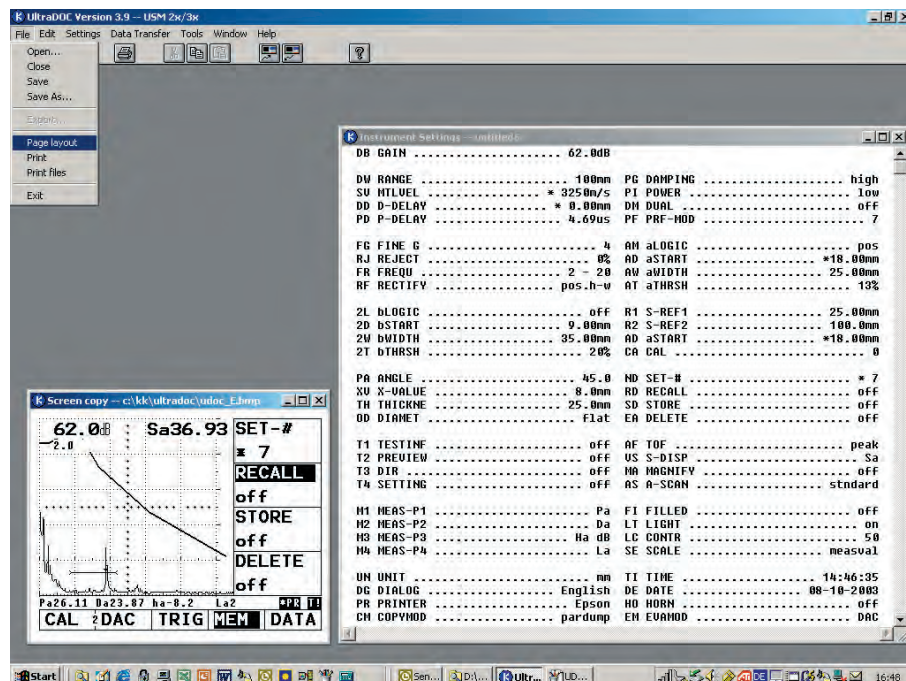
6.7 kg

Options

USLT 2000B	USLT software
USLT 2000BP3	USLT software + UltraLOG
USLT 2000BA3	USLT software + UDB-Manager + UltraLOG

Krautkramer UltraDOC

On the safe side
with your documentation



The value of today's quality assurance tests depends on the quality of the corresponding documentation. You know the statutory provisions: in the case of damage, an objective proof of all measures that had been taken for the quality assurance of a product must be furnished.

Test instruments in combination with the UltraDOC software provide you with the required safety because UltraDOC makes the documentation process considerably easier.

UltraDOC allows you to transfer test data from the test instrument to the PC (for example parameter dumps, A-scans, menus) and to store them in usual data formats so that you will be able to further process them as you like. Word processing, DTP or spreadsheet programs - the whole world of EDP is at your feet.

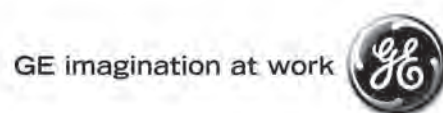
You will have no trouble in creating your test reports and in carrying out the documentation of your test results quickly, reliably and conveniently.

Other documents, such as training documentation or re-research reports, can also be presented in a professional way using UltraDOC. But UltraDOC has a lot more to offer: from the transfer of stored instrument calibrations back to the test instrument, through quick viewing of stored test data on the PC display, up to the remote control of the test instrument.

By using UltraDOC you can:

- transfer instrument settings from the test instrument to a PC, store them as ASCII text and further process them
- transfer any display contents of your choice, store them in IMG, BMP or PCX format and further process them
- store complete instrument settings and calibration tables and transfer them back to the testinstrument
- gain a quick overview of stored test data
- remote control your test instrument.

UltraDOC was developed for a great number of our flaw detectors and other test instruments having an RS232 interface. It is available as Windows version, it only requires standard computer systems, it is easy to install - and even easier to use.



GE
Measurement & Control

Standard Phased Array Probes and Accessories

www.UTprobes.com



GE imagination at work

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GE's Inspection Technologies business manufactures a wide variety of phased array transducers for use with Phasor XS and other ultrasonic flaw detectors.

33 standard phased array transducers cover a broad application spectrum and are stocked and available with short delivery times. All these probes offer three connector options and are manufactured to GE's high quality standards.

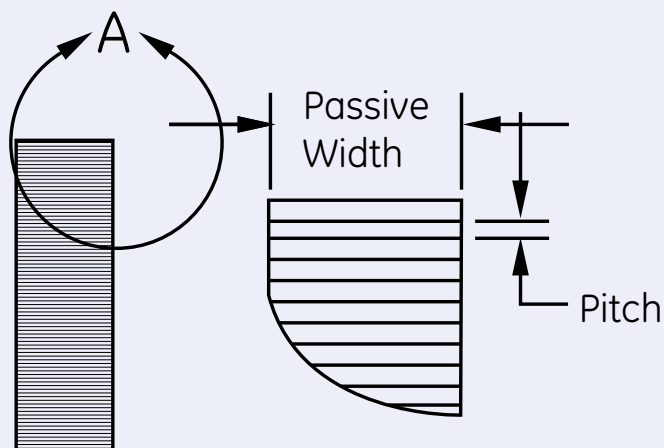
More information on our full range of phased array transducers is available at www.UTprobes.com



Definitions

1. **KERF:** Spacing between elements.
2. **PITCH:** Element size plus kerf.
3. **PASSIVE WIDTH / Elevation:** Size of element on linear array in non steering axis.
4. **LINEAR ARRAY:** Array with the ability to steer in one axis and fixed on the opposite axis or scan in one axis.
5. **TEST MATERIAL:** The common name of the material being tested (ex. carbon steel).
6. **ACOUSTIC VELOCITY:** The wave speed of the desired wave mode in the material (preferred units = inches x 106 per second). Please specify the acoustic velocity if it is known. Otherwise, GE will use the general published velocity for the material.
7. **COUPLANT MEDIUM:** What couplant material will be used between the probe and the test specimen (wedge, water, coolant, etc... also include wedge thickness or water patch used).
8. **VIRTUAL PROBE:** Size of the element when fired (example: linear array 1 mm pitch x 10 mm width fired with 10 elements would have a virtual probe size of 10 mm x 10 mm).
Note: Array near field and focus ability will be determined by the Virtual Probe size used during the test.
9. **LINE FOCUS:** Array will focus in a line (flat linear array when focused at a certain depth will give a line focus, similar to a cylindrical focus single element probe).
10. **SPOT FOCUS:** Array will focus at a point.

Linear Array



Connector Options

Almost every probe in this catalog can be delivered with three connector options. The part numbers for each connector option are directly listed on product pages.

Phasor connector



Omniscan® connector



Hypertronics connector



As an example, if 115-120-001 part number from the table below is ordered, the probe will be delivered with Hypertronics connector with a short lead time.

Part number Phasor	Part number Hypertronics	Part number Omniscan®	Aperture (mm)	Frequency (MHz)	Element Count	Pitch (mm)	Elevation (mm)	Cable (m)	Case Style	A (mm)	B (mm)	C (mm)	D (mm)
115-100-001	115-120-001	115-130-001	8.0 x 9.0	2	8	1.0	9.0	3.0	C2	15.0	28.0	27.0	21.0
115-100-002	115-120-002	115-130-002	8.0 x 9.0	4	16	0.5	9.0	3.0	C2	15.0	28.0	27.0	21.0
115-100-003	115-120-003	115-130-003	16.0 x 10.0	5	16	1.0	10.0	3.0	C2	23.0	34.0	37.0	25.0
115-100-004	115-120-004	115-130-004	16.0 x 10.0	5	32	0.5	10.0	3.0	C2	23.0	34.0	37.0	25.0
115-100-005	115-120-005	115-130-005	16.0 x 13.0	2.25	16	1.0	13.0	3.0	C2	22.0	37.0	36.0	29.0
115-100-006	115-120-006	115-130-006	24.0 x 19.0	2.25	16	1.5	19.0	3.0	C2	30.0	45.0	30.0	37.0
115-100-007	115-120-007	115-130-007	64.0 x 10.0	5	64	1.0	10.0	3.0	C4	84.0	36.0	32.0	36.0

General Use Probes

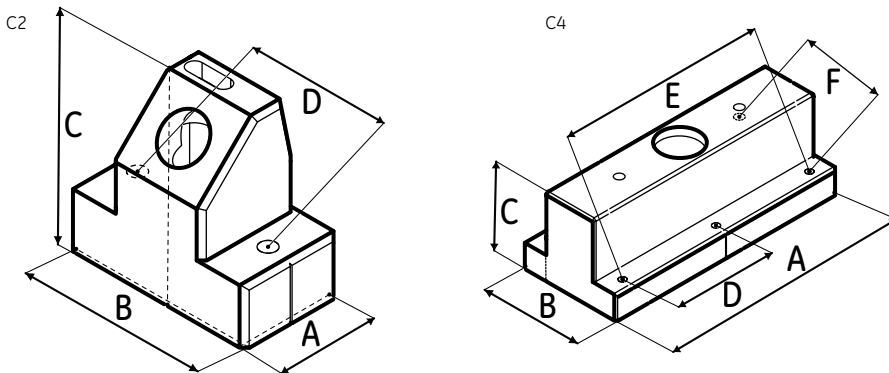


Applications

- General weld inspection
- Tubes, pipes, tanks, pressure vessels
- Axles, forgings, castings
- Bridges and other structures
- Railroad wheels and rail
- Pumps, valve housings
- Turbine blades, shafts
- Wheel rims

Features

- Wide range of applications
- 3 different connector types available
- Used with wedges, delay lines, or wear caps
- Used for sector scanning or linear scanning



Part number Phasor	Part number Hypertronics	Part number Omniscan®	Aperture (mm)	Frequency (MHz)	Element Count	Pitch (mm)	Elevation (mm)	Cable (m)	Case Style	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)
115-100-001	115-120-001	115-130-001	8.0 x 9.0	2	8	1.0	9.0	3.0	C2	15.0	28.0	27.0	21.0	-	-
115-100-002	115-120-002	115-130-002	8.0 x 9.0	4	16	0.5	9.0	3.0	C2	15.0	28.0	27.0	21.0	-	-
115-100-003	115-120-003	115-130-003	16.0 x 10.0	5	16	1.0	10.0	3.0	C2	23.0	34.0	37.0	25.0	-	-
115-100-004	115-120-004	115-130-004	16.0 x 10.0	5	32	0.5	10.0	3.0	C2	23.0	34.0	37.0	25.0	-	-
115-100-005	115-120-005	115-130-005	16.0 x 13.0	2.25	16	1.0	13.0	3.0	C2	22.0	37.0	36.0	29.0	-	-
115-100-006	115-120-006	115-130-006	24.0 x 19.0	2.25	16	1.5	19.0	3.0	C2	30.0	45.0	30.0	37.0	-	-
115-100-007	115-120-007	115-130-007	64.0 x 10.0	5	64	1.0	10.0	3.0	C4	84.0	36.0	32.0	36.0	71.0	28.0

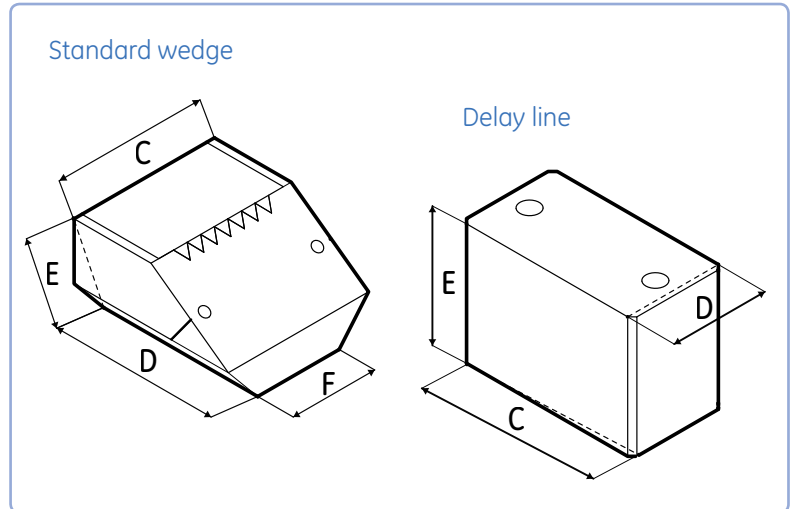
Wedges/Delay Lines/Wear Caps for General Use Probes

Features

- Sectorial scanning
- Small footprint design
- Curved wedges available
- Optional carbide and couplant ports

* Z-Offset is the dimension from the center of the array mounted on the wedge to the bottom of the wedge (perpendicular to the bottom). This value is used to calculate delay laws in the Phasor.

* WF (Wedge Front) is the dimension from the center of the array mounted on the wedge to the front of the wedge. This value is entered into the Phasor and directly affect the frame of reference from which all projection results are measured.



Accessories Part numbers

Part number Phasor	Part number Hypertronics	Part number Omniscan®	Shear Wedge 35° to 75°	Delay Line 20 mm (0.79")	Delay Line 40 mm (1.58")	Wear Cap
115-100-001	115-120-001	115-130-001	118-350-024	118-350-036	118-350-048	118-240-003
115-100-002	115-120-002	115-130-002	118-350-024	118-350-036	118-350-048	118-240-003
115-100-003	115-120-003	115-130-003	118-350-025	118-350-037	118-350-049	118-240-004
115-100-004	115-120-004	115-130-004	118-350-025	118-350-037	118-350-049	118-240-004
115-100-005	115-120-005	115-130-005	118-350-027	118-350-039	118-350-063	118-240-001
115-100-006	115-120-006	115-130-006	118-350-028	118-350-040	118-350-064	118-240-002
115-100-007	115-120-007	115-130-007	360-141-182 (sweep angle) 118-350-026 (fixed angle, lateral sweep)	118-350-038	118-350-050	118-240-005

Standard Wedges	C (mm)	D (mm)	E (mm)	F (mm)	Incident	Z-Offset * (mm)	WF * (mm)
118-350-024	28.2	24.7	15.0	12.3	36	10.6	18.7
118-350-025	33.5	32.6	18.5	21.3	36	12.4	24.1
118-350-026	84.0	54.8	31.1	84.1	36	20.6	40.5
360-141-182	35.6	124.5	59.9	35.6	36	35.3	65.8
118-350-027	37.3	37.8	22.9	22.0	36	15.9	28.9
118-350-028	45.4	50.0	29.6	26.4	36	20.5	37.4

Standard Delay Lines	C (mm)	D (mm)	E (mm)
118-350-036	28.2	15.0	20.0
118-350-037	33.5	23.0	20.0
118-350-038	84.0	35.6	20.0
118-350-039	37.3	21.0	20.0
118-350-063	37.3	21.0	40.0
118-350-040	45.4	30.0	20.0
118-350-064	45.4	30.0	40.0

Standard Delay Lines	C (mm)	D (mm)	E (mm)
118-350-048	28.2	15.0	40.0
118-350-049	33.5	23.0	40.0
118-350-050	84.0	35.6	40.0

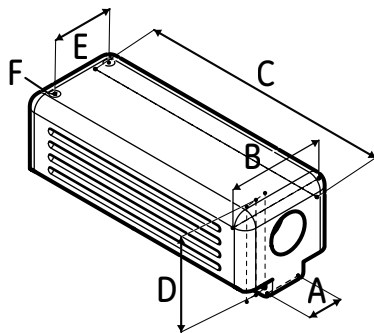
Corrosion Probes

Applications

- Remaining wall thickness, corrosion, erosion
- Near surface flaw detection
- Bond testing

Features

- Amazing near surface resolution; 1.9 mm (0.075") on a #4 flat bottomed hole (1.5 mm / 0.062" diameter)
- Optimum test range 1.9 mm (0.075") to 25.4 mm (1") in steel
- Adjustable wear bars
- Available with 3 different connectors



Part number Phasor	Part number Hypertronics	Part number Omniscan®	Aperture (mm)	Frequency (MHz)	Element Count	Pitch (mm)	Elevation (mm)	Cable (m)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F
115-100-020	115-120-020	115-130-020	48.0 x 10.0	5	Dual 32	1.5	5.0	3.0	9.1	25.4	65.5	24.4	16.0	M3X0.5
115-100-021	115-120-021	115-130-021	24.0 x 10.0	5	Dual 32	0.8	5.0	3.0	9.1	25.4	41.0	24.4	16.0	M3X0.5

Accessories for Corrosion Probes

Features

- Curved wear bars for alignment on curved pipe
- Flat wear bars for durability on flat plate
- Potted wear bars for flat or curved bars with fittings for couplant feed

Curved wear bars



Curved wear bars



Long flat wear bars



Flat ported wear bars



Curved ported wear bars

Flat Wear Bars	Mate
389-075-530	115-100-020, 115-120-020, 115-130-020
389-075-540	115-100-021, 115-120-021, 115-130-021

Curved Wear Bars	Mate
389-075-560	115-100-020, 115-120-020, 115-130-020
389-075-570	115-100-021, 115-120-021, 115-130-021

Curved Ported Wear Bars	Mate
389-077-160	115-100-020, 115-120-020, 115-130-020
389-077-150	115-100-021, 115-120-021, 115-130-021

Flat Ported Wear Bars	Mate
389-076-700	115-100-020, 115-120-020, 115-130-020
389-077-140	115-100-021, 115-120-021, 115-130-021

MSWS Probes



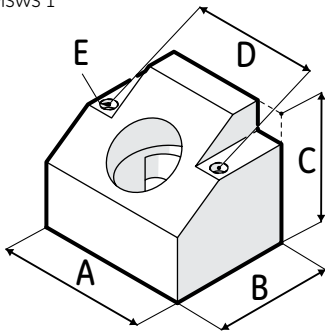
Applications

- General weld inspection, smaller objects, thinner sections
- Tubes, pipes, pressure vessels, containers
- Pumps, valve housings
- Turbine blades, shafts
- Wheel rims

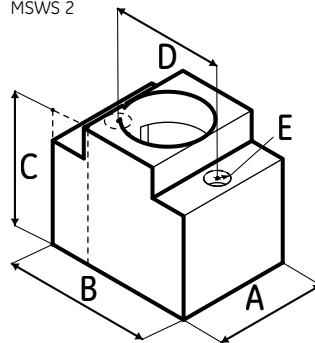
Features

- Small contact area
- Fits on standard single element MSWS wedges
- Comparable to standard single element MSWS probes with Phased Array capabilities
- Available with 3 different connectors

MSWS 1



MSWS 2

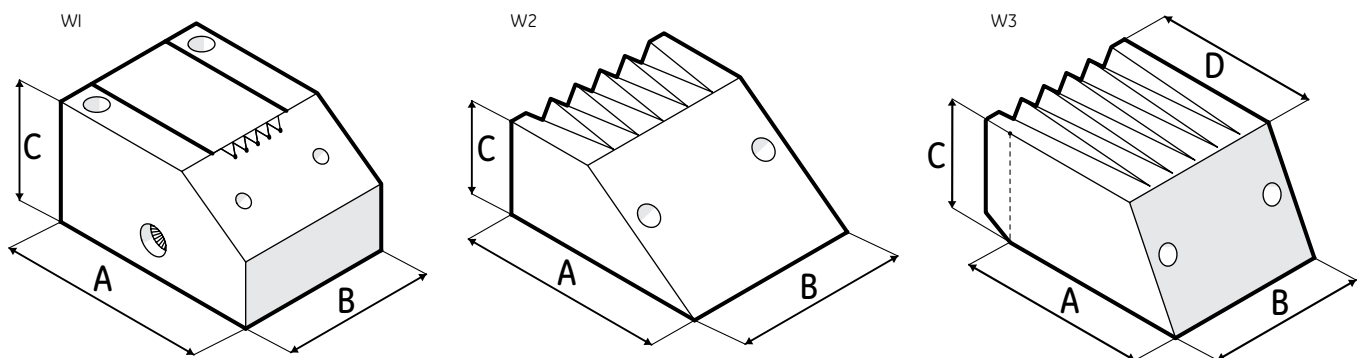


Part number Phasor	Part number Hypertronics	Part number Omniscan®	Aperture (mm)	Frequency (MHz)	Element Count	Pitch (mm)	Elevation (mm)	Cable (m)	Case Style	A (mm)	B (mm)	C (mm)	D (mm)	E
115-100-010	115-120-010	115-130-010	12.8 × 12.7	5	32	0.4	12.7	3	MSWS1	19.1	15.1	16.3	16.0	#1-64
115-100-011	115-120-011	115-130-011	12.8 × 12.7	10	32	0.4	12.7	3	MSWS1	19.1	15.1	16.3	16.0	#1-64
115-100-015	115-120-015	115-130-015	6.35 × 6.35	10	16	0.4	6.35	3	MSWS2	9.5	12.6	11.2	9.5	#1-64
115-100-012	115-120-012	115-130-012	12.8 × 12.7	5	16	0.8	12.7	3	MSWS1	19.1	15.1	16.3	16.0	#1-64
115-100-013	115-120-013	115-130-013	12.8 × 12.7	2.25	16	0.8	12.7	3	MSWS1	19.1	15.1	16.3	16.0	#1-64
115-100-037	115-120-037	115-130-037	6.4 × 6.4	5	16	0.4	6.4	3	MSWS2	9.5	12.6	11.2	9.5	#1-64

Wedges for MSWS Probes

Features

- Delay line or wedge attachment
- Small contact area
- Custom wedge angles and curvatures can be special ordered
- Manual or automated inspections



Mates to Case style	Wedge Style	Order Code	Shear Wave Carbon Steel	A (mm)	B (mm)	C (mm)	D (mm)
MSWS2	W1	360-141-219	30-80 DG	22.9	16.8	12.9	-
MSWS2	W2	118-340-028	45 DG	15.2	12.7	6.7	-
MSWS2	W2	118-340-030	60 DG	16.6	12.7	7.6	-
MSWS2	W2	118-340-032	70 DG	18.5	12.7	8.2	-
MSWS2	W2	118-340-034	80 DG	20.2	12.7	8.5	-
MSWS2	W3	118-340-036	90 DG	15.2	12.7	8.6	17.4
MSWS1	W2	118-340-040	45 DG	23.9	19.1	10.9	-
MSWS1	W2	118-340-042	60 DG	26.7	19.1	12.6	-
MSWS1	W2	118-340-044	70 DG	29.8	19.1	13.5	-
MSWS1	W2	118-340-046	80 DG	32.4	19.1	14.0	-
MSWS1	W3	118-340-048	90 DG	26.3	19.1	14.8	30.2

Scribeline Probes

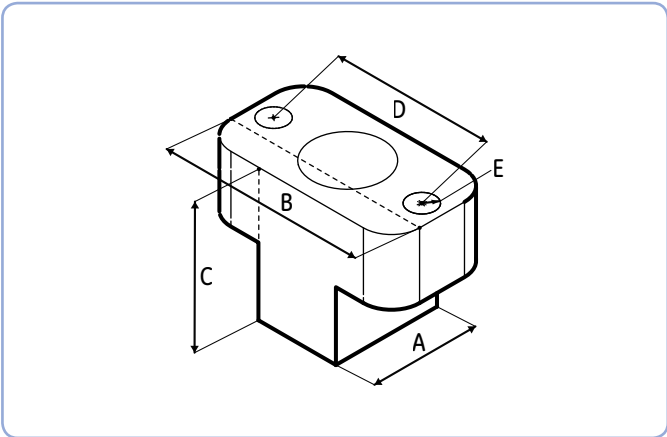


Applications

- General weld inspection, smaller objects, thinner sections
- Tubes, pipes, pressure vessels, containers
- Pumps, valve housings
- Turbine blades, shafts
- Aircraft lap joint inspections

Features

- Small contact area
- Available in 3 different connectors

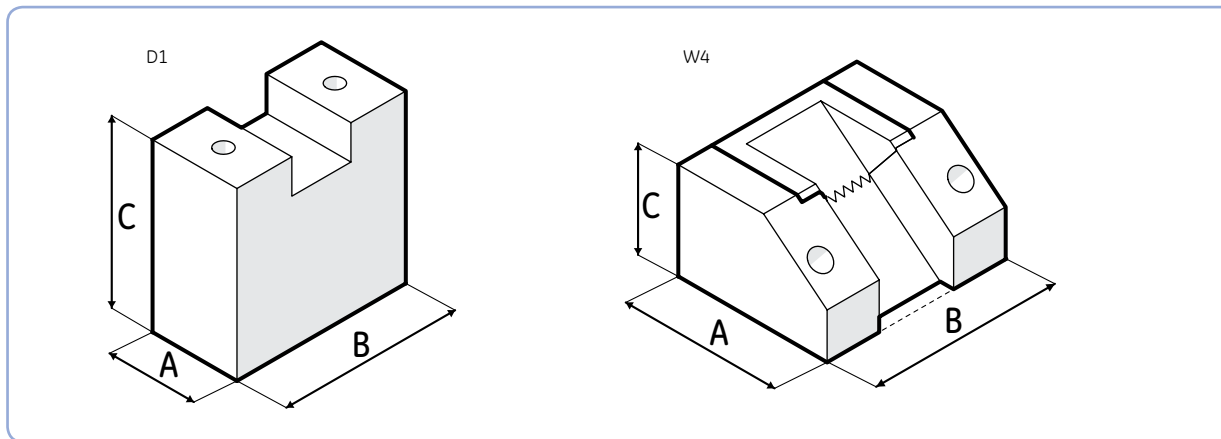


Part Number Phasor	Part Number Hypertronics	Part number Omniscan	Aperture (mm)	Freq. (MHz)	Element Count	Pitch (mm)	Elev. (mm)	Cable (m)	A (mm)	B (mm)	C (mm)	D (mm)	E
115-100-017	115-120-017	115-130-017	5.0 x 5.0	10	16	0.3	5.0	3.0	11.0	21.0	15.0	17.0	M3X0.5
115-100-016	115-120-016	115-130-016	5.0 x 5.0	5	16	0.3	5.0	3.0	11.0	21.0	15.0	17.0	M3X0.5

Wedges/Delay line for Scribeline Probes

Features

- Delay line and wedge attachment
- Small contact area
- Custom wedge angles and curvatures can be special ordered
- Manual or automated inspections



Order Code	Wedge	A (mm)	B (mm)	C (mm)
360-141-129	W4	17.8	21.3	11.6
360-141-148	W4	20.8	21.3	10.2

Order Code	Delay line	A (mm)	B (mm)	C (mm)
389-081-360	D1	12.7	25.4	19.9
389-071-220	D1	12.7	25.4	10.0

Hardwater Probes



Applications

- Composite inspection
- Bubbler applications where water is an issue

Features

- Probes use hardwater delay* to minimize water required for coupling
- Delay acoustically matched to water to minimize the water to delay interface
- Available with 3 different connectors

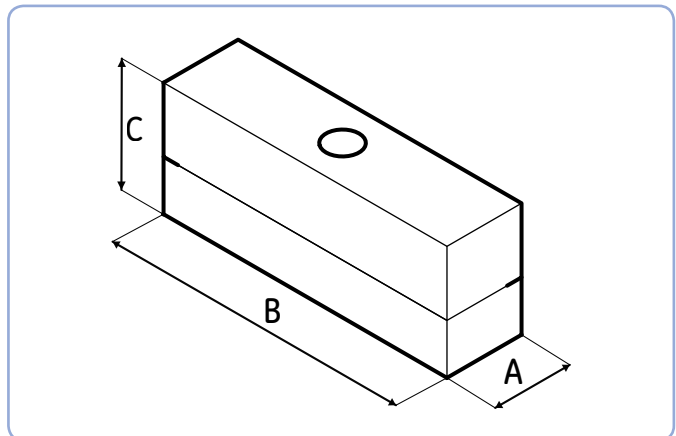
*Hardwater delay is a material applied to the face of the probe that is non-removable.

Main benefits:

Acoustically matches water to minimize interface echo.

Improves near surface resolution.

Decreases operating gain and frequency. (5MHz design frequency operates at approximately 2.6MHz)



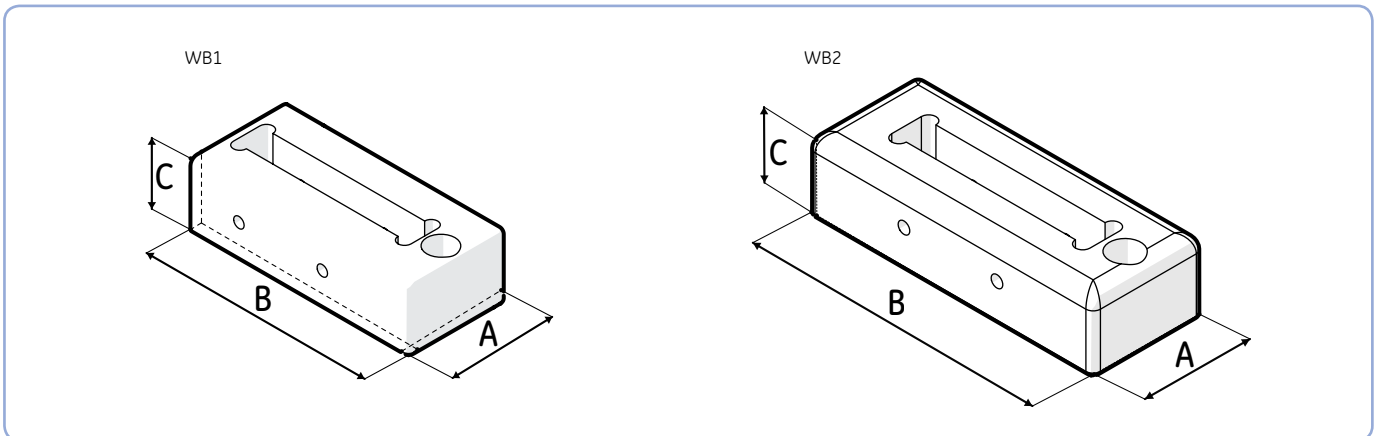
Part number Phasor	Part number Hypertronics	Part number Omniscan	Aperture (mm)	Freq. (MHz)	Element Count	Pitch (mm)	Elev. (mm)	Cable (mm)	A (mm)	B (mm)	C (mm)
115-100-027	115-120-027	115-130-027	40.6 x 8.0	5	32	1.3	8.0	6.0	13.0	43.0	31.0
115-100-028	115-120-028	115-130-028	81.2 x 8.0	5	64	1.3	8.0	6.0	13.0	86.0	31.0

Accessories for Hardwater Probes



Features

- Bubbler fixture for automated or hand scanning
- Available with or without encoder
- Applies 0.050" water coupling to hardwater probe



Part Number	Waterbox	Description	Mating Probe	A (mm)	B (mm)	C (mm)
022-509-571	WB1	Waterbox with side mount encoder module	Hardwater Probe, 115-100-028, 115-120-028, 115-130-028	48.0	106.0	31.0
389-064-070	WB2	Waterbox, no encoder		48.0	125.0	31.0
389-074-200	WB2	Waterbox with mini encoder		48.0	125.0	31.0

Immersion Probes

Applications

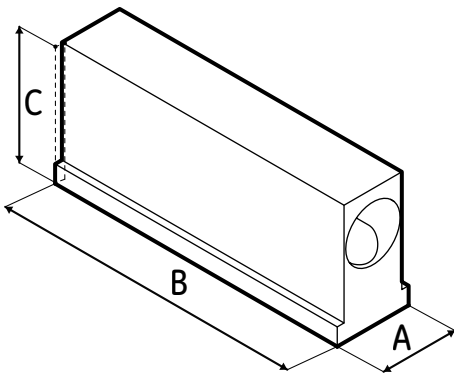
- Composite plate inspection
- Immersion scanning area coverage
- Plates, billets and bars
- Disks, axles and shafts
- Large area scanning

Features

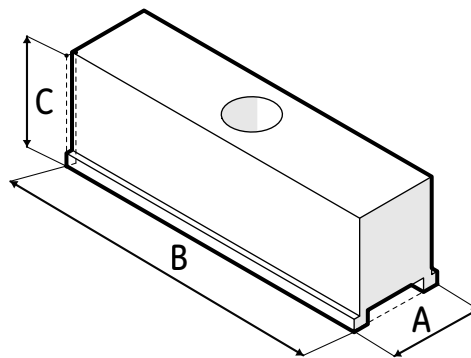
- Acoustically matched for best efficiency in water
- Fixture mountable
- Fast inspection of large areas
- Waterproof design
- Near wall design allows close access to edge of case (~1 mm)
- 6 meter cable



IM2 & IM3



INW2



Part number Phasor	Part number Hypertronics	Part number Omniscan®	Aperture (mm)	Frequency (MHz)	Element Count	Pitch (mm)	Elevation (mm)	Cable (m)	Case Style	A (mm)	B (mm)	C (mm)
115-100-035	115-120-035	115-130-035	64.0 x 7.0	3.5	64	1.0	7.0	6.0	INW2	19.0	65.9	22.0
115-100-036	115-120-036	115-130-036	64.0 x 7.0	5	64	1.0	7.0	6.0	INW2	19.0	65.9	22.0
N/A	115-120-031	115-130-031	76.8 x 10.0	5	128	0.6	10.0	6.0	IM2	21.0	83.0	35.0
N/A	115-120-032	115-130-032	64.0 x 7.0	10	128	0.5	7.0	6.0	IM2	21.0	83.0	35.0
N/A	115-120-033	115-130-033	96.0 x 12.0	2.25	128	0.8	12.0	6.0	IM3	21.0	102.0	35.0
N/A	115-120-034	115-130-034	96.0 x 10.0	5	128	0.8	10.0	6.0	IM3	21.0	102.0	35.0

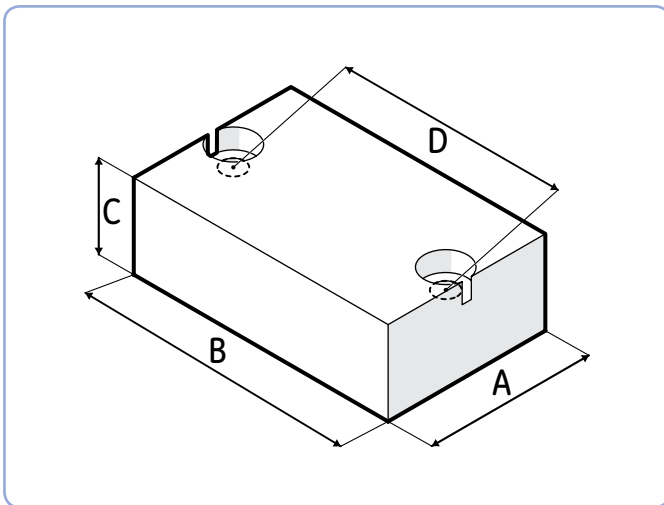
High Resolution Probes

Typical Applications

- Thin Plate, near surface defects, small defects

Advantages

- High frequency highly damped arrays for near surface inspections
- Acoustically matched to water/delay material
- Waterproof design



Part number Phasor	Part number Hypertronics	Part number Omniscan®	Aperture (mm)	Frequency (MHz)	Element Count	Pitch (mm)	Elevation (mm)	Cable (m)	Case Style	A (mm)	B (mm)	C (mm)	D (mm)	E
115-100-025	115-120-025	115-130-025	16.0 x 10.0	10	32	0.5	10.0	3.0	HRD1	23.8	38.5	12.7	32.2	M3X.5
115-100-026	115-120-026	115-130-026	32.0 x 10.0	10	64	0.5	10.0	3.0	HRD1	23.8	54.5	12.7	48.2	M3X.5

Removable Delay Line (included with transducer)	Transducer number
387-007-296 (12.7 mm length)	115-100-025, 115-120-025, 115-130-025
387-007-295 (12.7 mm length)	115-100-026, 115-120-026, 115-130-026

RotoArray



Applications

- Primarily for the inspection of composite materials and structures
- Flaw detection and thickness measurement in a wide range of materials
- Inspection during manufacture as well as for in service inspection

Features

- Excellent acoustic performance
- Use in any attitude including overhead
- Transparent tire for easy bubble removal
- Unique encoder
- 3 popular connector options
- Owner serviceable
- Platform for future models
- Interactive digital manual on UTprobes.com

Standard 0-59 mm width array

The compact 51.2 mm RotoArray is designed for quick and easy scanning of a variety of different applications. Its small design allows it to be used in tight locations and its light weight and ergonomic design keeps the operator from becoming fatigued during long periods of use.

Part number Phasor	Part number Hypertronics	Part number Omniscan®	Coverage area (mm)	Frequency (MHz)	Pitch (mm)	Elements	Elevation (mm)	Focus	Cable (m)	Probe Offset (mm)
115-910-100	115-920-100	115-930-100	51.2	5	0.8	64	6.4	Flat	3.0	28.2

Standard 60-99 mm width array

The 81.3 mm RotoArray is currently our only standard offering in the 60-99 mm range. Its larger size makes it ideal for inspecting airframes and fuselages.

Part number Phasor	Part number Hypertronics	Part number Omniscan®	Coverage area (mm)	Frequency (MHz)	Pitch (mm)	Elements	Elevation (mm)	Focus	Cable (m)	Probe Offset (mm)
115-910-200	115-920-200	115-930-200	81.3	5	1.3	64	8.0	Flat	3.0	28.2

Accessories for RotoArray

Included Accessories



The accessories included with the RotoArray allow for full functionality, and help to keep it maintained and functioning.

Optional Accessories



The optional accessories are highly recommended for the RotoArray and provide an ease of maintenance, verification, and use. The comprehensive RotoArray Service Station is one of the most useful accessories allowing users to minimize downtime by carrying out any necessary repairs and maintenance on a customized workbench fitted with all the necessary tools.

	Included / Optional Accessories	Part Numbers	115-910-100	115-920-100	115-930-100	115-910-200	115-920-200	115-930-200
Encoder 3 meter cable to 7 pin Lemo	Included (if Yes)	388-000-506	YES	YES	YES	YES	YES	YES
Frame Assembly w/ handels	Included (if Yes)		YES	YES	YES	YES	YES	YES
3 switch assembly w/ 3meter lemo	Included (if Yes)	388-000-500	NO	YES	YES	NO	YES	YES
Fluid fill bottle assembly	Included (if Yes)	389-079-240	YES	YES	YES	YES	YES	YES
Couplant Spray bottle	Included (if Yes)	021-265-015	YES	YES	YES	YES	YES	YES
Propylene Glycol 1Qt	Included (if Yes)	111-200-559	YES	YES	YES	YES	YES	YES
RotoArray tool kit	Included (if Yes)	388-000-502	YES	YES	YES	YES	YES	YES
RotoArray spare parts kit	Included (if Yes)	388-000-503	YES	YES	YES	YES	YES	YES
Case	Included (optional large or small)	Small= 021-026-099 Large= 021-026-354	Small or large	Small or large	Small or large	Small or large	Small or large	Small or large
Adapter Cable	Included (if Yes) (optional DBHD or Fisher)	DBHD= 388-000-501 Fisher= 388-000-525	NO	DBHD-15 or Fisher	DBHD-15 or Fisher	NO	DBHD-15 or Fisher	DBHD-15 or Fisher
Tire Change Station	Optional	389-079-390	Optional	Optional	Optional	Optional	Optional	Optional
Egronomic Water Sprayer	Optional	021-265-020	Optional	Optional	Optional	Optional	Optional	Optional
Demo Block Kit	Optional	389-081-400	Optional	Optional	Optional	Optional	Optional	Optional

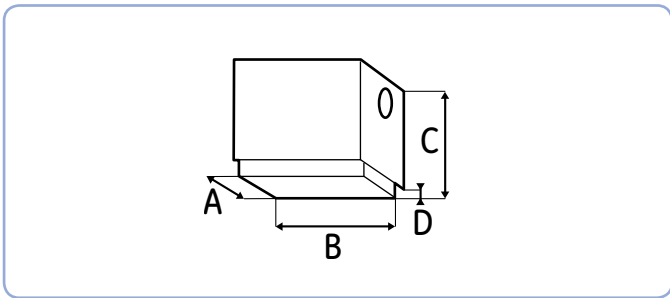
Integral Wedge Probes

Applications

- General weld inspection: MWB for small parts, SWB for thick parts
- Other applications where conventional MWB or SWB probes are in use

Features

- Easy transfer from conventional to phased array inspection
- Durable and ergonomically-designed, die-cast housing as known from conventional probes
- Existing mechanics and probe holders can be re-used
- Non-detachable wedges, no coupling loss between probe and wedge
- Replacement soles (sold separately) for extended service life



Part number Phasor	Part number Hypertronics	Part number Omniscan®	Probe Description	Aperture (mm)	Frequency (MHz)	Element Count	Pitch (mm)	Elevation (mm)	Cable (m)	Case Style	A (mm)	B (mm)	C (mm)	D (mm)
69141	69732	69730	MWB2PA16	8.0 x 9.0	2	16	0.5	9.0	2.0	MWB	14.0	24.0	22.0	2.0
69142	69733	69731	MWB4PA16	8.0 x 9.0	4	16	0.5	9.0	2.0	MWB	14.0	24.0	22.0	2.0

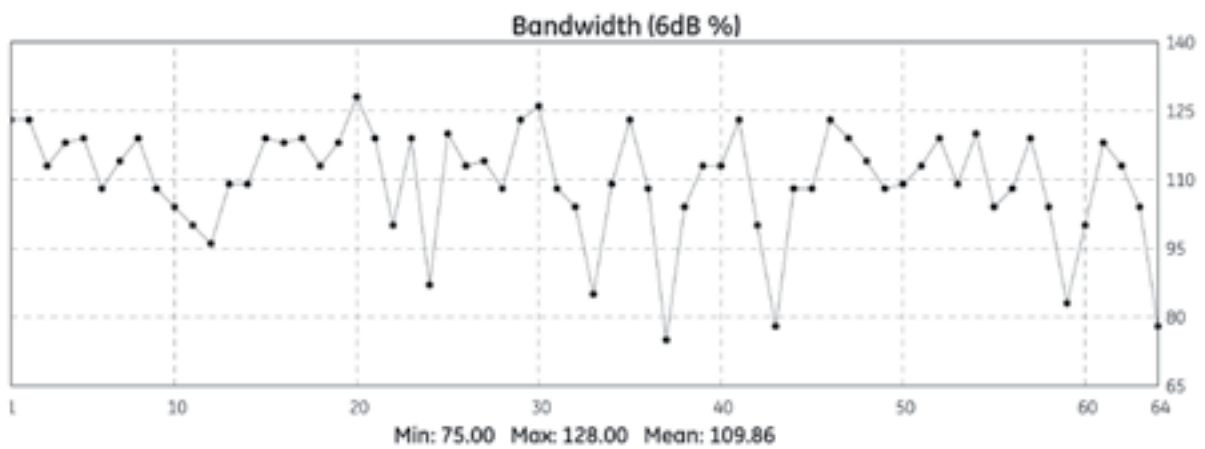
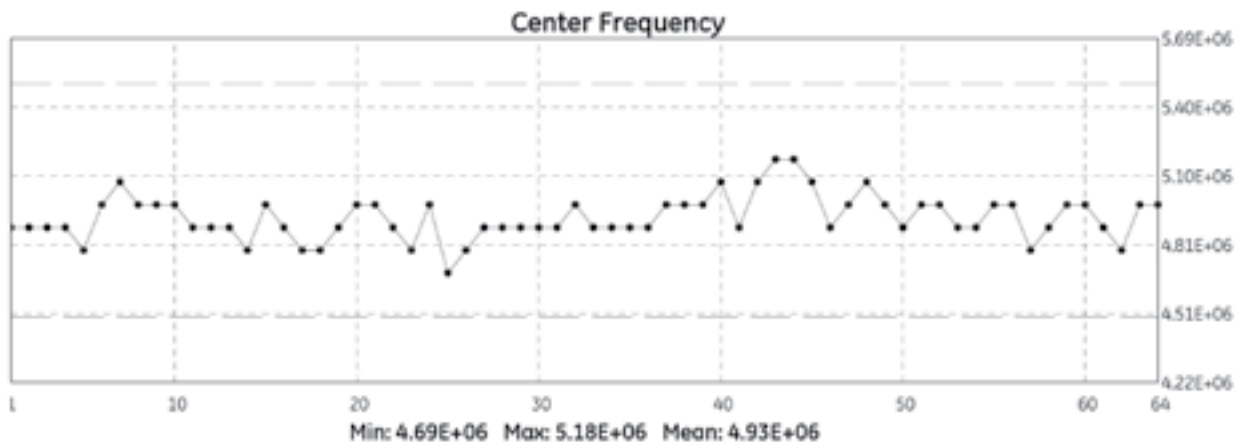
Part number Phasor	Part number Hypertronics	Part number Omniscan®	Probe Description	Aperture (mm)	Frequency (MHz)	Element Count	Pitch (mm)	Elevation (mm)	Cable (m)	Case Style	A (mm)	B (mm)	C (mm)	D (mm)
69143	69738	69736	SWB2PA16	14.0 x 14.0	2	16	0.9	14.0	2.0	SWB	22.0	37.0	31.0	3.0
69144	69739	69737	SWB4PA16	14.0 x 14.0	4	16	0.9	14.0	2.0	SWB	22.0	37.0	31.0	3.0

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Certification of Conformity

115-000-546 64EL .5MM PITCH ARRAY

Monday, July 12, 2010



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The accuracy of the transducer described above has been confirmed by factory standard test equipment and laboratory reference standards traceable to the National Institute of Standards and Technology. This facility's Quality System is registered to ISO 9001-2008, and is compliant to MIL-STD-45662A and ANSI/NCSL Z540-1-1994.

GE Inspection Technologies, LP
50 Industrial Park Rd.
Lewistown, PA 17044
Tel: 717.242.0327
Fax: 717.242.2606
GEInspectionTechnologies.com

021-247-480, Rev 1



GE imagination at work

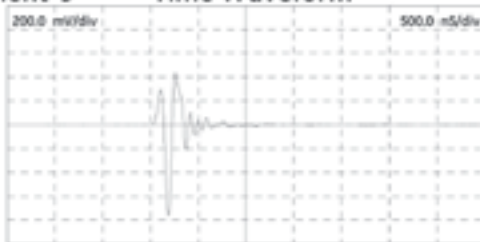
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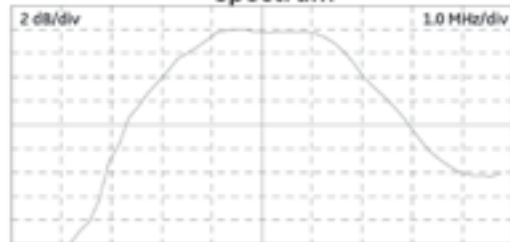
115-000-546 64EL .5MM PITCH ARRAY

Monday, July 12, 2010

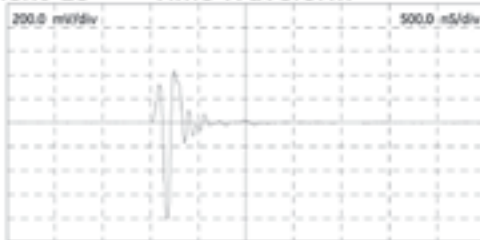
Element 9 Time Waveform



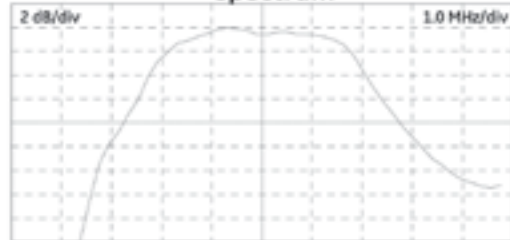
Spectrum



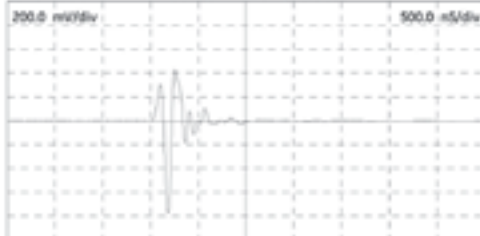
Element 18 Time Waveform



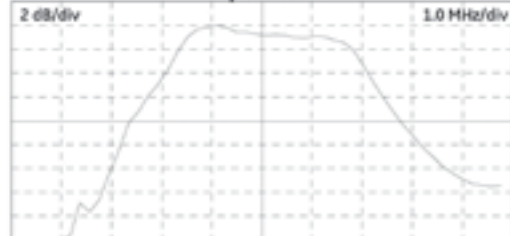
Spectrum



Element 27 Time Waveform



Spectrum



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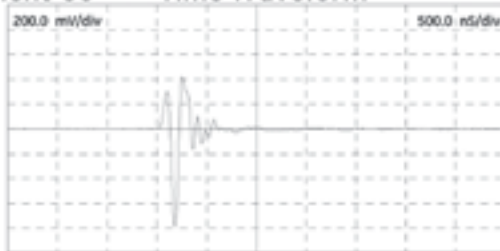
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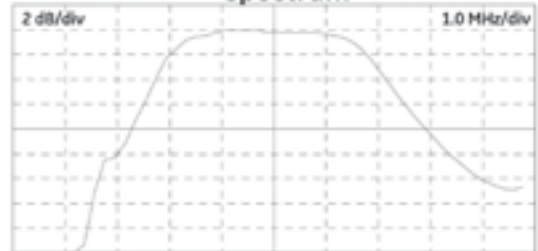
115-000-546 64EL .5MM PITCH ARRAY

Monday, July 12, 2010

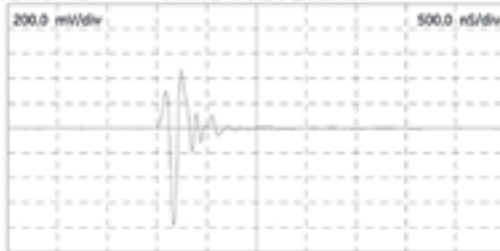
Element 36 Time Waveform



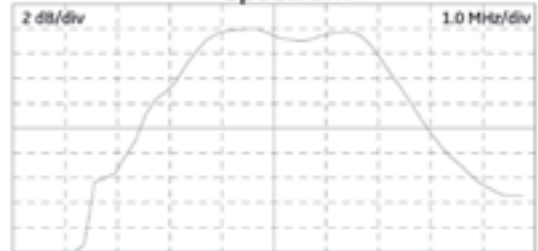
Spectrum



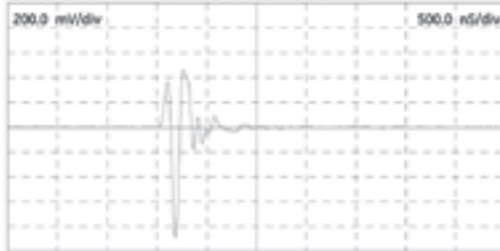
Element 45 Time Waveform



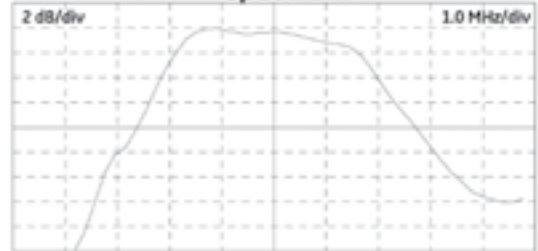
Spectrum



Element 54 Time Waveform



Spectrum



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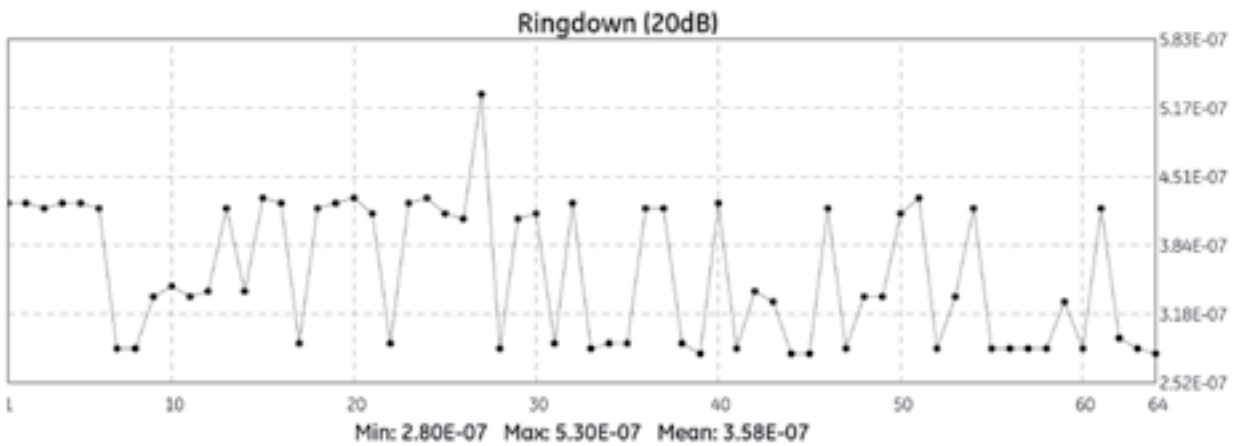
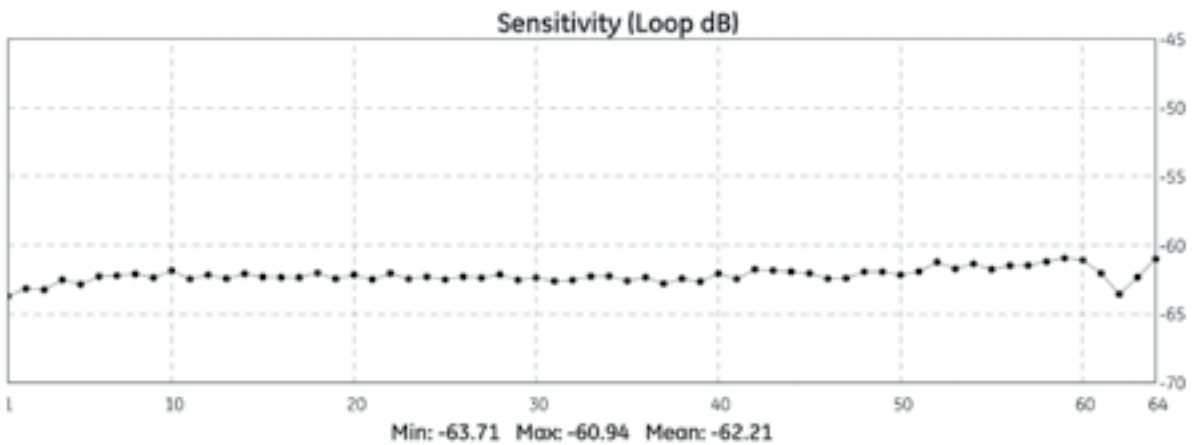
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115-000-546 64EL .5MM PITCH ARRAY

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Date Tested	7/12/2010 6:52:51 AM
Operator	BA
Test Specification	0512170
Test Specification Rev	C
Oscilloscope Serial Number	8747-DP310-001
Oscilloscope Cal Date	10/31/10
UTA Serial Number	MM00107
UTA Cal Date	6/14/2011
Software Designation	FNT0101
Software Rev	A



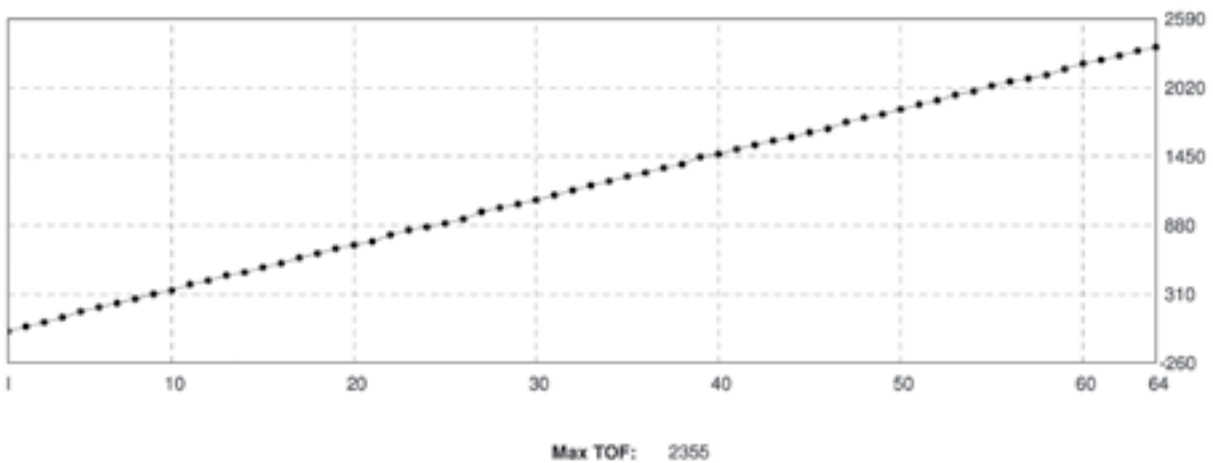
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Monday, July 12, 2010

TOF Wiring Verify



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Integral Wedge Probes Certificate

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Measurement & Control

Technische Daten/Technical data				Min. Toleranz	Max. Toleranz	Min. Toleranz	Max. Toleranz	Einheit
Element	T ₀ /μs	L/ MHz	E ₀ / %	Actual	Actual	Actual	Actual	
1	0.60	4.18	88.8	4	5.1	6	6	mm
2	0.91	4.33	77.8	5	8	8.5	12	mm
3	0.92	4.33	88.8	5	12	11	11	mm
4	0.64	4.32	85.8	var	15	17	17	mm
5	0.89	4.33	88.8	5	---	43.2	---	Distibution
6	0.91	4.33	88.7	---	---	270	---	mm
7	0.68	4.33	88.3	2	---	8.5	---	mm
8	0.91	4.33	88.8	5	---	18	---	mm
9	0.62	4.32	88.7	---	---	11	---	mm
10	0.88	4.33	87.4	---	---	---	---	---
11	0.83	4.32	88.3	---	---	---	---	---
12	0.89	4.33	88.7	---	---	---	---	---
13	0.91	4.33	88.3	---	---	---	---	---
14	0.94	4.33	88.3	---	---	---	---	---
15	0.89	4.33	88.3	---	---	---	---	---
16	0.75	4.22	88.8	---	---	---	---	---

Hersteller / Model	Serien-Nr. / Serial no.	Produktions- / Mfg. no.	Kalibrierdatum / Cal. Date	Gültig bis / Due Date
GE SAT GmbH / USM25 PK-Messplatz	7821	9885	12.08.2012	12.08.2013
Teilname / TID: ID12	8018372	8538	25.01.2012	25.01.2014
Schreiber / V1-100	8	0403	18.02.2012	18.02.2014
GE SAT GmbH / M30	2113	3883	09.05.2011	09.05.2013
GE SAT / Kontrollkörper 41.2"		8143	12.08.2011	12.08.2013

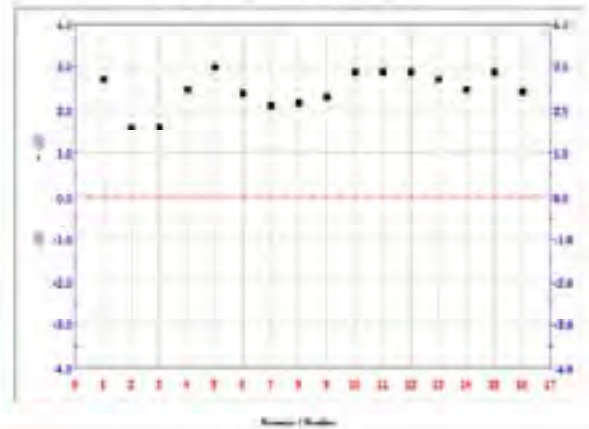
Teilname	41.2" Integral probe
Material	Flussglas / Flowglas
Ballgeschwindigkeit / Sound velocity	2730 m/s
Refaktor / Refractor	ebene Rückwand / Flat backwall
Abmessung / Dimension	30 mm
Kabelänge / Cable length	3m
Stecker / Connector	Type

PZ(E)

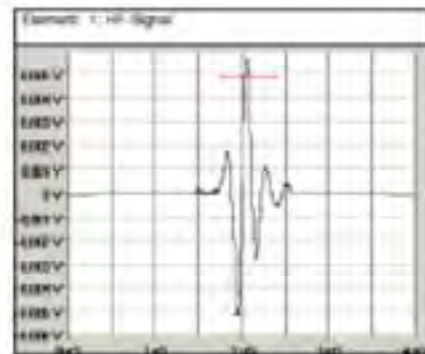
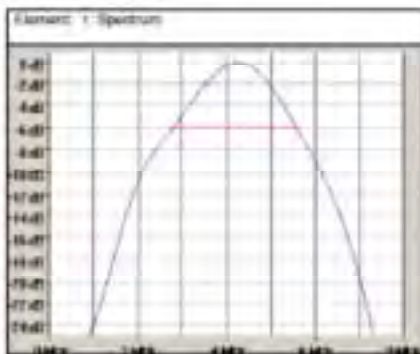
Prüfkopf-Typ / Probe type: HWB4PA16
 Ident-Nr. / Ident no.: 0881A2
 Serien-Nr. / Serial no.: 00558_00
 Prüfvorschrift / Spec: 10691A2_00010001
 Prüfdatum / Test date: 29.10.2012
in Anb. ERM2_pos08.2009



rel. Homogenität / rel. homogeneity



Waveforms and spectra



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GE Sensing & Inspection Technologies has sales and service offices all over the world. Below are some of our locations. Visit www.geit.com for a complete listing.

- Berchem, Belgium
- Alzenau, Germany
- Burford, United Kingdom
- Moscow, Russia
- Bucharest, Romania
- Prague, Czech Republic
- Stockholm, Sweden
- Milan, Italy
- East Perth, Australia
- Singapore
- Dubai, UAE
- Buenos Aires, Argentina
- Mexico City, Mexico
- Airdrie, Alberta, Canada
- Toronto, Ontario, Canada
- Montreal, Quebec, Canada

www.UTprobes.com





Mentor UT

The power of ultrasonic phased array inspection meets everyday use.



Reimagine ultrasonic testing

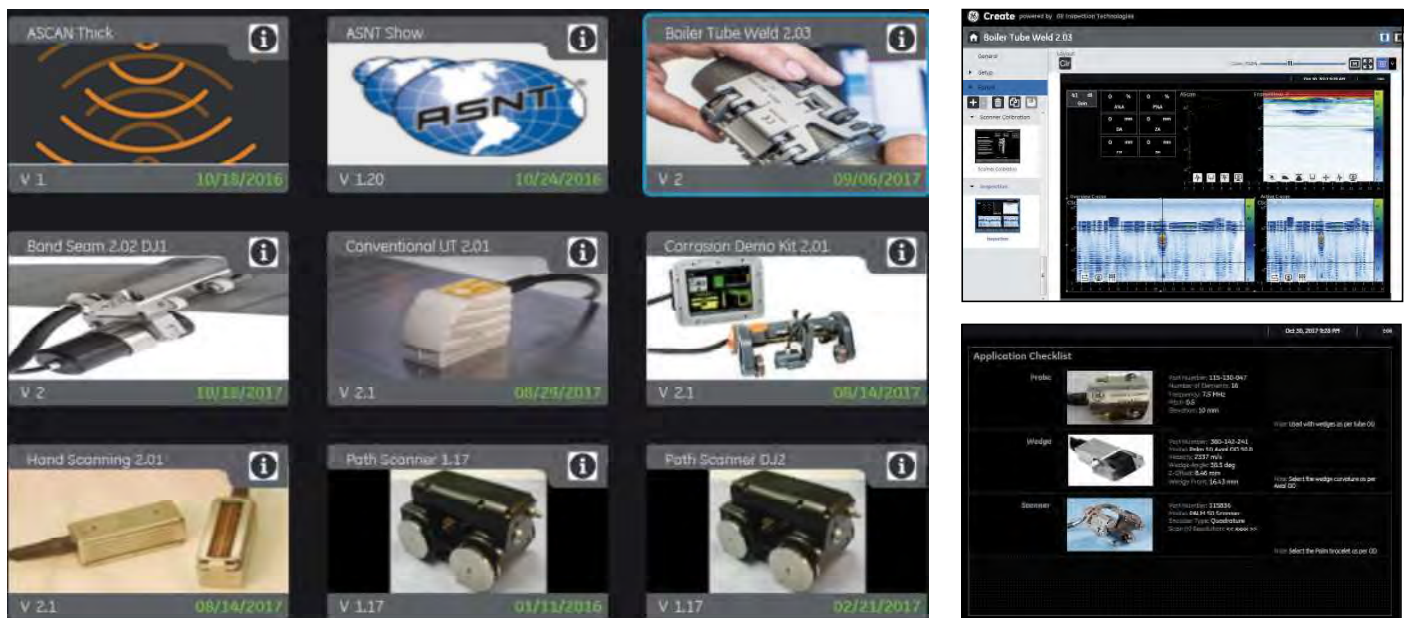
Pressure is higher than ever to lower operating costs and improve productivity, amidst stringent regulations and rapidly advancing technology that is ever more complex and expensive. For NDT inspectors, delivering the most effective and reliable inspections to help customers meet those demands means overcoming the challenges of increasingly complex testing procedures, an increasing number of instrument parameters to understand, and the growing loss of domain expertise.

Despite the accuracy and versatility of Ultrasonic Phased Array Testing (PAUT), the design of PAUT equipment currently available on the market can increase the cost of these inspections while decreasing the efficiency and consistency. Complicated inspection processes require extensive inspector training, while instruments designed to gather a wealth of data for a range of use-cases can lead to inconsistency among procedures.

But what if performing high-quality and efficient UT inspections was as easy as using a smartphone? With Mentor UT from GE, it is.



Mentor UT offers a new kind of inspection experience by combining outstanding UT performance, customizable workflow applications and user interfaces, and intuitive hardware with embedded expertise—making inspections more accessible and efficient.



Using Mentor Create is as easy as creating a powerpoint presentation, with each screen in the Mentor Create App acting like it's own slide.

Design your own inspection workflows for Mentor UT using GE's desktop software, Mentor Create. Customize inspection "apps" tailored to your unique testing procedures, industry applications and experience levels that can be as detailed or generic as each individual user sees fit.

User defined menus walk technicians through every step of an inspection—from probe selection and

calibration to reporting—ensuring consistency across your inspections, every time, from every inspector. And with the flexibility to load multiple workflows on one device, you can guarantee constant access to the right workflow needed for your inspection.

With Mentor UT, you get more productive, quality inspections.

Power meets performance

Mentor UT was developed with the quality and precision you expect from GE.

Field-ready right out of the box

Take the guesswork out of inspection setup with probe kits and inspection apps already installed on your Mentor UT device. Whether you're inspecting composites, welds, bolts, erosion or corrosion, create workflows that run the gamut from simple to extensive using GE-provided on-device apps for basic inspections. Reference guides are also immediately accessible during field inspections with pictures, videos, training documents and detailed inspection procedures.

Collaborative by design— save time and resources

Every Mentor UT is InspectionWorks enabled. This makes it the first UT device to easily allow wireless connectivity and live streaming. Now you can get expert advice or a second opinion for tough inspection calls when you need it—in real-time.

Rugged durability

Mentor UT stands up to tough environments with its IP65 durability rating—tested for water and dust resistance, extreme heat and humidity, cold, vibration, shocks and drops.

High-performance design

With 20 kHz pulse repetition frequency (PRF), Mentor UT combines a 32:32 phased array flaw detector (upgradable to 32:128) with a conventional UT channel to instantly switch between phased array and conventional inspections as needed.

Intuitive operation

With a glove-friendly, daylight-readable touchscreen, data collection, archiving and reporting are simplified with the ability to store A-scan data, as well as post-inspection analyses, right on the device.



Ultrasonic Testing is not one-size-fits-all.

Maximize your investment with unparalleled compatibility

A fleet of Phased Array Transducers is a significantly larger investment than a fleet of single element transducers. That's why Mentor UT was designed with three connector options. Easily pair the instrument with GE's rugged, field-proven line of probes and a variety of commercially available aftermarket scanners and robotic systems to meet a range of inspection needs.



For a low cost, lightweight option, connect directly to your Mentor UT device



Mentor UT delivers integral standard probe connection. Choose from commonly found Tyco or Ipex options.



MUX with increased capability up to 32:128 available with Tyco or Ipex options.

General specifications

Physical	
Dimensions (W x H x D)	295 mm x 230 mm x 60 mm (12" x 9.4" x 2.4")
Weight, w/Battery	2.9 kg (6.5 lbs)

Display	
Size	264 mm (10.4") diagonal
Resolution	1024 x 768 pixels
Mode	Indoor and outdoor specific color modes
Viewing Angle	± 85° all directions

Touch Screen (Multi-touch)	
Gloved Operation	Yes
Surface	Chemically strengthened glass, scratch resistant, chemical resistant, optically bonded to display

Data Storage	
Solid State Hard Drive	128 GB
USB Storage	USB 2.0 w included module
Data Capture	Full ASCAN capture for every CSCAN point, all settings. Recall on instrument with full analysis capability
Data Files	memd files, CSV files
Settings Files	All instrument settings plus position in workflow
Screen Capture	JPG Format
Report	PDF Format

Connectivity	
Wi-Fi	802.11 b, g, n
Connectors	USB 2.0, Ethernet, HDMI
Remote Collaboration	Local Network and Internet-Enabled via InspectionWorks Connect
InspectionWorks	Enabled

I/O	
Axes	2 digital quadrature encoders for X-Y axes
Audible	Tone, 2.7 kHz

Power	
Internal Battery	63 WH Lithium Ion
External Battery	84 WH Lithium Ion
Power Supply	100 to 240 VAC, 47-63 Hz, 1.9 A; 12VDC
Battery Life	3 hrs internal, 6 hrs with external battery under typical operating conditions
Compliance	Meets IATA air transport regulations with one contained installed battery and one packed external battery

Environmental	
Operating Temperature	-20C to +55 C (-4F to 131F) to MIL-STD-810G Method 501.5 & 502.5, Procedure I
Storage Temperature	-20C to +70C (-4F to 158F) to MIL-STD-810G Method 501.5 & 502.5, Procedure II
Ingress Protection	Tested to IP65
Shock	4' Transit Drop to MIL-STD-810G method 516.6, Procedure V

Data Visualization	
User Interface	Customizable with Mentor Create software
Zoom	Any data view may be expanded to full screen with gesture
Instructional Material	Rich Text, JPG, PNG, BMP, PDF or Video (MP4)
Views	A-SCAN, C-SCAN, C-SCAN OVERVIEW, E-SCAN, S-SCAN
Probe Selection	Swap between conventional and phased array on same screen
Evaluation	2 Gates, one can be used as interface echo gate
Measurements	Amplitudes, Depth, Distance, % Wall Loss, Thinnest Point, X and Y Positions
Calibrations	Phased Array: TCG, Material Velocity, Probe Delay, Auto80, Encoder Cal, Dead Element Check Conventional: 2 Point (Material Velocity and Probe Delay)

Ultrasonic specifications

Configuration	
Phased Array	
Channels	32
Aperture	1-32 Elements
Max Elements	32
Focal Laws	1024
Scanning	Linear, sectorial, focused
Conventional	
Channels	1
Pulsar (Phased Array and Conventional)	
PRF	10 Hz to 20 kHz
Pulse Shape	Bipolar or unipolar square wave
Voltage	20-150 V _{pp} , 0 - -75V _{up} ; in 5 V steps
Width (auto or manual)	50-3000 nS
Delay Step Increment	10 nS
Receiver and Digitizer (Phased Array and Conventional)	
Gain	0-78 dB (Phased Array), 0-94 dB (Conventional); in 0.2 dB steps
TCG	
Number of Points	Up to 16
Slope	50 dB/μS
Rectification	Pos HW, Neg HW, Full, RF
Bandwidth	0.5 MHz to 15 MHz
Digitizing Rate	62.5 MHz, up-sampled to 500 MHz
Delay Step Increment	2.5 nS
Acquisition Range	50 nS to 150 μS
ASCAN Compression Points	512, 1024, 2048, 4096

MUX module specifications

Physical	
Dimensions (W x H x D)	8.6" x 8.4" x 4.1"
Weight, w/Battery	6.5 lbs
Power	
Exchangable Battery, hot swap	84 WH Lithium Ion
Power Supply	100 to 240 VAC, 47-63 Hz, 1.9 A; 12VDC
Configurations	
Phased Array	
Channels	32
Aperture	1-32 Elements
Max Elements	128
Focal Laws	1024
Scanning	Linear, sectorial, focused
Conventional	
Channels	1

With GE, innovation is the standard.

True to form for the world's preeminent Digital Industrial Company, GE's industry-leading Mentor platform of connected NDT portables is designed to enable reliable inspection for all users, regardless of experience level. With outstanding performance and advanced software, the Mentor family of products is ready and able to help your organization improve inspection productivity and equipment reliability.

GE Inspection Technologies

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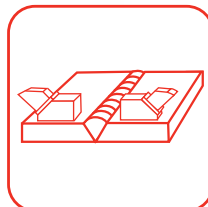
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GEA32151A (12/2017)

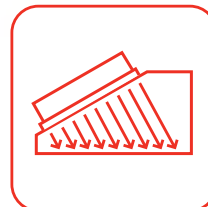


NEW USM Vision 1.2

A Total Weld Inspection Solution to Increase Productivity in New Process Pipework Fabrication



Parallel scanning



Linear scan



More channels



Introduction

The USM Vision has been developed to meet a market need to transition from radiographic inspection to ultrasonic inspection in the fabrication of new process pipework for the process, water, power generation and oil & gas sectors. Conventional film radiography has long been the preferred method of weld inspection in fabrication shops and it provides excellent results, which are easy to understand.

However, film radiography is necessarily accompanied by significant restraints, such as safety considerations, chemicals storage, waste disposal, long film development times, and film archiving.

Ultrasonic inspection suffers from none of these restraints and, although it cannot be used instead of radiography in every instance, it offers accurate, code-compliant, reliable and fast data. Unfortunately, this type of inspection requires a qualified ultrasonics inspector. And highly skilled ultrasonics inspectors can often be very difficult to find.

NEW USM Vision 1.2

Following user feedback, the scope and functionality of the USM Vision has been extended. This field-proven, pipe weld inspection system now features parallel scanning, and supports 128 element Phased Array Probes. With parallel scanning, both sides of the weld are scanned in one pass, effectively doubling productivity. The system also incorporates the ability to use up to 128 element Phased Array probes instead of 64 element versions, so that linear Phased Array scans can now be carried out for pipes of even greater wall thickness.

USM Vision, the Efficient Solution to Managing Task Sharing

The USM Vision provides a cost-effective and elegant solution to the problem. It allows ultrasonics to be applied to pipe weld inspection, eliminating the constraints of film radiography and allows tasks in the inspection process to be shared among non-ultrasonics specialists (e.g. radiography inspectors with minimum ultrasonics training) and highly qualified ultrasonics experts, so that optimum use is made of the time of all levels of NDT technicians. The highly qualified ultrasonic personnel can focus on the task for which he is most valuable, like set-ups validation and data analysis, and manage several UT trained operators doing inspection plan creation, calibration and field data acquisition.

And all this with no compromise on accuracy and reliability of data and a significant improvement in productivity.

Compliance codes

ASME V
B31.3
API 1104
ASTM E 2373
B31 Case 181
Code Case 2235

EN ISO 17640
EN ISO 10863
Pr EN ISO 13588

DICONDE

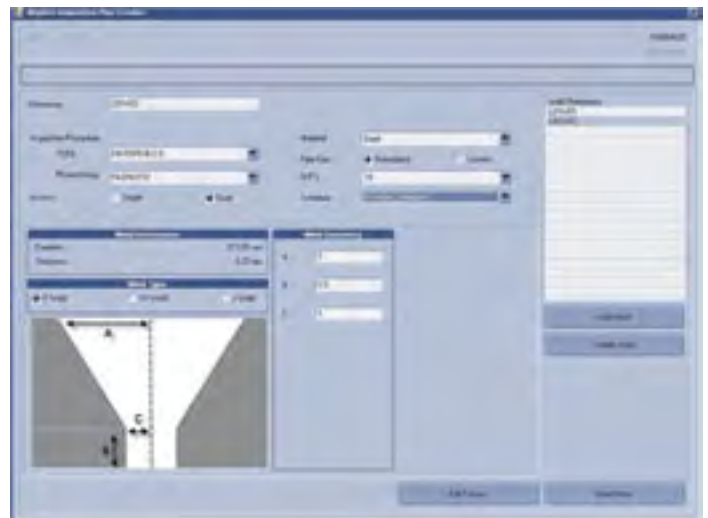
USM Vision Rationalizes

Inspections Plan Creation and Validation

Creating an Inspection Plan

No ultrasonic knowledge is required to create and populate an inspection plan. All that is required is to describe the inspection task, and enter the basic information such as site location, number of welds, pipe diameter, thickness and material, weld preparation, procedure and method to be used. The software will then calculate and generate all the UT set-ups required to perform TOFD and/or Phased Array inspection of the specified welds. These set-ups include:

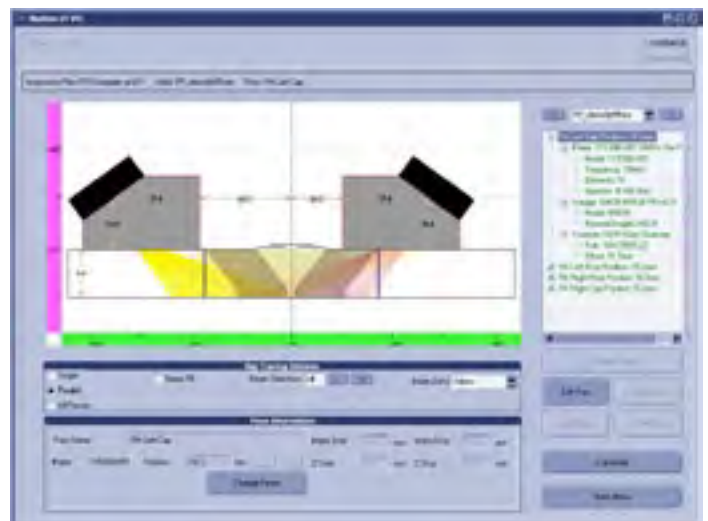
- selection of the correct probes and wedges from a database
 - positioning of the probe
 - positioning of the required UT parameters
- to perform an efficient inspection according to the standard and code-based procedure selected.



Validating an Inspection Plan

A technician qualified in ultrasonics must then validate the set-ups. Each weld is split in one or several passes with TOFD or PA technique. The UT specialists have to validate these passes by using a ray tracing tool. They also have the ability to modify them by selecting another probe from the database, adjusting the probe(s) position(s). When all the passes are validated, the inspection plan can be exported to the acquisition unit.

NEW The import and export function for inspection plan files is simplified so that the inspection plan can be exported without forwarding the entire database.



s the Weld Inspection Pro

Calibration and Data Acquisition

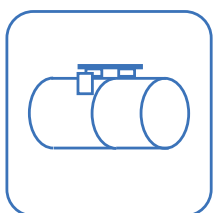
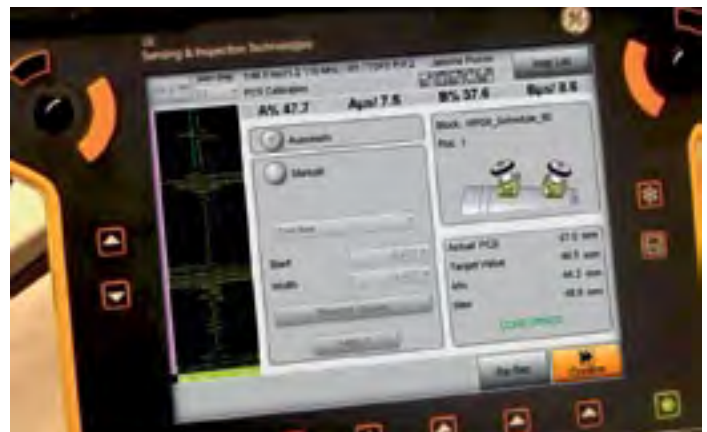
Calibration

As the data acquisition is 100% guided, this task doesn't require a highly trained UT operator. The technician merely selects an inspection plan, and is then guided through a step-by-step process from the probe and wedge validation, UT calibration (PCS and sensitivity calibration for TOFD, element and wedge check, DAC / TCG curve recording for PA), scanner settings and calibration.

Acquiring the Inspection Data

The inspection data for each weld, is simply acquired by following the inspection plan and the different TOFD and PA passes calculated by the IPC. After each pass the software will propose the next weld or pass to be inspected helping the operator to use the best, most productive way in the inspection plan. Data can be exported, for one pass, one weld or for the complete inspection plan, for analysis and reporting at any time during the inspection.

NEW For Phased Array, the system can inspect the two sides of the weld with one physical scan which effectively doubles productivity. The instrument can now perform inspection with linear Phased Array scans as recommended in some codes. USM Vision 1.2 can handle probes up to 128 elements which means that pipes of greater wall thickness can be inspected with linear scans.



Process Ensuring Efficient and

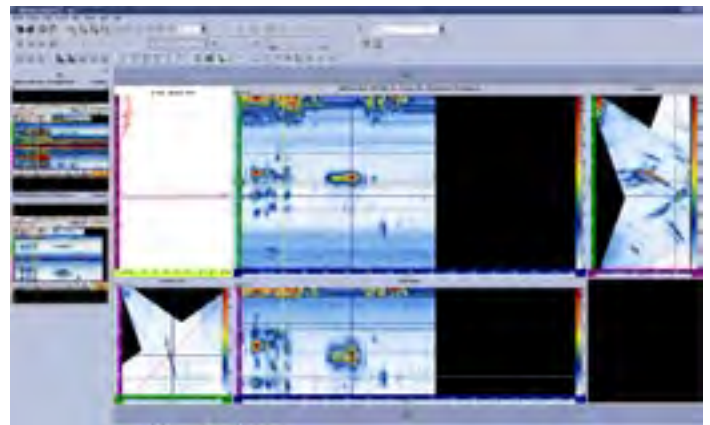
Data Analysis and Reporting

Analyzing the Inspection Data

All inspection data is communicated to an analysis station using the Rhythm software platform. Here the suitably qualified ultrasonic inspector can review and analyze the inspection data, using advanced analysis tools such as real time, volume-corrected imaging, as well as conventional digital tools features for image analysis, enhancement and measurement. In addition, a variety of measurement and viewing tools is contained within the analysis software.

Reporting

Expert interpretation of inspection results can be provided immediately and reports can be printed off in real time. This offers a very fast assessment of the weld status as feedback for weld repairs.



The collage includes a printed report with the following sections:

- Company Information:** ET Inspection Technologies (Service Company in charge of the inspection)
- Inspection Details:** Inspection plan number, Reference of the Inspection, Client Name, Customer address, and ET Installation.
- Personnel:** Inspection plan validated by, Report validated by, and Report reviewed by, each with Operator name, Level, Date Validation, and Signature.
- Table:** A table with columns for Reference (EN 10204-2.2), Procedure, and Status.
- Dimensions:** Weld diameter, Weld thickness, and Weld reinforcement.
- 3D Model:** A 3D visualization of a weld joint with yellow and red highlights.
- Software Screenshot:** A smaller version of the software interface showing inspection data.
- Table:** A table with columns for ID, Material, Length (along axis), Position (along depth), and other parameters.



and Accurate Inspection

Archive and Share Data

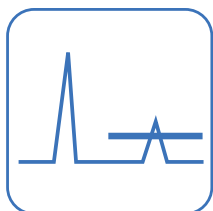
Archiving the Inspection Data

The inspection data are saved in the Rhythm Archive software, allowing to save the raw data with necessary tags. Input and retrieval of information is quick and easy. This accepts data from any number of LAN-connected, remote Rhythm Review workstations and stores them using various compression techniques to save storage space without sacrificing data quality

Sharing the Inspection Data

All inspection data can be shared with other interested parties, either as enhanced imagery or as raw data. It can be transmitted to other Rhythm Review stations for third party verification.

Turning information into intelligence and sharing inspection data across experts and locations with ease!



Scope of Applications

The USM Vision has been developed to simplify and to democratize the Ultrasonic Inspection according to the international codes and standards through:

- Optimizing the use of specialized inspection personnel
- Increase productivity
- Reducing the current weld inspection radiographic constraints
- Reducing the ultrasonic weld inspection complexity

USM Vision is especially dedicated to:

- Energy construction industry
- Carbon steel and Stainless steel pipes
- Covers the Normalized Pipe Size (NPS) in automatic setup
 - Diameters from 73 mm (2.875") up to 1219 mm (48")
 - Thicknesses from 6 mm (1/4") up to 50 mm (2")
 - Higher thickness and diameter in manual setting
- Circumferential welds
- Short exit point wedges and short scanner arms available for pipe to elbow and pipe to flange



USM Vision a Total Weld Inspection Solution

The USM Vision is supplied as a complete weld inspection solution, consisting of:

- IPC software for creation of the inspection plan and automatic generation of the UT set-ups.
Integrate a database with procedures based on international codes and standards and ray tracing functionality for the validation of the UT parameters.
- The USM Vision hand-held flaw detector, featuring:
 - Conventional channel, TOFD, 16/64 or 16/128 Phased Array, Real Time Volume Corrected Images, A-scan saving
 - Unique user interface to operate a pointing device by two trackballs
 - Ease of use for untrained operators
 - 26,5 cm (10.4") color touch screen with 1024 x 768 resolution
 - Weighs only 4 kg (8.8 lb)
 - Hot swap battery exchange for continuous operation
 - Robust, rubber housing, IP 54
 - Dimensions:
 - Length top: 367 mm (14.4")
 - Length bottom: 310 mm (12.2")
 - Width: 250 mm (9.8")
 - Height: varying from 60 to 100 mm (2.36" to 3.93")
 - Modern PC interfaces including USB, Ethernet, wireless connection (WiFi)
 - IPC and analysis software can be operated from the USM Vision
 - Transport case
- An encoder-scanner, designed for TOFD and Phased Array manual acquisition including:
 - Manual handle cart with magnetic wheels
 - Optional chain for the inspection of pipes
 - Arm with probe and center line pointer holders, forks for TOFD and PA wedges
 - Transport case
- Set of probes and wedges relating to the specified pipe ranges and inspection codes
- Rhythm Review 4.2 software for the analysis and reporting – Windows 7
- Optional Rhythm modules for archiving, sharing and advance reporting functionalities

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www.geinspectiontechnologies.com

GEIT-20058EN (01/12)

Multi-Axis XYZ-TT-GS INDUSTRIAL IMMERSION SCANNING

Utilizing the very latest technologies, immersion inspection allows for internal and flaw detection. Parts are submerged in water which acts as a coupling medium for the ultrasonic probe. Internal and external inspection for defects or thickness measurement is very accurately carried out via the inspection software. Subsurface flaws, disbands, cracks and other irregularities can be analyzing for size, thickness, depth and other quantitative features.

- High speed low vibration Linear Motor
- Offline analysis for virtual re-scanning of parts that are no longer available
- Multi Axis scan options (X, Y, Z 1&2, Gimbal 1&2, Swivel 1&2 and Turntable)
- Contour following for inspection of curved parts
- Squirter transducer holder available
- Real-time A, B & C-scans
- Simultaneous Multi-zone inspection



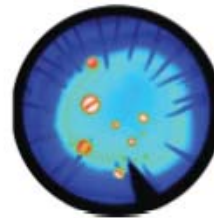
Multi-Axis XYZ-TT-GS INDUSTRIAL IMMERSION SCANNING

OKOS Digital Imaging System



ODIS Acoustic Microscopy software with rich technical content is built on industry feedback. It includes both time domain and frequency domain imaging in real-time. Advanced analysis is provided through quantitative tools for measurement and classification of parts.

The Analysis version of ODIS allows non-scanning computers to virtually re-scan, view, and analyze data.

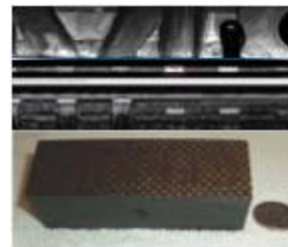


Defect Detection
Multiple Zones
Near Surface
Sub Surface
Inside Part

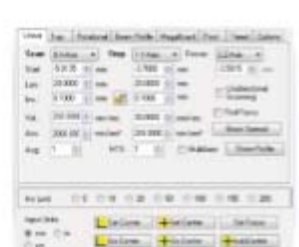


Feature	ODIS	Others
Ultra Large Scans (up to 40 GB)	✓	x
Ultra High Rep Rate (up to 30 KHz)	✓	x
90 Simultaneous Gates/Channel	✓	x
Multiple Gates on Multiple Channel	✓	Limited
Image Analysis	✓	✓

B-scan & SLICE Imaging



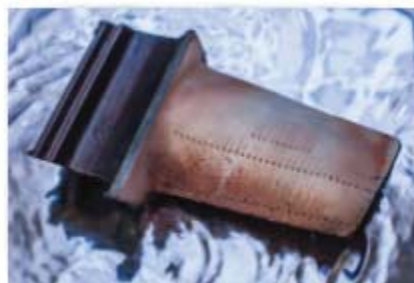
Advanced Software Controls for Engineers



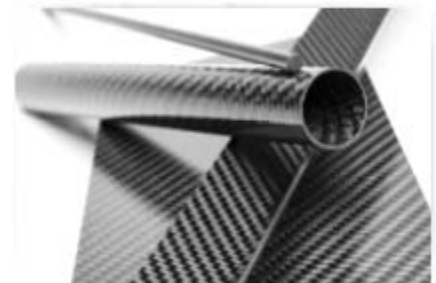
Metals & Alloys



Turbine Blades



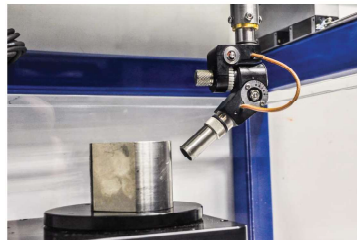
Composites



NDT-CF 300 Multi Axes NDT Scanner Compact Footprint

Ultrasonic NDT Inspection of

- Hard-cutting materials
- Composites
- Custom alloys
- Solder joints
- Plastics
- Printed circuit boards
- Turbine blades



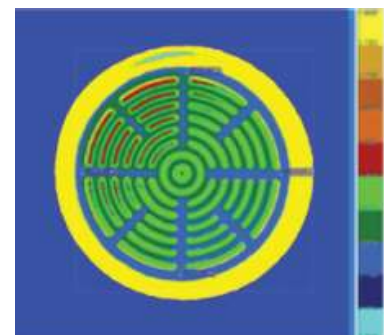
Gimbal



Turntable

- X, Y and Z linear axes
- Scan Envelope 300 mm x 300 mm x 150 mm
- Optional Turntable
- Optional Through Transmission Yoke
- Optional Gimbal
- 360 Degree view acrylic tank
- Optional linear servo on X axis

- 12-bit dynamic range instrumentation
- High gain Pulser/Receiver
- Hardware TGC/DAC control
- Application-specific transducers
- Full-featured NDT scanning software
- Off-line Analysis



Defect Detection

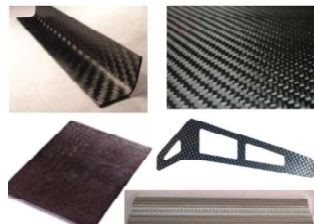
- Multiple Zones
- Near Surface
- Sub Surface
- Inside Part

ODIS WinSAM Software Acoustic Microscopy Imager



ODIS WinSAM is the latest Acoustic Microscopy software with rich technical content built on current platforms and industry feedback.

It includes **both** time and **frequency domain** Imaging in real-time. The software provides advanced analysis through quantitative tools for measurement and classification of parts.



Composites



Metals and Alloys



Turbine blades



- Multi Axis scan options
- Highly customizable software
- A, B and C-scans
- Contour following
- Off-line analysis
- Virtual rescanning



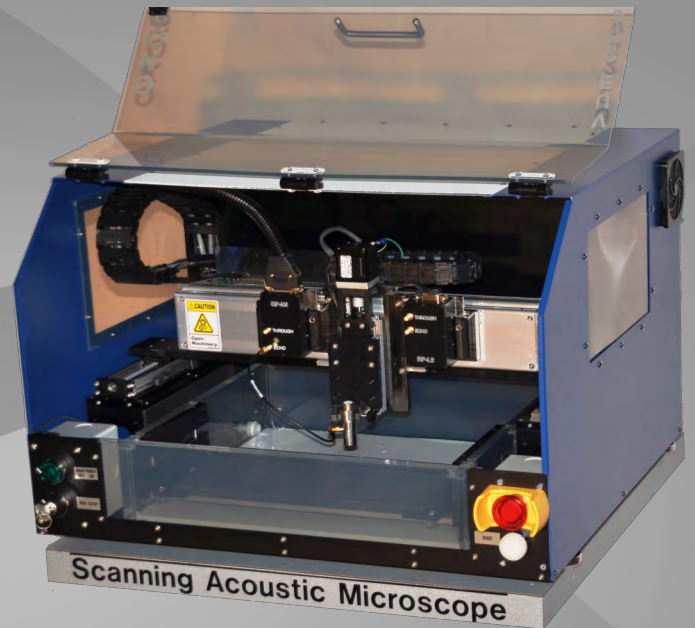
info@okos.com



Multi-Gating

Virtual Rescanning

Thickness Measurements



VUE 250-P

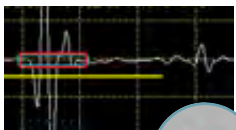
SCANNING ACOUSTIC MICROSCOPY

Semiconductor Package Failure Analysis

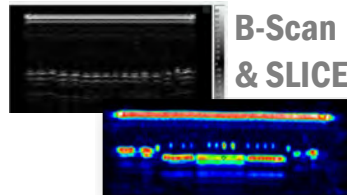
voids · disbonds · cracks · delamination · internal defects

Included Software Modes:

- Basic (user friendly)
- Advanced (detailed analysis)
- Offline Analysis (virtual scanning)



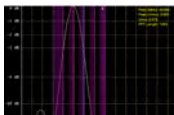
Real-time A-Scan & A-Scan Capture



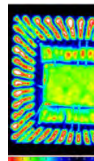
B-Scan & SLICE



Threshold Mapping (post processing)



Frequency Domain Imaging (FFT)

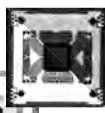


C-Scan with Multi-gate, SALI, & SALI Groups



Cluster Analysis (post processing)

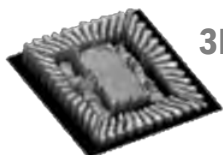
Size (µm)	Area	Bounding Area	Bounds (µm)
7.45%	Total area: 1.57 mm ² 0.00 mm ²		
3.23%	0.88 mm ² 0.00 mm ²	1.10 mm x 0.90 mm	1.10 x 1.10
1.17%	0.30 mm ² 0.00 mm ²	0.40 mm x 0.40 mm	0.40 x 0.40
1.13%	0.30 mm ² 0.00 mm ²	0.36 mm x 0.36 mm	0.36 x 0.36
0.64%	0.17 mm ² 0.00 mm ²	0.20 mm x 0.20 mm	0.40 x 0.40
0.64%	0.17 mm ² 0.00 mm ²	0.20 mm x 0.20 mm	0.36 x 0.36
0.26%	0.07 mm ² 0.00 mm ²	0.10 mm x 0.10 mm	0.20 x 0.20



Scan Math Before and After Reflow Characterization



Advanced Time-of-Flight & Thickness Measurements



3D Imaging



Void Gating (real-time)



SPECS

Maintenance Free Scan Axis

Motor: Linear Servo
 Max Velocity: 500 mm/s
 Accuracy & Repeatability: +/- 1.0 micron
 Scan Envelope: 250 mm

Low Maintenance Step Axis

Step Envelope: 150 mm

Low Maintenance Focus Axis

Focus Envelope: 35 mm

Dimensions

0.64 m x 0.61 m x 0.5 m (WDH)
 52 kg

Customer Interface

Dual 22" HD LED Monitors

Fixtures

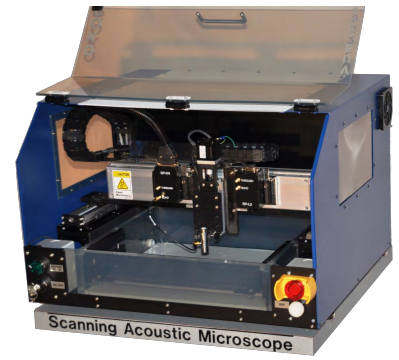
Tray Fixture
Optional Through Transmission Bracket
 LED illumination

Instrumentation

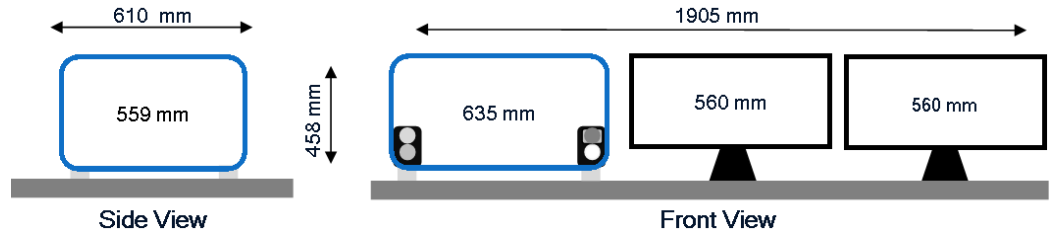
Digital Pulser Receiver
 Up to 4 GHz Digitizer

Scan Area

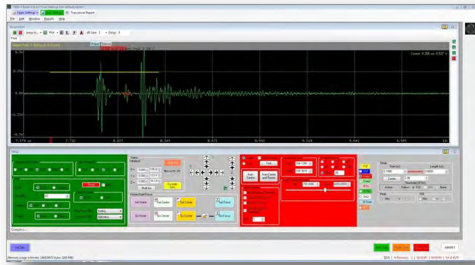
Partial JEDEC Tray



WORKSPACE



OKOS Digital Imaging System (ODIS)



ODIS is the latest Acoustic Microscopy software with rich technical content built on current platforms and industry feedback. It includes both time domain and frequency domain imaging in real-time. Advanced analysis is provided through quantitative tools for measurement and classification of parts. The Analysis version of ODIS allows non-scanning computers to

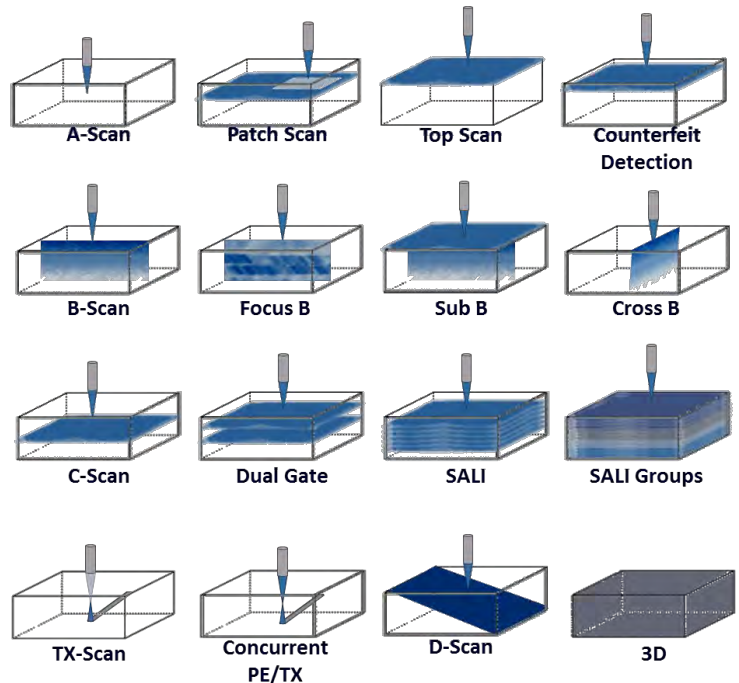
- | | |
|-----------------------|--------------------|
| Counterfeit Detection | Product Inspection |
| Product Reliability | Quality Control |
| Process Validation | Failure Analysis |
| Vendor Qualification | R&D |

virtually scan, view, and analyze data for simultaneous real-time analysis or post collection review. Previously undetected flaws can now be imaged with poled peak analysis.



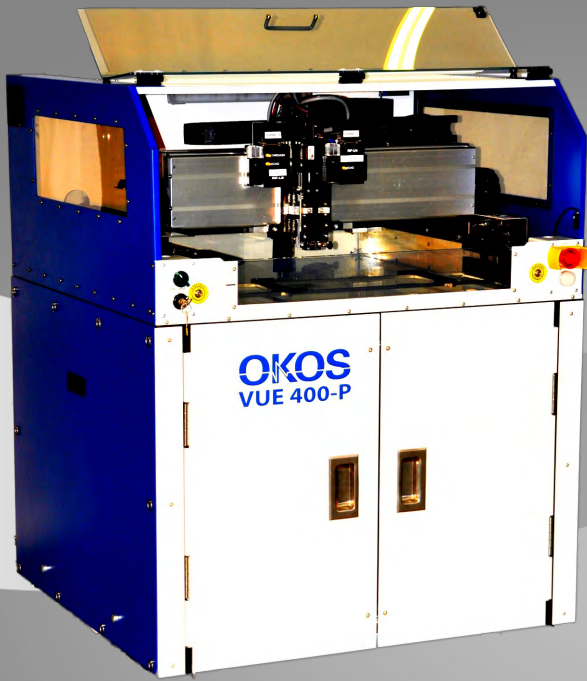
Application Specific Transducers

for the highest quality resolution. Multiple transducer designs for enhanced scan capability.



TEL +1 703 880 3039
 FAX +1 240 235 7277
www.okos.com
info@okos.com

4429 Brookfield Corporate Dr., STE 700, Chantilly, VA 20151, USA

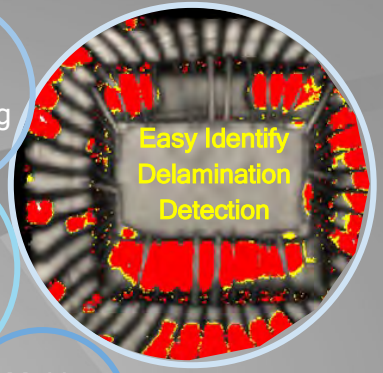


Virtual
Rescanning

Pass/Fail
scan sorting

Flatness
Measurements

Multi-
Gating

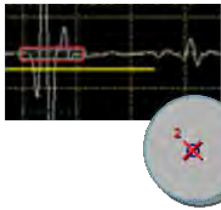


VUE 400-P

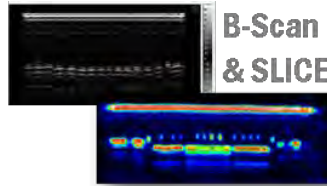
SCANNING ACOUSTIC MICROSCOPY
Semiconductor Package Failure Analysis
 voids · disbonds · cracks · delamination · internal defects

Included Software Modes:

- Basic (user friendly)
- Advanced (detailed analysis)
- Production (automated scanning)
- Offline Analysis (virtual scanning)



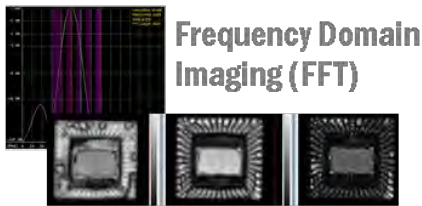
Real-time
A-Scan
&
A-Scan
Capture



B-Scan
& SLICE



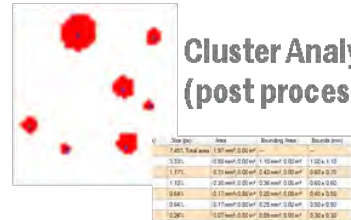
Threshold Mapping
(post processing)



Frequency Domain
Imaging (FFT)



C-Scan with
Multi-gate, SALI,
& SALI Groups



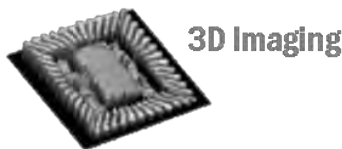
Cluster Analysis
(post processing)



Advanced Time-of-
Flight & Thickness
Measurements



Scan Math
Before and After
Reflow
Characterization



3D Imaging



Void Gating
(real-time)



SPECS

Maintenance Free Scan Axis

Motor: Quad Linear Servo
 Max Velocity: 1500 mm/s
 Accuracy & Repeatability: +/- 0.5 micron
 Scan Envelope: 380 mm

Low Maintenance Step Axis

Step Envelope 350 mm

Low Maintenance Focus Axis

Focus Envelope 50 mm

Dimensions

0.9 m x 0.86 m x 1.18 m (WDH)
 227 kg

Customer Interface

Dual 22" HD LED Monitors

Fixtures

Tray Fixture
Optional Through Transmission Bracket
 LED illumination

Instrumentation

Digital Pulsar Receiver
Optional second channel
 Up to 12 GHz Digitizer

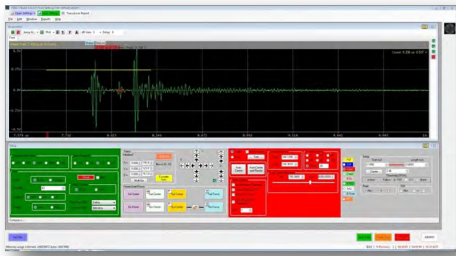
Scan Area

Dual JEDEC Trays
 Up to 300 mm wafer



Clean Room Ready

OKOS Digital Imaging System (ODIS)



VUE 400-P imaging power surpasses modern standards delivering premium FA Lab features to semiconductor fabrication facilities. ODIS is the latest Acoustic Microscopy software with rich technical content built on current platforms and industry feedback. It includes

Counterfeit Detection

Product Reliability

Process Validation

Vendor Qualification

Product Inspection

Quality Control

Failure Analysis

R&D

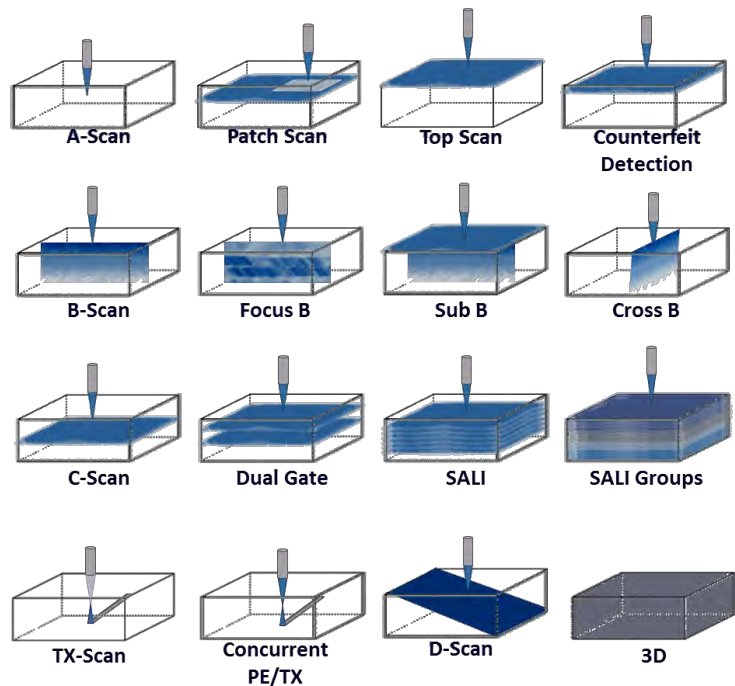
both time domain and frequency domain imaging in real-time.

Advanced analysis is provided through quantitative tools for measurement and classification of parts. The Analysis version of ODIS allows non-scanning computers to virtually scan, view, and analyze data for simultaneous real-time analysis or post collection review. Previously undetected flaws can now be imaged with poled peak analysis. Supplied with your choice of Windows 7 or 8.



Application Specific Transducers

for the highest quality resolution. Multiple transducer designs for enhanced scan capability.



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4429 Brookfield Corporate Dr., STE 700, Chantilly, VA 20151, USA

GE
Inspection Technologies

USIP 40

Multi-Channel Ultrasonic
Inspection Instrument



The USIP40 is a precision, multi-channel inspection platform that can be configured as a remote ultrasonic unit, an integrated rack-mountable instrument, or as a portable battery-powered instrument. All USIP 40 versions take advantage of the same basic ultrasonic hardware, graphical user interface, and application specific software tools.



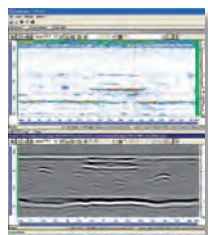
GE imagination at work

Performance and Productivity by Design.

The USIP 40 delivers precision, multi-channel ultrasonic testing performance you can rely on. It is available with up to ten ultrasonic channels and comes in three different package options – a remote ultrasonic unit, an integrated rack-mount instrument, or a fully portable, battery-powered instrument. All of these versions utilize the same core electronic hardware and Graphical User Interface. When you combine its outstanding ultrasonic performance with optional application specific imaging and analysis tools, you can see that the USIP 40 is the ultimate solution for your current and future inspection needs.

The Ultimate Inspection Confidence

Application specific GUI



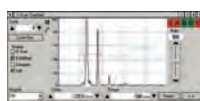
The USIP 40 takes full advantage of its Microsoft Windows™ based operating environment. Each of its instrument functions is designed as a separate plug-in.

This allows the operator to set-up a customized display showing the right information for a particular application.

Several levels of graphical user interface

can be created with their own password protection to control access to specific functions.

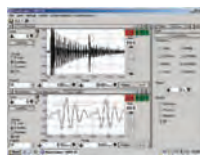
EchoMAX



Screen update rates on digital instruments are not able to keep up with the pulse repetition frequency of high performance ultrasonic instruments. As a result, previous digital flaw detectors had difficulty

displaying an alarmed defect's actual A-Scan. GE's exclusive EchoMAX technology is designed to overcome this issue and offers the ultimate in A-Scan display for reliable echo visualization by completely digitizing the A-Scan of each ultrasonic pulse. The EchoMAX uses advanced algorithms to capture and display the exact A-Scan of every alarm condition, ensuring real time visual alarm verification. The operator can be confident to never miss a shot and has the ability to pass a defect standard through at full test speed.

Multi A-Scan

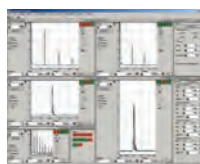


With the USIP 40's Multi A-Scan feature, you can view up to ten channels of ultrasonic data on the same screen simultaneously. Each A-Scan can be controlled independently with different gain, range and delay and include up to four colored bar gates. Because each

window is independent, the operator can size the A-Scan as large or small as required for easy viewing.

The Multi A-Scan feature also allows you to simultaneously display two A-Scans from the same cycle using different display ranges. You can now display an overall A-Scan and zoom in to inspect details at the same time.

Multi-Cycle operation



A USIP 40 can be provided with up to 10 ultrasonic channels depending on inspection needs. In addition to this channel flexibility, the USIP 40 provides up to 20 separate ultrasonic setups (cycles) to automatically drive single or multiple channels complete with DAC or

TCG compensation during an inspection sequence. As each cycle is independent, gain and gate positions can be varied between cycles. This allows the operator to carry out multiple tests using a single probe.





Feature Summary

- Up to 10 ultrasonic channels
- Up to 20 kHz PRF
- Aero version qualified to GE and RRAE specifications
- Independent pulser and receiver for each channel
- 20 Programmable cycles for multi-zone inspection
- EchoMAX A-Scan display function
- View up to 10 A-Scans at once
- Available strip chart , C-Scan imaging, and TOFD weld inspection software
- Interface gate synchronizing for surface following
- Back-wall echo attenuator
- Direct 3-axis encoder input
- Automatic Gain Control
- User configurable in English, French, German, Spanish, Japanese, Chinese

Wide Fields of Application

Aerospace

The USIP 40 Aero configuration is qualified to GE DFO P3TF22, P3TF30, P3TF35, and RRAE RPS705 specifications for jet engine component inspections. USIP 40 instruments are also extensively used for airframe composite inspection by leading aircraft manufacturers.

Automotive

Used in conjunction with Ultraproof imaging software, the USIP 40 is the perfect instrument for inspecting pistons and other safety critical parts. Configured in this way, the USIP 40 provides visualization and recording of alarm outputs as well as automatic evaluation and reporting of single flaws, interacted flaws, and total numbers of flaws per part and per batch.

Pipe and tube

With the appropriate probe holders and imaging software, the USIP 40 is easily set up for weld inspection, multi-channel flaw detection and wall thickness measurement.

Plate and billet

Combining inspection productivity and coverage requires multiple inspection channels. The 10-Channel USIP 40 fills this need in both manual and automated inspection environments.

Roll testing

The multi-channel USIP 40 combined with C-Scan imaging provides rapid scanning of industrial rollers. GE's K-Scan software knits multiple ultrasonic channels to form one continuous C-Scan. In combination with the USIP 40's 20,000 Hz PRF, this package is perfect for high-speed defect evaluation and sizing.

Vessel weld inspection

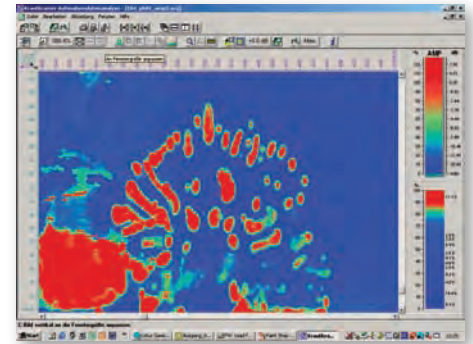
Combined with Ultramap Weld software, the USIP 40 can be configured to perform multi-channel inspections of welds on pressure vessels to ASME Case 2235 utilizing both Time of Flight Diffraction (TOFD) and pulse-echo B-Scan imaging and data archiving tools.

Technical Specifications

USIP 40	
Number of Channels	Up to 10 Channels in Maximum 20 Cycles
Pulse Repetition Freq.	4 to 20000 Hz, Proportionally Divided for Each Cycle
Pulser	Spike Pulse 100 V, 400 V / Charging Capacitor, 1 nF, 220 pF / Rise Time, 10 ns
Wide-Band Filter (-3 dB)	0.2 - 30 MHz / 10 - 30 MHz / 1 - 10 MHz
Narrow-Band Filter	1 / 2.25 / 5 / 10 / 15 MHz
Gain	0 - 110 dB, in 0.5 dB Steps
Fine Gain Setting	1 dB, Continuously Variable in 10 Steps
Rectifier	Full-Wave, Negative, Positive Half-Wave, RF Mode
Reject	Linear, 0 - 80 % Screen Height
TCG	44 dB with Maximum 12 dB/ μ s
DAC/TCG	DAC or TCG with up to 16 Reference Echoes per Cycle, Multiple DAC Mode with up to Four Additional Curves at Variable Spacing from the Reference Curve, Individual Curves for Each Cycle Possible
Backwall Echo Attenuation	Full Dynamic Range of 110 dB
Sound Velocity	500m/sec - 20000m/sec (0.02 inch/sec - 0.78 "/sec)
Digital Upsampling	400 MHz, 9 bits
A-Scan Display	512 or 1024 Pixels, Range: 4.5 mm - 15 m in 0.1 mm Increments (0.1" - 590" in 0.004" Increments), Pulse Delay -10 mm - 15 m in 0.1 mm Increments (-0.4" - 590" in 0.004" Increments), Display Start with Initial Pulse or Interface Echo
Evaluation Gates	Four (Interface, A, B, C) Color Coded and Independent per Cycle, Coincidence or Anticoincidence Logic Selectable, Flaw Suppression per Counter (1 - 16), Trigger: Initial Pulse or Interface, Width 0.1 mm - 15 m in 0.1 mm Increments (0.003" - 590" in 0.004" Increments), Start 0.0 mm - 15 m in 0.1 mm Increments (0" - 590" in 0.004" Increments)
Amplitude Resolution	0.5 % of Display Range
Thickness Resolution	2.5 ns Corresponding to 0.007 mm (0.000275") at Sound Velocity of Steel
Thickness Measurement Modes	Measurements Selectable between Initial Pulse or Interface Echo and Gates A, B, or C or between Gates A and B. Start/Stop at Zero Crossing, Flank or Peak Echo Including Tolerance Monitor with 4 Thickness Values Min and Max per Cycle
Data Output	Measurement Readings Output as Max Amplitude or Min/Max Thickness Value. Alarm Output Amplitude Threshold or Min/Max Thickness Value.
Analog Outputs	10 User-Programmable for Measurement Readings (Active/Min/Max), Wall Thickness/Echo Amplitude 0 to 10 V, 12 Bit Resolution.
Alarm Outputs	16 User-Programmable for Cycle and Threshold, for Flaw Threshold via TTL (Coincidence/Anticoincidence), for Thickness Tolerance Monitor via TTL with Range Overflow and Underflow.
Test Data Release	4 User-Programmable Inputs for Each Test Channel.
Encoder Inputs	3 Inputs for Quadrature or Pulse/Direction Encoders, Compression of Ultrasonic Data on Path Grid.
Units	mm, inch, μ s
Operator Interface Languages	User Configurable in English, German, French, Spanish, Chinese and Japanese
Interconnects	Probes: Lemo 00 or BNC; RF Output: Lemo 00; I/O: 25-pin Sub D; 37-pin Sub D; Sync: 9-pin Sub D; Video: VGA Out 15-pin Sub D Rack and Portable Configuration also Include - Mouse and Keyboard: PS2 (Rack only); Serial Interface: 9-pin Sub D; 2 x USB
Network	Box with Ethernet - TCP/IP, 100 MB/s
Mains Operation	Rack and Box via Internal Power Supply (85 - 265 VAC); Power Consumption 40 W (Rack), 24 W (Box). Portable Version via External Power Supply (85 - 265 VAC), Battery Operation: Two Li-Ion Battery Packs (Hot Swap), 10.8 V, 7.2 Ah ea, 3.25 h Operation. 70 W During Charging
Operating Temperature	0 - 40° C (32 F - 104 F)
Size (HxWxD) and Weight	Rack: 310 mm x 450 mm x 375 mm (12.2" x 17.7" x 14.75") (7U), 16.5 kg (36.36 lb) Box: 125 mm x 450 mm x 430 mm (4.9" x 17.7" x 16.9") (3U), 7 kg (15.4 lb) Portable: 390 mm x 374 mm x 150 mm (15.3" x 14.7" x 5.9"), 8.2 kg (18.1lb) Incl. 2 Li-Ion Batteries

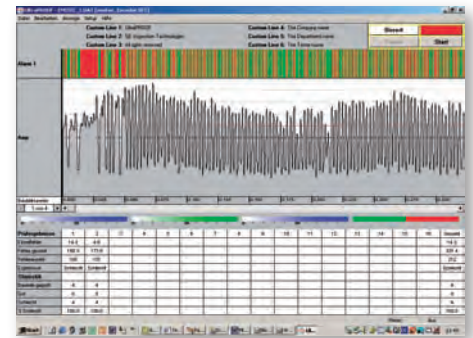
K-Scan

Multi-featured C-Scan imaging option that, when combined with the USIP 40, provides a powerful inspection tool for immersion tank, roller and other applications.



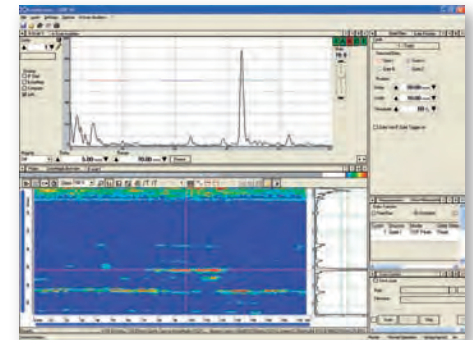
Ultraproof

Strip chart data recording, imaging and analysis option for the USIP 40 provides a series of tools for applications requiring linear scans.



Ultramap weld

Multi-channel imaging option for the USIP 40 providing TOFD and pulse echo tools for weld inspection.



GE Inspection Technologies: productivity through inspection solutions

GE Inspection Technologies provides technology-driven inspection solutions that deliver productivity, quality and safety. We design, manufacture and service Ultrasonic, Remote Visual, Radiographic and Eddy Current equipment and systems. Offering specialized solutions that will help you improve productivity in your applications in the Aerospace, Power Generation, Oil & Gas, Automotive or Metals Industries.

Visit www.ge.com/inspectiontechnologies for more information.



SENSOR[®]
NETWORKS, INC

Inspection, Testing & Asset-Integrity Solutions



Standard and Custom Ultrasonic Transducers:

- ▶ Conventional
- ▶ Phased Array
- ▶ Applications Engineering



Who We Are:

Sensor Networks, Inc. (SNI) is a Pennsylvania-based technology company specializing in the design and fabrication of industrial ultrasonic transducers and tooling for demanding in-situ test and inspection applications. Engineered for precision, ease of use, and maximum durability, our offerings include ultrasonic transducers, fixtures, couplant-delivery systems, qualification/calibration standards, procedure development, personnel training and instrumentation.

“The transducer enables and/or optimizes the UT exam.”

Ultrasonic Transducers:

- ▶ Conventional
- ▶ Phased Array
- ▶ Applications Engineering

SNI’s deep domain expertise enhances NDT solutions through the selection, design, and optimization of the ultrasonic technique. The transducers’ efficiency is paramount for converting electrical energy into sound, then coupling and directing that acoustic energy into the test piece to maximize its signal-to-noise ratio.

With an average of 21 years and an aggregate of 916 years, our experienced team of engineers, technicians, assemblers, and general managers have an extremely deep level of knowledge and background in solving unusual, demanding, and complicated NDT projects. Industries served over this time include aerospace engines and airframes, nuclear vessels, heat exchangers, large gas turbines and others.



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Contact Transducers

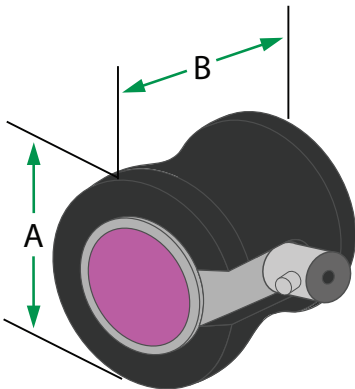
CR

Single-Element Contacts are longitudinal-wave (straight-beam) transducers designed for general purpose manual ultrasonic inspection where test materials are relatively flat and smooth. They provide high sensitivity for better penetration, small-flaw detection, and have abrasion-resistant wear plates for extended service life.



Model CR Standard Contact Transducers

The larger element sizes of Model CR provide greater scan widths and penetration for applications such as plate, billet, bars, thick-section parts, pipe, and tanks. They have side-mounted BNC connectors and removable comfort grip to reduce operator fatigue. **GP series*** offer the best combination of sensitivity and resolution.



Model CR

Element Ø		A		B	
inch	mm				
0.50	12.7	1.5 in.	38.1 mm	1.3 in.	33 mm
0.75	19	1.75 in.	44.5 mm	1.3 in.	33 mm
1	25.4	2.0 in.	50.8 mm	1.4 in.	35.6 mm

Frequency (MHz)	Element Diameter		Part Number	
	inch	mm	GP	Accessories
1	0.5	12.7	00-010626	Cable BNC - BNC 6-ft (1.83 m) 07-010018
	0.75	19	00-010901	
	1	25.4	00-010902	
2.25	0.5	12.7	00-010616	
	0.75	19	00-010419	
	1	25.4	00-010416	
3.5	0.5	12.7	00-010903	
	0.75	19	00-010904	
	1	25.4	00-010905	
5	0.5	12.7	00-010617	
	0.75	19	00-010906	
	1	25.4	00-010907	
10	0.5	12.7	00-010908	

* GP = General Purpose.
 * See appendix for technical details.



Contact Transducers

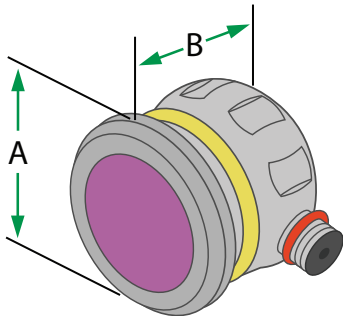
F Fingertip

Single-Element Contacts are longitudinal-wave (straight-beam) transducers designed for general purpose manual ultrasonic inspection where test materials are relatively flat and smooth. They provide high sensitivity for better penetration, small-flaw detection, and have abrasion-resistant wear plates for extended service life.



Model F Fingertip Contact Transducers

Model F are small diameter transducers with side-mounted Microdot connectors. **GP series*** offer the best combination of sensitivity and resolution for most applications. **HR series*** are highly damped for applications where high resolution is required. **C series*** have piezocomposite elements and offer superior penetration in highly-attenuative materials. All Model F transducers feature an ergonomic design for improved operator control and comfort.



Model F Fingertip

Element Ø		A		B	
inch	mm				
0.25	6.4	0.58 in.	14.7 mm	0.66 in.	16.8 mm
0.375	9.5	0.71 in.	18 mm	0.66 in.	16.8 mm
0.50	12.7	0.83 in.	21.1 mm	0.66 in.	16.8 mm

Frequency (MHz)	Element Diameter		Part Number			Accessories
	inch	mm	GP	HR	C	
2.25	0.25	6.4	00-010612		00-011084	Cable MD - BNC 6-ft (1.83 m) 07-010012
	0.375	9.5	00-010618		00-011085	
	0.5	12.7	00-010622		00-011086	
3.5	0.25	6.4	00-010613		00-011087	
	0.375	9.5	00-010619		00-011088	
	0.5	12.7	00-010623		00-011089	
5	0.25	6.4	00-010614	00-010602	00-011090	
	0.375	9.5	00-010620	00-010606	00-011091	
	0.5	12.7	00-010624	00-010610	00-011092	
10	0.25	6.4	00-010615	00-010603		
	0.375	9.5	00-010621	00-010607		

* GP = General Purpose; HR = High Resolution; C = Composite.
 * See appendix for technical details.



Delay-Line Contact

DFR

Delay-Line Contacts are single-element, longitudinal-wave (straight beam) transducers designed for detection of near-surface flaws and thickness measurement of thin-section materials. Replaceable delay lines (stand-offs) improve near-surface resolution and extend service life.

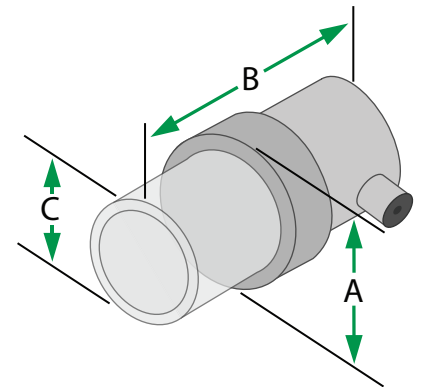


Model DFR Fingertip Delay-Line Transducers

Model DFR are small-diameter delay-line transducers with side-mounted Microdot connectors. Removable delay lines and highly damped piezoceramic elements enable measurement of very thin parts or detection of small near-surface flaws. Delay lines can be contoured for improved coupling to I.D. or O.D. curved parts. Custom sizes and shapes also available upon request.

Model DFR

Element Ø		A		B		C	
inch	mm						
0.125	3.2	0.51 in.	13 mm	0.83 in.	21.1 mm	0.30 in.	7.6 mm
0.25	6.4	0.51 in.	13 mm	0.83 in.	21.1 mm	0.30 in.	7.6 mm
0.5	12.7	0.88 in.	22.4 mm	1.15 in.	29.2 mm	0.60 in.	15.2 mm
Mini-DFR							
0.125	3.2	0.41 in.	10.4 mm	0.77 in.	19.6 mm	0.19 in.	4.8 mm



Frequency (MHz)	Element Diameter		Part Number HR	Delay 10-PK L=.38 in (10mm)	Delay 10-PK L=.5 in (12.7mm)	Accessories
	inch	mm				
2.25	0.25	6.4	00-010940	01-010810	01-010811	Cable MD - BNC 6-ft (1.83 m) 07-010012
	0.5	12.7	00-012301	01-011971	01-011973	
3.5	0.25	6.4	00-010824	01-010810	01-010811	
	0.5	12.7	00-010941	01-011971	01-011973	
5	0.25	6.4	00-010246	01-010810	01-010811	
	0.5	12.7	00-010492	01-011971	01-011973	
10	0.25	6.4	00-010247	01-010810	01-010811	
	0.5	12.7	00-012302	01-011971	01-011973	
15	0.25	6.4	00-011077	01-010810	01-010811	

Frequency (MHz)	Element Diameter		Part Number HR	Delay 10-PK L=.41 in (10.4mm)	Accessories
	inch	mm			
Nominal 20MHz	0.125	3.2	00-012300	01-011974	See above



Delay-Line Contact

Pencil Probes

Delay-Line Contacts are single-element, longitudinal-wave (straight beam) transducers designed for detection of near-surface flaws and thickness measurement of thin-section materials. Replaceable delay lines (stand-offs) improve near-surface resolution and extend service life.



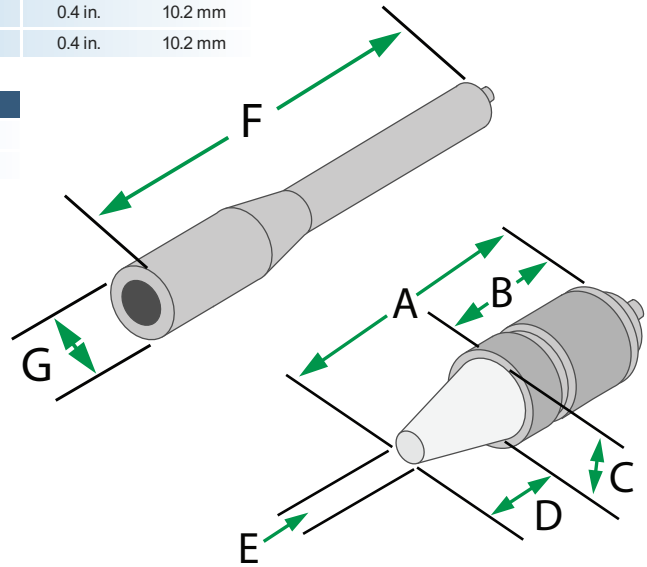
Replaceable Delay-Line Pencil Probes

Pencil probes are designed for applications requiring a very small contact face, such as curved turbine blades or thickness measurement from the inside of a pit. They can be used with most flaw detectors and precision thickness gauges. Interchangeable delay lines are tapered to tip diameters of 0.065 inch (1.7mm) and 0.090 inch (2.3mm). Replaceable delay lines are available in packs of 10. The straight model features a removable handle, which also allows it to be used as a fingertip probe. All models have Microdot connectors.

Pencil Probes

Frequency	A		B		C		D	
7.5	1.0 in.	25.4 mm	0.60 in.	15.2 mm	0.42 in.	10.7 mm	0.4 in.	10.2 mm
20	1.0 in.	25.4 mm	0.60 in.	15.2 mm	0.42 in.	10.7 mm	0.4 in.	10.2 mm

Frequency	E		F		G	
7.5	0.09 in.	2.3 mm	4.0 in.	101.6 mm	0.42 in.	10.7 mm
20	0.09 in.	2.3 mm	4.0 in.	101.6 mm	0.42 in.	10.7 mm



Frequency (MHz)	Part Number		
	Straight	45 Degree	90 Degree
7.5	00-011083	00-012296	00-012297
20	00-011039	00-012298	00-012299

Delay 10-PK .065" (1.7mm) Tip	Delay 10-PK .090" (2.3mm) Tip	Cable MD - BNC
00-012222	00-012221	6-ft (1.83 m) 07-010012

Extension Handle	Knurled Ring
00-012220	06-014005



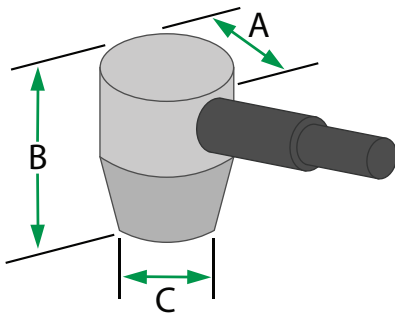
Dual Element ADP

Dual-Element Contacts are longitudinal-wave (straight beam) transducers designed for near-surface and thin range flaw detection and thickness measurement. Two elements, one transmitter and one receiver, are mounted at an included (roof) angle to improve signal-to-noise ratio (SNR) and optimize near-surface resolution.



Model ADP Dual-Element Contact Transducers

Model ADP are small-diameter, low-profile transducers with 2 fixed co-axial cable and BNC connectors*. They are especially suitable for flaw detection and thickness measurement on pitted, curved, and irregular surfaces. Because the elements are mounted on internal delay lines they can be contoured to fit I.D. or O.D. curved surfaces.



Model ADP

Element Ø		A		B		C	
inch	mm						
0.25	6.4	0.50 in.	12.7 mm	0.64 in.	16.3 mm	0.28 in.	7.1 mm
0.375	9.5	0.62 in.	15.7 mm	0.64 in.	16.3 mm	0.41 in.	10.4 mm
0.5	12.7	0.75 in.	19 mm	0.68 in.	17.3 mm	0.60 in.	15.2 mm

Frequency (MHz)	Element Diameter		Part Number
	inch	mm	C
2.25	0.25	6.4	00-011405
	0.375	9.5	00-011406
	0.5	12.7	00-011407
3.5	0.25	6.4	00-011408
	0.375	9.5	00-011409
	0.5	12.7	00-011410
5	0.25	6.4	00-010656
	0.375	9.5	00-010655
	0.5	12.7	00-011411
10	0.25	6.4	00-011412
	0.375	9.5	00-011413
	0.5	12.7	00-011414
7.5 FH2E+ Flaw	0.3	7.6	00-010532

* Also available with Lemo-00 connectors upon request.



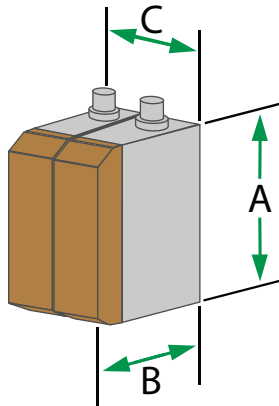
Dual Element

DU

Dual-Element Contacts are longitudinal-wave (straight beam) transducers designed for near-surface and thin-range flaw detection and thickness measurement. Two elements, one transmitter and one receiver, are mounted at an included (roof) angle to improve signal-to-noise ratio and optimize near-surface resolution.

Model DU Dual-Element Contact Transducers

Model DU are general purpose dual-element transducers with side-mounted Microdot connectors. Replaceable/interchangeable delay lines and cross-talk barriers greatly extend versatility, cost-effectiveness, service life and can be contoured to fit I.D. or O.D. curved surfaces.



Model DU

Element Dimensions		A		B		C	
inch	mm						
0.5 x 0.5	12.7 x 12.7	0.89 in.	22.6 mm	0.92 in.	23.4 mm	0.78 in.	19.8 mm
0.5 x 1	12.7 x 25.4	1.39 in.	35.3 mm	0.92 in.	23.4 mm	0.78 in.	19.8 mm

Frequency (MHz)	Element Dimensions		Part Number		
	inch	mm	GP	Delay Set	Accessories
2.25	0.5 x 0.5	12.7 x 12.7	00-012322	01-010740	Dual Cable MD - BNC
	0.5 x 1	12.7 x 25.4	00-012323	01-010741	
5	0.5 x 0.5	12.7 x 12.7	00-010487	01-010740	6-ft (1.83 m) 07-010012
	0.5 x 1	12.7 x 25.4	00-010584	01-010741	



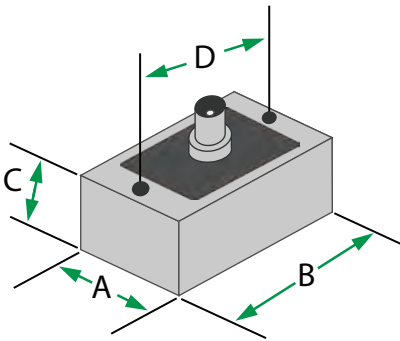
Large Angle Beam AWS

Angle-Beam Transducers and their wedges generate shear (transverse) waves at the specified angle in a given test material to detect flaws that cannot be detected by a straight beam transducer. Typical applications include weld inspection, tube and pipe, shafts, turbine blades and wheel rims. Shear waves are produced by refracting a longitudinal wave in a precision machined acrylic wedge that also minimizes wedge noise.



Model AWS Angle-Beam Transducers

Model AWS transducers and wedges meet the requirements of American Welding Society Structural Welding Code D1.1 and Bridge Welding Code D1.5. The transducers are available with piezoceramic elements (**GP series***) and piezocomposite elements (**C series***).



Model AWS

Element Dimensions		A		B		C		D	
inch	mm								
0.625 x 0.625	16 x 16	0.80 in.	20.3 mm	1.26 in.	32 mm	0.75 in.	19.1 mm	0.75 in.	19.1 mm
0.625 x 0.75	16 x 19	0.80 in.	20.3 mm	1.26 in.	32 mm	0.75 in.	19.1 mm	0.75 in.	19.1 mm
0.75 x 0.75	19 x 19	0.85 in.	21.6 mm	1.26 in.	32 mm	0.75 in.	19.1 mm	0.75 in.	19.1 mm
									Thread
									4-40

Frequency (MHz)	Element Dimensions		Part Number			
	inch	mm	GP	C	Wedges	Accessories
2.25	0.625 x 0.625	16 x 16	00-010393	00-010242	45° 01-010268	Cable BNC - BNC 6-ft (1.83 m) 07-010018
					60° 01-010269	
					70° 01-010270	
	0.625 x 0.75	16 x 19	00-010395	00-010394	45° 01-010268	
					60° 01-010269	
					70° 01-010270	
	0.75 x 0.75	19 x 19	00-010397	00-010396	45° 01-010268	
					60° 01-010269	
					70° 01-010270	

* GP = General Purpose; C = Composite.
* See appendix for technical details.



Large Angle Beam

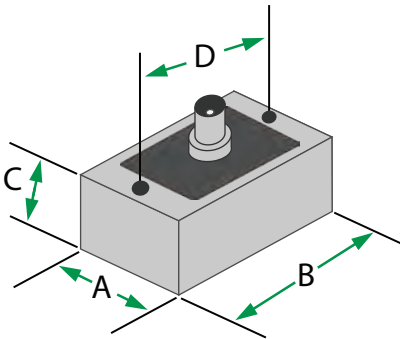
SWS

Angle-Beam Transducers and their wedges generate shear (transverse) waves at the specified angle in a given test material to detect flaws that cannot be detected by a straight-beam transducer. Typical applications include weld inspection, tube and pipe, shafts, turbine blades and wheel rims. Shear waves are produced by refracting a longitudinal wave in a precision machined acrylic wedge that also minimizes wedge noise.



Model SWS Angle-Beam Transducers

Model SWS are designed for general weld inspection and other applications such as pipes, tanks, pressure vessels, forgings and castings. They have top mounted BNC connectors and are available with piezocomposite elements (**C series***). Interchangeable acrylic wedges provide maximum versatility and service life.



Model SWS

Element Size		A		B		C		D	
inch	mm								
0.5 Ø	12.7 Ø	0.72 in.	18.3 mm	1.0 in.	25.4 mm	0.75 in.	19 mm	0.81 in.	20.6 mm
0.5 x 1	12.7 x 25.4	0.73 in.	18.5 mm	1.5 in.	38.1 mm	0.75 in.	19 mm	1.31 in.	33.3 mm
0.75 x 1	19 x 25.4	1.0 in.	25.4 mm	1.5 in.	38.1 mm	0.75 in.	19 mm	1.31 in.	33.3 mm
1 Ø	25.4 Ø	1.22 in.	31.0 mm	1.65 in.	41.9 mm	0.75 in.	19 mm	1.38 in.	35.1 mm
Thread									
4-40									

Frequency (MHz)	Element Dimensions		Part Number		
	inch	mm	C	Wedges	Accessories
0.5	0.5 Ø	12.7 Ø	00-010478	45° 01-010206	Cable BNC - BNC 6-ft (1.83 m) 07-010018
				60° 01-010207	
				70° 01-010208	
	0.5 x 1	12.7 x 25.4	00-010479	45° 01-010210	
				60° 01-010211	
				70° 01-010212	
	0.75 x 1	19 x 25.4	00-010480	45° 01-010214	
				60° 01-010215	
				70° 01-010216	
	1 Ø	25.4 Ø	00-010481	45° 01-010218	
				60° 01-010219	
				70° 01-010220	

Chart continues on page 12

* C = Composite. See appendix for technical details.



Large Angle Beam

SWS Continued

Frequency (MHz)	Element Dimensions		Part Number		
	inch	mm	C	Wedges	Accessories
1	0.5 Ø	12.7 Ø	00-010445	45° 01-010206	
				60° 01-010207	
				70° 01-010208	
	0.5 x 1	12.7 x 25.4	00-010446	45° 01-010210	
				60° 01-010211	
				70° 01-010212	
	0.75 x 1	19 x 25.4	00-010447	45° 01-010214	
				60° 01-010215	
				70° 01-010216	
	1 Ø	25.4 Ø	00-010448	45° 01-010218	
				60° 01-010219	
				70° 01-010220	
2.25	0.5 Ø	12.7 Ø	00-010449	45° 01-010206	
				60° 01-010207	
				70° 01-010208	
	0.5 x 1	12.7 x 25.4	00-010450	45° 01-010210	
				60° 01-010211	
				70° 01-010212	
	0.75 x 1	19 x 25.4	00-010451	45° 01-010214	
				60° 01-010215	
				70° 01-010216	
	1 Ø	25.4 Ø	00-010452	45° 01-010218	
				60° 01-010219	
				70° 01-010220	
3.5	0.5 Ø	12.7 Ø	00-010453	45° 01-010206	
				60° 01-010207	
				70° 01-010208	
	0.5 x 1	12.7 x 25.4	00-010454	45° 01-010210	
				60° 01-010211	
				70° 01-010212	
	0.75 x 1	19 x 25.4	00-010455	45° 01-010214	
				60° 01-010215	
				70° 01-010216	
	1 Ø	25.4 Ø	00-010456	45° 01-010218	
				60° 01-010219	
				70° 01-010220	
5	0.5 Ø	12.7 Ø	00-010457	45° 01-010206	
				60° 01-010207	
				70° 01-010208	
	0.5 x 1	12.7 x 25.4	00-010458	45° 01-010210	
				60° 01-010211	
				70° 01-010212	
	0.75 x 1	19 x 25.4	00-010459	45° 01-010214	
				60° 01-010215	
				70° 01-010216	
	1 Ø	25.4 Ø	00-010460	45° 01-010218	
				60° 01-010219	
				70° 01-010220	

Cable
BNC - BNC
6-ft (1.83 m)
07-010018



Small Angle Beam

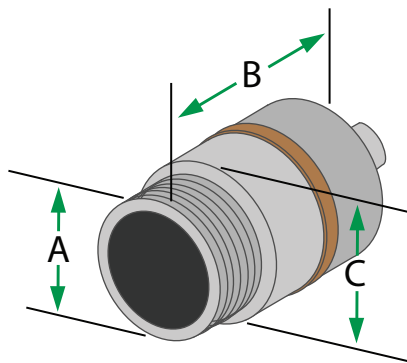
QS

Angle-Beam Transducers and their wedges, generate shear (transverse) waves at the specified angle in a given test material to detect flaws that cannot be detected by a straight-beam transducer. Typical applications include weld inspection, tube and pipe, shafts, turbine blades and wheel rims. Shear waves are produced by refracting a longitudinal wave in a precision-machined acrylic wedge that also minimizes wedge noise.



Model QS Angle-Beam Transducers

Model QS features Quick Swap screw-in wedge attachment. They are available with top-mounted Microdot (MD) or new MCX low-profile swivel connectors. Piezocomposite (**C series***) offer superior penetration and signal-to-noise ratio in highly-attenuative and coarse-grain materials.



Model QS

Element Ø		A	B		C	
inch	mm					
0.25	6.4	3/8 - 32 UNEF	0.58 in.	14.7 mm	0.43 in.	10.9 mm
0.375	9.5	1/2 - 28 UNEF	0.58 in.	14.7 mm	0.54 in.	13.7 mm
0.5	12.7	5/8 - 24 UNEF	0.65 in.	16.5 mm	0.69 in.	17.5 mm



MCX connectors are snap-in and can swivel, preventing the risk of back threading. (Shown above with 90° cable connector)

Frequency (MHz)	Element Diameter		Part Number			
	inch	mm	C**	Wedges	Accessories	
1	0.375	9.5	00-010137 MD or MCX	30° 01-010193	Cables	
				45° 01-010194		
				60° 01-010195		
				70° 01-010196		
	0.5	12.7	00-010138 MD or MCX	30° 01-010197		MD - BNC
				45° 01-010198		6-ft (1.83 m)
				60° 01-010199		07-010012
				70° 01-010200		
1.5	0.25	6.4	00-010216 MD or MCX	30° 01-010189	MCX - BNC	
				45° 01-010190	Straight	
				60° 01-010191	6-ft (1.83 m)	
				70° 01-010192	07-010007	
	0.375	9.5	00-010217 MD or MCX	30° 01-010193	MCX - BNC	
				45° 01-010194		Right Angle
				60° 01-010195		6-ft (1.83 m)
				70° 01-010196		07-010008
	0.5	12.7	00-010218 MD or MCX	30° 01-010197	07-010008	
				45° 01-010198		
				60° 01-010199		
				70° 01-010200		

Chart continues on page 14

* C = Composite. See appendix for technical details.

** When ordering QS transducers, please include the part number followed by the connector type (MD or MCX)



Small Angle Beam

QS Continued

Frequency (MHz)	Element Diameter		C**	Part Number	
	inch	mm		Wedges	Accessories
2.25	0.25	6.4	00-010122 MD or MCX	30° 01-010189	Cables MD - BNC 6-ft (1.83 m) 07-010012 MCX - BNC Straight 6-ft (1.83 m) 07-010007 MCX - BNC Right Angle 6-ft (1.83 m) 07-010008
				45° 01-010190	
				60° 01-010191	
				70° 01-010192	
	0.375	9.5	00-010123 MD or MCX	30° 01-010193	
				45° 01-010194	
				60° 01-010195	
				70° 01-010196	
	0.5	12.7	00-010124 MD or MCX	30° 01-010197	
				45° 01-010198	
				60° 01-010199	
				70° 01-010200	
3.5	0.25	6.4	00-010125 MD or MCX	30° 01-010189	
				45° 01-010190	
				60° 01-010191	
				70° 01-010192	
	0.375	9.5	00-010126 MD or MCX	30° 01-010193	
				45° 01-010194	
				60° 01-010195	
				70° 01-010196	
	0.5	12.7	00-010127 MD or MCX	30° 01-010197	
				45° 01-010198	
				60° 01-010199	
				70° 01-010200	
5	0.25	6.4	00-010128 MD or MCX	30° 01-010189	
				45° 01-010190	
				60° 01-010191	
				70° 01-010192	
	0.375	9.5	00-010129 MD or MCX	30° 01-010193	
				45° 01-010194	
				60° 01-010195	
				70° 01-010196	
	0.5	12.7	00-010130 MD or MCX	30° 01-010197	
				45° 01-010198	
				60° 01-010199	
				70° 01-010200	
7.5	0.25	6.4	00-010131 MD or MCX	30° 01-010189	
				45° 01-010190	
				60° 01-010191	
				70° 01-010192	
	0.375	9.5	00-010132 MD or MCX	30° 01-010193	
				45° 01-010194	
				60° 01-010195	
				70° 01-010196	
	0.5	12.7	00-010133 MD or MCX	30° 01-010197	
				45° 01-010198	
				60° 01-010199	
				70° 01-010200	
10	0.25	6.4	00-010134 MD or MCX	30° 01-010189	
				45° 01-010190	
				60° 01-010191	
				70° 01-010192	
	0.375	9.5	00-010135 MD or MCX	30° 01-010193	
				45° 01-010194	
				60° 01-010195	
				70° 01-010196	
	0.5	12.7	00-010136 MD or MCX	30° 01-010197	
				45° 01-010198	
				60° 01-010199	
				70° 01-010200	

** When ordering QS transducers, please include the part number followed by the connector type (MD or MCX)



Miniature Angle Beam MSWS

Angle-Beam Transducers and their wedges, generate shear (transverse) waves at the specified angle in a given test material to detect flaws that cannot be detected by a straight-beam transducer. Typical applications include weld inspection, tube and pipe, shafts, turbine blades and wheel rims. Shear waves are produced by refracting a longitudinal wave in a precision machined acrylic wedge that also minimizes wedge noise.

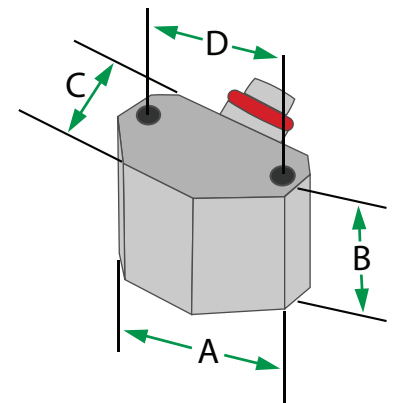


Model MSWS Angle Beam Transducers

Model MSWS have captive screws for wedge attachment and angled Microdot connectors for applications requiring low profile. Piezocomposite (**C series***) offer superior penetration and signal-to-noise ratio in highly-attenuative and coarse-grain materials.

Model MSWS

Element Ø		A		B		C		D	
inch	mm								
0.25	6.4	0.48 in.	12.2 mm	0.34 in.	8.6 mm	0.31 in.	7.9 mm	0.38 in.	9.7 mm
0.5	12.7	0.73 in.	18.5 mm	0.5 in.	12.7 mm	0.56 in.	14.2 mm	0.63 in.	16 mm
		Thread							
		1-64							



Frequency (MHz)	Element Diameter		Part Number		
	inch	mm	C	Wedges	Accessories
1	0.5	12.7	00-010497	45° 01-010535	Cable MD - BNC 6-ft (1.83 m) 07-010012
				60° 01-010536	
				70° 01-010537	
2.25	0.25	6.4	00-010498	45° 01-010532	
				60° 01-010533	
				70° 01-010534	
	0.5	12.7	00-010499	45° 01-010535	
				60° 01-010536	
				70° 01-010537	
3.5	0.25	6.4	00-010500	45° 01-010532	
				60° 01-010533	
				70° 01-010534	
	0.5	12.7	00-010501	45° 01-010535	
				60° 01-010536	
				70° 01-010537	
5	0.25	6.4	00-010502	45° 01-010532	
				60° 01-010533	
				70° 01-010534	
	0.5	12.7	00-010503	45° 01-010535	
				60° 01-010536	
				70° 01-010537	
10	0.25	6.4	00-010504	45° 01-010532	
				60° 01-010533	
				70° 01-010534	
	0.5	12.7	00-010505	45° 01-010535	
				60° 01-010536	
				70° 01-010537	

* C = Composite. See appendix for technical details.



Integral-Wedge Angle Beam

MWB+ & MWK+

European-Style Angle-Beam Transducers generate shear (transverse) waves at the specified angle in a given test material to detect flaws that cannot be detected by a straight beam transducer. Typical applications include weld inspection, tube and pipe, shafts, turbine blades and wheel rims. Shear waves are produced by refracting a longitudinal wave in a precision-machined acrylic wedge that also minimizes wedge noise.

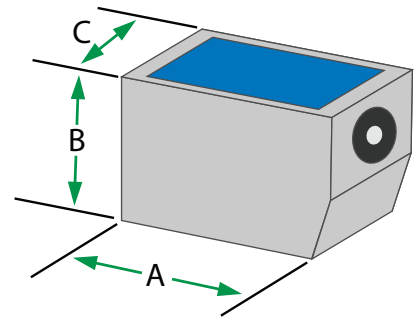


Model MWB+/MWK+ Angle-Beam Transducers

Models MWB+ and MWK+ are small transducers with side or top-mounted Microdot connectors and integral wedges for maximum versatility. **GP series*** (MWB+) offer the best combination of sensitivity and resolution. **C series*** (MWK+) with piezocomposite elements offer superior resolution, penetration and signal-to-noise ratio in highly-attenuative and coarse-grain materials such as austenitic stainless steel or cast iron.

Model MWB+/MWK+

Element Dimensions		A		B		C	
inch	mm						
0.31 x 0.35	8 x 9	1.07 in.	27.1 mm	0.86 in.	21.8 mm	0.66 in.	16.8 mm



Frequency (MHz)	Element Dimensions		Angle (Steel)	Connector Location	Part Number		
	inch	mm			GP (MWB+)	C (MWK+)	Accessories
2	0.31 x 0.35	8 x 9	35	Top	00-012227	00-012306	Cables MD - BNC Straight 6-ft (1.83 m) 07-010012 MCX - BNC Straight 6-ft (1.83 m) 07-010007 MCX - BNC Right Angle 6-ft (1.83 m) 07-010008
				Side	00-012226	00-012307	
			45	Top	00-012229	00-012308	
				Side	00-012228	00-012251	
			60	Top	00-012231	00-012309	
				Side	00-012230	00-012252	
			70	Top	00-012233	00-012310	
				Side	00-012232	00-012253	
			80	Top	00-012235	00-012311	
				Side	00-012234	00-012312	
			90	Side	00-012236	00-012313	
				4	0.31 x 0.35	8 x 9	
Side	00-012237	00-012315					
45	Top	00-012240	00-012316				
	Side	00-012239	00-012248				
60	Top	00-012242	00-012317				
	Side	00-012241	00-012249				
70	Top	00-012244	00-012318				
	Side	00-012243	00-012250				
80	Top	00-012246	00-012319				
	Side	00-012245	00-012320				
90	Side	00-012247	00-012321				

* GP = General Purpose; C = Composite.
 * See appendix for technical details.



Small Angle Beam TOFD

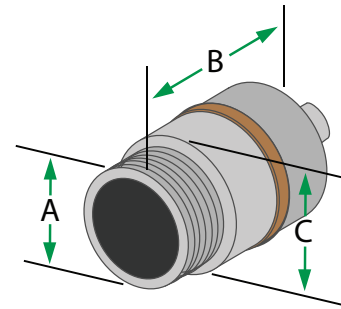
TOFD Angle-Beam Transducers

Time-Of-Flight Diffraction (TOFD) is a method used to determine the size of cracks in metallic welds. It requires highly-damped, broadband transducers and wedges that generate refracted longitudinal waves (L-waves). SNI's TOFD transducers have state-of-the-art piezocomposite elements (**C series***) and Quick Swap screw-in wedge attachment. Straight-mounted connectors are Microdot (3/8-32) or Lemo-00 (M12 case).



TOFD Microdot

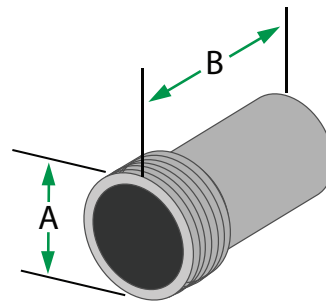
Frequency (MHz)	Element Diameter		Part Number			
	inch	mm	Connector	C	Wedges	Accessories
5	0.125	3	Microdot	00-010168	45°L 01-010475	Cables
					60°L 01-010476	
					70°L 01-010477	
	0.25	6			45°L 01-010475	
					60°L 01-010476	
					70°L 01-010477	
10	0.125	3	Microdot	00-010166	45°L 01-010475	MD - BNC
					60°L 01-010476	
					70°L 01-010477	
	0.25	6			45°L 01-010475	
					60°L 01-010476	
					70°L 01-010477	
15	0.125	3	Microdot	00-010165	45°L 01-010475	6-ft (1.83 m)
					60°L 01-010476	
					70°L 01-010477	
					45°L 01-010475	
					60°L 01-010476	
					70°L 01-010477	



	Element Ø		
	inch	0.125	0.25
	mm	3	6
A		0.37 in.	0.37 in.
		9.4 mm	9.4 mm
B		0.72 in.	0.72 in.
		18.3 mm	18.3 mm
C		0.41 in.	0.41 in.
		10.4 mm	10.4 mm

TOFD Lemo-00

Frequency (MHz)	Element Diameter		Part Number			
	inch	mm	Connector	C	Accessories	
5	0.125	3	Lemo-00	00-010299	Cables	
	0.25	6	Lemo-00	00-010300		
10	0.125	3	Lemo-00	00-010298		Lemo-00 - BNC
	0.25	6	Lemo-00	00-010386		
15	0.125	3	Lemo-00	00-010631		6-ft (1.83 m)
						07-010014



	Element Ø		
	inch	0.125	0.25
	mm	3	6
A		0.47 in.	0.47 in.
		12 mm	12 mm
B		0.83 in.	0.83 in.
		21 mm	21 mm

* C = Composite. See appendix for technical details.



Immersion Transducers

Immersion Transducers are typically used in automatic and manual scanning systems using water or other liquid as a coupling medium to enable the inspection of parts with complex geometries and with near-surface resolution superior to that of contact transducers. Spherical (point) or cylindrical (line) focusing can further improve sensitivity and resolution. Focal length must be specified.



Frequency (Mhz)		Element Ø (Inches)					
		1	0.75	0.5	0.375	0.25	0.125
1	Near	4.3	2.4	1.1			
	Min	2	1.5	1			
	Max	3	2	1			
2.25	Near	9.5	5.4	2.4	1.4	0.6	
	Min	2	1.5	1	0.8	0.5	
	Max	6	4	2	0.8	0.5	
3.5	Near	15	8.4	3.7	2.1	0.9	
	Min	2	1.5	1	0.8	0.5	
	Max	8	6	2.5	0.5	0.5	
5	Near	21	12	5.4	3	1.3	0.3
	Min	2	1.5	1	0.8	0.5	0.3
	Max	8	8	4	1	0.8	0.3
10	Near		12	10.7	6	2.7	0.7
	Min		1.5	1	0.8	0.5	0.3
	Max		8	6	4.5	1.5	0.3
15	Near			16	9	4	1
	Min			1	0.8	0.5	0.3
	Max			6	6	2	0.5
25	Near					6.7	1.7
	Min					0.5	0.3
	Max					2	1

This table lists the near-field lengths of minimum and maximum practical focal lengths in water (inches). Customers should only request focal lengths within these limits to achieve good focal performance. SNI is aware that some customers have experience with transducers focused longer than the recommended maximum (sometimes called "Beam Correction" since the transducer cannot achieve a focal point that long). These are available on a best-effort basis.

N = Near-field practical focal length
 Min = Minimum practical focal length
 Max = Maximum practical focal length

$$N = \frac{(\text{Dia.})^2 \times (\text{Freq.})}{4 \times \text{Velocity}}$$

When ordering immersion transducers, please include the part number followed by type of focus and focal length in inches (if applicable).

(ex. 00-011321 NF, 00-011321 6.0S, 00-011321 8.0C)

NF = Non-focused (flat)

S = Spherical focus

C = Cylindrical focus



Immersion

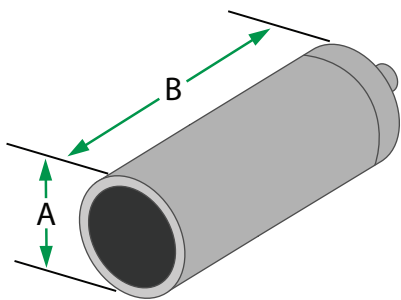
I1

Immersion Transducers are typically used in automated and manual-scanning systems using water or other liquid as a coupling medium. This enables the inspection of parts with complex geometries and near-surface resolution superior to that of contact transducers. Spherical (point) or cylindrical (line) focusing can further improve sensitivity and resolution. Focal length must be specified.



Model I1 Immersion Transducers

Model I1 are small-diameter, pencil-type transducers with straight-mounted Microdot connectors. Because the connectors are not waterproof, sealing with non-water-soluble grease is recommended. **GP series*** offer the best combination of sensitivity and resolution for general applications. **HR series*** are highly damped for applications where high resolution is required. **C series*** have piezocomposite elements and offer superior penetration, resolution and signal-to-noise ratio in highly-attenuative and coarse-grain materials.



Model I1

Element Ø		A		B	
inch	mm				
0.25	6.4	0.38 in.	9.7 mm	1.25 in.	31.8 mm

Frequency (MHz)	Element Diameter		Focus	Part Number			Accessories
	inch	mm		GP	HR	C	
2.25	0.25	6.4	None	00-011300 NF	00-011301 NF	00-011302 NF	Cable MD - BNC 6-ft (1.83 m) 07-010012
			Spherical	00-011300 X.XS	00-011301 X.XS	00-011302 X.XS	
			Cylindrical	00-011300 Y.YC	00-011301 Y.YC	00-011302 Y.YC	
5	0.25	6.4	None	00-011303 NF	00-010593 NF	00-010711 NF	
			Spherical	00-011303 X.XS	00-010593 X.XS	00-010711 X.XS	
			Cylindrical	00-011303 Y.YC	00-010593 Y.YC	00-010711 Y.YC	
10	0.25	6.4	None	00-010822 NF	00-010377 NF	00-010823 NF	
			Spherical	00-010822 X.XS	00-010377 X.XS	00-010823 X.XS	
			Cylindrical	00-010822 Y.YC	00-010377 Y.YC	00-010823 Y.YC	
15	0.25	6.4	None		00-010596 NF	00-011304 NF	
			Spherical		00-010596 X.XS	00-011304 X.XS	
			Cylindrical		00-010596 Y.YC	00-011304 Y.YC	

* GP = General Purpose; HR = High Resolution; C = Composite.
* See appendix for technical details.



Immersion

I2, I3, I4

Immersion Transducers are typically used in automated and manual-scanning systems using water or other liquid as a coupling medium. This enables the inspection of parts with complex geometries and near-surface resolution superior to that of contact transducers. Spherical (point) or cylindrical (line) focusing can further improve sensitivity and resolution. Focal length must be specified.



Models I2, I3 and I4 Immersion Transducers

All model I2, I3 and I4 transducers have straight-mounted waterproof UHF connectors. Available I2 element diameters are 0.25, 0.375 and 0.5 inch (6, 10 and 13 mm). I3 have 0.75 inch (19 mm) and I4 have 1.0 inch (25 mm) element diameters. **GP series*** offer the best combination of sensitivity and resolution for general applications. **HR series*** are highly-damped for applications where high resolution is required. **C series*** have piezocomposite elements and offer superior penetration, resolution and signal-to-noise ratio in highly- attenuative and coarse-grain materials.

Frequency (MHz)	Element Diameter		Case	Focus	Part Number		
	inch	mm			GP	HR	C
1	0.75	19	I3	None	00-011201 NF		00-011313 NF
				Spherical	00-011201 X.XS		00-011313 X.XS
	Cylindrical	00-011201 Y.YC		00-011313 Y.YC			
	1	25.4	I4	None	00-011314 NF		00-010683 NF
Spherical				00-011314 X.XS		00-010683 X.XS	
Cylindrical	00-011314 Y.YC		00-010683 Y.YC				
2.25	0.25	6.4	I2	None	00-011315 NF	00-011316 NF	00-011317 NF
				Spherical	00-011315 X.XS	00-011316 X.XS	00-011317 X.XS
	Cylindrical	00-011315 Y.YC	00-011316 Y.YC	00-011317 Y.YC			
	0.375	9.5	I2	None	00-011318 NF	00-011319 NF	00-011144 NF
				Spherical	00-011318 X.XS	00-011319 X.XS	00-011144 X.XS
	Cylindrical	00-011318 YC	00-011319 Y.YC	00-011144 Y.YC			
	0.5	12.7	I2	None	00-010830 NF	00-011114 NF	00-011320 NF
				Spherical	00-010830 X.XS	00-011114 X.XS	00-011320 X.XS
	Cylindrical	00-010830 Y.YC	00-011114 Y.YC	00-011320 Y.YC			
	0.75	19	I3	None	00-011321 NF	00-011322 NF	00-011146 NF
				Spherical	00-011321 X.XS	00-011322 X.XS	00-011146 X.XS
	Cylindrical	00-011321 Y.YC	00-011322 Y.YC	00-011146 Y.YC			
1	25.4	I4	None	00-011323 NF	00-011324 NF	00-011353 NF	
			Spherical	00-011323 X.XS	00-011324 X.XS	00-011353 X.XS	
Cylindrical	00-011323 Y.YC	00-011324 Y.YC	00-011353 Y.YC				
3.5	0.25	6.4	I2	None	00-011325 NF	00-011326 NF	00-011327 NF
				Spherical	00-011325 X.XS	00-011326 X.XS	00-011327 X.XS
	Cylindrical	00-011325 Y.YC	00-011326 Y.YC	00-011327 Y.YC			
	0.375	9.5	I2	None	00-011328 NF	00-011329 NF	00-011141 NF
				Spherical	00-011328 X.XS	00-011329 X.XS	00-011141 X.XS
	Cylindrical	00-011328 Y.YC	00-011329 Y.YC	00-011141 Y.YC			
	0.5	12.7	I2	None	00-011330 NF	00-011331 NF	00-010858 NF
				Spherical	00-011330 X.XS	00-011331 X.XS	00-010858 X.XS
	Cylindrical	00-011330 Y.YC	00-011331 Y.YC	00-010858 Y.YC			
	0.75	19	I3	None	00-011332 NF	00-011333 NF	00-011334 NF
				Spherical	00-011332 X.XS	00-011333 X.XS	00-011334 X.XS
	Cylindrical	00-011332 Y.YC	00-011333 Y.YC	00-011334 Y.YC			
1	25.4	I4	None	00-011335 NF	00-011336 NF	00-010586 NF	
			Spherical	00-011335 X.XS	00-011336 X.XS	00-010586 X.XS	
Cylindrical	00-011335 Y.YC	00-011336 Y.YC	00-010586 Y.YC				

Chart continues on page 21

Velocity Testing

Frequency (MHz)	Element Diameter		Case	Focus	C
	inch	mm			
5	0.25	6.4	I2	None	00-011403
	0.375	9.5	I2	None	00-011404
	0.5	12.7	I2	None	00-010437

* GP = General Purpose; HR = High Resolution; C = Composite.
* See appendix for technical details.

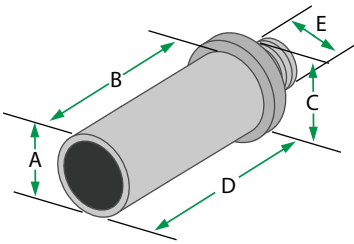


Immersion

I2, I3, I4 Continued

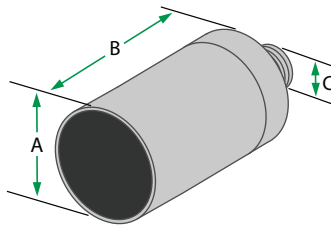
Frequency (MHz)	Element Diameter		Case	Focus	Part Number		
	inch	mm			GP	HR	C
5	0.25	6.4	I2	None	00-011337 NF	00-011351 NF	00-011338 NF
				Spherical	00-011337 X.XS	00-011351 X.XS	00-011338 X.XS
				Cylindrical	00-011337 Y.YC	00-011351 Y.YC	00-011338 Y.YC
	0.375	9.5	I2	None	00-011339 NF	00-011340 NF	00-010679 NF
				Spherical	00-011339 X.XS	00-011340 X.XS	00-010679 X.XS
				Cylindrical	00-011339 Y.YC	00-011340 Y.YC	00-010679 Y.YC
	0.5	12.7	I2	None	00-010778 NF	00-010594 NF	00-011013 NF
				Spherical	00-010778 X.XS	00-010594 X.XS	00-011013 X.XS
				Cylindrical	00-010778 Y.YC	00-010594 Y.YC	00-011013 Y.YC
	0.75	19	I3	None	00-010585 NF	00-011341 NF	00-010868 NF
				Spherical	00-010585 X.XS	00-011341 X.XS	00-010868 X.XS
				Cylindrical	00-010585 Y.YC	00-011341 Y.YC	00-010868 Y.YC
1	25.4	I4	None	00-011152 NF	00-011350 NF	00-011153 NF	
			Spherical	00-011152 X.XS	00-011350 X.XS	00-011153 X.XS	
			Cylindrical	00-011152 Y.YC	00-011350 Y.YC	00-011153 Y.YC	
10	0.25	6.4	I2	None	00-011352 NF	00-010833 NF	00-011342 NF
				Spherical	00-011352 X.XS	00-010833 X.XS	00-011342 X.XS
				Cylindrical	00-011352 Y.YC	00-010833 Y.YC	00-011342 Y.YC
	0.375	9.5	I2	None	00-010825 NF	00-010644 NF	00-011343 NF
				Spherical	00-010825 X.XS	00-010644 X.XS	00-011343 X.XS
				Cylindrical	00-010825 Y.YC	00-010644 Y.YC	00-011343 Y.YC
	0.5	12.7	I2	None	00-010595 NF	00-011349 NF	00-011344 NF
				Spherical	00-010595 X.XS	00-011349 X.XS	00-011344 X.XS
				Cylindrical	00-010595 Y.YC	00-011349 Y.YC	00-011344 Y.YC
	0.75	19	I3	None	00-011148 NF	00-010369 NF	00-011345 NF
				Spherical	00-011148 X.XS	00-010369 X.XS	00-011345 X.XS
				Cylindrical	00-011148 Y.YC	00-010369 Y.YC	00-011345 Y.YC
15	0.25	6.4	I2	None		00-011149 NF	00-011346 NF
				Spherical		00-011149 X.XS	00-011346 X.XS
				Cylindrical		00-011149 Y.YC	00-011346 Y.YC
	0.375	9.5	I2	None		00-010597 NF	00-011347 NF
				Spherical		00-010597 X.XS	00-011347 X.XS
				Cylindrical		00-010597 Y.YC	00-011347 Y.YC
0.5	12.7	I2	None		00-010774 NF	00-011348 NF	
			Spherical		00-010774 X.XS	00-011348 X.XS	
			Cylindrical		00-010774 Y.YC	00-011348 Y.YC	

Immersion I2



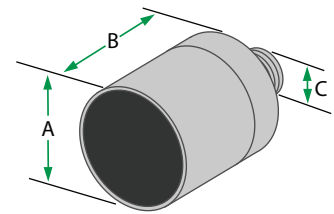
	Element Ø			
	inch mm	0.25 6.4	0.375 9.5	0.5 12.7
A		0.63 in. 16 mm	0.63 in. 16 mm	0.63 in. 16 mm
B		1.4 in. 35.6 mm	1.4 in. 35.6 mm	1.4 in. 35.6 mm
C		0.73 in. 18.5 mm	0.73 in. 18.5 mm	0.73 in. 18.5 mm
D		1.55 in. 39.4 mm	1.55 in. 39.4 mm	1.55 in. 39.4 mm
E		5/8 - 24 UNEF		

Immersion I3



	Element Ø	
	inch mm	0.75 19
A		1.0 in. 25.4 mm
B		1.3 in. 33 mm
C		5/8 - 24 UNEF

Immersion I4



	Element Ø	
	inch mm	1 25.4
A		1.35 in. 34.3 mm
B		1.25 in. 31.8 mm
C		5/8 - 24 UNEF



Immersion

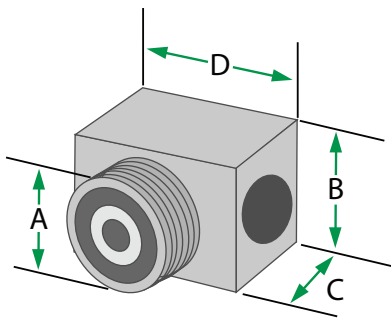
IR

Immersion Transducers are typically used in automatic and manual scanning systems using water or other liquid as a coupling medium to enable the inspection of parts with complex geometries and near-surface resolution superior to that of contact transducers. Spherical (point) or cylindrical (line) focusing can further improve sensitivity and resolution. Focal length must be specified.



Models IR Immersion Transducers

Model IR transducers have right-angle-mounted waterproof UHF connectors and small case design for applications where space is limited. Available element diameters are 0.25, 0.375 and 0.5 inch (6, 10 and 13 mm). **GP series*** offer the best combination of sensitivity and resolution for general applications. **HR series*** are highly damped for applications where high resolution is required. **C series*** have piezocomposite elements and offer superior penetration, resolution and signal-to-noise ratio in highly attenuative and coarse grain materials.



Immersion IR

Element Ø		A	B	C	D
inch	mm				
0.25	6.4	5/8 - 24 UNEF	0.75 in. 19 mm	0.75 in. 19 mm	0.94 in. 23.9 mm
0.375	9.5	5/8 - 24 UNEF	0.75 in. 19 mm	0.75 in. 19 mm	0.94 in. 23.9 mm
0.5	12.7	5/8 - 24 UNEF	0.75 in. 19 mm	0.75 in. 19 mm	0.94 in. 23.9 mm

Frequency (MHz)	Element Diameter		Focus	Part Number		
	inch	mm		GP	HR	C
2.25	0.25	6.4	None	00-011385 NF	00-011386 NF	00-011387 NF
			Spherical	00-011385 X.XS	00-011386 X.XS	00-011387 X.XS
			Cylindrical	00-011385 Y.YC	00-011386 Y.YC	00-011387 Y.YC
	0.375	9.5	None	00-011388 NF	00-011389 NF	00-011390 NF
			Spherical	00-011388 X.XS	00-011389 X.XS	00-011390 X.XS
			Cylindrical	00-011388 Y.YC	00-011389 Y.YC	00-011390 Y.YC
0.5	12.7	None	00-011391 NF	00-011392 NF	00-011393 NF	
		Spherical	00-011391 X.XS	00-011392 X.XS	00-011393 X.XS	
		Cylindrical	00-011391 Y.YC	00-011392 Y.YC	00-011393 Y.YC	
5	0.25	6.4	None	00-011394 NF	00-011395 NF	00-011396 NF
			Spherical	00-011394 X.XS	00-011395 X.XS	00-011396 X.XS
			Cylindrical	00-011394 Y.YC	00-011395 Y.YC	00-011396 Y.YC
	0.375	9.5	None	00-011397 NF	00-011398 NF	00-011399 NF
			Spherical	00-011397 X.XS	00-011398 X.XS	00-011399 X.XS
			Cylindrical	00-011397 Y.YC	00-011398 Y.YC	00-011399 Y.YC
	0.5	12.7	None	00-011400 NF	00-011401 NF	00-011402 NF
			Spherical	00-011400 X.XS	00-011401 X.XS	00-011402 X.XS
			Cylindrical	00-011400 Y.YC	00-011401 Y.YC	00-011402 Y.YC

Velocity Testing

Frequency (MHz)	Element Diameter		Focus	C
	inch	mm		
5	0.25	6.4	None	00-010591
	0.375	9.5	None	00-010438
	0.5	12.7	None	00-010475

* GP = General Purpose; HR = High Resolution; C = Composite.
* See appendix for technical details.



Immersion Paintbrush

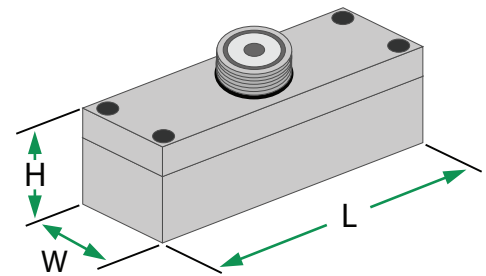
Paintbrush Transducers

are single-element immersion transducers which give a greater scanning width than conventional transducers with round or rectangular elements. They are often used in scanning tanks where large plates, bars, and other parts are tested which have large surface areas. Their large coverage decreases scan time dramatically. Like other conventional probes, they can be ordered with GP*, HR* or C* performance and are available in flat or cylindrical focuses.



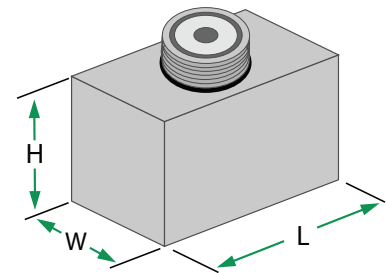
Frequency (MHz)	Element Dimensions		Focus	Part Number
	Short Axis	Long Axis		HR
10	0.25 in (6.4 mm)	2.5 in (63.5 mm)	Flat	00-010590 NF
			Cylindrical	00-010590 Y.YC

Element Dimensions		H		L		W	
inch	mm						
0.25 x 2.5	6.4 x 63.5	0.65 in.	16.5 mm	2.85 in.	72.4 mm	0.75 in.	19 mm



Frequency (MHz)	Element Dimensions		Focus	Part Number
	Short Axis	Long Axis		HR
10	0.25 in (6.4 mm)	1 in (25.4 mm)	Flat	00-010175 NF
			Cylindrical	00-010175 Y.YC

Element Dimensions		H		W		L	
inch	mm						
0.25 x 1	6.4 x 25.4	0.95 in.	24.1 mm	0.75 in.	19 mm	1.5 in.	38.1 mm



The majority of paintbrush transducers are built to specific customer requirements. These are a few examples of SNI Paintbrush Transducers but do not represent our full capabilities. Please contact us for specific probe requests.

* GP = General Purpose; HR = High Resolution; C = Composite.
* See appendix for technical details.



Thickness

Single Element, Dual Element, Phased Array

Precision (Single Element) Thickness Gauging Transducers

For use with commercial thickness gauges and flaw detection instruments.

Model	Transducer Type	Contact Diameter		Measuring Range in Steel	Nominal Frequency	SNI Part Number
		inch	mm			
Alpha2 DFR Plus	Delay Line Removable	0.3	7.6	0.007 to 1 inch 0.18 to 25.4 mm	15 MHz	00-010417
CA211 Plus	Standard Contact	0.75	19	0.60 to 20 inch 1.5 to 508 mm	5 MHz	00-010415
Alpha2 F Plus	Small Contact	0.38	9.7	0.60 to 10 inch 1.5 to 254 mm	10 MHz	00-010625
Alpha2 Mini DFR Plus	Thin Range Delay Line	0.19	4.8	0.005 to 0.2 inch 0.13 to 5.1 mm	20 MHz	00-010589
Pencil Probe	Delay Line Pencil Case	0.065 or 0.090	1.7 or 2.3	0.008 to 0.175 inch 0.20 to 0.44 mm	20 MHz	00-011039



Corrosion (Dual Element) Thickness Gauging Transducers

For use with commercial corrosion thickness gauges and flaw detection instruments.

Model	Transducer Type	Contact Diameter		Measuring Range in Steel	Temperature Maximum	SNI Part Number
		inch	mm			
FH2E Plus	Fingertip	0.38	9.7	0.030 to 2.0 inch 7.6 to 50.8 mm	<130° F <54° C	00-010424
FH2E Plus WR	Fingertip Wear Resistant	0.55	14	0.030 to 2.0 inch 7.6 to 50.8 mm	<130° F <54° C	00-010565
FH2E Plus MD	Fingertip	0.38	9.7	0.030 to 2.0 inch 7.6 to 50.8 mm	<130° F <54° C	00-011017
FH2E Plus M	Fingertip Small Diameter	0.28	7.1	0.030 to 1.0 inch 7.6 to 25.4 mm	<130° F <54° C	00-010675
FH2E Plus with BNC	Fingertip	0.38	9.7	0.030 to 2.0 inch 7.6 to 50.8 mm	<130° F <54° C	00-010532
FH2E Plus BT	Studded Boiler Tube	0.38	9.7	0.060 to 2.0 inch 1.5 to 50.8 mm	<130° F <54° C	00-010676
DA 512 Plus	Fingertip	0.295	7.5	0.024 to 2.4 inch .6 to 61 mm	<130° F <54° C	00-010638
SNI 525	Potted Fingertip	0.2	5	0.025 to 2 inch .6 to 50.8 mm	<130° F <54° C	00-012223



Dual-Linear Phased-Array™ for Corrosion Inspection

Frequency (MHz)	Number of Elements	Element Pitch		Elevation		Array Description and Application	SNI Part Number	Case
		in	mm	in	mm			
5	32 Transmit 32 Receive	0.060	1.50	0.20	5	Dual linear, corrosion inspection	00-010863	Corrosion
5	32 Transmit 32 Receive	0.030	0.75	0.20	5	Dual linear, corrosion inspection	00-011200	Corrosion





Phased Array

Standard Models

Phased Array Transducers*

SNI's phased array transducers are available in many configurations, including linear, matrix, dual matrix, curved, annular and annular sectorial. Standard cable length is 8.2-ft (2.5 m) with ZPAC, IPEX, Phasor, Mentor, or Hypertronics connector. Other cable lengths and connectors are available upon request.

General Purpose

Frequency (MHz)	Number of Elements	Element Pitch		Elevation		Array Description and Application	SNI Part Number**	Case
		inch	mm	inch	mm			
1.5	16	0.040	1.00	0.47	12	Low-frequency linear, coarse-grain materials	00-010276	E2
2.25	16	0.030	0.75	0.47	12	General purpose linear	00-010265	AM
2.25	16	0.030	0.75	0.47	12	General purpose linear	00-011419	A1
2.25	16	0.060	1.50	0.75	19	General purpose linear	00-010277	E3
2.25	64	0.024	0.60	0.38	10	General purpose linear	00-010267	LM
2.25	64	0.024	0.60	0.38	10	General purpose linear	00-011420	A12
2.25	64	0.030	0.75	0.47	12	General purpose linear	00-011421	A2
4	16	0.020	0.50	0.35	9	General purpose linear	00-010275	E1
5	16	0.024	0.60	0.38	10	General purpose linear	00-010266	AM
5	16	0.024	0.60	0.38	10	General purpose linear	00-011422	A10
5	16	0.024	0.60	0.38	10	General purpose linear	00-011423	A1
5	32	0.024	0.60	0.38	10	General purpose linear	00-010329	A11
5	64	0.024	0.60	0.38	10	General purpose linear	00-010268	LM
5	64	0.024	0.60	0.38	10	General purpose linear	00-011426	A12
5	64	0.024	0.60	0.38	10	General purpose linear	00-011427	A2
10	32	0.012	0.31	0.28	7	General purpose linear	00-011429	A10
10	32	0.012	0.31	0.28	7	General purpose linear	00-011430	A1
10	64	0.024	0.60	0.38	10	General purpose linear	00-010269	LM

Immersion

Frequency (MHz)	Number of Elements	Element Pitch		Elevation		Array Description and Application	SNI Part Number**	Case
		in	mm	in	mm			
3.5	64	0.040	1.00	0.28	7	Near wall linear immersion (elements close end)	00-010331	Near Wall
5	64	0.040	1.00	0.28	7	Near wall linear immersion (elements close end)	00-010332	Near Wall
5	128	0.030	0.75	0.38	10	Linear immersion	00-010333	I3
5	64	0.024	0.60	0.38	10	Linear immersion	00-011431	I1
5	128	0.024	0.60	0.38	10	Linear immersion	00-011432	I2
5	32	0.052	1.32	0.24	6	Curved array for composite radius inspection	00-010334	R4
5	64	0.050	1.27	0.31	8	Hardwater linear (minimizes water gap needed)	00-010327	HW

Deep Penetration

Frequency (MHz)	Number of Elements	Element Pitch		Elevation		Array Description and Application	SNI Part Number**	Case
		in	mm	in	mm			
1.5	16	0.110	2.80	1.02	26	Deep penetration probes	00-011416	A4
2.25	16	0.080	2.00	1.26	32	Deep penetration probes	00-011417	A4
2.25	32	0.030	0.75	0.94	24	Deep penetration probes	00-011418	A5
5	32	0.024	0.60	0.76	20	Deep penetration probes	00-011424	A5

* See page 36 for phased-array transducer connector types.

** When ordering phased-array transducers, please include the part number followed by the desired connector type (ex. 00-010328 ZPAC).



Phased Array

Standard Models

Small Footprint

Frequency (MHz)	Number of Elements	Element Pitch		Elevation		Array Description and Application	SNI Part Number**	Case
		in	mm	in	mm			
2.25	32	0.016	0.40	0.50	12.7	Miniature angle beam; fits conventional wedges	00-010340	.5 in. MSWS
3.5	32	0.016	0.40	0.50	12.7	General purpose linear	00-010381	.5 in. MSWS
3.5	16	0.016	0.40	0.25	6.25	General purpose linear	00-010379	.25 in. MSWS
5	16	0.016	0.40	0.25	6.25	General purpose linear	00-010380	.25 in. MSWS
5	32	0.016	0.40	0.50	12.7	Miniature angle beam; fits conventional wedges	00-010339	.5 in. MSWS
7.5	16	0.016	0.40	0.25	6.25	General purpose linear	00-010867	.25 in. MSWS
10	16	0.012	0.31	0.20	5	Small footprint, high frequency linear	00-010341	A00
10	16	0.016	0.40	0.25	6.25	General purpose linear	00-011207	.25 in. MSWS
10	32	0.016	0.40	0.50	12.7	Miniature angle beam; fits conventional wedges	00-010338	.5 in. MSWS

Wedge Mount

Frequency (MHz)	Number of Elements	Element Pitch		Elevation		Array Description and Application	SNI Part Number**	Case
		inch	mm	inch	mm			
2	8	0.040	1.00	0.35	9	Low-frequency linear, coarse-grain materials	00-010274	E1

Matrix (2D)

Frequency (MHz)	Number of Elements	Element Pitch		Elevation		Array Description and Application	SNI Part Number**	Case
		in	mm	in	mm			
1.5	2x15 5x3 element	0.150	3.80	0.16	4	Dual matrix (T/R) - coarse-grain materials	00-010278	E4
2	2x32 16x2 element	0.070	1.75	0.16	4	Dual matrix (T/R) - coarse-grain materials	00-010342	E5

Low Profile

Frequency (MHz)	Number of Elements	Element Pitch		Elevation		Array Description and Application	SNI Part Number**	Case
		in	mm	in	mm			
5	16	0.020	0.50	0.38	10	Low-profile linear	00-011211	Cobra
7.5	16	0.020	0.50	0.38	10	Low-profile linear	00-011212	Cobra
7.5	32	0.010	0.25	0.38	10	Low-profile linear	00-011213	Cobra
10	16	0.020	0.50	0.38	10	Low-profile linear	00-010214	Cobra
10	32	0.010	0.25	0.38	10	Low-profile linear	00-010215	Cobra

* See page 36 for phased-array transducer connector types.

** When ordering phased-array transducers, please include the part number followed by the desired connector type (ex. 00-010328 ZPAC).



Phased Array

Standard Models & Size Diagrams

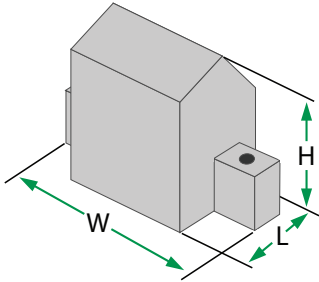
Pipeline Probe

Frequency (MHz)	Number of Elements	Element Pitch		Elevation		Array Description and Application	SNI Part Number**	Case
		in	mm	in	mm			
5	60	0.040	1.00	0.38	10	General purpose linear	00-011425	A14
7.5	60	0.040	1.00	0.38	10	General purpose linear	00-011428	A14

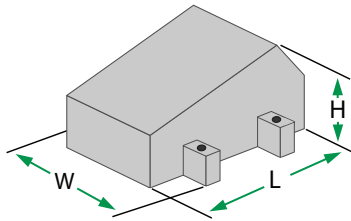
Weld Inspection

Frequency (MHz)	Number of Elements	Element Pitch		Elevation		Array Description and Application	SNI Part Number**	Case
		in	mm	in	mm			
2.25	16	0.040	1.00	0.63	16	AWS linear	00-010477	AWS

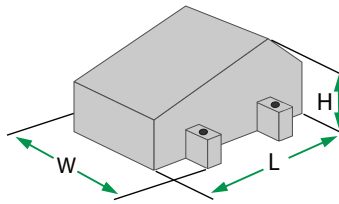
A1



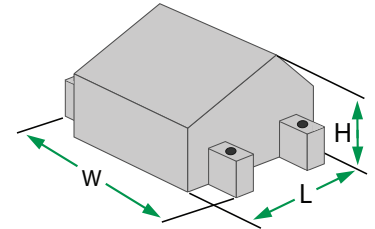
A2



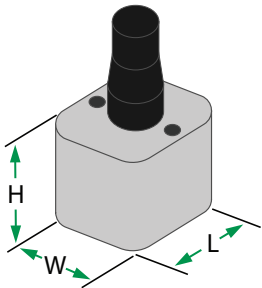
A4



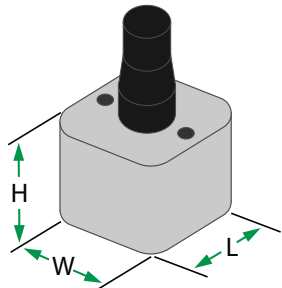
A5



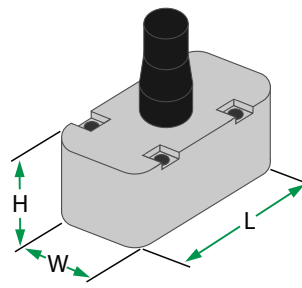
A10



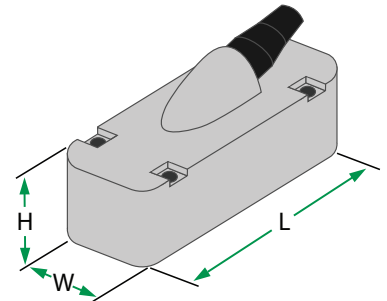
A11



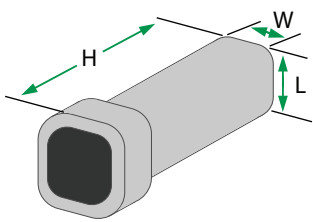
A12



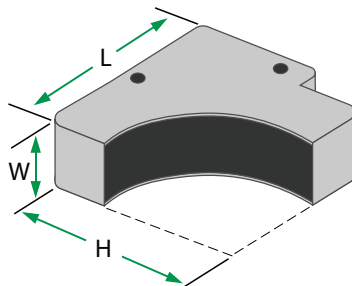
A14



A00



R4



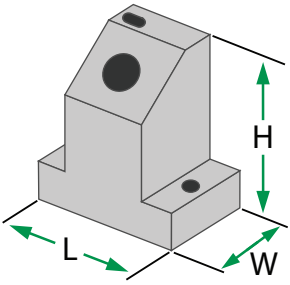
Case Type	Case Dimensions					
	Length		Width		Height	
A1	0.67 in.	17 mm	1.14 in.	29 mm	0.98 in.	24.9 mm
A2	2.09 in.	53.1 mm	1.14 in.	29 mm	1.38 in.	35.1 mm
A4	2.24 in.	56.9 mm	1.81 in.	46 mm	1.18 in.	30 mm
A5	1.14 in.	29 mm	1.69 in.	42.9 mm	0.94 in.	23.9 mm
A10	0.91 in.	23.1 mm	0.63 in.	16 mm	0.79 in.	20.1 mm
A11	0.98 in.	24.9 mm	0.91 in.	23.1 mm	0.79 in.	20.1 mm
A12	1.77 in.	45 mm	0.91 in.	23.1 mm	0.79 in.	20.1 mm
A14	2.67 in.	67.8 mm	0.91 in.	23.1 mm	0.79 in.	20.1 mm
A00	0.31 in.	7.9 mm	0.31 in.	7.9 mm	0.91 in.	23.1 mm
R4	1.67 in.	45.2 mm	0.59 in.	15 mm	1.67 in.	42.4 mm



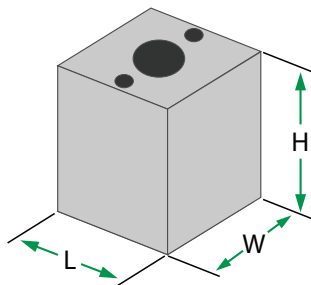
Phased Array

Case Dimensions

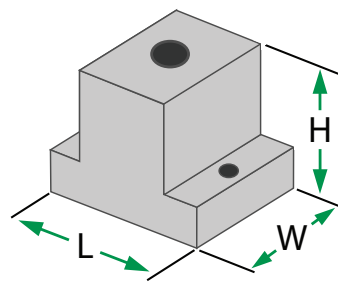
E1



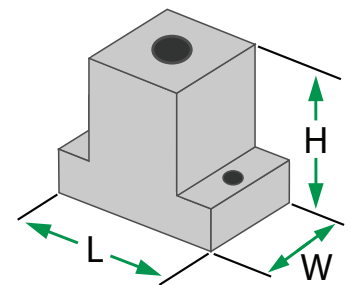
E2



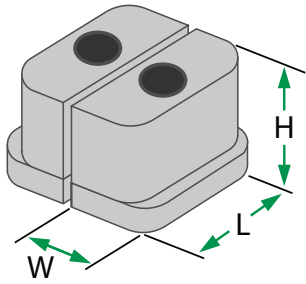
E3



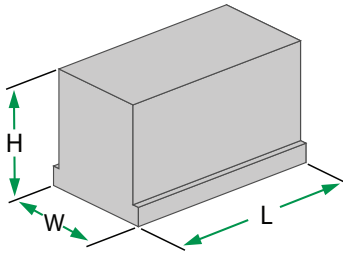
E4



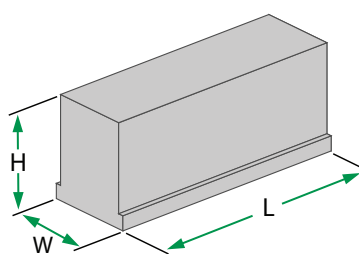
E5



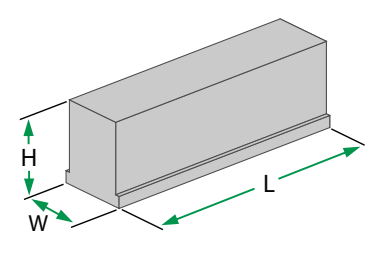
I1



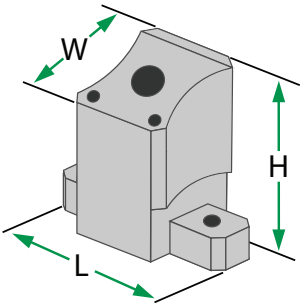
I2



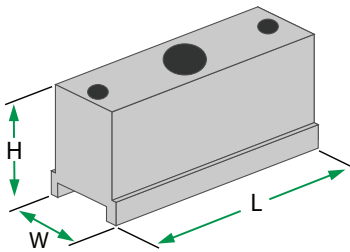
I3



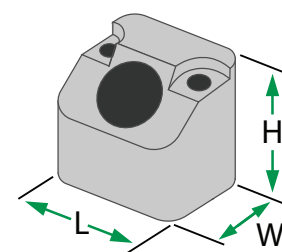
AM



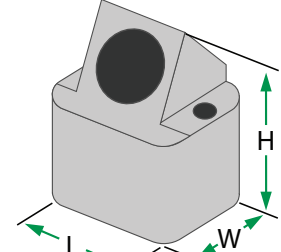
LM



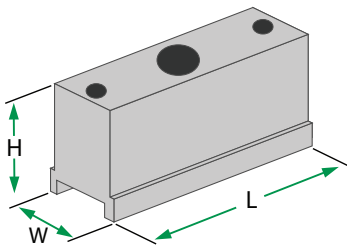
0.25 MSWS



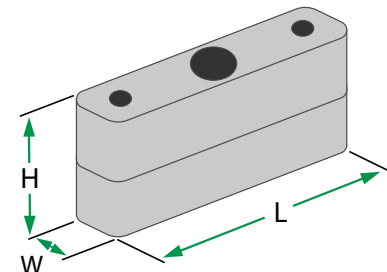
0.5 MSWS



Near Wall



HW



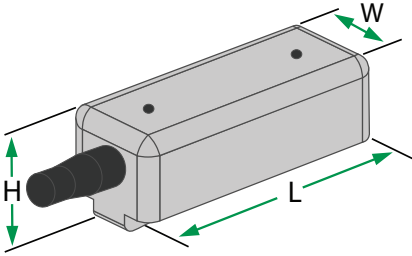
Case Type	Case Dimensions					
	Length		Width		Height	
E1	1.1 in.	27.9 mm	0.59 in.	15 mm	1.06 in.	26.9 mm
E2	0.75 in.	19 mm	0.75 in.	19 mm	1.0 in.	25.4 mm
E3	1.45 in.	36.8 mm	1.25 in.	31.8 mm	1.0 in.	25.4 mm
E4	1.33 in.	33.8 mm	0.65 in.	16.5 mm	1.0 in.	25.4 mm
E5	1.41 in.	35.8 mm	.62 in.	15.7 mm	1.0 in.	25.4 mm
I1	1.97 in.	50 mm	0.75 in.	19 mm	0.98 in.	24.9 mm
I2	3.27 in.	83.1 mm	0.83 in.	21.1 mm	1.38 in.	35.1 mm
I3	4.02 in.	102.1 mm	0.83 in.	21.1 mm	1.38 in.	35.1 mm
AM	1.18 in.	30 mm	0.63 in.	16 mm	0.98 in.	24.9 mm
LM	1.69 in.	42.9 mm	1.1 in.	27.9 mm	0.98 in.	24.9 mm
0.25 MSWS	0.5 in.	12.7 mm	0.37 in.	9.4 mm	0.5 in.	12.7 mm
0.5 MSWS	0.76 in.	19.3 mm	0.61 in.	15.5 mm	0.75 in.	19 mm
Near Wall	2.6 in.	66 mm	0.75 in.	19 mm	0.98 in.	24.9 mm
HW	3.4 in.	86.4 mm	0.5 in.	12.7 mm	1.25 in.	31.8 mm



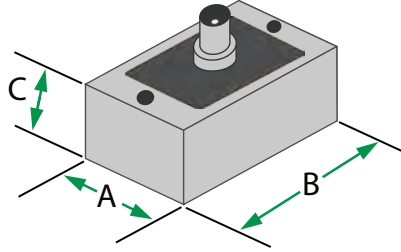
Phased Array

Case Dimensions

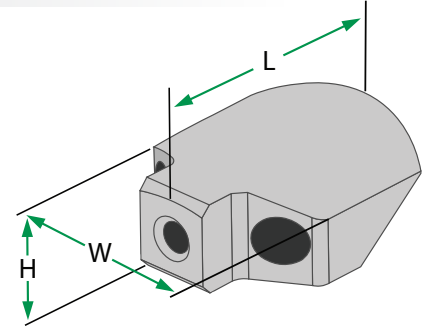
Corrosion



AWS



Cobra



Case Type	Case Dimensions					
	Length		Width		Height	
Corrosion	2.58 in.	65.5 mm	1.0 in.	25.4 mm	0.95 in.	24.1 mm
AWS	1.26 in.	32 mm	0.80 in.	20.3 mm	0.75 in.	19 mm
Cobra	0.98 in.	24.9 mm	0.87 in.	22.1 mm	0.39 in.	9.9 mm



Accessories

Standard Wedges & Cables

Standard Wedges

Transducer Type	Element Dimensions		Wedges
	inch	mm	
AWS	0.625 x 0.625	16 x 16	45° 01-010268
			60° 01-010269
			70° 01-010270
SWS	0.5 Ø	12.7 Ø	45° 01-010206
			60° 01-010207
			70° 01-010208
	0.5 x 1	12.7 x 25.4	45° 01-010210
			60° 01-010211
			70° 01-010212
	0.75 x 1	19 x 25.4	45° 01-010214
			60° 01-010215
			70° 01-010216
	1 Ø	25.4 Ø	45° 01-010218
			60° 01-010219
			70° 01-010220

Transducer Type	Element Dimensions		Wedges
	inch	mm	
QS	0.25	6.4	30° 01-010189
			45° 01-010190
			60° 01-010191
			70° 01-010192
	0.375	9.5	30° 01-010193
			45° 01-010194
			60° 01-010195
			70° 01-010196
	0.5	12.7	30° 01-010197
			45° 01-010198
			60° 01-010199
			70° 01-010200
MSWS	0.25	6.4	45° 01-010532
			60° 01-010533
			70° 01-010534
	0.5	12.7	45° 01-010535
			60° 01-010536
			70° 01-010537
TOFD	0.125	3.2	45°L 01-010475
			60°L 01-010476
			70°L 01-010477
	0.25	6.4	45°L 01-010475
			60°L 01-010476
			70°L 01-010477

Cables

Cable	Material	Length	Part Number
BNC - BNC	RG58	6-ft (1.83 m)	07-010018
BNC - MD	RG174 TPR	6-ft (1.83 m)	07-010012
BNC - MCX	RG174 TPR	6-ft (1.83 m)	07-010007
BNC - 00-Lemo	RG174 TPR	6-ft (1.83 m)	07-010014
00-Lemo - MD	RG174 TPR	6-ft (1.83 m)	07-010028
00-Lemo - 00-Lemo	RG174 TPR	6-ft (1.83 m)	07-010034

Cable	Material	Length	Part Number
00-Lemo - MCX	RG174 TPR	6-ft (1.83 m)	07-010035
00-Lemo - MCX (RA)	RG174 TPR	6-ft (1.83 m)	07-010008
Dual BNC - Dual MD	RG174 TPR	6-ft (1.83 m)	07-010030
Dual 00-Lemo - Dual MD	RG174 TPR	6-ft (1.83 m)	07-010032
Lemo 1 - MD	RG174 TPR	6-ft (1.83 m)	07-020175
Lemo 1 - BNC	RG174 TPR	6-ft (1.83 m)	07-020176



Accessories

Phased-Array Wedges

Phased-Array Wedges

SNI's proprietary **Low-Noise-Blue™** damping material minimizes wedge noise for improved resolution and signal-to-noise ratio.

Type	Description	Part Number
E1	Wedge, REX, 38.0 DEG INC, Flat, A	01-010293
E1	Wedge, REX, 38.0 DEG INC, Flat, B	01-010294
E1	Wedge, 30-70 Shear	01-011731
E2	Wedge, REX, 38.0 DEG INC, Flat, A	01-010295
E2	Wedge, REX, 38.0 DEG INC, Flat, B	01-010296
E3	Wedge, REX, 38.0 DEG INC, Flat	01-010297
E4	Wedge, Dual, REX, 18.0 DEG INC, Flat	01-010298
E5	Wedge, Dual 18 INC 2.3RF, REX, Flat	01-010035
MSWS 1/2	Wedge, .5" MSWS, 45S, Plex	01-010535
MSWS 1/2	Wedge, .5" MSWS, 60S, Plex	01-010536
MSWS 1/2	Wedge, .5" MSWS, 70S, Plex	01-010537
MSWS 1/2	Wedge, .50" MSWS PA, REX, 35-75 SW, Flat	01-011015
MSWS 1/2	Wedge, .50" MSWS PA, REX, 35-75 L-WAVE, Flat	01-011016
AM	Wedge 40-70L, AM Case	01-010531
AM	Wedge 40-70S, AM Case	01-010703
AM	Wedge 0 Degree, AM Case	01-011975
LM	Wedge 0 Degree, LM Case	01-010706
LM	Wedge 40-70S, LM Case	01-010707
LM	Wedge 40-70L, LM Case	01-010708
A00	Wedge 30-60S, A00 Case	01-010710
A00	Wedge 45-70S, A00 Case	01-010711
A1	Wedge 0 Degree, A1 Case	01-011733
A1	Wedge 45-70 Shear, A1 Case	01-011734
A2	Wedge 0 Degree, A2 Case	01-011741
A2	Wedge 30-70 Shear, A2 Case	01-011742
A4	Wedge 0 Degree, A4 Case	01-011743
A4	Wedge 30-70 Shear, A4 Case	01-011744
A5	Wedge 0 Degree, A5 Case	01-011745
A5	Wedge 30-70 Shear, A5 Case	01-011746
A10	Wedge 0 Degree, A10 Case	01-011735
A10	Wedge 30-70 Shear, A10 Case	01-010944
A11	Wedge 0 Degree, A11 Case	01-011749
A11	Wedge 30-70 Shear, A11 Case	01-010709
A12	Wedge 0 Degree, A12 Case	01-011737
A12	Wedge 30-70 Shear, A12 Case	01-011738
A14	Wedge 0 Degree, A14 Case	01-011739
A14	Wedge 30-70 Shear, A14 Case	01-011740
A31	Wedge 30-70 Shear, A31 Case	01-010943
MSWS 1/4"	Wedge, .25" MSWS PA, REX, 35-75 SW, Flat	01-010705
MSWS 1/4"	Wedge, .25" MSWS PA, REX, 35-75 L-WAVE, Flat	01-010977
MSWS 1/4"	Wedge, .25" MSWS, 45S, Plex	01-010532
MSWS 1/4"	Wedge, .25" MSWS, 60S, Plex	01-010533
MSWS 1/4"	Wedge, .25" MSWS, 70S, Plex	01-010534
Cobra	Low profile wedge, fits Cobra Style Prbs, Flat	01-011229
Cobra	Low profile wedge, fits Cobra Style Prbs, Curved to Customer request	01-011230-XX



Applications Engineering

Custom Transducer Capabilities

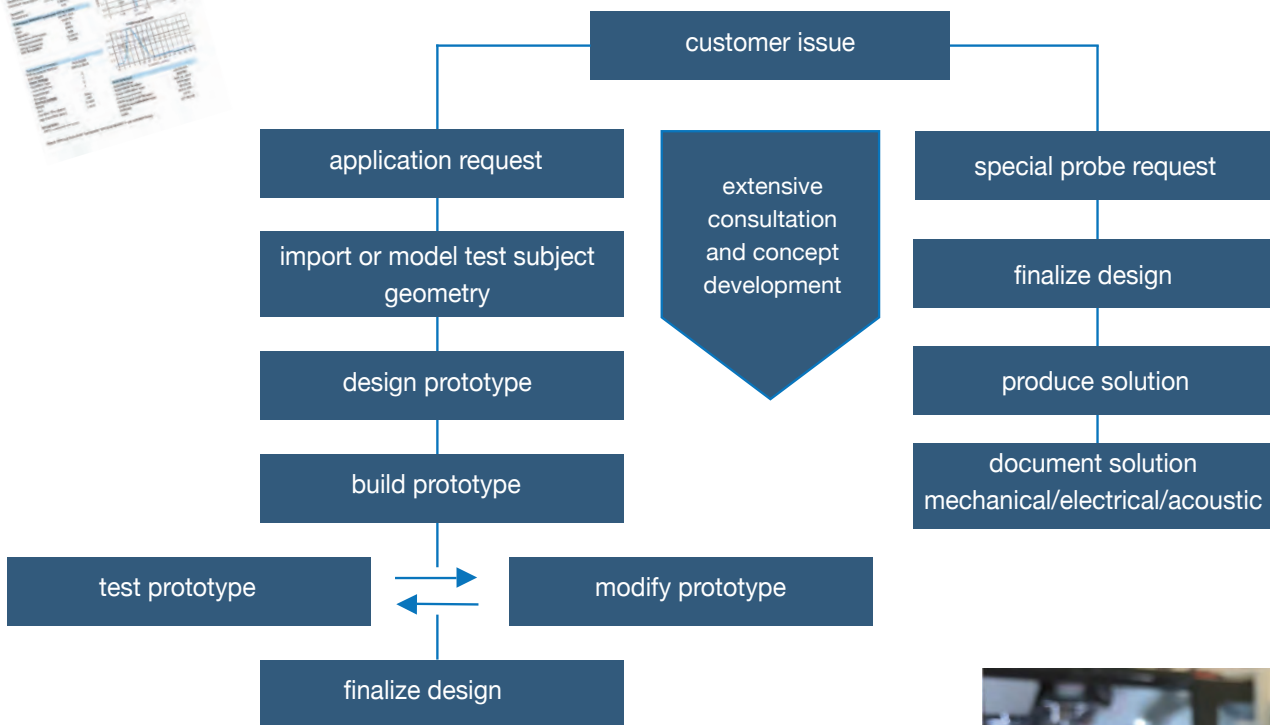
Successful Ultrasonic Applications Engineering

is the result of three major elements:

- ▶ Experience
- ▶ Capabilities
- ▶ Process

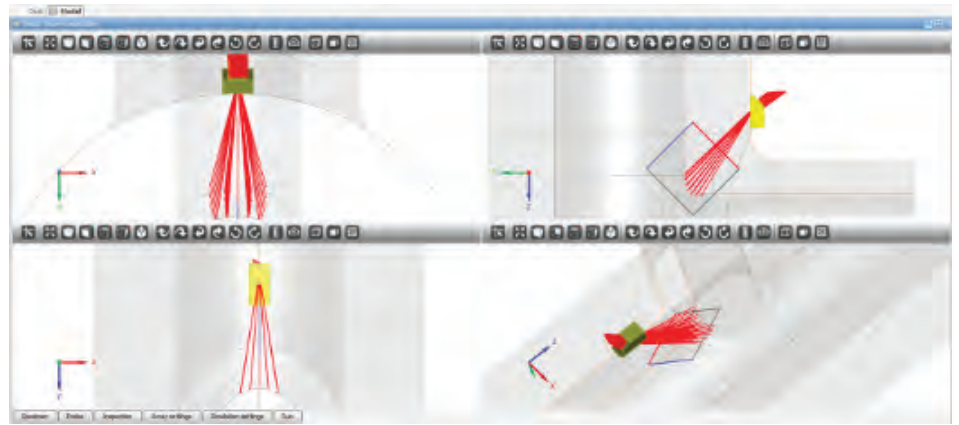
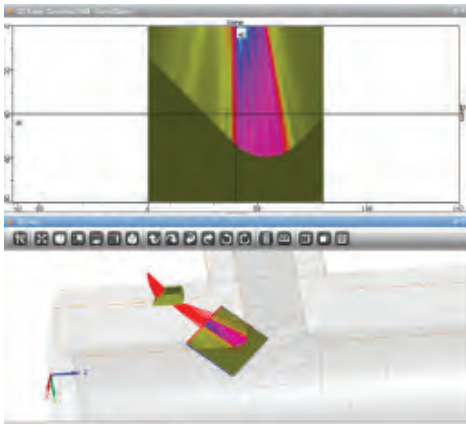


Our Process



SNI's customers have direct access to our highly experienced team of NDT professionals.





In-house CAD/CAM capabilities, including our 5-axis CNC Mill and CNC Lathe, allows for rapid prototyping of complex shapes in most engineering materials.

Sensor Networks, Inc. uses industry-preferred design and simulation tools to create an optimized mechanical, electrical, and ultrasonic model of the inspection task, including its scan plan.

In-house ceramic fabrication capabilities enable rapid prototyping of complex, piezo-composite materials. This capability creates a fast and efficient project turn around.

- ▶ **SolidWorks:** Parametric 3D CAD and Mechanical Properties Modeling
- ▶ **AutoCad:** 2D CAD and Ray-Tracing
- ▶ **CIVA:** Acoustic Beam Modeling and Delay Law Calculation for Conventional and Phased Arrays
- ▶ **PiezoCad:** Transducer Construction and Performance Modeling
- ▶ **Field II:** Transducer Construction and Performance Modeling
- ▶ **UltraVision 3D:** NDT Data Imaging and Analysis Software for Conventional and Phased Arrays
- ▶ **ES Beam Tool:** Ultrasonic Inspection Plan Design and Validation Software



Precision fixturing is key to reproducible test results

Optimized Solutions for Cost-Effective Productivity

Sensor Networks offers transducers and UT solutions in a variety of styles, compatible with any major manufacturer's conventional or phased-array instruments.



Small Diameter (<0.25"/6mm) ID Bore Probes: shear-wave, L-wave, duals and tandem types.



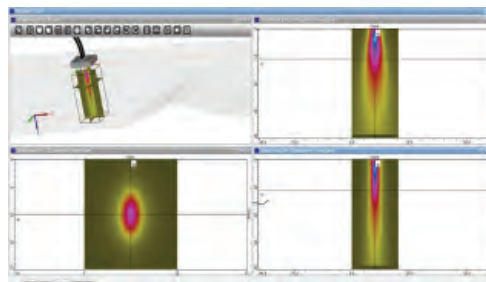
SensorScan® QS: conventional transducers for the quick swapping onto delay lines or wedges.



ASME Section XI: compound radius wedges, refracted longitudinal, phased array duals, contact or immersion, TOFD, complex wedges & delays.



O.D. Transducers: for tube weld or braze joints.



CIVA of Dual: Acoustic modeling of dual-element transducer performance on a small pit.



In-Situ: self aligning wand transducers for the hard to access rotating equipment.



Phased Array: linear & matrix, annular, daisy & circular, contact & immersion, single & dual, flat & curved.



2MHz PAUT Dual: with 2x16 elements per probe and detachable wedge.



7MHz Ultra High-Temp Delay Line: transducer and mounting clamp for continuous 500°C (932°F).



10MHz PAUT Dual: special 64-element dual for HTHA exams.



1.5MHz PAUT: replaceable wear face on 64-element phased-array Matrix probe.

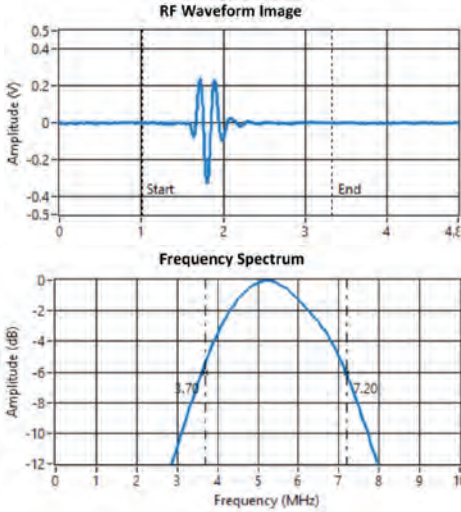


5MHz PAUT: 92-element transducer for bar testing machines.



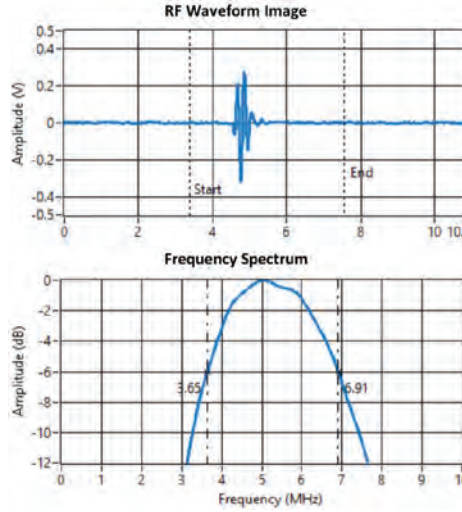
Appendix

High Resolution Series



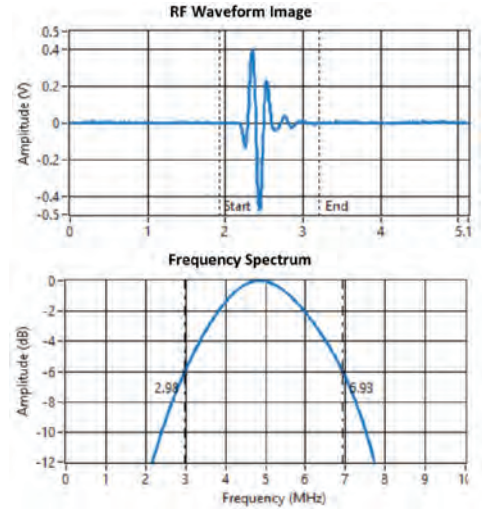
HR: High Resolution Series of transducers are highly damped and recommended for applications where enhanced axial and near-surface resolution are more important. Generally includes thickness measurement and near-surface flaw detection. HR series have less sensitivity than the GP or C series with -6db frequency bandwidth of 50-100% range.

General Purpose Series



GP: General Purpose Series of transducers are recommended for most applications and have a good trade-off between sensitivity and resolution. They have a medium frequency bandwidth of 30-40% at -6db but with more ring-down cycles in the waveform.

Composite or Piezo-composite Series



C: Composite (Piezocomposite) Series of transducers have superior sensitivity and penetration especially in highly-attenuative materials. C Series have both higher resolution, sensitivity, and have wide bandwidth (60-120% at -6db) due to the lower acoustic impedance of the material. They couple more efficiently into plastic wedges, delay lines, and water.

Ultrasonic Transducer Certification

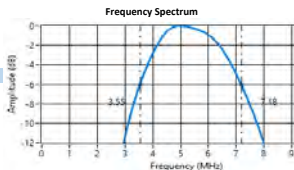
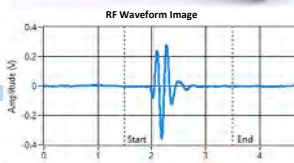


Phone: 814-466-7207
Website: www.sensornetworksinc.com

Transducer Information	
*Part Number:	00-010778NF
*Serial Number:	778PRETESTK2
Transducer Description:	H2-5MHz-.50"-GP-NF-UHF
Frequency:	5MHz
Element Size:	.50"
Transducer Measurements per ASTM E1065	
Date:	Jun 4, 2018
Time:	6:44 PM
Operator:	DEH
**Transducer Disposition:	PASS
Relative Sensitivity:	68dB
Center Frequency:	5.37MHz
-6dB Bandwidth:	67.66%

Test Setup & Conditions	
Test Procedure Number:	Tp
Test Object:	3" H2O-SST
Pulser Settings	
Repetition Rate:	4
Pulse Amplitude:	5
Pulse Energy:	2 - LowZ
Damping:	9

Receiver Settings	
Mode:	Pulse Echo
Gain:	10 + 1
Low Pass Filter (MHz):	35 MHz
High Pass Filter (MHz):	1 MHz



Test Equipment	
Pulser/Receiver:	IDPR300
Pulser Serial Number:	DA0901
Pulser Calibration Due Date:	Dec 14, 2018
Oscilloscope Model:	DPO2022B
Oscilloscope Serial Number:	C030032
Oscilloscope Calibration Due Date:	Oct 12, 2018
Software:	1.2.0
Cable:	6FT RG-58

*Please reference Transducer Part Number and Serial Number in any correspondence

Ultrasonic Beam Profile



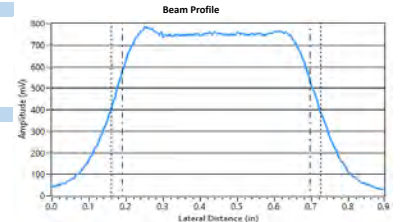
Phone: 814-466-7207
Website: www.installedensors.com

Transducer Information	
*Part Number:	XDCR100N
*Serial Number:	U11CA7
Transducer Description:	XDCR 100, .75" DIA, 5 MHz, 2.3" CXL, FCS, 11A-1967, B CASE
Frequency:	5MHz
Element Size:	.75"
Transducer Measurements per ASTM E1065	
Date:	Jun 4, 2019
Time:	10:18 AM
Operator:	KPR
Transducer Disposition:	PASS
-3dB Beam length (in):	0.505"

Test Setup & Conditions	
Test Procedure Number:	
Test Object:	1/4" SST ROD
Water Path (in):	3.0"
Pulser Settings	
Repetition Rate:	4
Pulse Amplitude:	5
Pulse Energy:	2 - LowZ
Damping:	9
Receiver Settings	
Mode:	Pulse Echo
Gain:	20 + 2
Low Pass Filter (MHz):	35 MHz
High Pass Filter (MHz):	1 MHz

Special Notes:

*Please reference Transducer Part Number and Serial Number in any correspondence



Test Equipment	
Pulser/Receiver:	JSR DPR300
Pulser Serial Number:	DA0901
Pulser Calibration Date:	Dec 19, 2019
Oscilloscope Model:	DPO2022B
Oscilloscope Serial Number:	C030032
Oscilloscope Calibration Date:	Oct 11, 2019
Software:	1.0.3
Cable:	6FT RG-58



Appendix

▶ Phased-Array Transducer Connector Types

SNI can build any phased-array transducer with:



Phasor

Mentor



(L to R) IPEX, ZPAC, Hypertronics

Linear Phased Array Ultrasonic Transducer Certification

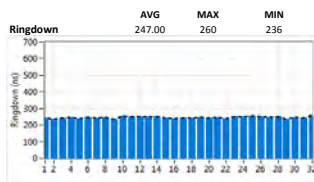
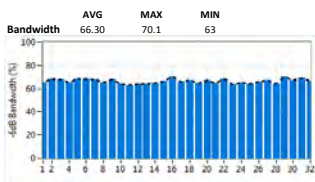
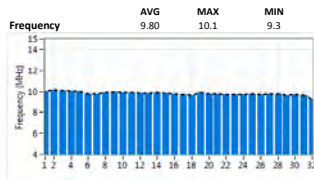
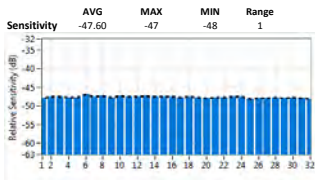


176-500 Technology Drive
Boalsburg, PA 16827
Phone: 814-466-7207
Website: www.sensornetworksinc.com

Transducer Information

*Part Number: 00-010848
*Serial Number: U11795

Parameter	Measurement	Specification	RESULT
Average Center Freq	9.8	+/-10%	PASS
Average Bandwidth	66.3	>=60%	PASS
Sensitivity deviation	1	+/-3dB	PASS
Probe Wiring Configuration Check			PASS
Probe Cable/Connector Check			PASS



*Please reference Transducer Part Number and Serial Number in any correspondence

Linear Phased Array Ultrasonic Transducer Certification



176-500 Technology Drive
Boalsburg, PA 16827
Phone: 814-466-7207
Website: www.sensornetworksinc.com

Transducer Information

*Part Number: 00-010536-SMT
*Serial Number: U115CV
Transducer Description: 5MHz, 28EL, 1.6mmP X 10mm, 30m CBL, Rectangular

Probe Type: Rectangular
Housing: 5.0MHz
Element Pitch: 1.6 mm
Element Elevation: 10 mm
Number of Elements: 28
Cable Jacket: PU
Cable Length: 30M
Connector Type: SAMTEC

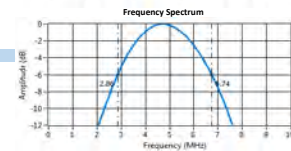
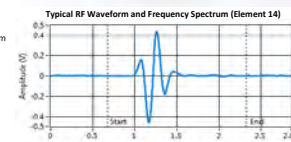
Transducer Measurements per ASTM E1065

Date: 6/13/2018
Time: 9:20:55AM
Operator: KYLE RYAN
**Transducer Disposition: PASS
Average Relative Sensitivity: -45dB
Average Center Frequency: 4.89MHz
Average -6dB Bandwidth: 78.70%

Test Setup & Conditions

Test Procedure Number: TP
Test Object: 20mm REX BW
Pulse Width: 100ns
Pulse Voltage: -12.3V

Image of Transducer



Test Equipment

Acquisition Unit: TC3
Acq. Unit Serial Number: 17054368
Acq. Unit Calibration Due Date: April 06, 2019
Hardware Version: 1.1
Software: 1.2.1
Adapter: 07-020155

Special Notes:

*Please reference Transducer Part Number and Serial Number in any correspondence

**This item was manufactured and tested according to product specific parameters. The "Pass" Disposition confirms that all steps in the manufacturing process were completed satisfactorily and that all test requirements were satisfied.

All SensorScan® Transducers carry a one-year warranty from the date of purchase, for the original owner, covering defects in materials and workmanship.

Ultrasonic Probes

Ultrasonics



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Transducer Performance

GE Inspection Technologies offers three series of transducers: **Alpha**, **Gamma**, and new **Benchmark**. To determine which of these series is best for your application, please read the technical information on this page. If you need assistance, contact one of our Transducer Product Specialists (717-242-0327) or your local sales representative.

Real time waveform and frequency certification is included with every transducer at no charge (refer to the Technical Information section for details).

Alpha Series Features

- Recommended for applications where resolution is the primary consideration.
- Suitable for applications such as thickness measurement and near-surface flaw detection.
- Very short pulse—mechanically damped to the limit of current technology.
- Gain is usually lower than that of the Gamma and Benchmark Series.
- Broadband—typical 6 dB bandwidths range from 50% to 100%.
- Typical Alpha waveforms (right) exhibit one to two full ring cycles, depending on frequency, size and other parameters.

Benchmark Series Features

- Proprietary **BENCHMARK COMPOSITE®** (piezocomposite) active elements.
- Penetration in attenuative materials is far superior to conventional transducers.
- High signal to noise on coarse grain metals, fiber reinforced composites, et al.
- Short pulse—resolution usually superior to Gamma Series.
- Gain is usually higher than that of the Gamma and Alpha Series.
- Very broadband—typical 6 dB bandwidths range from 60% to 120%.
- Low acoustic impedance element improves performance of angle beam, delay line, and immersion probes—excellent match to plastic and water.

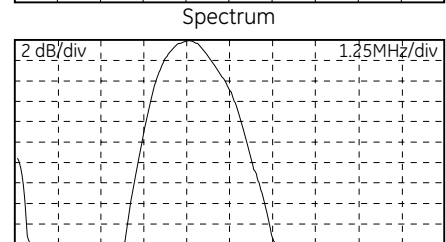
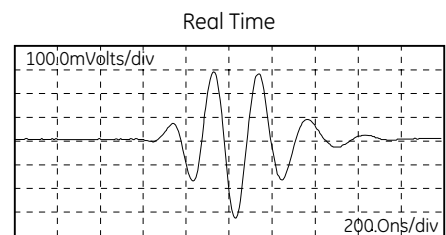
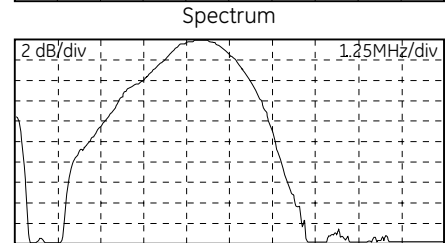
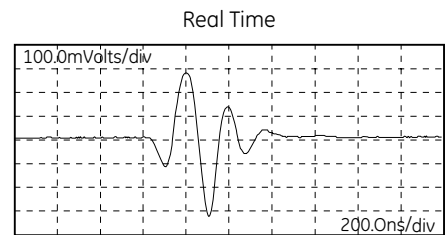
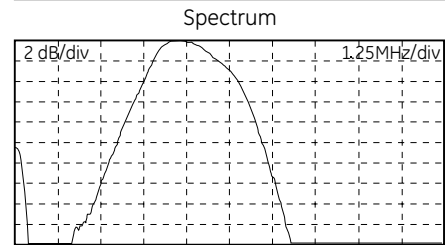
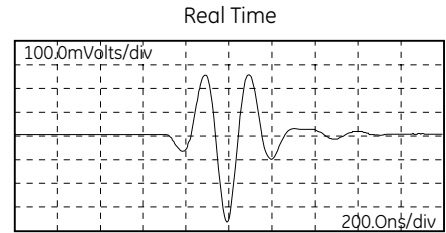
Gamma Series Features

- General purpose transducers, recommended for the majority of applications.
- Medium pulse, medium damping—best combination of gain and resolution.
- Matching electrical network ensures maximum gain and optimum waveform for general use.
- Medium bandwidth—typical 6 dB bandwidths range from 30% to 50%.
- Typical Gamma waveform exhibits three to four full ring cycles, depending on frequency, size and other parameters.

Frequency Color Coding

For easy identification of frequency, most GE Inspection Technologies transducers are color coded as follows:

Frequency (MHz)	.50	1.0	2.25	3.50	5.00	10.00
Color	Gray	Red	Yellow	Blue	Green	Black

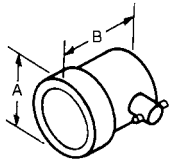


Contact Transducers

Single Element Contact Transducers are longitudinal wave transducers designed for general purpose manual ultrasonic inspection where test materials are relatively flat and smooth. Contact transducers provide high sensitivity for better penetration and are ruggedly constructed for extended service life under the roughest testing conditions.

RHP and XLC Style Contacts

Standard Contact Transducers are designed for abusive "scrubbing" applications. Gamma series are for applications where sensitivity and penetration are essential. Alpha series have maximum bandwidth for axial resolution. RHP style probes feature ceramic wearplates for the best combination of acoustic matching and durability and stainless steel housings to resist corrosion. New XLC (Extended Life Contact) style probes have special, high durability wearplates for the most abusive applications. Both styles feature an improved comfort grip and color band for frequency identification. CR models have right angle mounted BNC connectors and the CS models have top-mounted BNC connectors.



Element Ø	A	B
.500	1.15	1.50
.750	1.40	1.50
1.000	1.65	1.50

Standard Contact Transducers—RHP and XLC Styles

Freq. (MHz)	Size (in.)	Product Codes				Freq. (MHz)	Size (in.)	Product Codes				
		Style	Alpha Series	Gamma Series	Accessories			Style	Alpha Series	Gamma Series	Accessories	
.5	.750	RHP		250-043-CR	Cables 6' BNC C-016 6' LEMO C-018	.500	RHP		243-043-CR	Cables 6' BNC C-016 6' LEMO C-018		
		RHP		250-123-CS			RHP		243-123-CS			
	1.00	RHP		260-043-CR			RHP		243-050-CR			
		RHP		260-123-CS			XLC		243-150-CS			
1.0	.500	RHP		241-043-CR		Cables 6' BNC C-016 6' LEMO C-018	3.5	.750	RHP			253-043-CR
		RHP		241-123-CS					RHP			253-123-CS
	.750	RHP		251-043-CR				XLC			253-050-CR	
		RHP		251-123-CS				XLC			253-150-CS	
	1.00	RHP		261-043-CR				RHP			263-043-CR	
				261-123-CS				RHP			263-123-CS	
		XLC		261-050-CR				XLC			263-050-CR	
				261-150-CS				XLC			263-150-CS	
2.25	.500	RHP	142-043-CR	242-043-CR	Cables 6' BNC C-016 6' LEMO C-018	5.0	.500	RHP	144-043-CR	244-043-CR		
		RHP	142-123-CS	242-123-CS				RHP	144-123-CS	244-123-CS		
		XLC		242-050-CR				RHP	154-043-CR	254-043-CR		
		XLC		242-150-CS				RHP	154-123-CS	254-123-CS		
	.750	RHP	152-043-CR	252-043-CR			Cables 6' BNC C-016 6' LEMO C-018	1.00	RHP	164-043-CR	264-043-CR	
		RHP	152-123-CS	252-123-CS					RHP	164-123-CS	264-123-CS	
		XLC		252-050-CR								
		XLC		252-150-CS								
	1.00	RHP		262-043-CR			Cables 6' BNC C-016 6' LEMO C-018	10.0	.500	RHP		246-043-CR
				262-123-CS						RHP		246-123-CS
		XLC		262-050-CR								
				262-150-CS								

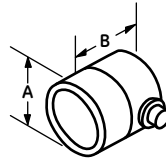
Contact Transducers

Single Element Contact Transducers are longitudinal wave transducers designed for general purpose manual ultrasonic inspection where test materials are relatively flat and smooth. Contact transducers provide high sensitivity for better penetration and are ruggedly constructed for extended service life under the roughest testing conditions.



F Style Contact

F Style Contact transducers are small diameter fingertip probes with a right angle mounted Microdot connector. Gamma Series are recommended for applications where high sensitivity and penetration are essential. Alpha Series are designed for optimum damping and resolution. Benchmark Series, with Benchmark Composite® elements, are best for punching through highly attenuative materials.



Element Ø	A	B
.250	.50	.66
.375	.63	.66
.500	.75	.66

Fingertip Contact Transducers—F Style

Freq. (MHz)	Size (in.)	Product Codes				Accessories	Freq. (MHz)	Size (in.)	Product Codes			Accessories
		Benchmark Series	Alpha Series	Gamma Series					Benchmark Series	Alpha Series	Gamma Series	
2.25	.250	822-000	122-000	222-000	Cables	6' BNC C-012	5.0	.250	824-000	124-000	224-000	Cables
	.375	832-000	132-000	232-000				.375	834-000	134-000	234-000	
	.500	842-000	142-000	242-000				.500	844-000	144-000	244-000	
3.5	.250		123-000	223-000	6' LEMO C-022	10.0	.250		126-000	226-000	6' LEMO C-022	
	.375		133-000	233-000			.375		136-000	236-000		
	.500		143-000	243-000			.500		146-000	246-000		

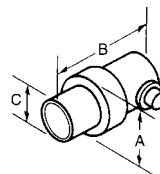
DFR Style Removable Delay Line Contact

DFR Style Removable Delay Line Fingertip Transducers are specifically designed for thickness gauging and flaw detection of thin materials. High frequency and critical damping results in a high performance transducer, which exhibits excellent resolution capability. All DFR Style Transducers have right angle mounted Microdot connectors.



Removable Delay Line—DFR Style

Freq. (MHz)	Size (in.)	Product Codes			Accessories
		Alpha Series	Delay Line 10-PK .38" Lg	Delay Line 10-PK .5" Lg	
2.25	.250	122-660	D-050	D-051	Cables
	.500	140-500		D-052	
3.5	.250	123-660	D-050	D-051	6' BNC C-012
	.500	144-660	D-050	D-051	
5.0	.250	124-660	D-050	D-051	6' LEMO C-022
	.500	144-660	D-050	D-052	
10.0	.250	126-660	D-050	D-051	Delay Line Couplant XD-740
	.500	140-602		D-052	
15.0	.250	127-660	D-050	D-051	Spring Loaded VEE Block H-007*
22.0	.125	118-660	D-050	D-051	
Mini-DFR 20.0	.125	518-650	MD-502		



Element Ø	A	B	C
.125 or .250	.51	.835	.30
.500	.875	1.375	.595
Mini-DFR			
.125	.41	.765	.19

*H-007 fits .125" and .25" units only with exception of Mini DFR.

Contact Transducers

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K-PEN Replaceable Delay Line Pencil Probe

K-PEN's are high resolution pencil type probes. They are designed for applications requiring an extremely small contact area, such as tightly curved surfaces of turbine blades or remaining wall thickness measurements from a pit bottom. They can be used with most flaw detectors, precision thickness gauges, and general pulser / receiver units. Probes come with interchangeable delay tips that are tapered to a .065" and .090" contact diameter. Replacement delays are available in packs of 10. The straight model features a removable handle, which also allows it to be used as a fingertip probe. All models have Microdot connectors.



K-PEN Probes

Freq. (MHz)	Product Codes					
	Straight K-PEN	45° K-PEN	Right Angle K-PEN	.065" Tip Delay 10-PK	.090" Tip Delay 10-PK	6' BNC Cable
7.5	389-042-200	389-042-880	389-042-870	387-003-109	387-003-110	C-012
20.0	389-030-290	389-041-270	389-040-660			

ZIP Probes for Testing Composite and Other Attenuative Plastics

Zero Interface (ZIP) Probes are highly damped, low frequency delay line transducers designed for composite inspection. ZIP delay lines are acoustically matched to most composite and other plastic materials. This eliminates or minimizes the delay line interface echo, significantly improving near surface resolution. The low frequency characteristics of ZIPs make them excellent for penetrating thick or highly attenuative cross-sections. ZIPs can also be used on many smooth surfaced materials without couplant.



Zero Interface Probes (ZIP)

Freq. (MHz)	Size (in.)	Product Codes	Product Codes	
			Cables	Delay Line
0.45	1.00	560-130	6' BNC C-016	D-071
1.5	.500	560-131	6' BNC C-012	D-072
2.25	.375	560-132		D-073

Contact Transducers

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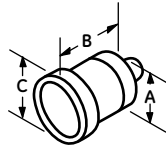
PFCR and PFCS Style Contacts

The Protective Face Combination transducers are designed to allow one basic transducer to be used with three different types of protective face: membrane, wear cap, or delay line. All models have BNC connectors, PFCR are right angle mount and PFCS are top-mount.

Style PM Kit includes a knurled ring, gland nut, wrench, 12 membranes, and a 2 oz. bottle of couplant (transducer not included).

Style PWC Kit includes a knurled ring, three wear caps, and a 2 oz. bottle of couplant (transducer not included). This option may not be usable if near surface resolution is critical.

Style PHTD Kit includes a knurled ring, either 1" or 1.5" long high temperature delay line, and a 2 oz. bottle of couplant (transducer not included).



Element Ø	A	B	C
.500	.75	1.20	.94
.750	1.00	1.20	1.19
1.000	1.25	1.20	1.44

Protective Face Combination Transducers—PFCR/PFCS Style

Freq. (MHz)	Size (in.)	Product Codes		Freq. (MHz)	Size (in.)	Product Codes	
		Gamma Series PFCR Style	Gamma Series PFCS Style			Gamma Series PFCR Style	Gamma Series PFCS Style
1.0	.500	241-240	241-260	3.50	.500	243-240	243-260
	.750	251-240	251-260		.750	253-240	253-260
	1.00	261-240	261-260		1.00	263-240	263-260
2.25	.500	242-240	242-260	5.0	.500	244-240	244-260
	.750	252-240	252-260		.750	254-240	254-260
	1.00	262-240	262-260		1.00	264-240	264-260

Accessories—PFCR/PFCS

	Product Codes	Transducer Element Ø		
		.500"	.750"	1.00"
		Spare Membranes Pkg. of 12 pcs.	PM-020	PM-021
Spare Wear caps Pkg. of 12 pcs.	PC-123	PC-122	PC-121	
Hi-Temp. Delay Line* 1.0" Long	PD-027	PD-031	PD-035	
Hi-Temp. Delay Line* 1.5" Long	PD-029	PD-033	PD-037	
6" BNC cable		C-016		
Membrane, Wear cap & Delay line Couplant		XD-740		

Protective Face Option Kits—PFCR/PFCS

Kit Style	Product Codes		
	Transducer Element Ø		
	.500"	.750"	1.00"
PM	PK-120	PK-140	PK-160
PWC	PK-220	PK-240	PK-260
PHTD (1" Delay)*	PK-320	PK-340	PK-360
PHTD (1.5" Delay)*	PK-420	PK-440	PK-460

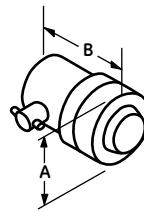
* High Temp (PHTD) delay line: maximum temperature 400°F, maximum contact time 10 seconds; cool to ambient before reuse.

Contact Transducers

Single Element Contact Transducers are longitudinal wave transducers designed for general purpose manual ultrasonic inspection where test materials are relatively flat and smooth. Contact transducers provide high sensitivity for better penetration and are ruggedly constructed for extended service life under the roughest testing conditions.

PMCR and PMCS Style Contacts

Protective Membrane Contact Transducers are excellent for coupling to rough or uneven surfaces. The membrane will conform to surface irregularities providing better coupling to the test material. PMCR and PMCS Style contacts are designed for quick, easy membrane replacement and have color-coded grips identifying transducer frequency. The PMCR Style has right angle BNC connectors while the PMCS Style has straight top-mount BNC connectors.



Element Ø	A	B
.500	1.13	1.75
.750	1.41	1.75
1.000	1.63	1.75

Protective Membrane Transducers—PMCR/PMCS Style

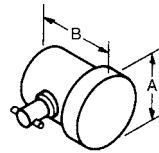
Freq. (MHz)	Size (in.)	Product Codes			Freq. (MHz)	Size (in.)	Product Codes		
		Gamma Series	Membranes 1 dozen	Accessories			Gamma Series	Membranes 1 dozen	Accessories
1.0	.500	241-241-PMCR 241-261-PMCS	PM-020	Cables 6' BNC C-016	3.5	.500	243-241-PMCR 243-261-PMCS	PM-020	Cables 6' BNC C-016
	.750	251-241-PMCR 251-261-PMCS	PM-021			.750	253-241-PMCR 253-261-PMCS	PM-021	
	1.00	261-241-PMCR 261-261-PMCS	PM-022			1.00	263-241-PMCR 263-261-PMCS	PM-022	
2.25	0.500	242-241-PMCR 242-261-PMCS	PM-020	6' LEMO C-018	5.00	.500	244-241-PMCR 244-261-PMCS	PM-020	6' LEMO C-018
		252-241-PMCR 252-261-PMCS	PM-021			.750	254-241-PMCR 254-261-PMCS	PM-021	
	0.750	262-241-PMCR 262-261-PMCS	PM-022	Membrane Couplant XD-740		1.00	264-241-PMCR 264-261-PMCS	PM-022	Membrane Couplant XD-740
		1.00	262-241-PMCR 262-261-PMCS			PM-022	1.00	264-241-PMCR 264-261-PMCS	

Contact Transducers

Single Element Contact Transducers are longitudinal wave transducers designed for general purpose manual ultrasonic inspection where test materials are relatively flat and smooth. Contact transducers provide high sensitivity for better penetration and are ruggedly constructed for extended service life under the roughest testing conditions.

PWCCR and PWCCS Style Contacts

Protective Wear Cap Contact Transducers have expendable wear caps which are easily replaced when worn. This means unlimited economy when the job calls for "scrubbing" which would normally destroy a standard contact probe. The PWCCR Style has right angle mounted BNC connectors while the PWCCS Style has straight top-mount BNC connectors. High temperature delay lines are also available for applications to 400°F.



Element Ø	A	B
.500	1.0	1.12
.750	1.25	1.12
1.000	1.50	1.12

Protective Wear Cap/Delay Line Transducers—PWCCR/PWCCS

Freq. (MHz)	Size (in.)	Product Codes				Freq. (MHz)	Size (in.)	Product Codes					
		Gamma Series	Wear Cap 10 pc. Kit	HT Delay Line Kit*	Accessories			Gamma Series	Wear Cap 10 pc. Kit	HT Delay Line Kit*	Accessories		
1.0	.500	241-250-PWCCR 241-270-PWCCS	PC-221	PK-050-1" PK-060-1.5"	Cables	3.5	.500	243-250-PWCCR 243-270-PWCCS	PC-221	PK-050-1" PK-060-1.5"	Cables		
	.750	251-250-PWCCR 251-270-PWCCS	PC-241	PK-070-1" PK-080-1.5"			6' BNC C-016	.750	253-250-PWCCR 253-270-PWCCS	PC-241		PK-070-1" PK-080-1.5"	6' BNC C-016
	1.00	261-250-PWCCR 261-270-PWCCS	PC-261	PK-090-1" PK-100-1.5"			6' LEMO C-018	1.00	263-250-PWCCR 263-270-PWCCS	PC-261		PK-090-1" PK-100-1.5"	6' LEMO C-018
2.25	.500	242-250-PWCCR 242-270-PWCCS	PC-221	PK-050-1" PK-060-1.5"	Wear Cap Couplant	5.0	.500	244-250-PWCCR 244-270-PWCCS	PC-221	PK-050-1" PK-060-1.5"	Wear Cap Couplant		
	.750	252-250-PWCCR 252-270-PWCCS	PC-241	PK-070-1" PK-080-1.5"			254-250-PWCCR 254-270-PWCCS	PC-241	PK-070-1" PK-080-1.5"				
	1.00	262-250-PWCCR 262-270-PWCCS	PC-261	PK-090-1" PK-100-1.5"			264-250-PWCCR 264-270-PWCCS	PC-261	PK-090-1" PK-100-1.5"	XD-740			

* High Temp (HT) Delay Line: maximum temperature 400°F, maximum contact time 10 seconds; cool to ambient before reuse.

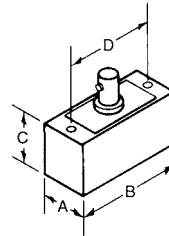
Angle Beam Transducers

Angle Beam Transducers are single or dual element transducers designed for weld inspection or flaw detection where flaws have an angular orientation with respect to the material surface. Weld inspections are performed using shear waves refracted from a longitudinal wave by means of a lucite wedge. Lucite wedges are designed to produce shear waves of a particular angle in a specified material with minimal wedge noise.



SWS and AWS Style Angle Beam, Gamma Series

SWS and AWS Style Angle Beam Transducers are designed to fit on removable wedges. Refracted shear wave angles may be specified as required. The AWS series are designed to meet or exceed all of the requirements outlined in AWS Structural Welding Code D1.1. All SWS and AWS transducers utilize captive screws for fastening the probe to the wedge and have top-mount BNC connectors. High temperature wedges are for temperatures up to 400° F.



Element Size	A	B	C	D
.50 dia.	.72	1.0	.75	.81
.50 x 1.0	.725	1.51	.75	1.31
.75 x 1.0	1.00	1.5	.75	1.31
1.0	1.22	1.65	.75	1.38
.625 x .625	.725	1.25	.75	1.00
.625 x .750	.725	1.25	.75	1.00
.750 x .750	.85	1.25	.75	1.00

Standard Angle Beam—SWS and AWS Styles, Gamma Series

Freq. (MHz)	Size (in.)	Product Codes				Freq. (MHz)	Size (in.)	Product Codes			
		Gamma Series	Standard Wedge	Hi-Temp Wedge*	Accessories			Gamma Series	Standard Wedge	Hi-Temp Wedge*	Accessories
0.50	1.0 Dia	260-600	W-021 45° W-022 60° W-023 70° W-025 90°	W-081 45° W-082 60° W-083 70°	Cables 6' BNC C-016 6' LEMO C-018 Wedge Couplant XD-740	2.25 AWS Series	.63 x .63	292-603	W-104 45° W-105 60° W-106 70°		
	.5 Dia	241-600	W-009 45° W-010 60° W-011 70° W-013 90°	W-076 45° W-077 60° W-078 70°			.63 x .75	292-601	W-104 45° W-105 60° W-106 70°		
	.5 x 1	291-600	W-015 45° W-016 60° W-017 70° W-019 90°	W-070 45° W-086 60° W-071 70°			.75 x .75	292-604	W-104 45° W-105 60° W-106 70°		
	.75 x 1	291-605	W-051 45° W-052 60° W-053 70° W-054 90°				.5 Dia	243-600	W-009 45° W-010 60° W-011 70° W-013 90°	W-076 45° W-077 60° W-078 70°	
1.0	1.0 Dia	261-600	W-021 45° W-022 60° W-023 70° W-025 90°	W-081 45° W-082 60° W-083 70°	Cables 6' BNC C-016 6' LEMO C-018 Wedge Couplant XD-740	3.5	.5 x 1	293-600	W-015 45° W-016 60° W-017 70° W-019 90°	W-070 45° W-086 60° W-071 70°	
	.5 Dia	242-600	W-009 45° W-010 60° W-011 70° W-013 90°	W-076 45° W-077 60° W-078 70°			.75 x 1	293-605	W-051 45° W-052 60° W-053 70° W-054 90°		
	.5 x 1	292-600	W-015 45° W-016 60° W-017 70° W-019 90°	W-070 45° W-086 60° W-071 70°			1.0 Dia	263-600	W-021 45° W-022 60° W-023 70° W-025 90°	W-081 45° W-082 60° W-083 70°	
	.75 x 1	292-605	W-051 45° W-052 60° W-053 70° W-054 90°				.5 Dia	244-600	W-009 45° W-010 60° W-011 70° W-013 90°	W-076 45° W-077 60° W-078 70°	
2.25	1.0 Dia	262-600	W-021 45° W-022 60° W-023 70° W-025 90°	W-081 45° W-082 60° W-083 70°	Cables 6' BNC C-016 6' LEMO C-018 Wedge Couplant XD-740	5.0	.5 x 1	294-600	W-015 45° W-016 60° W-017 70° W-019 90°	W-070 45° W-086 60° W-071 70°	
	.5 Dia	242-600	W-009 45° W-010 60° W-011 70° W-013 90°	W-076 45° W-077 60° W-078 70°			.75 x 1	294-605	W-051 45° W-052 60° W-053 70° W-054 90°		
	.5 x 1	292-600	W-015 45° W-016 60° W-017 70° W-019 90°	W-070 45° W-086 60° W-071 70°			1.0 Dia	264-600	W-021 45° W-022 60° W-023 70° W-025 90°	W-081 45° W-082 60° W-083 70°	
	.75 x 1	292-605	W-051 45° W-052 60° W-053 70° W-054 90°								

* Duty Cycle: at 400°F, maximum contact time is 10 seconds; cool to ambient before reuse. Note: Standard wedge angles are specified for carbon steel.

Angle Beam Transducers

Angle Beam Transducers are single or dual element transducers designed for weld inspection or flaw detection where flaws have an angular orientation with respect to the material surface. Weld inspections are performed using shear waves refracted from a longitudinal wave by means of a lucite wedge. Lucite wedges are designed to produce shear waves of a particular angle in a specified material with minimal wedge noise.

SWS and AWS Style Angle Beam, Benchmark Series

Benchmark series SWS and AWS Style Angle Beam Transducers feature proprietary BENCHMARK COMPOSITE® active elements. They are available in the same range of sizes and fit the same removable wedges as the Gamma series. Benchmark series offer a superior combination of sensitivity, resolution, and penetration for punching through highly attenuative materials. They are especially beneficial when signal to noise ratio is a problem, for example coarse grain materials and fiber reinforced composites. The AWS models meet all requirements of Structural Welding Code D1.1.



Standard Angle Beam—SWS and AWS Styles, Benchmark Series

Freq. (MHz)	Size (in.)	Product Codes			Freq. (MHz)	Size (in.)	Product Codes						
		Benchmark Series	Standard Wedge	Accessories			Benchmark Series	Standard Wedge	Accessories				
1.0	.5 Dia	841-600	W-009 45° W-010 60° W-011 70° W-013 90°	Cables 6'BNC C-016 6' LEMO C-018 Wedge Couplant XD-740	3.5	.5 Dia	843-600	W-009 45° W-010 60° W-011 70° W-013 90°	Cables 6'BNC C-016 6' LEMO C-018 Wedge Couplant XD-740				
	.5 x 1	891-600	W-015 45° W-016 60° W-017 70° W-019 90°			.5 x 1	893-600	W-015 45° W-016 60° W-017 70° W-019 90°					
	.75 x 1	891-605	W-051 45° W-052 60° W-053 70° W-054 90°			.75 x 1	893-605	W-051 45° W-052 60° W-053 70° W-054 90°					
	1.0 Dia	861-600	W-021 45° W-022 60° W-023 70° W-025 90°			1.0 Dia	863-600	W-021 45° W-022 60° W-023 70° W-025 90°					
2.25	.5 Dia	842-600	W-009 45° W-010 60° W-011 70° W-013 90°		Cables 6'BNC C-016 6' LEMO C-018 Wedge Couplant XD-740	5.0	.5 Dia	844-600		W-009 45° W-010 60° W-011 70° W-013 90°	Cables 6'BNC C-016 6' LEMO C-018 Wedge Couplant XD-740		
	.5 x 1	892-600	W-015 45° W-016 60° W-017 70° W-019 90°				.5 x 1	894-600		W-015 45° W-016 60° W-017 70° W-019 90°			
	.75 x 1	892-605	W-051 45° W-052 60° W-053 70° W-054 90°				.75 x 1	894-605		W-051 45° W-052 60° W-053 70° W-054 90°			
	1.0 Dia	862-600	W-021 45° W-022 60° W-023 70° W-025 90°				1.0 Dia	864-600		W-021 45° W-022 60° W-023 70° W-025 90°			
2.25 AWS Series	.63 x .63	892-603	W-104 45° W-105 60° W-106 70°			Cables 6'BNC C-016 6' LEMO C-018 Wedge Couplant XD-740	5.0	1.0 Dia		864-600		W-021 45° W-022 60° W-023 70° W-025 90°	Cables 6'BNC C-016 6' LEMO C-018 Wedge Couplant XD-740
	.63 x .75	892-601	W-104 45° W-105 60° W-106 70°										
	.75 x .75	892-604	W-104 45° W-105 60° W-106 70°										

Note: Standard wedge angles are specified for carbon steel.

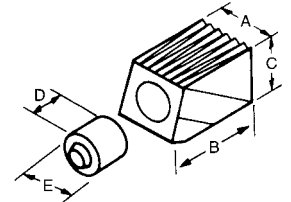
Angle Beam Transducers

Angle Beam Transducers are single or dual element transducers designed for weld inspection or flaw detection where flaws have an angular orientation with respect to the material surface. Weld inspections are performed using shear waves refracted from a longitudinal wave by means of a Lucite wedge. Lucite wedges are designed to produce shear waves of a particular angle in a specified material with minimal wedge noise.



MSW-QC Style Angle Beam, Gamma Series

MSW-QC Style are miniature angle beam transducers that screw directly into our "Quick Change" Lucite wedges. All MSW-QC transducers have top-mount Microdot connectors. Gamma series utilize conventional monolithic ceramic elements and are recommended for regular inspection of non-attenuative materials. 10.0 MHz MSW-QC transducers are available only in Gamma series.



Wedge Angle	Replaceable Wedge .25"					Wedge Angle	Replaceable Wedge .375"					Wedge Angle	Replaceable Wedge .50"				
	A	B	C	D	E		A	B	C	D	E		A	B	C	D	E
45°	.45	.75	.37	.41	.47	45°	.55	.89	.47	.56	.50	45°	.70	1.05	.55	.70	.62
60°	.45	.84	.44	.41	.47	60°	.55	1.04	.55	.56	.50	60°	.70	1.24	.64	.70	.62
70°	.45	1.00	.50	.41	.47	70°	.55	1.19	.58	.56	.50	70°	.70	1.41	.68	.70	.62
90°	.45	.95	.50	.41	.47	90°	.55	1.15	.61	.56	.50	90°	.70	1.39	.73	.70	.62

Miniature Angle Beam Transducers—MSW-QC Style

Freq. (MHz)	Size (in.)	Product Codes			Freq. (MHz)	Size (in.)	Product Codes		
		Gamma Series	Standard Wedge	Accessories			Gamma Series	Standard Wedge	Accessories
1.0	.500	241-590	W-210 30° W-211 45° W-212 60° W-213 70° W-214 90°	Cables 6' BNC C-012 6' LEMO C-022 Wedge Couplant XD-740	3.5 cont.	.500	243-590	W-210 30° W-211 45° W-212 60° W-213 70° W-214 90°	
	.375	231-590	W-220 30° W-221 45° W-222 60° W-223 70° W-224 90°			.250	224-590	W-200 30° W-201 45° W-202 60° W-203 70° W-204 90°	
1.5	.500	241-595	W-210 30° W-211 45° W-212 60° W-213 70° W-214 90°		5.0	.375	234-590	W-220 30° W-221 45° W-222 60° W-223 70° W-224 90°	
	.250	222-590	W-200 30° W-201 45° W-202 60° W-203 70° W-204 90°			.500	244-590	W-210 30° W-211 45° W-212 60° W-213 70° W-214 90°	
2.25	.375	232-590	W-220 30° W-221 45° W-222 60° W-223 70° W-224 90°		10	.250	226-590	W-200 30° W-201 45° W-202 60° W-203 70° W-204 90°	
	.500	242-590	W-210 30° W-211 45° W-212 60° W-213 70° W-214 90°			.375	236-590	W-220 30° W-221 45° W-222 60° W-223 70° W-224 90°	
3.5	.250	223-590	W-200 30° W-201 45° W-202 60° W-203 70° W-204 90°		5.0	.500	246-590	W-210 30° W-211 45° W-212 60° W-213 70° W-214 90°	
	.375	233-590	W-220 30° W-221 45° W-222 60° W-223 70° W-224 90°						

Note: Standard wedge angles are specified for carbon steel.

Angle Beam Transducers

Angle Beam Transducers are single or dual element transducers designed for weld inspection or flaw detection where flaws have an angular orientation with respect to the material surface. Weld inspections are performed using shear waves refracted from a longitudinal wave by means of a lucite wedge. Lucite wedges are designed to produce shear waves of a particular angle in a specified material with minimal wedge noise.

MSW-QC Style Angle Beam, Benchmark and Alpha Series

Benchmark and Alpha series MSW-QC Miniature Angle Beam Transducers are available in the same range of sizes and fit the same standard "Quick Change" wedges as the Gamma series. Their one-piece stainless steel case insures long service life. All MSW-QC probes are color coded by frequency and have top mounted Microdot connectors.

Benchmark series probes feature proprietary BENCHMARK COMPOSITE® active elements. They offer a superior combination of sensitivity, resolution, and penetration for punching through highly attenuative materials. They are especially beneficial when signal to noise ratio is a problem, for example coarse grain materials and fiber reinforced composites. Alpha series MSW-QC probes are made with highly damped monolithic ceramic elements and are recommended when very short pulse lengths are required for axial resolution.



Miniature Angle Beam Transducers–MSW-QC Style

Freq. (MHz)	Size (in.)	Product Codes			Accessories	Freq. (MHz)	Size (in.)	Product Codes			Accessories
		Benchmark Series	Alpha Series	Standard Wedge				Benchmark Series	Alpha Series	Standard Wedge	
1.0	.500	241-591	141-591	W-210 30° W-211 45° W-212 60° W-213 70° W-214 90°	Cables 6' BNC C-016 6' LEMO C-022 Wedge Couplant XD-740	3.5 cont.	.500	243-591	143-591	W-210 30° W-211 45° W-212 60° W-213 70° W-214 90°	Cables 6' BNC C-012 6' LEMO C-022 Wedge Couplant XD-740
	.375	231-596	131-596	W-220 30° W-221 45° W-222 60° W-223 70° W-224 90°				.250	224-591	124-591	
1.5	.500	241-596	141-596	W-210 30° W-211 45° W-212 60° W-213 70° W-214 90°		5.0	.375	234-591	134-591	W-220 30° W-221 45° W-222 60° W-223 70° W-224 90°	
	.250	222-591	122-591	W-200 30° W-201 45° W-202 60° W-203 70° W-204 90°				.500	244-591	144-591	
2.25	.375	232-591	132-591	W-220 30° W-221 45° W-222 60° W-223 70° W-224 90°		7.5	.375	225-591	125-591	W-200 30° W-201 45° W-202 60° W-203 70° W-204 90°	
	.500	242-591	142-591	W-210 30° W-211 45° W-212 60° W-213 70° W-214 90°				.500	245-591	145-591	
3.5	.250	223-591	123-591	W-200 30° W-201 45° W-202 60° W-203 70° W-204 90°		7.5	.500	245-591	145-591	W-210 30° W-211 45° W-212 60° W-213 70° W-214 90°	
	.375	233-591	133-591	W-220 30° W-221 45° W-222 60° W-223 70° W-224 90°							

Note: Standard wedge angles are specified for carbon steel.

Angle Beam Transducers

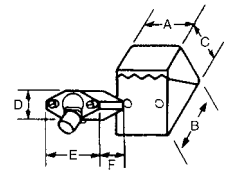
Angle Beam Transducers are single or dual element transducers designed for weld inspection or flaw detection where flaws have an angular orientation with respect to the material surface. Weld inspections are performed using shear waves refracted from a longitudinal wave by means of a lucite wedge. Lucite wedges are designed to produce shear waves of a particular angle in a specified material with minimal wedge noise.

MSWS Style Angle Beam

MSWS Angle Beam Transducers are designed to fit removable lucite wedges. Refracted shear wave angles may be specified as required. All MSWS transducers have captive screws for fastening the probe to the wedge and are fitted with Microdot connectors. High temperature wedges are for use at temperatures up to 400°F.



Wedge Angle	Replaceable Wedge .25"						Wedge Angle	Replaceable Wedge .50"					
	A	B	C	D	E	F		A	B	C	D	E	F
45°	.47	.60	.30	.31	.48	.34	45°	.73	.96	.42	.56	.73	.50
60°	.47	.65	.35	.31	.48	.34	60°	.73	1.08	.50	.56	.73	.50
70°	.47	.70	.38	.31	.48	.34	70°	.73	1.16	.54	.56	.73	.50
90°	.47	.90	.38	.31	.48	.34	90°	.73	1.56	.58	.56	.73	.50



Miniature Angle Beam Transducers—MSWS Style

Freq. (MHz)	Size (in.)	Product Codes			Freq. (MHz)	Size (in.)	Product Codes			
		Gamma Series	Standard Wedge	Accessories			Gamma Series	Standard Wedge	Accessories	
1.0	.500	241-580	W-040 45°	Cables 6' BNC C-012 6' LEMO C-022 Wedge Couplant XD-740	5.0	.250	224-580	W-028 45°	Cables 6' BNC C-012 6' LEMO C-022 Wedge Couplant XD-740	
	W-042 60°		W-030 60°							
W-044 70°	W-032 70°									
W-046 80°	W-034 80°									
W-048 90°	W-036 90°									
2.25	.250	222-580	W-028 45°		5.0	.500	244-580	W-040 45°		Cables 6' BNC C-012 6' LEMO C-022 Wedge Couplant XD-740
	W-030 60°		W-042 60°							
W-032 70°	W-044 70°									
W-034 80°	W-046 80°									
W-036 90°	W-048 90°									
2.25	.500	242-580	W-040 45°	10.0	.250	226-580	W-028 45°	Cables 6' BNC C-012 6' LEMO C-022 Wedge Couplant XD-740		
	W-042 60°		W-030 60°							
W-044 70°	W-032 70°									
W-046 80°	W-034 80°									
W-048 90°	W-036 90°									
3.5	.250	223-580	W-028 45°	10.0	.500	246-580	W-040 45°		Cables 6' BNC C-012 6' LEMO C-022 Wedge Couplant XD-740	
	W-030 60°		W-042 60°							
W-032 70°	W-044 70°									
W-034 80°	W-046 80°									
W-036 90°	W-048 90°									
3.5	.500	243-580	W-040 45°	Cables 6' BNC C-012 6' LEMO C-022 Wedge Couplant XD-740	10.0	.500	W-028 45°	Cables 6' BNC C-012 6' LEMO C-022 Wedge Couplant XD-740		
	W-042 60°		W-040 45°							
W-044 70°	W-042 60°									
W-046 80°	W-044 70°									
W-048 90°	W-046 80°									

Note: Standard wedge angles are specified for carbon steel.

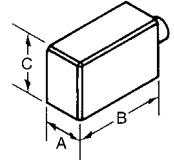
Angle Beam Transducers

Angle Beam Transducers are single or dual element transducers designed for weld inspection or flaw detection where flaws have an angular orientation with respect to the material surface. Weld inspections are performed using shear waves refracted from a longitudinal wave by means of a lucite wedge. Lucite wedges are designed to produce shear waves of a particular angle in a specified material with minimal wedge noise.



ABFP Style Angle Beam

ABFP Style, fingertip, fixed angle, shear wave transducers are available in standard angles for inspecting steel and aluminum. Custom angles for other materials may be special ordered. Their small size makes them ideal for weld inspection in restricted access areas. All ABFP Transducers are equipped with right angle Microdot connectors. Top mounted connectors may be special ordered.



Fingertip Potted Angle Beam Transducers—ABFP Style

Freq. (MHz)	Size (in.)	Product Codes				Accessories
		45°	60°	70°	90°	
2.25	.187 x .187	292-640	292-641	292-642	292-643	Cables 6' BNC C-012
	.250 x .250	292-620	292-621	292-622	292-623	
5.0	.187 x .187	294-640	294-641	294-642	294-643	6' LEMO C-022
	.250 x .250	294-620	294-621	294-622	294-623	
10.0	.187 x .187	296-640	296-641	296-642	296-643	6' LEMO C-022
	.250 x .250	296-620	296-621	296-622	296-623	

Element Dimensions	A	B	C
.187 x .187	.32	.70	.57
.25 x .25	.50	1.0	.55

Note: Part numbers above are for carbon steel. For aluminum, specify frequency, size, and refracted angle in aluminum.

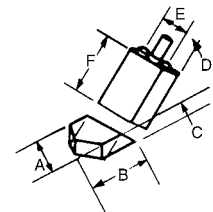
SMSWS Style Angle Beam

SMSWS Angle Beam Transducers are subminiature transducers designed to fit removable lucite wedges. Refracted shear wave angles may be specified as required. All SMSWS transducers have standard screws for fastening the probe to the wedge and have top-mount miniature Microdot connectors.



Subminiature Angle Beam—SMSWS Style

Freq. (MHz)	Size (in.)	Product Codes		Accessories
		Gamma Series	Standard Wedge	
2.25	.125	212-585	W-120 45°	Cables 6' BNC C-047
			W-121 60°	
			W-122 70°	
			W-123 90°	
5.0	.125	214-585	W-120 45°	Wedge Couplant XD-740
			W-121 60°	
			W-122 70°	
			W-123 90°	
10.0	.125	216-585	W-120 45°	
			W-121 60°	
			W-122 70°	
			W-123 90°	



Angle	Wedge Dimensions					
	A	B	C	D	E	F
45°	.31	.25	.21	.19	.23	.28
60°	.31	.42	.21	.19	.23	.28
70°	.31	.42	.21	.19	.23	.28
90°	.31	.72	.34	.19	.23	.28

Note: Standard wedge angles are specified for carbon steel.

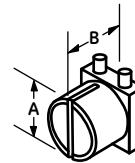
Dual Element Transducers

Dual Element Contact Transducers are longitudinal wave transducers with a split element; one half functions as a transmitter while the other functions as a receiver. Each half-element is angled slightly toward the other forming the "roof" angle. This "roof" angle effectively focuses the sound beam. These transducers are excellent for thin range flaw detection and thickness gauging. Because they have a discrete transmitter and receiver, better signal to noise ratios are achieved compared to single element transducers.



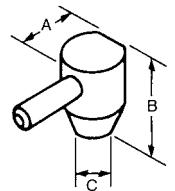
ADP, RC, and FDU Style Dual Element

Dual Element Transducers are for general flaw detection and thickness gauging on materials with irregular or pitted surfaces. The ADP and RC models are color coded for quick frequency identification. The low profile ADP model has a potted BNC cable. The RC Dual models have a 4-pin LEMO connector which allows for quick and easy cable replacement. All FDU models have mini Microdot threaded connectors. All models may be contoured to fit ID and OD curvatures.



FDU

Element Ø	A	B
.250	.38	.50
.375	.50	.50



ADP/RC

Element Ø	A	B	C
.250	.50	.64	.36
.375	.63	.64	.47
.500	.75	.68	.60

Fingertip Dual Element Transducers—ADP/RC/FDU Styles

Freq. (MHz)	Size (in.)	Product Codes			Freq. (MHz)	Size (in.)	Product Codes		
		ADP Dual	RC Dual*	FDU Dual			ADP Dual	RC Dual*	FDU Dual†
2.25	.250	222-700	222-681	222-680	5.0	.250	224-700	224-681	224-680
	.375	232-700	232-681	232-680		.375	234-700	234-681	234-680
	.500	242-700	242-681			.500	244-700	244-681	
3.5	.250	223-700	223-681	223-680	7.5	.375	135-700		
	.375	233-700	233-681	233-680					
	.500	243-700	243-681						

* Standard BNC Cable (C-088) or Heavy Duty BNC Cable (C-089) sold separately

† Standard BNC Cable (C-014) sold separately

HT400A and KBA560V Style High Temperature Dual Element Transducers

HT400A and KBA560V models are available with replaceable BNC cables and can be used for both flaw detection and thickness gauging applications. Model HT400A can be used intermittently on materials up to 1000° F. Model KBA560V can be used intermittently on materials up to 750° F.



High Temperature Transducers*

Freq. (MHz)	Size (in.)	Product Codes		
		Model	Gamma Series	Accessories
5.0	.250	HT400A	224-760	Cables 6' BNC Standard: C-102 Armored: C-101
	.375	KBA560V	544-230	Cable 6' BNC C-067

*Duty Cycle: KBA560V—750°F, maximum contact time is 10 seconds; HT400A—1000°F, maximum contact time is 5 seconds; cool to ambient before reuse.

Dual Element Transducers

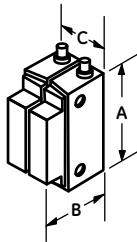
Dual Element Contact Transducers are longitudinal wave transducers with a split element; one half functions as a transmitter while the other functions as a receiver. Each half-element is angled slightly toward the other forming the “roof” angle. This “roof” angle effectively focuses the sound beam. These transducers are excellent for thin range flaw detection and thickness gauging. Because they have a discrete transmitter and receiver, better signal to noise ratios are achieved compared to single element transducers.



DU Style Dual Element

DU Dual Element Transducers with replaceable delays are excellent general-purpose probes for applications with flat or curved surfaces. High temperature delays are also available for inspections at temperatures up to 400°F. All DU transducers have standard Microdot connectors for easy replacement.

Element Size	A	B	C
.500 x .500	.75	.85	.78
.500 x 1.00	1.38	.92	.78



Standard Dual Element Transducers–DU Style

Freq. (MHz)	Size (in.)	Product Codes			Accessories
		Gamma Series	Delay Set	HT Delay Set*	
1.00	.5 x .5	291-750	DS-620	DS-720	Cables 6' BNC C-024
	.5 x 1	291-740	DS-640	DS-740	
2.25	.5 x .5	292-750	DS-620	DS-720	Coulplant XD 740
	.5 x 1	292-740	DS-640	DS-740	
5.0	.5 x .5	294-750	DS-620	DS-720	Coulplant XD 740
	.5 x 1	294-740	DS-660	DS-760	

*Duty Cycle: at 750°F, maximum contact time is 10 seconds; cool to ambient before reuse.

DU-F Style Dual Element, Benchmark Series

Benchmark series DU-F Style Dual Element Transducers feature proprietary BENCHMARK COMPOSITE® active elements. Benchmark series offer a superior combination of sensitivity, resolution, and penetration for punching through highly attenuative materials. They are especially beneficial when signal to noise ratio is a problem, for example coarse grain materials and fiber reinforced composites. Close tolerance, integral delays assure consistent performance.



Standard Dual Element Transducers–DU-F Style

Freq. (MHz)	Size (in.)	Product Codes	
		Benchmark Series	Accessories
2.25	.5 x .5	292-751	Cable 6' BNC C-024
	.5 x 1	292-741	
5.0	.5 x .5	294-751	Cable 6' BNC C-024
	.5 x 1	294-741	

FAST™ Probes for Rapid Manual Weld Inspection

Benchmark series FAST™ Probes are dual, high angle, longitudinal wave probes with proprietary BENCHMARK COMPOSITE® elements. They are primarily for inspection using the FAST™ method developed by SPIN (LLC). FAST™ high speed, manual weld scanning can reduce inspection costs for fabrication shops, field welding organizations, or any industry that performs inservice NDE of components. For a detailed Product Bulletin, contact our sales department.

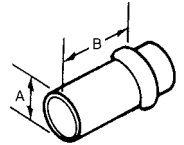


FAST™ Probes

Model	Freq. (MHz)	Useful Depth	Product Codes
FAST1	5.0	0" to 0.6"	389-016-880
FAST2	5.0	0" to 1.5"	389-016-900
FAST3	5.0	0.5" to 4"	389-016-780

Immersion Transducers

Single Element Immersion Transducers are longitudinal wave transducers typically used in manual, semi-automatic, and automatic scanning systems. Scanning parts with irregular or complex geometries is possible because of the conforming "water path" layer between the probe and the inspected material. Superior near-surface resolution can be achieved when compared to contact transducers. Angle beam inspection is possible by simply angling the probe or search tube in relation to the part surface. Spherical (point) or cylindrical (line) focusing can also be accomplished using acoustically matched lenses. Focal length must be specified.



ISS and IS Style Element

ISS and IS Immersion Transducers are for general ultrasonic immersion inspections requiring element diameters between .25" and 1.0". Available in Alpha, Gamma, and BENCHMARK COMPOSITE® series, they can be focused for critical applications to improve near-surface resolution or sensitivity to small discontinuities. All ISS and IS Transducers have waterproof UHF connectors. BNC connectors may be special ordered. Gamma Series are recommended for applications where high sensitivity and penetration are required. Alpha Series (where available) are designed for optimum damping and resolution. New Benchmark Series (where available), with BENCHMARK COMPOSITE® elements, offer a superior combination of sensitivity, resolution, and penetration for punching through highly attenuative materials.

Element Ø	A	B
.250	.63	1.55
.375	.63	1.55
.500	.63	1.55
.750	1.0	1.77
1.00	1.25	1.82

Immersion Transducers—ISS and IS Styles

Freq. (MHz)	Size (in.)	Product Codes			Freq. (MHz)	Size (in.)	Product Codes			
		*Focus	Alpha Series	Gamma Series			Benchmark Series	*Focus	Alpha Series	Gamma Series
1.0	.250	N		221-300	5.0	.250	S C N	124-280 124-290 124-300	224-280 224-290 224-300	824-300
	.375	N		231-300		.375	S C N	134-280 134-290 134-300	234-280 234-290 234-300	834-280 834-290 834-300
	.500	S C N		241-280 241-290 241-300		.500	S C N	144-280 144-290 144-300	244-280 244-290 244-300	844-280 844-290 844-300
	.750	S C N		251-360 251-370 251-380		.750	S C N	154-360 154-370 154-380	254-360 254-370 254-380	854-360 854-370 854-380
	1.00	S C N		261-360 261-370 261-380		861-360 861-370 861-380	1.00	S C N	164-360 164-370 164-380	264-360 264-370 264-380
2.25	.250	S C N	122-280 122-290 122-300	222-280 222-290 222-300	822-300	10.0	.250	S C N	126-280 126-290 126-300	226-280 226-290 226-300
	.375	S C N	132-280 132-290 132-300	232-280 232-290 232-300	832-300		.375	S C N	136-280 136-290 136-300	236-280 236-290 236-300
	.500	S C N	142-280 142-290 142-300	242-280 242-290 242-300	842-280 842-290 842-300		.500	S C N	146-280 146-290 146-300	246-280 246-290 246-300
	.750	S C N	152-360 152-370 152-380	252-360 252-370 252-380	852-360 852-370 852-380		.750	S C N	156-360 156-370 156-380	256-360 256-370 256-380
	1.00	S C N	162-360 162-370 162-380	262-360 262-370 262-380	862-360 862-370 862-380		.250	S C N	127-280 127-290 127-300	
3.5	.250	S C N	123-280 123-290 123-300	223-280 223-290 223-300	823-300	15.0	.250	1.5"S	127-302 (TTC-100)	
	.375	S C N	133-280 133-290 133-300	233-280 233-290 233-300	833-280 833-290 833-300		.375	S C N	137-280 137-290 137-300	
	.500	S C N	143-280 143-290 143-300	243-280 243-290 243-300	843-280 843-290 843-300		.500	S C N	147-280 147-290 147-300	
	.750	S C N	153-360 153-370 153-380	253-360 253-370 253-380	853-360 853-370 853-380	25.0	.250	S C N	129-280 129-290 129-300	
	1.00	S C N	163-360 163-370 163-380	263-360 263-370 263-380	863-360 863-370 863-380					

Note: Waterproof cables are in Accessories Section.

* Focus: S = Spherical; C = Cylindrical, N = Non-focus. Focal length must be specified. For available focal lengths, see table at the end of the Immersion Transducers section.

Immersion Transducers

Single Element Immersion Transducers are longitudinal wave transducers typically used in manual, semi-automatic, and automatic scanning systems. Scanning parts with irregular or complex geometries is possible because of the conforming "water path" layer between the probe and the inspected material. Superior near-surface resolution can be achieved when compared to contact transducers. Angle beam inspection is possible by simply angling the probe or search tube in relation to the part surface. Spherical (point) or cylindrical (line) focusing can also be accomplished using acoustically matched lenses. Focal length must be specified.

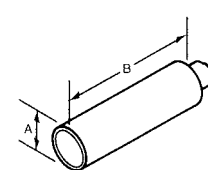
IPS Style Immersion

IPS Immersion Transducers with small diameter cases are designed for immersion applications where transducer size limitations exist. The Alpha series are designed for maximum bandwidth and resolution capabilities. The Gamma series are for increased sensitivity and penetration. All IPS Transducers have Microdot connectors. For best results the connector should be sealed with a nonwater soluble grease.



Immersion Transducers-IPS Style

Freq. (MHz)	Size (in.)	Product Codes			Freq. (MHz)	Size (in.)	Product Codes			
		*Focus	Alpha Series	Gamma Series			Accessories	*Focus	Alpha Series	Gamma Series
1.0	.250	N		221-340	10	.250	S	126-320	226-320	Cable 6' BNC C-012
		C	122-320	222-320			C	126-330	226-330	
		N	122-340	222-340			N	126-340	226-340	
2.25	.250	S	123-320	223-320	15	.125	S	117-320		
		C	123-330	223-330			C	117-330		
		N	123-340	223-340			N	117-340		
3.5	.250	S	124-320	224-320	22	.125	S	127-320		
		C	124-330	224-330			C	127-330		
		N	124-340	224-340			N	127-340		
5.0	.250	S	129-320	229-320	25	.250	S	129-320		
		C	129-330	229-330			C	129-330		
		N	129-340	229-340			N	129-340		



Element Ø	A	B
.125	.38	1.45
.250	.38	1.45

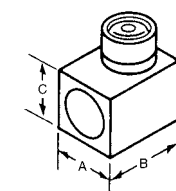
* Focus: S = Spherical; C = Cylindrical; N = Non-focus. Focal length must be specified. For available focal lengths, see table at the end of the Immersion Transducers section.

IR Style Immersion

IR Immersion Transducers are used where .25" to .5" diameter probes are desired, but where space constraints exist that prohibit the use of standard ISS Style transducers. IR Style transducers have a right angle mounted UHF connector and will fit into a 1.5 cubic inch area. The IR is available in both the Alpha and Gamma series and can be focused for critical applications to improve near-surface resolution or sensitivity to small discontinuities.

Immersion Transducers-IR Style

Freq. (MHz)	Size (in.)	Product Codes		Freq. (MHz)	Size (in.)	Product Codes			
		*Focus	Alpha Series			Gamma Series	*Focus	Alpha Series	Gamma Series
1.0	.250	N		221-420	3.5	.250	N	123-420	223-420
		C					C	123-410	223-410
		S					S	123-400	223-400
	.375	N		231-420		.375	N	133-420	233-420
		C					C	133-410	233-410
		S					S	133-400	233-400
2.25	.500	N		241-420	5.0	.500	N	143-420	243-420
		C		241-410			C	143-410	243-410
		S		241-400			S	143-400	243-400
	.250	N	122-420	222-420		.250	N	124-420	224-420
		C	122-410	222-410			C	124-410	224-410
		S	122-400	222-400			S	124-400	224-400
.375	N	132-420	232-420	.375	N	134-420	234-420		
	C	132-410	232-410		C	134-410	234-410		
	S	132-400	232-400		S	134-400	234-400		
.500	N	142-420	242-420	.500	N	144-420	244-420		
	C	142-410	242-410		C	144-410	244-410		
	S	142-400	242-400		S	144-400	244-400		



Element Ø	A	B	C
.250, .375, .500	.75	.94	.75

* Focus: S = Spherical; C = Cylindrical; N = Non-focus. Focal length must be specified. For available focal lengths, see table at the end of the Immersion Transducers section. Note: Waterproof cables are available in Accessories Section.

Immersion Transducers

Single Element Immersion Transducers are longitudinal wave transducers typically used in manual, semi-automatic, and automatic scanning systems. Scanning parts with irregular or complex geometries is possible because of the conforming "water path" layer between the probe and the inspected material. Superior near-surface resolution can be achieved when compared to contact transducers. Angle beam inspection is possible by simply angling the probe or search tube in relation to the part surface. Spherical (point) or cylindrical (line) focusing can also be accomplished using acoustically matched lenses. Focal length must be specified.

Velocity System Immersion Transducers

These transducers are specifically designed for use with through transmission GE Inspection Technologies Velocity Systems. These transducers are available in either the ISS Style or IR Style housing and are provided with standard waterproof UHF connectors.



Velocity System Immersion Transducers ISS/IR Styles

Freq. (MHz)	Product Codes	
	Style ISS	Style IR
5.0	144-301	144-421

Immersion Transducer Focal Lengths

$$N = \frac{(\text{Dia.})^2 \times (\text{Freq.})}{4 \times \text{Velocity}}$$

Dia. = Crystal diameter
 Freq. = Frequency of probe
 Velocity = Velocity of material

Freq. (MHz)		Element Ø					
		1.0	.75	.50	.375	.25	.125
1.00	N	4.3	2.4	1.1			
	Min	2.0	1.5	1.0			
	Max	3.0	2.0	1.0			
2.25	N	9.6	5.4	2.4	1.4	.6	
	Min	2.0	1.5	1.0	.8	.5	
	Max	6.0	4.0	2.0	.8	.5	
3.5	N	15.0	8.4	3.7	2.1	.9	
	Min	2.0	1.5	1.0	.8	.5	
	Max	8.0	6.0	2.5	.5	.5	
5.0	N	21.0	12.0	5.4	3.0	1.3	.3
	Min	2.0	1.5	1.0	.8	.5	.3
	Max	8.0	8.0	4.0	2.0	.8	.3
10.0	N		24.0	10.7	6.0	2.7	.7
	Min		1.5	1.0	.8	.5	.3
	Max		8.0	6.0	4.5	1.5	.3
15.0	N			16.0	9.0	4.0	1.0
	Min			1.0	.8	.5	.3
	Max			6.0	6.0	2.0	.5
25.0	N					6.7	1.7
	Min					.5	.3
	Max					2.0	1.0

This table lists the near field lengths and minimum and maximum practical focal lengths in water expressed in inches. To find the approximate near field length in steel, divide all N values by 4.

N = Near field length.
 Min = Minimum practical focal length.
 Max = Maximum practical focal length.

Single Element Transducers

For use with precision thickness gauges

Precision thickness gauging transducers are single element, delay line and contact transducers designed primarily for use with GE Inspection Technologies precision thickness gauges. They may also be used with most standard flaw detection instruments. A wide variety is available to satisfy virtually any inspection requirement on most metals and nonmetals with relatively smooth, parallel front and back surfaces. Depending on probe selection and material conditions, most precision gauges can measure from 0.005 to 15.00 inches in steel and plastic.



CL3 and CL3 DL Compatible Transducer Specifications

Model	Transducer Type	Contact Ø	Nominal Frequency	Measuring Range (steel unless noted)	Product Code
Alpha 2DFR	Delay, Standard Housing	7.6 mm (0.30")	15 MHz	0.25 mm to 25 mm (0.010" to 1.0")	113-527-660
Alpha 2A, Mini DFR	Delay, Small Housing	4.8 mm (0.19")	20 MHz	0.25 mm to 5 mm (0.010" to 0.200")	113-518-655
CA211A	Contact, Standard	19.1 mm (0.75")	5 MHz	2 mm to 381 mm (0.080" to 15.0")	113-544-000
CA215	Contact, Standard	12.7 mm (0.50")	5 MHz	2 mm to 51 mm (0.080" to 2.0")	113-124-011
Alpha 2F	Contact, Fingertip	9.7 mm (0.38")	10 MHz	2 mm to 254 mm (0.80" to 10.0")	113-526-000
Alpha DFR-P	Plastics, Delay Line	7.6 mm (0.30")	22 MHz	0.13 mm to 3.8 mm (0.005" to .150") Plastics only	113-118-661

For instrument and transducer connection use a 022-505-604 cable (Microdot to right angle Lemo connector), or a 022-504-925 (Microdot to straight Lemo Connector)

CL 300 and CL 304 Compatible Transducer Specifications

Model	Transducer Type	Contact Ø	Nominal Frequency	Measuring Range (steel unless noted)	Product Code
Alpha 2DFR	Delay, Standard Housing	7.6 mm (0.30")	15 MHz	0.25 mm to 25 mm (0.007" to 1.0")	113-527-660
Alpha 2A, Mini DFR	Delay, Small Housing	4.8 mm (0.19")	20 MHz	0.13 mm to 5 mm (0.005" to 0.200")	113-518-655
CA211A	Contact, Standard	19.1 mm (0.75")	5 MHz	1.5 mm to 381 mm (0.060" to 15.0")	113-544-000
Alpha 2F	Contact, Fingertip	9.7 mm (0.38")	10 MHz	1.5 mm to 51 mm (0.060" to 10.0")	113-526-000
KBA125	Plastics, Contact	4.6 mm (0.18")	20 MHz	0.25 mm minimum (0.010" minimum) Plastics only	113-518-006
K-Pen CL304 Only	Pencil Style Transducer	1.7 mm or 2.3 mm (.065" or .090")	20 MHz	Dependent on application and required CL 304 special menu setting	389-030-290

Dual Element D-Meter Probes

Compatible with the D-Meter line of ultrasonic thickness gauges

Standard probes are readily available to satisfy a wide range of remaining wall thickness applications including: high-temperature, through-coating, erosion/corrosion, thin materials, areas of limited access, tough-to-penetrate materials (coarse-grained/nonmetals), external pitting, wear resistance, boiler tubing, small diameter piping and tubing, and general-purpose applications.

DIALOG Intelligent Probes are automatically recognized by the DM4 Family of instruments for quick setup, best performance, and test documentation. The model FH2E-D-REM contains a built-in membrane switch with no additional cable lines to send and store readings in the DM4 DL's onboard data logger at a press of the index finger of the probe hand.



Label	Model	Designation	Probe Cable	Contact Ø	Measuring Range in Steel	Temp Range	Product Code
A	FH2E	Fingertip	Potted	.380"	.030" - 2.0"	< 130° F	113-552-005
B	FH2E-D**	Fingertip	Potted	.380"	.030" - 2.0"	< 130° F	113-552-007
C	FH2E-D-REM**	Remote Send	Potted	.380"	.030" - 2.0"	< 130° F	113-552-009
D	KB550FH*	Fingertip	Potted	.375"	.060" - 2.0"	< 130° F	113-550-001
E	DA312	Thin Materials	KBA532	.300"	.025" - 1.0"	< 130° F	083-056-906
F	KBA525	5mm Footprint	Potted	.200"	.025" - 2.0"	< 130° F	113-516-002
G	DA312B16*	3mm Footprint	Potted	.120"	.025" - 5.0"	< 130° F	083-066-934
H	KBA560	General Purpose	KBA531	.625"	.060" - 8.0"	< 450° F	113-544-210
I	KBA560-D**	General Purpose	KBA531	.625"	.060" - 8.0"	< 250° F	113-544-213
J	DA301	General Purpose	KBA533	.475"	.050" - 8.0"	< 140° F	083-056-904
K	DA303	Penetration	KBA533	.635"	.200" min.	< 140° F	083-506-905
L	DP-104	High Penetration	KBA532	1.25"	.200" min.	< 140° F	113-561-104
M	FH2E-WR	Wear Resistant	Potted	.550"	.030" - 2.0"	< 130° F	113-552-006
N	KBA560-WR	Wear Resistant	KBA531	.700"	.060" - 8.0"	< 450° F	113-544-212
O	FH2E-D-WR**	Wear Resistant	Potted	.550"	.030" - 2.0"	< 130° F	113-552-008
P	HT400* HT400A†	High Temperature	KBA535 KBA536	.500"	.040" - 10.0"	< 1000° F	113-524-760 113-224-760
Q	KB550BTH*	Studded Boiler Tube	C-BTH	.375"	.060" - 2.0"	< 130° F	113-550-003

* 2 - PT Calibration required on DM4E, DM4, DM4 DL

** DIALOG INTELLIGENT Probes when used with DM4E, DM4, DM4 DL and DMS 2

† DMS and DMS 2 ONLY

Specifications are subject to change without notice.

Applications and Special Probes Lab

The GE Inspection Technologies Applications Lab has a long history of providing a broad spectrum of services to our customers. Experienced Application Engineers and Specialists will work closely with the customer to provide technical assistance and custom designed products to solve challenging ultrasonic testing applications.

Applications Support Group

This group specializes in the evaluation of customer supplied samples to provide practical recommendations and solutions for ultrasonic testing problems. Typical applications include thickness and velocity measurements, flaw detection and evaluation and material characterization. This group also provides applications support for small, integrated ultrasonic testing systems. The Applications Lab is fully equipped with a large selection of ultrasonic instrumentation to aid in providing total testing solutions.

Special Probes Group

The Special Probes Group designs and manufactures custom transducers for specific ultrasonic testing applications. This may include the modification of transducer case design, element size and shape or the connector type and location. The customer may require transducers with custom electrical and acoustic performance including non-standard frequencies, resolution, sensitivity, bandwidth or focusing. Special test fixtures, custom wedges, delay lines and cables are also designed and built to meet customer specifications.

Examples of Special Probes Types

- I.D. and O.D. Bore Probes.
- Special Paintbrush Probes.
- Coarse Grain Inspection Probes.
- Special Focused Probes.
- High Temperature Probes.
- Multiple Transducer Probes.
- Advanced Flaw Sizing Probes.
- Radiation Resistant Probes.
- Industrial Linear, Phased, and Annular Arrays.



For further assistance from the Applications Lab, please copy and complete the customer inquiry form and fax it to (717)-242-4170—make extra copies for additional inquiries. You can also phone the Applications Lab at (717)-242-0327 or visit GE Inspection Technologies on the Internet at www.ge.com/inspectiontechnologies

Phased Array Transducers

Principles of Phased Array Transducers

By sequentially firing the individual elements of an array transducer at slightly different times, the ultrasonic wavefront can be focused or steered in a specific direction.

Additionally, electronically phasing the order and sequential firing speeds of an array allows for "sweeping" or "panning" through a selection of beam angles or across an area of inspection without manually manipulating the transducer.



Annular Phased Array



Linear Phased Array



Curved Phased Array

Key Features

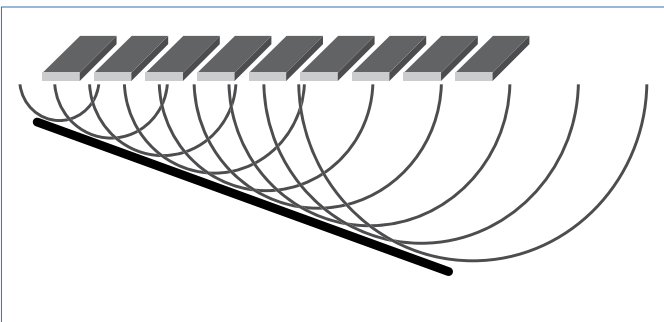
- Electronic focal length adjustments.
- Electronic linear scanning.
- Electronic beam steering/angulation.

Key Benefits

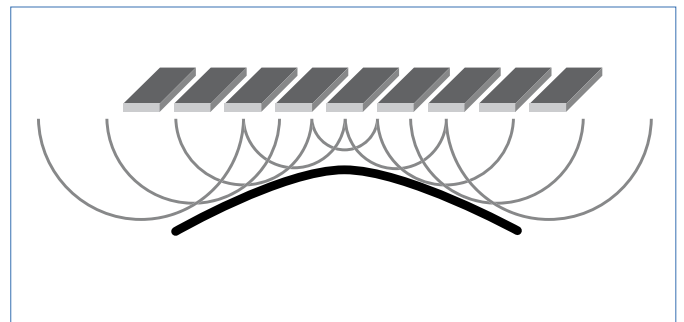
- Reduced manual manipulation.
- Reduced scanning surface contact area necessary (footprint).
- Reduced need for multiple inspections with specifically angled or focused probes.
- Increased inspection speed and efficiency.
- Increased coverage of inspection area.

General Specifications

- Frequency: 1 MHz to 7.5 MHz (10 MHz in some cases).
- Piezoelectric material: Proprietary BENCHMARK COMPOSITE®.
- Number of elements: 16–256 elements (application dependent).
- Pitch: 0.2 mm minimum.
- Bandwidth (-6dB): 60% - 80% typical.
- Crosstalk: > 30dB.
- Element sensitivity variation: ± 2 dB.
- Cable options: Detachable connector or potted cable.



Phased Array Steering



Phased Array Focusing

Accessories

Cables

GE Inspection Technologies offers a complete selection of transducer cables and adaptors with the most commonly used connections. Cables are designed with reinforced connector-cable junctions for long service life. Custom transducer cables and adaptors are available upon request. Call or write for price and delivery.



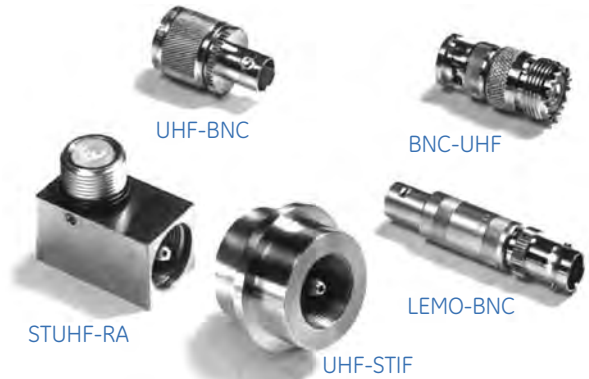
Description	Length (feet)	Cable Type	Product Codes
BNC to MMD	6.0	RG178	C-047
BNC to MD	6.0	RG174	C-012
BNC to MD	12.0	RG174	C-011
UHF to MMD	6.0	RG174	C-030
LEMO to MD	6.0	RG174	C-022
BNC to Right Angle MD	6.0	RG174	C-033
BNC to BNC	6.0	RG58	C-016
BNC to BNC	12.0	RG58	C-021
UHF to BNC	6.0	RG58	C-027
LEMO to BNC	6.0	RG58	C-018
UHF to UHF (non-waterproof)	6.0	RG58	C-020
UHF to UHF (non-waterproof)	12.0	RG58	C-025
LEMO to UHF (non-waterproof)	6.0	RG58	C-035
BNC to Waterproof UHF	6.0	Belden 8218	C-013
UHF to Waterproof UHF	6.0	Belden 8218	C-029
Dual BNC to MMD	6.0	MD 250-3909	C-014
Dual BNC to MD	6.0	RG174	C-024
Dual UHF to MD	6.0	RG174	C-034
RC Dual to BNC	6.0	RG174	C-088
RC Dual to BNC, Heavy Duty	6.0	RG174	C-089
KBA560V to BNC Dual	6.0	RG174	C-067
HT400A to BNC Dual, Armored	6.0	RG174	C-101
HT400A to BNC Dual, Standard	6.0	RG174	C-102

Special cables available on request.

Adaptors

Type	Description	Product Codes
BNC-UHF	Adapts transducer or instrument with BNC connector to cable with UHF connector	A-025
UHF-BNC	Adapts transducer or instrument with UHF connector to cable with BNC	A-026
LEMO-BNC	*Adapts instrument with LEMO #1 connector to BNC	A-030
STUHF-RA	Right angle adaptor for type STUHF, 3/4" diameter search tube	A-032
UHF-STIF	Adapts transducer with UHF connector to 1.375" flange tpe search tube	A-031
DM-BNC	Adapts LEMO plug on D-meter probe cable to dual BNC connectors	A-045
BNC-BNC	Couples BNC cable to another BNC cable	A-010

Special adaptors available on request.



Search Tubes

The STUHF stainless steel immersion search tube has an outside diameter of .735" and is for use with all immersion transducers with UHF (threaded) connectors.



Length (in.)	Product Codes	Length (in.)	Product Codes
1.5	ST-010	12.0	ST-016
2.0	ST-011	18.0	ST-018
3.0	ST-012	24.0	ST-015
4.5	ST-013	36.0	ST-019
6.0	ST-014		

Special lengths available on request.

Accessories

Exosen Couplants (General Purpose)

GE Inspection Technologies Exosen ultrasonic couplant is specially formulated for ultrasonic coupling in all general applications. Exosen is available in five standard viscosities and has the following properties:

- Water soluble.
- Low sulphur and halogens.
- Non-toxic and nonflammable.
- Antiseptic–non-irritating–pleasantly scented–safe.
- High viscosity grades ideal for vertical and overhead surfaces.
- Rust preventative added.
- Shelf life of one year when stored between 50°F and 80°F and out of direct sunlight.

Please order by product code from the table.

Couplant Grade	Equivalent Viscosity	1 gallon	Case of Four 1 gallon	5 gallon	55 gallon
Exosen 10	30 Oil	X-220	X-225	X-240	X-260
Exosen 14	40 Oil	X-320	X-325	X-340	X-360
Exosen 20	90 Oil	X-420	X-425	X-440	X-460
Exosen 30	Heavy Pourable	X-520	X-525	X-540	X-560
Exosen 40	Semisolid			X-640	X-660

Note: MSDS included with each Exosen shipment. Letter of certification available upon request. Empty 8 ounce squeeze bottle included with each gallon of Exosen.

XL Couplant

(Laboratory and Smooth Surfaces)

GE Inspection Technologies XL ultrasonic couplant is specifically made for laboratory testing of transducers and for contact testing of materials having smooth surface finish of 62 microinches RMS or better in both general production and laboratory testing.

Quantity	Product Codes
8 ounce squeeze bottle	XL-820
16 ounce squeeze bottle	XL-840
1 gallon container	XL-860
5 gallon container	XL-880

Note: Letter of certification included with each Hitempo shipment.

SLC Couplant

(Curved, Rough, Vertical, and Overhead Surfaces)

GE Inspection Technologies SLC couplant is a thick highly attenuative couplant ideal for making thickness measurements on very rough surfaces that would not be possible with thinner couplants. Its high viscosity also makes it an excellent couplant for use on vertical and overhead surfaces.

Quantity	Product Codes
4 ounce container	X-080

ZGM Couplant

(High Temperature)

ZGM is a highly viscous, high temperature couplant manufactured by GE Inspection Technologies. It is designed for use on surfaces with temperatures of 400°F (minimum) to 1000°F. Primarily intended for wall thickness measurement, ZGM contains a solid filler that melts at high temperature.

Quantity	Product Codes
100 g. (3.5 oz.) tube	XZ-471

Exosen Couplants

(General Purpose)

GE Inspection Technologies Hitempo is an excellent high temperature couplant for inspection on surfaces at temperatures up to 550°F. Its high viscosity (toothpaste consistency) makes it ideal on vertical and overhead surfaces.

Quantity	Product Codes
2.8 ounce tube	XH-010
Dozen 2.8 ounce tubes	XH-015

Note: Letter of certification included with each Hitempo shipment.

Delay Line, Wedge and Protective Face Couplant

This couplant is for use between the face of the transducer and the delay line, wedge, membrane, or wear cap with which it is used.

Quantity	Product Codes
2 ounce squeeze bottle	XD-740

Accessories

Type DC Block (AWS type)

For shear wave distance calibration. Contains a 1.0" radius overlaying a 2.0" radius on 180° half circle.

Dimensions:

2.0" radius section is .50" thick;

1.0" radius section is 1.0" thick.

Product Code: 118-540-290



Type SC Block (AWS type)

For shear wave sensitivity calibration. Contains two .062" diameter sidedrilled holes. Distance from front surface to center of holes is .178" and .521".

Dimensions: 3.000" x 1.250" x .905".

Product Code: 118-540-330



AWS Resolution Block

For checking resolution capabilities of angle beam transducers. Contains three sets of three .062" diameter thru holes for 45°, 60°, and 70°.

Dimensions: 6" x 3" x 1"

Product Code: 118-540-350



Angle Beam Block (Miniature Size)

Substitute for DSC Block for general angle beam calibration. Contains 1.0" radius opposite a 2.0" radius, and a 5/64" sidedrilled, flat bottom hole .750" deep

Dimensions: 1.0" thick.

Product Code: 118-540-260



IOW Beam Profile Block

(English or Metric)

For beam profile measurement of angle beam transducers and for measurement of transducer angles.

Dimensions: 12" x 3" x 2"

Product Code: 118-540-240



Type DSC Block (AWS type)

For shear wave distance and sensitivity calibration. Contains a 1.0" radius opposite a 3.0" radius. The 3.0" radius includes a radius slot .375" deep x .032" wide. Also contains 0° reference point for checking exit point on wedge, and a .125" diameter side-drilled thru hole and corresponding markings at 45°, 60°, and 70° for measuring actual refracted angle. Dimensions: 1.0" thick

Product Code: 118-540-300



Step Blocks

For Thickness and linearity calibration.

Available in 4-step version with thickness of .250", .500", .750", and 1.00"; or 5-step version, with thickness of .100", .200", .300", .400", and .500".

4-Step Product Code: 118-540-320.

5-Step Product Code: 118-540-310



Type DS Block (AWS type)

For longitudinal distance and sensitivity calibration. Contains a 2.0" high section between two 4.0" high sections.

Dimensions: 6.0" x 4.0" x 2.0"

Product Code: 118-540-340



IIW Block Type 1

For calibration of shear and longitudinal transducers, and for verification of shear wedge exit point and refracted angle. Also can be used to check resolution and sensitivity.

Dimensions: 12" x 4" x 1"

Product Code: 118-540-270



IIW Block Type 2

Modified version of original IIW Type 1. Includes a 2.0" radius x .250" deep cut-out and additional side-drilled holes for resolution studies.

Dimensions: 12" x 4" x 1"

Product Code: 118-540-280



NAVSHIPS Test Block

Used in accordance with NAVSHIPS Specification 0900-006-3010. Section 6, for distance amplitude correction, sensitivity levels and flaw depth information.

Contains six 3/64" diameter side-drilled

holes at distances from 1/4" to 2 3/4"

Dimensions: 12" x 3" x 1 1/4"

Product Code: 118-540-370



30FBH Resolution Block

For determining resolution and sensitivity capabilities and to produce area/amplitude plots for normal beam transducers.

Contains ten flat bottom holes each of diameters 3/64", 5/64", and 8/64" at test metal distances from .050" to 1250"

Dimensions: 11" x 1 1/2"

Product Code: 118-540-230



ASME-625 Reference Plate

For longitudinal, shear, and surface wave sensitivity calibrations. Contains six flat bottom holes: three 4/64" diameter holes, one each at a depth of .050", .250", and .50", and one 4/64" hole 1.500" deep, one 8/64" hole 1.625" deep, and one 16/64" hole 1.750" deep.

Dimensions: 12" x 6" x 1/2"

Product Code: 118-540-360



Accessories

Test Blocks, continued

Miniature Resolution Block

For checking resolution capabilities and calibrating high resolution test equipment. Contains four 3/16" wide and 5/8" long, milled slots to simulate flat plate reflectors at metal travel distances of .015", .020", .025", and .030", and six flat bottom holes, three each with diameters of 3/64" and 1/64" at metal travel distances of .020", .025", and .030".

Dimensions: 3 5/8" x 1 x 1/8".

Product Code: 118-540-250.

ASME Calibration Blocks

Provided with one flat bottom hole with diameter and depth per specifications. Special Order.

ASTM Distance/Amplitude Block Set

(19 Blocks) All 19 blocks have the same size test hole. Hole size must be specified when ordering (3/64", 5/64", or 8/64"). The metal travel distances, for the set are: 0006, 0012, 0025, 0037, 0050, 0062, 0075, 0087, 0100, 0125, 0175, 0225, 0275, 0325, 0425, 0475, 0525, and 0575.

Product Code: 118-540-028.

ASTM Area/Amplitude Block Set

(8 Blocks) Includes the following blocks: 1-0300, 2-0300, 3-0300, 4-0300, 5-0300, 6-0300, 7-0300, and 8-0300.

Product Code: 118-540-018.

ASTM Distance/Area Amplitude Set

(10 Blocks) Includes the following blocks: 3-0300, 5-0012, 5-0025, 5-0050, 5-0075, 5-0150, 5-0300, 5-0600, 8-0300, and 8-0600.

Product Code: 118-540-019.

Single ASTM Blocks

For measuring the sensitivity and/or resolution of normal beam transducers. Machined to E-127-64 dimension requirements. Available with flat bottom holes from 1/64" to 8/64" diameter, with test metal distances from .062" to 6.00". Prices for other lengths and diameters furnished on request. Block identification is as follows: first digit indicates hole diameter in 64ths, next four digits indicate test metal distance in hundredths of an inch. Therefore, a 3-0050 block would have a 3/64" diameter FBH at .500" TMD. Special Order.



Notes: (Apply to all test blocks)

1. Product codes listed are for steel test blocks only. Please order all steel blocks by product code listed for each type. All other block materials should be ordered on an individual basis by description.
2. Please see price list for ordering and delivery information.
3. GE Inspection Technologies' test blocks are machined to engineering specifications and to precision tolerances from ultrasonically inspected and approved material.
4. All blocks and sets listed include quality hardware cases except single ASTM blocks.
5. Steel blocks are nickel plated unless otherwise requested.

Transducer Certification

Real Time Waveform and Frequency Spectrum

The real time waveform and frequency spectrum certifies the natural, unbiased, unfiltered waveform and the degree of damping and shows the frequency components of the gated signal. A highly damped unit such as an Alpha Series transducer gives optimum resolution while displaying a broad frequency spectrum. This is necessary for thickness gauging of thin materials or when inspecting for near-surface flaws. A transducer that is not as highly damped will have greater penetrating power but less resolution and a narrower frequency spectrum. Product code TC-911

GE Inspection Technologies

Transducer Certificate of Conformity
Compliant to ASTM E-1065 Guidelines

Date:	9/3/2005
Product Code:	112-204-001
Serial Number:	03B Y 2
Description:	PAW-4000 PEARL 50.000MHz

Test Setup:

Test Target: .375" Plexiglas

Energy Impedance: 3
250

UT A S/N: HM00113

UT A Cal Due Date: 5/8/2006

D-scope S/N: 8023004

D-scope Cal Due Date: 10/31/2005

Software: FNT000 Rev. H

Test Data:

Sensitivity(A to dB): -33.80 dB

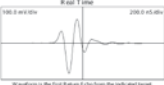
Pulse Duration@ 20dB: 4.48E-07 Sec

Peak Frequency: 4.70E+06 Hz

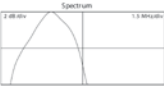
Center Frequency: 4.93E+06 Hz

% Bandwidth@ -6dB: 75.0 %


Inspector: JPT



Waveform to the first Return Echo from the indicated target.



The accuracy of the transducer described above has been confirmed by factory standard test equipment and laboratory reference standards available to the National Institute of Standards and Technology. This facility's Quality System is registered to ISO 9001:2000, and is compliant with: ISO 9001 and NADCAP's: 2000 System.

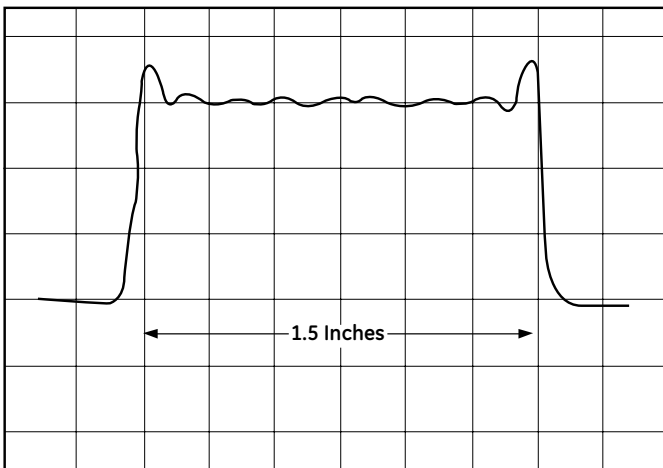


GE Inspection Technologies, LP
50 Industrial Park Rd.
Lewisburg, PA 17044
Tel: 717.242.0327
Fax: 717.242.2906
GEInspectionTechnologies.com

021-247-287, Rev D

Beam Profile

The beam profile plot is made by moving the transducer across a small rod reflector in an immersion tank. Ball or wire reflectors are also commonly used. The beam profile gives the relative intensity and width of the sound beam at a given distance from the transducer face. Product code TC-913



Tables and Formulas

dB vs. Amplitude Ratio Chart

dB	Ratio	dB	Ratio	dB	Ratio	dB	Ratio
0	1.00:1	5	1.78:1	11	3.55:1	17	7.08:1
.5	1.06:1	6	2.00:1	12	3.98:1	18	7.94:1
1	1.12:1	7	2.24:1	13	4.47:1	19	8.91:1
2	1.26:1	8	2.51:1	14	5.01:1	20	10.00:1
3	1.41:1	9	2.82:1	15	5.62:1	40	100.00:1
4	1.58:1	10	3.16:1	16	6.31:1	60	1000.00:1

Near Field Length (N) in Water (Inches)

Frequency (MHz)	Element Ø (inches)			
	1.00	.75	.50	.25
1.0	4.3	2.4	1.07	.27
2.25	9.6	5.4	2.4	.60
5.0	21.4	12.0	5.4	1.3
10.0	43	24	10.7	2.7

To find approx. length in steel, divide the above values by 4.

Velocity and Acoustic Impedance of Common Materials

Material	Longitudinal Velocity		Sheer Velocity		Acoustic Impedance
	$\frac{\text{in.}}{\text{sec.}} \times 10^6$	$\frac{\text{cm.}}{\text{sec.}} \times 10^5$	$\frac{\text{in.}}{\text{sec.}} \times 10^5$	$\frac{\text{cm.}}{\text{sec.}} \times 10^5$	
Air	.013	.33	-	-	.0004
Aluminum	.25	6.3	.12	3.1	17.0
Aluminum Oxide	.39	9.9	.23	5.8	32.0
Beryllium	.51	12.9	.35	8.9	23.0
Boron Carbide	.43	11.0	-	-	26.4
Brass	.17	4.3	.08	2.0	36.7
Cadmium	.11	2.8	.059	1.5	24.0
Copper	.18	4.7	.089	2.3	41.6
Glass (crown)	.21	5.3	.12	3.0	18.9
Glycerin	.075	1.9	-	-	2.42
Gold	.13	3.2	.047	1.2	62.6
Ice	.16	4.0	.08	2.0	3.5
Inconel	.22	5.7	.12	3.0	47.2
Iron	.23	5.9	.13	3.2	45.4
Iron (cast)	.18	4.6	.10	2.6	33.2
Lead	.085	2.2	.03	.7	24.6
Magnesium	.23	5.8	.12	3.0	10.0
Mercury	.057	1.4	-	-	19.6
Molybdenum	.25	6.3	.13	3.4	64.2
Monel	.21	5.4	.11	2.7	47.6
Neoprene	.063	1.6	-	-	2.1

Material	Longitudinal Velocity		Sheer Velocity		Acoustic Impedance
	$\frac{\text{in.}}{\text{sec.}} \times 10^6$	$\frac{\text{cm.}}{\text{sec.}} \times 10^5$	$\frac{\text{in.}}{\text{sec.}} \times 10^6$	$\frac{\text{cm.}}{\text{sec.}} \times 10^5$	
Nickel	.22	5.6	.12	3.0	49.5
Nylon, 6-6	.10	2.6	.043	1.1	2.9
Oil (SAE 30)	.067	1.7	-	-	1.5
Platinum	.13	3.3	.067	1.7	69.8
Plexiglass	.11	2.7	.043	1.1	3.1
Polythylene	.07	1.9	.02	.5	1.7
Polystyrene	.093	2.4	.04	1.1	2.5
Polyurethane	.070	1.9	-	-	1.9
Quartz	.23	5.8	.087	2.2	15.2
Rubber, Butyl	.07	1.8	-	-	2.0
Silver	.14	3.6	.06	1.6	38.0
Steel, mild	.23	5.9	.13	3.2	46.0
Steel, stainless	.23	5.8	.12	3.1	45.4
Teflon	.06	1.4	-	-	3.0
Tin	.13	3.3	.07	1.7	24.2
Titanium	.24	6.1	.12	3.1	27.3
Tungsten	.20	5.2	.11	2.9	101.0
Uranium	.13	3.4	.08	2.0	63.0
Water	.0584	1.48	-	-	1.48
Zinc	.17	4.2	.09	2.4	29.6

Useful Formulas

Near Field Length =	$D^2 F / 4C$ or $D^2 / 4\lambda$
Beam Spread	$\text{SIN} \gamma = C / DF \times 1.22$ or $1.22\lambda / D$
Snell's Law	$\text{SIN} \alpha / \text{SIN} \beta = C_1 / C_2$
Skip Distance =	$2T \times \text{TAN} \beta$
V-Path =	$2T / \text{COS} \beta$
Surface Distance (Projected) =	$S.P. \times \text{SIN} \beta$
Depth (1st Leg) =	$S.P. \times \text{COS} \beta$
Depth (2nd Leg) =	$2T - (S.P. \times \text{COS} \beta)$
Depth (3rd Leg) =	$(S.P. \times \text{COS} \beta) - 2T$
Wavelength =	C / F
Frequency =	C / λ
Acoustic Impedance =	$Z = C \times d$
% of Reflected Sound Pressure =	$R_p = (Z_2 - Z_1) / (Z_2 + Z_1)$
Coefficient of Transmission =	$T_p = 2Z_2 / (Z_2 + Z_1)$
Total Beam Width =	$TBW = (\text{Depth} - N) (2\text{TAN} \gamma) + T \times \text{Element Diameter}$

Transit Time =	$TT = 2T / C$
Center Frequency =	$F_c = (F_1 + F_2) / 2$
% Bandwidth =	$(F_1 - F_2) / F_c \times 100\%$
Q Factor =	$F_c / (F_1 - F_2)$
Circumference of a Circle =	$\pi \times \text{Diameter}$
Distance =	Speed x Time
RPM =	Speed / Circumference
Maximum Scanning Speed (x, y)	$(\text{Min. Flaw Length} + \text{EBW}) \times \text{PRR}$
Maximum Scanning Speed (polar)	$\text{RPM} \times \text{Diameter} \times \text{Clock interval (ft per min.)}$
dB Difference =	$20 \text{ Log } (A_1 / A_2)$
dB Ratio =	$\text{Inv log dB} / 20$
Water Equivalent = (steel)	$WE = F (\text{water}) \times (C(\text{water})) / (C(\text{steel}))$ (F= Focal length)
MAXB =	$\text{SIN}^{-1} (ID / OD)$
Focal Length =	$R = F (n - 1) / n$
Cylinder Offset Technique	Offset (X) = Outside Radius x SIN α

Symbol Key	
λ =	Wavelength
D =	Probe Diameter
F =	Probe Frequency
C =	Acoustic Velocity
d =	Density
α =	Incident Angle
β =	Refracted Angle
T =	Part Thickness
S.P. =	Sound Path
N =	Near Field
γ =	Divergence 1/2 angle

Transducer Kits

Transducer Kits combine the most popular transducers and accessories necessary for general ultrasonic testing applications. Discount priced and organized in a hard shell carrying case, the kit contents are easily accessible, convenient for storage, and economical.

Basic Contact Kit—Product Code 118-450-020

Contains a wide assortment for weld inspection, lamination detection, corrosion/erosion and thin gauge materials.

Qty.	Product Codes	Description
1	113-292-603	*2.25 MHz, .63" x .63" AWS Style, Single Element
1	113-242-591	2.25 MHz, .5" MSW-QC Style, BMC Single Element Angle Beam Probe
1	113-262-043	2.25 MHz, 1" CR Style, Single Element Contact Probe
1	113-544-000	5 MHz, .5" CA211A Style, Single Element Contact Probe
1	113-252-241	2.25 MHz, .75" PMCR Style, Single Element Membrane Probe

Qty.	Product Codes	Description
1	113-527-660	15 MHz, .25" ALPHA 2 DFR Style, Single Element Delay Line Probe
1	113-292-751	2.25 MHz, .5" x .5" DU-F Style, Dual Element Contact Probe
1	113-224-681	5 MHz, .25" RC Style, Dual Element Contact Probe
1	C-012	BNC-MD Coaxial Cable
1	C-016	BNC-BNC Coaxial Cable
1	C-024	BNC-MD Dual Coaxial Cable
1	C-088	BNC-RC Dual Coaxial Cable

Qty.	Product Codes	Description
1	D-050	Delay Lines for 113-527-660 (10 pcs.)
1	PM-021	Protective Membrane for 113-253-241 (12 pcs.)
1	W-104, 106	45° and 70° Lucite Wedge**
1	W-211, 212, 213	45°, 60° and 70° Lucite Wedge**
1	XD-740	Wedge/Delay Line Couplant
1	118-540-198	5 Step Reference Standard .1"-.5"
1	118-800-020	Hardshell Carrying Case

Basic AWS Weld Inspection Kit Part No. 118-450-500

Contains transducers and accessories required for testing weldments to specification AWS D1.1.

Multi-Purpose Contact Kit Part No. 118-450-510

Contains the most commonly used transducers for a variety of angle beam, lamination, corrosion, general flaw, and thickness testing.

Basic Angle Beam Kit Part No. 118-450-030

Contains an assortment for weld and other angle beam inspections.

Qty.	Product Codes	Description
1	113-292-603	2.25 MHz, .63" x .63" AWS Style, Single Element Angle Beam Probe
1	113-292-601	2.25 MHz, .63" x .75" AWS Style, Single Element Angle Beam Probe
1	113-292-604	2.25 MHz, .75" x .75" AWS Style, Single Element Angle Beam Probe
1	113-262-043	2.25 MHz, 1" dia. CR-RHP, L-Wave Contact Probe
1	W-104	45° Lucite Wedge**
1	W-105	60° Lucite Wedge**
1	W-106	70° Lucite Wedge**
1	C-016	BNC-BNC Coaxial Cable
1	B-196	DSC Reference Standard
1	XL-820	8 oz. Couplant
1	118-800-020	Hardshell Carrying Case

Qty.	Product Codes	Description
1	113-544-000	5 MHz, .5" dia. CA211A Style, Single Element Contact Probe
1	113-262-043	2.25 MHz, 1" dia. CR Style, Single Element Contact Probe
1	113-527-660	15 MHz, .25" Alpha 2 DFR Style, Delay Line Probe
1	113-224-700	5 MHz, .25" dia. ADP Style, Dual Element Probe
1	113-244-591	5 MHz, .5" dia. MSW-QC Style, Benchmark Angle Beam Probe
2	W-211	45° Lucite Wedge**
2	W-212	60° Lucite Wedge**
2	W-213	70° Lucite Wedge**
2	C-016	BNC-BNC Coaxial Cable
2	C-012	BNC-MD Coaxial Cable
1	118-540-198	5 Step Reference Standard, 1"-.5"
1	XL-820	8 oz. Couplant
1	118-800-020	Hardshell Carrying Case

Qty.	Product Codes	Description
1	113-29-642	5 MHz, .18" x .18" ABFP Style, Single Element Angle Beam Probe
1	113-216-585	10 MHz, .125" SMSWS Style, Single Element Angle Beam Probe
1	113-294-600	5 MHz, 5" x 1" SWS Style, Single Element Angle Beam Probe
1	113-224-591	5 MHz, .25" MSWQC Style, Benchmark Single Element Angle Beam Probe
1	118-540-196	DSC Reference Standard
1	C-047	BNC-MMD Coaxial Cable
1	C-016	BNC-BNC Coaxial Cable
1	C-012	BNC-MD Coaxial Cable
1 ea.	W-120, 122	45° and 70° Lucite Wedge**
1 ea.	W-015, 017	45° and 70° Lucite Wedge**
1 ea.	W-201, 202, 203	45°, 60° and 70° Lucite Wedge**
1	XL-820	8 oz. Couplant
1	118-800-020	Hardshell Carrying Case

Transducer Kits

High Temperature Kit

Part No. 118-450-530

Contains dual element delay line, and angle beam transducers for flaw detection at elevated temperatures to 1000°F.

Qty.	Product Codes	Description
1	113-224-760	5 MHz, .25" dia. HT400A Style, Dual Element (1000°F max)
1	113-242-270	2.25 MHz, .5" dia. PWCCS Style, Single Element Delay Line
1	113-292-600	2.25 MHz, .5" x 1" SWS Style, Single Element Angle Beam
1 ea.	W-070, 086	45° and 60° High Temperature Wedge (400°F max)
1	PK-050	High Temperature Delay Line Kit for 2, 42-270 (400°F max)
1	C-016	BNC-BNC Coaxial Cable
1	C-067	Dual MD-BNC Coaxial Cable
1	C-102	BNC-HT400/400A Probe Cable
2	XH-010	2 oz. Tube HITEMPO Couplant (ambient to 550°F)
1	XZ-471	3.5 oz. Tube ZGM Couplant (400-1000°F)
1	118-540-198	5 Step Reference Standard 1"- .5"
1	118-800-020	Hardshell Carrying Case

Basic Immersion Kit

Part No. 118-450-040

Contains an assortment of spherically focused transducers which exhibit good resolution and sensitivity and are ideal for determining which type of transducers are best suited for the testing situation.

Qty.	Product Codes	Description
1	113-127-302	15 MHz, .25" 155 Style Probe with 1.5" Spherical Focus
1	113-136-280	1.0 MHz, .38" 15 Style Probe with 3" Spherical Focus
1	113-254-360	5 MHz, .75" 155 Style Probe with 6" Spherical Focus
1	113-244-280	5 MHz, .5" 155 Style Probe with 2" Spherical Focus
1	118-560-007	UHF RA-UHF Isolated Coaxial Adaptor
1	C-016	BNC-BNC Coaxial Cable
1	A-025	BNC-UHF Adaptor
1	118-800-020	Hardshell Carrying Case

Corrosion Survey Kit

Part No. 118-450-520

Contains the most popular dual element flaw detection transducers for corrosion detection in materials from ambient to 1000°F.

Qty.	Product Codes	Description
1	113-224-700	5 MHz, .25" dia. ADP Style Dual Element Probe
1	113-544-210	5 MHz, .375" dia. KBA560 Style, Dual Element Probe (450°F max)
1	113-224-760	5 MHz, .25" dia. KBA-HT400A Style
1	113-292-751	2.25 MHz, .5" x .5" DU-F Style, Dual Element Probe
1	113-244-241	5 MHz, .5" dia. PMCR Style, Single Element Membrane Probe
1	C-067	BNC-KAB560 Coaxial Cable
1	C-016	BNC-BNC Coaxial Cable
1	C-024	BNC-MD Coaxial cable
1	C-102	BNC-HT400/400A Probe Cable
2	XH-010	2 oz. Tube HITEMPO Couplant (ambient to 550°F)
1	XZ-471	3.5 oz. Tube ZGM Couplant (400-100°F)
1	118-540-198	5 Step Reference Standard, 1"- .5"
1	XD-740	Wedge/Delay Line and Membrane Couplant
1	118-800-020	Hardshell Carrying Case

**Refracted angle in carbon steel @ 70°F.

Couplant Solutions Catalog

EchoPure™

The most universal water-soluble UT couplant

Operating Range: -60° to 350°F / -51° to 176°C

- Couplant of choice for phased array manual inspections (PAMUT)
- Complies with P91 steel requirement for water-free couplant
- Ideal for very cold and very warm inspection
- Four viscosities (fluids and gels)
- Very slow drying
- All ingredients approved for incidental food contact
- Water-free / water-soluble



EchoTrack™ A

Broadest operating range and slowest evaporation rate in a water-based, high performance couplant

Operating Range: -10° to 200°F / -23° to 93°C

- Slow drying
- Compatible with most materials
- Medium & high viscosity
- No nitrates, nitrites, glycol ethers or formaldehyde
- Water-soluble



EchoTrack™

Lowest price, high performance UT couplant

Operating Range: 18° to 180°F / -8° to 82°C

- Medium & high viscosity
- No nitrates, nitrites, glycol ethers or formaldehyde
- Water-soluble
- Acrylic polymer, least residue



UltraSonix™

High performance – Aircraft grade

Operating Range: 10° to 220°F / -12° to 104°C

- Glycerin-free – meets FAA AC 25-29 requirement of no glycerin for aluminum inspections
- Compatible with most materials
- Medium & high viscosity
- No nitrates, nitrites, glycol ethers or formaldehyde



Sonix™

Best choice for a low-cost general purpose ultrasonic couplant

Operating Range: 18° to 120°F / -8° to 50°C

- Strong coupling film, salt stable
- Good ferrous corrosion inhibition
- No nitrates, nitrites, glycol ethers or formaldehyde
- Water-soluble



ECONOgel™

Lowest cost water-soluble ultrasonic couplant

Operating Range: 26° to 120°F / -3.3° to 48°C

- Strong coupling film, salt stable
- Good ferrous corrosion inhibition
- No nitrates, nitrites, glycol ethers or formaldehyde
- Water-soluble



Glycerin

GE Approved Glycerol, Batch 205 for CFM56-7B engine fan blades

Operating Range: 65° to 500°F / 18° to 260°C

- Packaged from USP glycerin, 99+%
- Higher acoustic impedance
- Will not harden on equipment
- Pumpable fluid
- Compatible with plastics

Echo Shear Wave™

Transmits normal incidence shear wave

Operating Range: 40° to 90°F / 4° to 32°C

- Water-soluble
- Easily removed with water wash
- Low toxicity, non-irritating

Echo 8 ZH™

For flow metering and long term monitoring at elevated temperatures

Operating Range:

Short Term: -45° to 750°F / -42° to 398°C
Long Term: -45° to 400°F / -42° to 204°C

- Enhanced acoustic impedance
- Reduces surface roughness acoustic noise

Echo Z+™

High acoustic impedance

Operating Range: 0° to 200°F / -18° to 93°C

- Ideal for rough surfaces and concrete
- Very high viscosity
- Excellent ferrous corrosion inhibition

Phased Array Couplants

Forever Wedge™

- Facilitates more reproducible inspections, less artifacts and longer wedge coupling.
- High viscosity fluid couplant for use between phased array and angle beam transducers and the wedge.

EchoPure™

- Reduces noise and artifacts from couplant failure between the wedge and the test object.
- Eliminates dry spots under the wedge.
- See ABOVE for more information

Powder Couplants

EchoMix® Powder

Operating Range: 32° to 120°F / 0° to 50°C

- Easily mixed in water
- Salt resistant
- No formaldehyde
- Compact for shipping & storage



EchoMix®

- 2-part (two packets)
- Strongest coupling film
- Blue mixing tracer

EchoMix® Clear

- 2-part (two packets)
- No blue tracer

EchoMix® Single

- 1-part powder
- Easiest mixing
- Blue mixing tracer

High Temperature Couplants

Operating range printed on every label

VersaSonic®

Lowest cost, multiple viscosities

Operating Range: -10° to 700°F / -23° to 371°C

Auto Ignition: 788°F

- Fast response, no wait time
- No plastic polymers
- Low toxicity
- Non-irritating
- Three viscosities: fluid, medium and high viscosity gel
- Does not contain peanut oil



HiTempco

No residue, fast response

Operating Range: -50° to 775°F / -45° to 412°C

Auto Ignition: 820°F

- Fast response, no wait time
- No residue or varnish
- Less smoke than VersaSonic
- No plastic polymer or char
- Excellent corrosion inhibition
- Non-toxic, non-irritating



EchoTherm™

Lowest cost for use above 800°F

Operating Range: 200° to 1000°F / 93° to 538°C

Auto Ignition: 1300°F

- Less expensive couplant for use over 800°F and in inspection ports
- Ultra-high temperature
- Contains a plastic polymer which delays response time 2 seconds
- Leaves plastic residue (char)



EchoTherm Extreme™

The best – no residue, instant, stable response to 1250°F

Operating Range: -40° to 1250°F / -40° to 675°C

Auto Ignition: 1300°F

- Ultra-high temperature
- Fast response, no wait time
- No plastic polymer
- No plastic char residue
- Broadest operating range
- Low smoke



Fluid Couplants

Echo 8HT™

Most universal AUT fluid

Operating Range: -50° to 800°F / -45° to 425°C

Auto Ignition: 850°F

- Pumpable fluid
- Three viscosities (Grades 1, 4 & 10)
- Little or no residue
- Low toxicity
- Non-irritating



SpectrumGlide™

Highest performance AUT fluid

Operating Range:

Thickness Gaging: -50° to 730°F / -45° to 387°C

Flaw Detection: 0° to 600°F / -17° to 315°C

Auto Ignition: 752°F

- Least run off of all pumpable fluids
- Minimal residue
- Low toxicity
- Non-irritating



EchoPure Fluid™

Operating Range: -60° to 350°F / -51° to 176°C

- Best for very low to ambient temperatures
- Water-soluble (does not form oil slick)
- Least expensive fluid couplant
- Lowest viscosity fluid



ECHO ultrasonics
The couplant experts



DETEK

6805 Coolridge Drive

Temple Hills, MD 20748-6940

301-449-7300 FAX 301-449-7011

www.detek.com

email: sales@detek.com



NONDESTRUCTIVE TESTING EQUIPMENT

SONOTECH

ULTRASONIC COUPLANTS



**6805 COOLRIDGE DR ■ TEMPLE HILLS MD 20748
301-449-7300 ■ 800-638-0554 ■ FAX 301-449-7011**

EMAIL: sales@detek.com

Industry Standard Series

The Industry Standard Series of water-based couplants features high surface wetting capabilities to optimize transmission on dirty or oily surfaces. Ferrous corrosion inhibition factors for each are the highest in their performance class. The Industry Standard Series meets nuclear specifications for Halogens, Sulfur and low melting point metals and many aircraft and military specifications. The following products have established the standard by which other UT couplants are judged.

ULTRAGEL® II NSN 6850-01-157-4348

The Performance Standard

A gel couplant for use in ultrasonic inspections where corrosion inhibition is an important criterion and Halogens, Sulfur and low melting point metals must be kept to a minimum.

Since 1976, Ultragel II has been the NDT industry's most specified and used ultrasonic couplant because of its outstanding acoustic performance, chemical characteristics and corrosion inhibition. Ultragel II is ideal for flaw detection, thickness gaging, flow metering and acoustic emission testing from -10° to 210°F.

Ultragel II contains a ferrous corrosion inhibitor with a relative effectiveness rating of 90 (p15 & 16), meets a range of ASTM, military and industry specifications partially summarized below, and is compatible with most metals except magnesium. See Gel 3000 for Mg compatible couplant. (p12)



Tested and Approved:

ASTM: F519 Hydrogen Embrittlement Testing on high strength steel, F945 Stress Corrosion Cracking Testing on Titanium alloys

Boeing Specifications: BAC 5968 (adhesive bonds), 5980 (composites), 5439-PSD622 (welds, tubing and wrought material)

Pratt & Whitney: PWA 36604, MCL E-205 Type II (ASTM F945), PWA 36700/36604 Hot corrosion testing on high temperature alloys AMS 5544 (Waspalloy), 5536 (Hastelloy X), 6359 (Ferrous based alloys) 4037 (Aluminum), 5608 (Haynes 188), 5508 (Greek Ascoloy), 4375 (Magnesium), PWA 286 & 275 (Gas turbine blade coatings), 1484 PWA turbine blade alloy

Ultrasonic Couplant Storage

Couplant should be stored in the original container above freezing and out of direct sunlight. Once opened, the container must be closed when not in use. Never put unused couplant back into the original container. If pumps or valves are used on bulk couplant, wash thoroughly between drums to avoid contamination of new product.



DETEK

6805 Coolridge Drive
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Industry Standard Series

SONOTRACE®

For use in ultrasonic inspection where a *glycerine-free couplant* is required.



Sonotrace is a moderately priced, ambient temperature (25° to 175°F), water-based, glycerine-free couplant for flaw detection and thickness gaging where Halogens, Sulfur and low melting point metals must be kept to a minimum. Available in three viscosities from low viscosity fluid to very high viscosity gel.

Sonotrace contains a ferrous corrosion inhibitor with a relative effectiveness rating of 80 (p15 & 16) and is compatible with most composites and metals.

Tested and Approved:

Boeing Specifications: BAC 5968 (adhesive bonds) and BAC 5980 (composites).

ECHOGEL®

A *glycerine-free couplant* for use in inspection where salt cake or metal corrosion salts are present.

An industry standard since 1974, Echogel is an economically priced, glycerine-free couplant for flaw inspection in volume use at ambient temperatures from 27° to 140°F. Echogel resists viscosity breakdown on salt-caked boiler and corroded surfaces.

Echogel contains a ferrous corrosion inhibitor with a relative effectiveness rating of 65 (p15 & 16) and is compatible with most composites and metals.

Tested and Approved:

ASTM F519 Hydrogen Embrittlement Testing on high strength steel

Boeing Specifications: BAC 5439-PSD622

NAVSHIPS MIL-STD 767, 2041

ECHOGEL® XP

Extended Performance

Slow drying, glycerine-free couplant recommended for extended temperature range (5° to 190°F), or where slow drying is desired in flaw inspection on salt-caked boiler surfaces, corroded pipe or structural steel.

Echogel XP is an economically priced, glycerine-free couplant with a longer drying time designed for volume flaw detection over extended temperature ranges. Echogel XP resists viscosity breakdown on salt-caked boiler surfaces and corroded metals. Echogel XP contains a ferrous corrosion inhibitor with a relative effectiveness rating of 80 (p15 & 16) and is compatible with most composites and metals.



Tested and Approved: ASTM F519-05 Hydrogen Embrittlement Testing on high strength steel.



DETEK

6805 Coolridge Drive

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www.detek.com email: sales@detek.com

Environmentally Benign Couplant Series



Environmental Awareness

Sonotech developed environmentally benign couplants to minimize the impact of NDT on the environment. These environmentally benign couplants contain biodegradable materials safe for leave-on applications. Sonotech's environmentally benign couplants have low skin irritation potential, contain no dye or fragrance and will not stain clothing.

The Environmentally Benign Couplant Series meets nuclear power specifications for Halogens, Sulfur and low melting point metals. These couplants contain an environmentally benign ferrous corrosion inhibition system for steel. When ferrous corrosion is the most important criterion, Ultragel II and Sonotrace provide superior corrosion inhibition.

SONOGLIDE® UP (Ultra Pure)

Compatible with titanium, aluminum, copper, stainless steel, plastics, many magnesium alloys, and many composites.

Select when Halogens and Sulfur must be at a minimum, broad material compatibility, slow drying, water wash removability and a broad temperature range (-60° to 250°F) are desired.

Tested and Approved:

Pratt & Whitney: PWA 36604, MCL E-205 Type II, ASTM F945 Stress Corrosion Cracking testing on Titanium Alloys, PWA 36700/36604 Hot corrosion testing on high temperature alloys AMS 5544 (Waspalloy), 5536 (Hastelloy X), 6359 (Ferrous based alloys), 4037 (Aluminum), 5608 (Haynes 188), 5508 (Greek Ascology), 4375 (Magnesium), and PWA 286 & 275 (Gas turbine blade coatings), and 1484 PWA turbine blade alloy

SONOGLIDE® FE

For use with cast iron, steel and its alloys.

SonoGlide FE is a special grade of SonoGlide developed for **ferrous metals** where short-term corrosion is a concern. SonoGlide FE performs over a wide temperature range (-60° to 250°F) and is slow drying. SonoGlide FE remains stable on corroded or salt covered surfaces.

Corrosion Inhibition: There is low short-term corrosion potential with SonoGlide FE on cast iron, steel, and its alloys. SonoGlide contains a ferrous corrosion inhibitor with a relative effectiveness rating of 75 (p15 & 16).



DETEK

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Environmentally Benign Couplant Series

Ambient Temperature Couplants

SOUNDSAFE® & SOUNDSAFE® HV (High Viscosity)

The Environmental Standard NSN 6850-01-157-4348

A high performance couplant for use in overhead, vertical and horizontal applications where environmental concerns are a primary consideration.

Soundsafe offers the highest performance of the environmentally benign family of couplants. Soundsafe has a high humectant level to slow drying, increase acoustic impedance and provide transducer lubrication, and has a temperature range of 0° to 200°F.



Soundsafe Tested and Approved:

Pratt & Whitney: PWA 36604, MCL E-205 Type II or ASTM F945 Stress Corrosion Cracking Testing on titanium alloys, PWA 36700/36604 Hot corrosion testing on high temperature alloys AMS 5544 (Waspalloy), 5536 (Hastelloy X), 6359 (Ferrous based alloys) 4037 (Aluminum), 5608 (Haynes 188), 5508 (Greek Ascoloy), 4375 (Magnesium), PWA 286 & 275 (Gas turbine blade coatings) and 1484 PWA turbine blade alloy

Both Soundsafe and Soundsafe HV contain a ferrous corrosion inhibitor with a relative effectiveness rating of 75 (p15 & 16) and are compatible with most composites and metals except magnesium.

SOUNDCLEAR®

A good price to performance ratio couplant for flaw detection and thickness gaging where environmental concerns are a primary consideration. Fills depressions in rough surfaces.

Soundclear contains humectants to slow drying, increase acoustic impedance and provide an operating temperature range of 20° to 200°F.

Soundclear contains a corrosion inhibitor for steel with a relative effectiveness rating of 45 (p15 & 16) and is compatible with aluminum, titanium, and plastics. Not recommended for magnesium.



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Environmentally Benign Couplant Concentrates



Environmentally Benign Couplant Concentrates

are cost effective powders that are to be mixed with water at the inspection site. The compact and lightweight packets are easy to transport or store against unanticipated shortages.

UT-X and UT-X FE Powders are supplied in a two packet system to provide homogenous distribution of antimicrobial agents and corrosion inhibitors and to minimize air during mixing.



UT-X[®] POWDER

The most economical couplant, mix on site.

UT-X Powder is a couplant concentrate useful for flaw detection and thickness gaging. UT-X Powder resists viscosity breakdown from salts and has a ferrous corrosion inhibition rating of 10. (p15 & 16) For increased ferrous corrosion inhibition, select UT-X FE.

UT-X[®] FE POWDER

An economical, mix on site couplant for use where ferrous corrosion inhibition is required.

UT-X FE Powder is a couplant concentrate useful for flaw detection and thickness gaging. UT-X FE Powder incorporates a ferrous corrosion inhibitor, a preservative, and a viscosity building polymer. UT-X FE has a ferrous corrosion inhibition rating of 40. (p15 & 16)

UT-X Powders Storage & Shelf Life

UT-X and UT-X FE Powder couplants should be stored in the original zip-top bags out of sunlight. Once opened and prepared, store mixed couplant in a closed container.

The shelf life for unopened packets of UT-X Powder couplants is three (3) years from the date of manufacture. A prepared container of UT-X Powder has an approximate shelf life of one (1) month.

Cost Effective

- Costs significantly less than standard couplants
- Minimizes shipping charges
- Reduced storage requirements
- No drum disposal expense

Easy to use

- Pre-measured 1-gallon and 5-gallon packets
- Extremely compact storage: A drum's volume can fit in a drawer or briefcase
- Viscosity can be varied for exact job requirements simply by adjusting the amount of water
- Mixes quickly, uniformly and without lumps



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Specialty Couplants



HIGH Z

A very high acoustic impedance couplant which optimizes acoustic transmission and reduces surface noise on curved, rough, pitted or heavily corroded surfaces.

Provides the highest acoustic impedance of all Sonotech couplants, reducing surface noise and improving coupling performance on rough and curved surfaces. Many times, High Z will facilitate flaw inspection or thickness gaging when no other couplant will function. Available in two viscosities.



SHEAR GEL®

For use in true shear wave applications.

Provides coupling for shear wave generated by **normal incidence** (zero degree) shear wave transducers.



GEL 3000®

A water-soluble couplant with a fluorescent tracer to assure complete application and/or removal in flaw detection and thickness gaging over a broad temperature range.

Developed to test the space shuttle, Gel 3000 contains a fluorescent tracer that enables the inspector to monitor transducer overlap and ensure complete coverage and removal by illumination with ultraviolet light. Gel 3000 is water and humectant-free, enables testing verification and is available in a range of viscosities.

Gel 3000 has excellent corrosion inhibiting characteristics on most metals including magnesium, and has a ferrous corrosion inhibition rating of 95.

(p15 & 16)



THERMASONIC®

For use where rapid wetting, slow drying, broad temperature range and easy water removal are required.

Thermasonic is a water and humectant-free formula for flaw detection and thickness gaging where water solubility is required. Thermasonic, like Gel 3000, has excellent corrosion inhibiting characteristics on most metals.



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Extended and Extreme Temperature Couplants



Selection Tip

To achieve the most consistent results, select the couplant having the broadest temperature range overlap with the expected test temperature. For example, at 600°F (315°C) Pyrogel® will give the most consistent results, even though several other products will work at this temperature.

What to Expect

Smoke: All liquids and greases decompose above a certain temperature. Smoke does not mean that the couplant is not working, but does indicate that effective coupling time is limited.

Evaporation: At high temperatures couplants dry relatively quickly; the temperature range for flaw detection is narrower because of this evaporation. More couplant may be required near the upper temperature limit to compensate for drying.

Clean up: Wipe still hot transducers on a dry rag folded into several layers to protect skin. Clean room temperature oily residues with common solvents such as acetone, if required. (Do not use solvents on hot pipes!)

Flash Point vs. Auto-Ignition

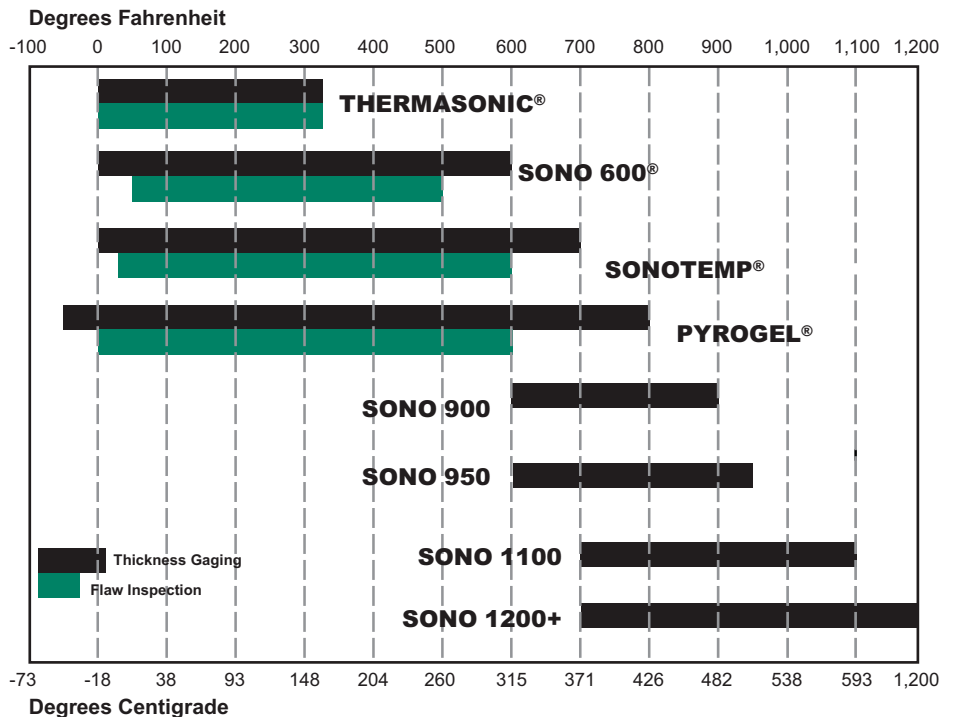
Auto-Ignition is the temperature at which a substance ignites without other sources of energy. This is usually the temperature of interest in UT inspections, as inspections are seldom done in the presence of spark or flame.

The **Flash Point** of a product is the lowest temperature at which vapors arising from the product will ignite momentarily when exposed to a flame.

Selection and Use Tips

- Pyrogel and Sono 600 are available in low viscosities to enable pumping of couplant to remote transducers in crawlers.

- When testing on vertical surfaces, a thicker grade of couplant is more likely to stay in place. A thinner grade generally gives better performance on flat surfaces.



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Extended and Extreme Temperature Couplants

Sonotech manufactures a wide variety of couplants with proven performance in flaw detection, thickness gaging, flow metering, and acoustic emission testing at extreme temperatures.



THERMASONIC®

Water-free formula for flaw detection, thickness gaging, flow metering, and acoustic emission testing where long inspection time and/or water solubility are required. 0° to 325°F

Polymer Fume Fever

Sonotech couplants do **NOT** contain perfluorocarbons found in many "high temperature" greases. "Polymer fume fever" is not an operator hazard with Sonotech Couplants.



SONO 600

Biodegradable formula for flaw detection, thickness gaging, and acoustic emission testing in petrochemical, power generating industries, food processing machinery, and pharmaceutical manufacturing and storage equipment. 0° to 600°F



PYROGEL®

Provides coupling over a wide temperature range for thickness gaging, flow metering, acoustic emission testing, and flaw detection. -50° to 800°F



SONO TEMP®

Useful in high temperature thickness gaging and flow metering where elevated temperature, curved or very rough surfaces present coupling difficulties. Sonotemp is our highest acoustic impedance high temperature couplant. 0° to 700°F



SONO 900

A thick, gritty, stay in place paste for thickness gaging. Used worldwide since 1977. 600° to 900°F



SONO 950

Sono 950 will maintain acoustic coupling to give ample time for obtaining good thickness readings at temperatures between 600° and 950° Thinner, smoother consistency than Sono 900.



SONO 1100

Sono 1100 will maintain acoustic coupling to give ample time for obtaining good thickness readings from 700° to 1100°F



SONO 1200+

Provides coupling for thickness gaging from 700° to well over 1200 °F



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PHASED ARRAY TEST BLOCKS

PACS™ Block



New Phased Array calibration block used for angle beam verification, probe angle exit point, calibration for wedge delay, sensitivity, DAC/TCG for thicknesses up to 2", and crack sizing. The three radii (0.200", 1.000", and 2.000") allow for velocity and sound path calculations. Block contains five holes at 3/64" diameter drilled through the 1.000" width, located at .100, .200, .400, .600, .800, 1.200, 1.400, 1.600, 1.800, and 1.900" from the respective scanning surface. Generous hole spacing eliminates "ghost" images from adjacent holes. Also includes an engraved scale from 30° to 70° associated with the .800" hole. Dimensions: 18.0" x 2.0" x 1.0"

Mini PACS™ Block



Mini PACS™ Block is a smaller, portable version of the original PACS™ Block. The block includes a total of four holes at 3/64" diameter drilled through the 1.000" width, located at .200, .400, .600, .700, .800, .900, 1.100, and 1.300" from the respective scanning surface. Dimensions: 1.500" tall x 1.000" wide x 10.00" long.

PACS™ Notch Block



The PACS™ Notch Block has been specially designed for use with Phased Array instruments used for sizing of OD and ID-connected cracks. The block contains four EDM slots at depths of 20, 40, 60, and 80% and a width of .031". Standard thickness is 1.000"; however, other sizes can be ordered. Dimensions: 1.000" thick x 2.000" wide x 7.00" long.

ASTM E2491 PA Assessment Block



The PH Tool ASTM E2491 Phased Array Assessment Block is a general purpose Phased Array calibration block used for beam characterization and evaluation of system performance characteristics. Use it as baseline block to determine long-term instrument performance changes, generate DAC curves, and evaluate linear/angular resolution, focusing ability and beam steering capability. With a variety of targets, this small, lightweight block is also perfect for customer demonstrations of phased array ultrasonics capabilities. This block is also referred to as a "Type B" block. Dimension: 150mm x 100mm x 25mm. In accordance with ASTM E2491.



Phased Array Type A Block (IIW-Type)



The Phased Array "Type A" Calibration Block is used during the initial setup and calibration of a phased array ultrasonic unit. This block can be used to perform tasks such as beam angle verification, calibration for wedge delay, sensitivity calibration, performing DAC/TCG, and more. This block has similar dimensions to an IIW-Type Block, but has been

specially-engineered for phased array applications. Blocks include both 50.0mm and 25.0mm radii, (19) through holes at 1.0mm diameter, (1) through hole at 2.0mm diameter, (4) FBHs at 2.0mm diameter x 2.0, 4.0, 6.0, and 8.0mm deep, (4) FBHs at 4.0mm diameter x 1.0, 3.0, 5.0, and 7.0mm deep, (3) FBHs at 2.0mm diameter x 3.0mm deep machined into the 25mm radius, and (4) EDM notches at 0.1, 0.2, 0.3, and 0.4mm deep x 0.5mm wide x 25.0mm long. Block dimensions are 25.0mm thick x 100.0mm tall x 300.0mm long.

Phased Array Calibration Block No. 2



This new Phased Array calibration block contains all of the required features on the ASME Section V, Article 4 Basic Calibration Block yet spaces the holes out on a longer, narrower block. The block contains three holes at 3/32" diameter drilled through the 1.500" width,

located at 114T, 112T, and 3/4T. It also contains two EDM notches at 2% deep x .010" wide x 1.500" long on opposite surfaces of one end. Dimensions: 14.0" x 1.5" x .75" thick.

Phased Array NAVSHIPS Block



This special Phased Array version of the popular NAVSHIPS block solves the problem of too many holes interfering with one another. The block contains four holes at 3/64" diameter drilled through the 1.250" width. The holes are located at .250, .750, 1.250, 1.750, 2.250, and 2.750".



NONDESTRUCTIVE TESTING EQUIPMENT

ULTRASONIC CALIBRATION BLOCKS



6805 COOLRIDGE DR TEMPLE HILLS MD 20748
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EMAIL: sales@detek.com

DETEK provides a full line of calibration blocks to all American standards and International Institute of Welding (IIW).

Standard blocks are readily available fabricated from:

Aluminum	7075-T6	(Clear Anodized)
Steel	A36, 1018 or 4340 VM	(Nickel Plated)
Stainless Steel	Type 304	

All raw material is ultrasonic inspected prior to manufacture of blocks.

Many other materials are kept on shelf and available for immediate fabrication to customer specifications. All blocks are available in metric geometry.

Blocks are precision manufactured to tolerances well within the allowable limits of their respective codes. All blocks pass a comprehensive quality control inspection in accordance with ISO 9002 (formerly Mil I 45208A) with instruments calibrated in accordance with ANSI/NCSL Z540 (formerly MIL C 45662-A) and traceable to the National Institute of Standards and Technology (NIST).

All blocks are permanently engraved with:

- Degree marks and numbers,
- Block identifications,
- Material and,
- Serial numbers

Handsome, durable hardwood cases are available for all standard blocks.

In addition to blocks illustrated here, DETEK provides the full line of Calibration Blocks to many other specifications such as MIL-STD- 2154 and McDonnell Douglas 21211.3 are also available.

DETEK also has wire and plunge type E.D.M. capabilities and can give prompt turnaround for customer notch and slot standards.

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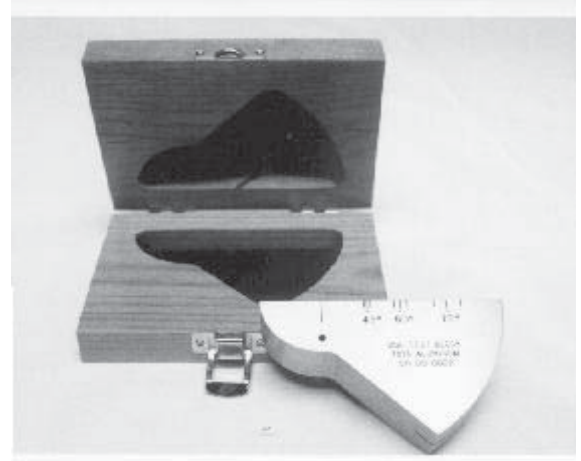
Block Type:
DSC

Application:
Shear wave distance and sensitivity calibration.

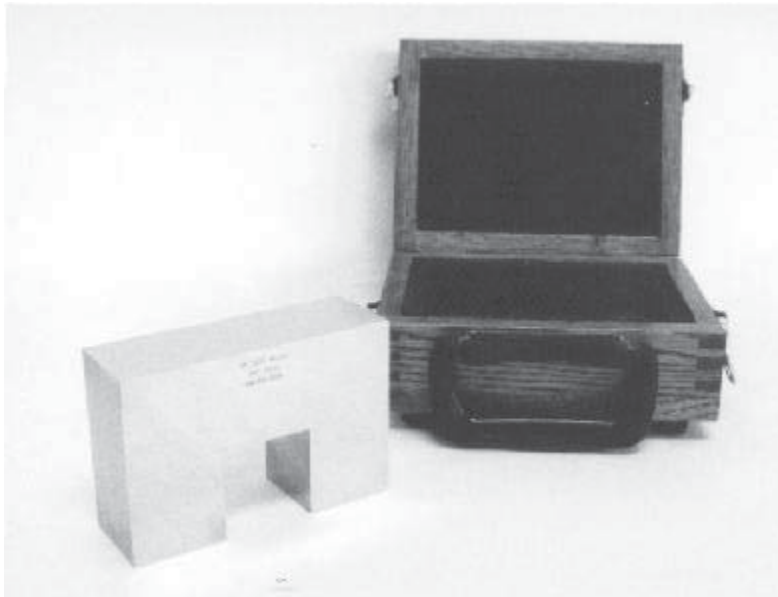
Geometry:
1" thick, 4" long with 1" radius and 3" radius. Contains a 1/2" deep X 1/32" radius notch and a 1/8" diameter side drilled hole for 45°, 60°, and 70°. Per AWS and ASTM-E-164

Standard Materials:

Aluminum 7075-T6	P/N UTB-301
Steel A36/ 1018	P/N UTB-300
Stainless Steel 304	P/N UTB-302



Case for DSC Block P/N UTB-303



Block Type:
DS

Application:
Distance and sensitivity.

Geometry:
2" x 2" x 6" with a 2" wide cutout. Per ANSI/ AWS

Standard Materials:

Aluminum 7075-T6	P/N UTB-311
Steel 1018	P/N UTB-310
Stainless Steel 304	P/N UTB-312

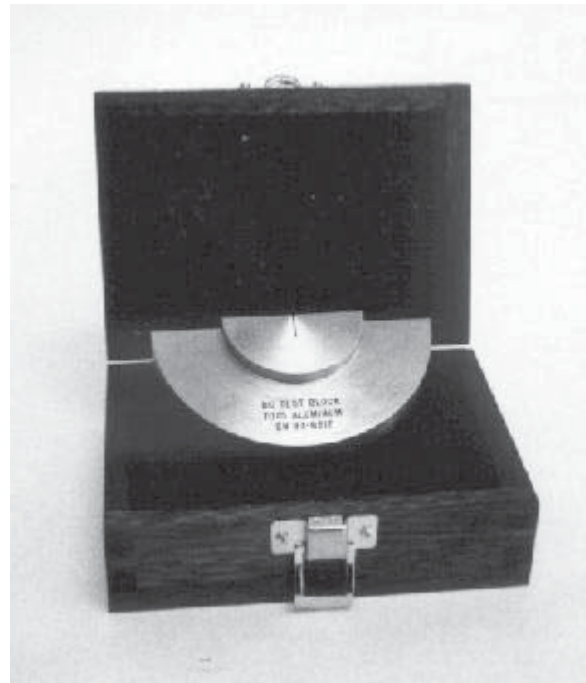
Case for DS Block P/N UTB-313

Block Type:
DC

Application:
Distance Calibration (shear wave)

Geometry:
1" radius overlying 2" radius on
180° half circle. Per AWS and
ASTM-E-164

Standard Materials:
Aluminum 7075-T6 P/N UTB-101
Steel 1018 P/N UTB-100
Stainless Steel 304 P/N UTB-102
Case for DC block P/N UTB-103



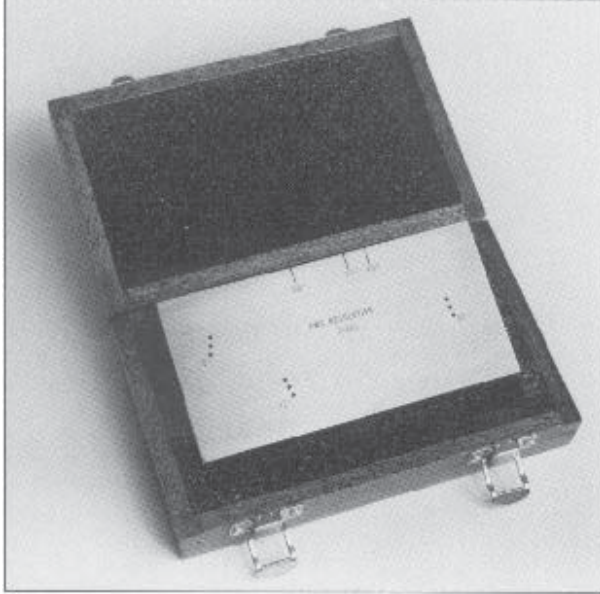
Block Type:
Angle Beam

Application:
Angle Beam Calibration (Rompas)

Geometry:
 $\frac{1}{2}$ " or 1" thick, 1" radius opposite 2" radius with $\frac{5}{64}$ " diameter by $\frac{3}{4}$ " deep flat bottom hole (1" thick only).

Per ASTM-E-164 and
U.S.A.F.T.O. 33B-1-1 (6-1-84)

Standard Materials:
Aluminum 7075 T-6 P/N UTB-901
Steel A36/ 1018 P/N UTB-900
Stainless Steel 304 P/N UTB-902
Case for angle Beam Block P/N UTB-903



Block Type:
ANSI/ AWS RESOLUTION

Application:
 Checking resolution capabilities of angle beam transducers.

Geometry:
 1" x 3" x 6". Contains nine .062" diameter holes for 45°, 60°, and 70°. Per AWS and BPR

Standard Materials:

Aluminum 7075 T-6	P/N UTB-401
Steel A36 / 1018	P/N UTB-400
Stainless Steel 304	P/N UTB-402
Case for AWS Block	P/N UTB-403

Block Type:
SC

Application:
 Sensitivity Calibration
 (Shear wave)

Geometry:
 .905" x 1.25" x 3"
 Contains two .062" diameter side drilled holes.
 Per AWS / ASTM-E-164

Standard Materials:

Aluminum 7075-T6	P/N UTB-201
Steel A36 / 1018	P/N UTB-200
Stainless Steel 304	P/N UTB-202
Case for SC Block	P/N UTB-203



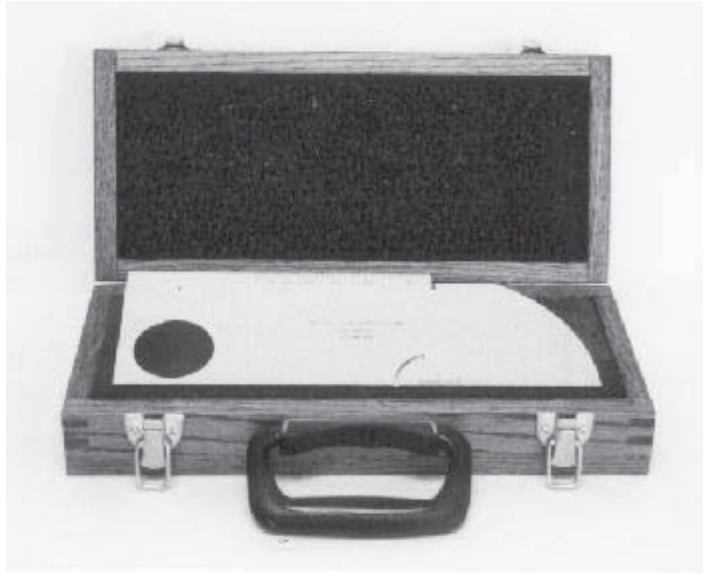
**Block Type:
IIW Type 1**

Application:

Calibration of transverse and longitudinal wave distance setting determination of the sound beam point of incidence and exact angle of propagation.

Geometry:

1" x 4" x 12". Contains 2" diameter hole and 4" radius. Also 1/8" x 1" radius alternate reflector 1/16" deep on echo side. Per Int'l Institute of Welding (IIW), ASTM-E-164, and MIL-STD-2154



Standard Materials:

Aluminum 7075 T-6	P/N UTB-501
Steel A36 / 1018	P/N UTB-500
Stainless Steel 304	P/N UTB-502
Case for IIW Block Type 1	P/N UTB-503



**Block Type:
IIW Type 2**

Application:

Modified version of IIW Type 1, with a 2" radius 1/4" deep cut out test side, and 3 extra side drilled resolution holes. Per IIW and U.S.A.F.T.O.33B-1-1 (6-1-84)

Standard Materials:

Aluminum 7075 T-6	P/N UTB-511
Steel A36 / 1018	P/N UTB-510
Stainless Steel 304	P/N UTB-512
Case for IIW Block Type 2	P/N UTB-513

Special USAF Block FSN 6635-00-148-5477

Aluminum P/N UTB-514

Special USAF Block FSN 6635-00-415-9225

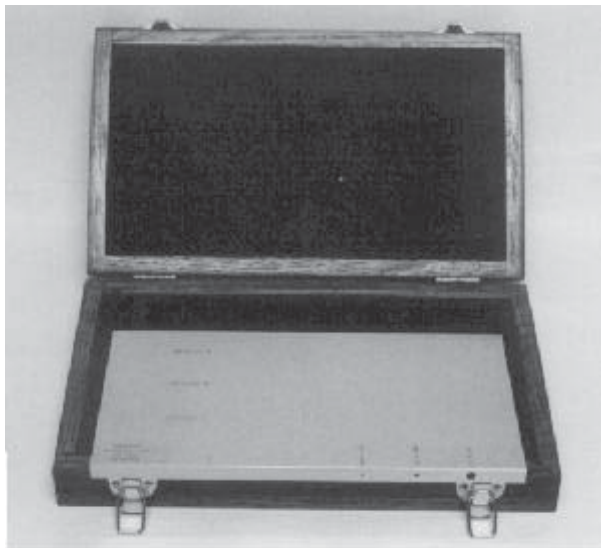
Steel P/N UTB-519

Block Type:
Mini IIW

Application:
Miniature version of IIW type blocks resembling the Type 2

Geometry:
1"x 2" x 6". Contains 1" diameter hole, 2" radius, 1" radius 1/4" deep cut out test side 3 side drilled resolution holes, and 3/4" sq X .100" deep cut out.

Steel P/N UTB-560
Case for Mini IIW P/N UTB-565



Block Type:
ASME-N-625 Reference Plate

Application:
For longitudinal shear and surface wave sensitivity calibration.

Geometry:
1/2" x 6" x 12". Contains five flat bottom holes and one through hole; three each .062" diameter holes at depths of .050", .250" and through, one .062" diameter hole at 1.5" depth; .125" diameter hole at 1.625 depth; one .250" diameter hole at 1.750" depth. Also contains one .002" deep surface wave notch.

Per ASME Boiler & Pressure Vessel Code Sect. III

Standard Materials:

Aluminum 7075-T6 P/N UTB-001
Steel 1018 P/N UTB-000
Case for ASME N-625 P/N UTB-003

Stainless Steel P/N UTB-002

Block Type:

30 FBH Resolution Block

Application:

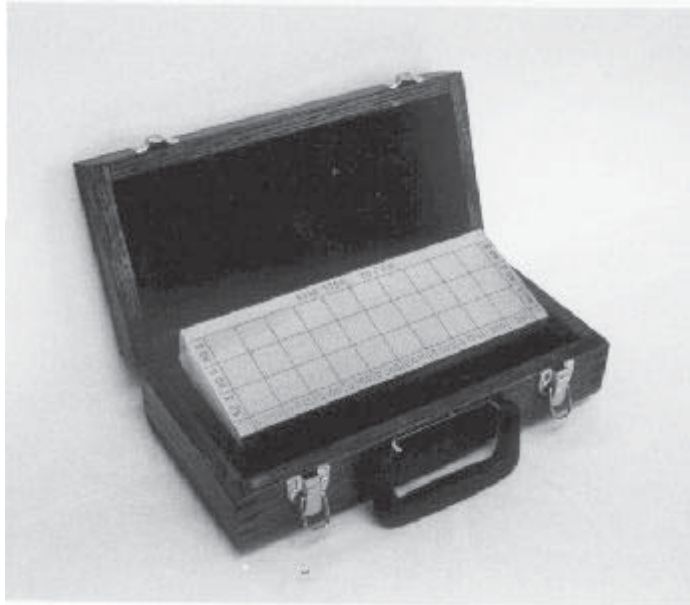
Area/ Amplitude plots for normal beam transducer and determining resolution and sensitivity capabilities.

Geometry:

1½" x 4" x 11". Contains three series of 3/64", 5/64", and 8/64" diameter holes at metal travel distances of .050" thru 1.250". Per ASTM-E-428; ASTM-E-127 D/A spec.

Standard Materials:

Aluminum 7075T-6	P/N UTB-405
Steel 4340	P/N UTB-404
Stainless Steel 304	P/N UTB-406
Case for 30 FBH	P/N UTB-407



Block Type:

Navships

Application:

Distance correction and sensitivity levels.

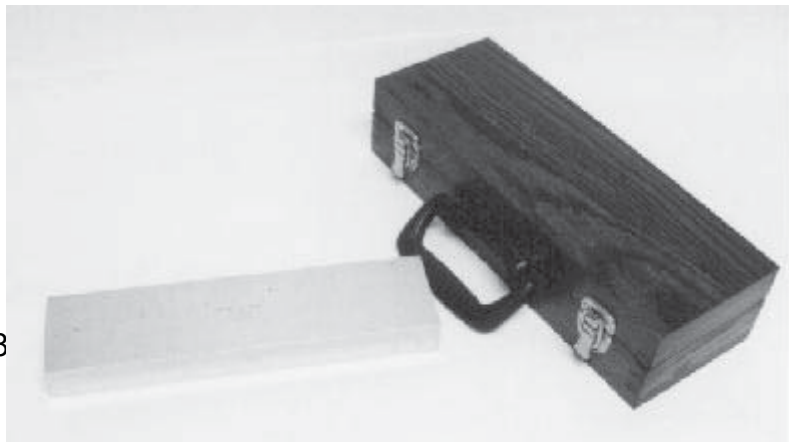
Geometry:

1¼" X 3" x 12". Contains seven 3/64" diameter side drilled holes at distances of 1/8 thru 2¾". Per NAVSEA T 9074-AS-GIB-010/271

(Formerly Navships 0900-006-3010sec. 6 & MIL-STD-271F)

Standard Materials:

Aluminum 7075 T-6	P/N UTB-409
Steel 1018	P/N UTB-408
Stainless Steel 304	P/N UTB-410
Case for NAVSHIPS Block	P/N UTB-411



Block Type:
IOW BEAM PROFILE

(English or Metric)

Application:

Beam profile measurement of Angle beam transducer. Per BS 2704

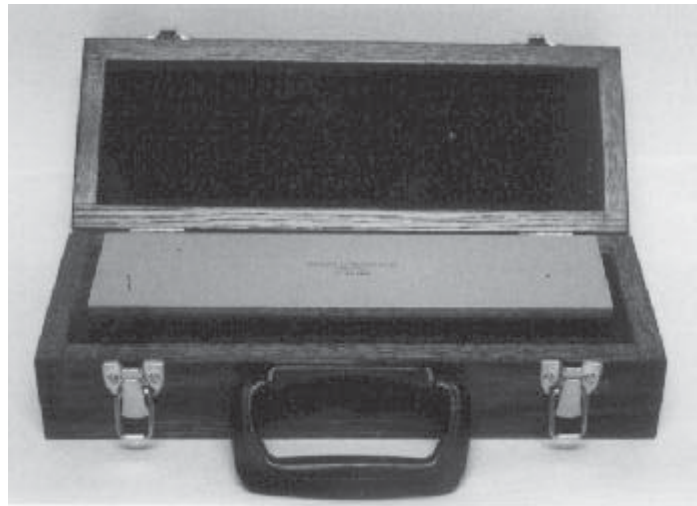
Geometry:

2" x 3" x 12".

Contains two 1/16" diameter x 7/8" deep calibration holes on near side; two 1/16" diameter x 7/8" deep calibration holes on far side. Contains five 1/16" diameter resolution holes drilled on a 10° slope, far side only.

Standard Materials:

Steel P/N UTB-550



Case for IOW Block P/N UTB-555

Block Type:

Step Blocks

Applications:

Thickness and linearity calibration.

Geometry:

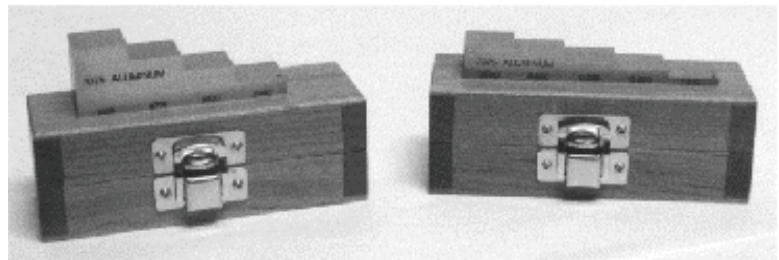
Available in a variety of step size, most common being a four step version with thickness of .250", .500", .750", and 1.00" or a five step version with thickness of .100", .200", .300", .400", and .500". Standard step dimensions are .750" square. Custom step blocks are available. Utility step blocks are fabricated from 1018 steel Per ASTM-E-797

Standard Materials: 4 Step 5 Step

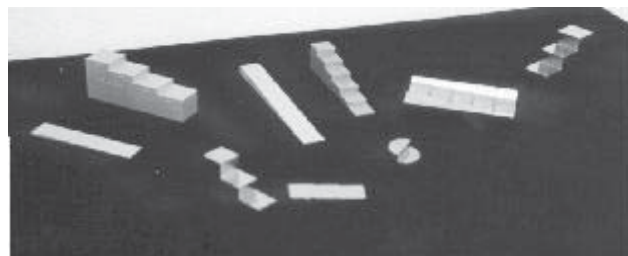
Aluminum 7075-T6 UTB-805 UTB-801

Steel 4340* UTB-804 UTB-800

Stainless UTB-806 UTB-802



Case for Step Block UTB-807 UTB-803



Block Type:

Miniature Resolution Block

Application:

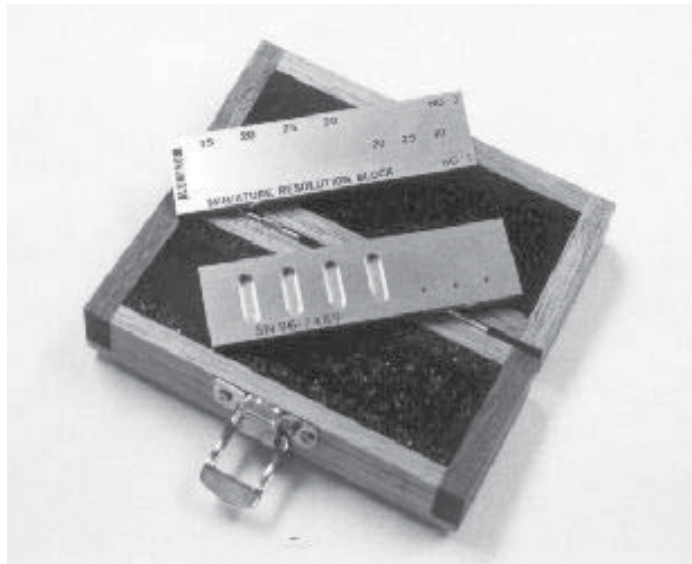
To check resolution capabilities and calibrate high resolution test equipment.

Geometry:

Contains four milled slots 3/16" wide X 5/8" long and six flat bottomed holes; three 3/64" diameter holes and three 1/64" holes:

Standard Materials:

Aluminum 7075 T-6	P/N UTB-315
Steel 1018	P/N UTB-314
Stainless Steel 304	P/N UTB-316
Case for Mini Res Block	P/N UTB-317



Block Type:

ASME Basic Calibration Block

Application:

Angle beam calibration

Geometry:

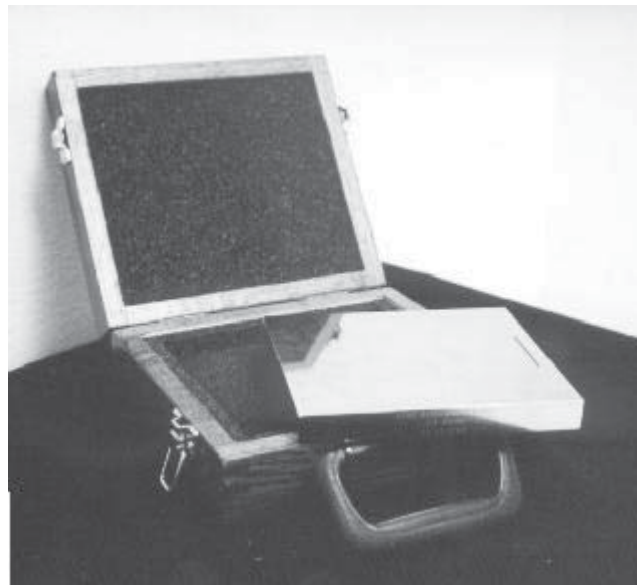
Material:	Block Dimensions:
1" or less	.750" X 6" X 7"
Over 1" thru 2"	1.5" X 6" X 10"
Over 2" thru 4"	3" X 6" X 10"

Contains 2 slots; one on each face, and three side drilled holes 1.5" deep X (diameter is determined by the thickness of the block).

Per ASME SEC V Article 23 T-542.1.1

Standard Materials:

Aluminum 7075 T-6	P/N UTB-021
Steel 1018	P/N UTB-020
Stainless Steel 304	P/N UTB-022
Case for ASME Block	P/N UTB-024





**ASTM
DISTANCE/AMPLITUDE
Set of 19 with Case**

ALUMINUM	P/N UTB-671
STEEL	P/N UTB-670
STAINLESS STEEL	P/N UTB-672

**ASTM
DISTANCE/ AREA AMPLITUDE
Set of 10 with Case**

ALUMINUM	P/N UTB-601
STEEL	P/N UTB-600
STAINLESS STEEL	P/N UTB-602



**ASTM
AREA/ AMPLITUDE
Set of 8 with Case**

ALUMINUM	P/N UTB-701
STEEL	P/N UTB-700
STAINLESS STEEL	P/N UTB-702



ASTM-E-127 or ASTM-E-428

ASTM DISTANCE/AMPLITUDE Set of 19

Contains hole diameters of 3/64", 5/64", or 8/64" with metal travel distances of:

.06" (X-0006)	1.25" (X-0125)
.12" (X-0012)	1.75" (X-0175)
.25" (X-0025)	2.25" (X-0225)
.37" (X-0037)	2.75" (X-0275)
.50" (X-0050)	3.25" (X-0325)
.62" (X-0062)	3.75" (X-0375)
.75" (X-0075)	4.25" (X-0425)
.87" (X-0087)	4.75" (X-0475)
1.0" (X-0100)	5.25" (X-0525)
	5.75" (X-0575)

ASTM DISTANCE/AREA AMPLITUDE Set of 10

Contains the following hole diameters and metal travel distances:

3/64" - 3.0" (3-0300)
5/64" - .12" (5-0012)
5/64" - .25" (5-0025)
5/64" - .50" (5-0050)
5/64" - .75" (5-0075)
5/64" - 1.5" (5-0150)
5/64" - 3.0" (5-0300)
5/64" - 6.0" (5-0600)
8/64" - 3.0" (8-0300)
8/64" - 6.0" (8-0600)

ASTM AREA / AMPLITUDE Set of 8

Contains the following hole diameters and metal travel distances:

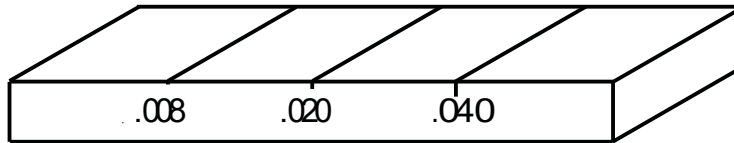
1/64" - 3.0" (1-0300)
2/64" - 3.0" (2-0300)
3/64" - 3.0" (3-0300)
4/64" - 3.0" (4-0300)
5/64" - 3.0" (5-0300)
6/64" - 3.0" (6-0300)
7/64" - 3.0" (7-0300)
8/64" - 3.0" (8-0300)

Standard Materials:

[Aluminum 7075 T-6 Individual Blocks](#)
[Steel 4340 Vac. Melt Individual Blocks](#)
[Stainless Steel 304 Individual Blocks](#)

EDDY – CURRENT BLOCKS

Detek, Inc provides a wide variety of Eddy Current standards in addition to the standard block shown here.



Block Type:

Eddy-Current Standard

Block dimensions:

.312" thick X 1.375" wide X 3.156" long

Contains three slots; .008", .020", and .040" deep

Standard Materials:

Steel 4340

P/N ESA-FETB1

Aluminum 7075 T-6

P/N ESA-ALTB1

Titanium 6Al-4V

P/N ESA-TITB1

Stainless Steel 304

P/N ESA-SSTB1

Magnesium AZ-31

P/N ESA-MGTB1



DETEK NONDESTRUCTIVE TESTING EQUIPMENT

FLAWTECH STANDARD KITS

**RT KIT
UT KIT
MT/PT KIT
VT KIT**

EACH KIT CONTAINS

- 20 "REAL" FLAWS PER KIT
- 10 LARGE 4" X 8" CARBON STEEL SPECIMENS PER KIT
- "FREE" CARRYING CASE
- DETAILED DOCUMENT PACKAGE WITH CAD DRAWINGS

DEMONSTRATION KIT

- 5 SPECIMENS & 11 FLAWS

REFERENCE RADIOGRAPHS

- FILM ONLY - 16 RADIOGRAPHS SHOWING 20 REAL FLAWS
- CUSTOM KITS AVAILABLE ●

**SPECIAL
KITS**

FLAWTECH STANDARD KIT SPECIMENS ARE DESIGNED TO:

- ENHANCE THE TRAINING & QUALIFICATION OF LEVEL I & II PERSONNEL WITH REGARDS TO SNT-TC-1A, EN473 & PCN.
- ASSIST WITH BASIC FLAW DETECTION, SIZING AND INTERPRETATION USING COMMON WELD GEOMETRIES AND FLAW TYPES.



**6805 COOLRIDGE DR ■ TEMPLE HILLS MD 20748
301-449-7300 ■ 800-638-0554 ■ FAX 301-449-7011**

EMAIL: sales@detek.com



NONDESTRUCTIVE TESTING EQUIPMENT

#	FLAW TYPE	WELD	NDT METHOD			
10	TOE CRACK	SV / DV	-	MT/PT	UT	RT
11	TOE CRACK	FILLET	-	MT/PT	UT	-
12	ROOT CRACK	SV	-	MT/PT	UT	RT
13	UNDERBEAD CRACK	FILLET	-	-	UT	-
14	CENTER LINE CRACK (SURFACE)	SV / DV	-	MT/PT	UT	RT
15	CENTER LINE CRACK (SUB-SURFACE)	SV / DV	-	-	UT	RT
16	CIRCUMFERENTIAL CRACK (FLUSH CROWN)	SV / DV	-	MT/PT	UT	RT
17	TRANSVERSE CRACK (FLUSH CROWN)	SV / DV	-	MT/PT	UT	-
18	BASE METAL CRACK (CROWN HAZ AREA)	SV / DV	-	MT/PT	UT	-
19	BASE METAL CRACK (ROOT HAZ AREA)	SV	-	MT/PT	UT	-
20	CRATER CRACK (CROWN STOP/START AREA)	SV / DV	VT	MT/PT	-	-
30	POROSITY (SUB-SURFACE)	SV / DV	-	-	UT	RT
31	POROSITY (SUB-SURFACE)	FILLET	-	-	UT	RT
32	POROSITY (SURFACE)	SV / DV	VT	MT/PT	-	-
33	POROSITY (SURFACE)	FILLET	VT	MT/PT	-	-
34	SINGLE GAS PORE	SV / DV	-	-	UT	RT
35	SINGLE GAS PORE	FILLET	-	-	-	RT
36	SLAG INCLUSION (ROOT AREA)	SV	-	-	UT	RT
37	SLAG INCLUSION (WELD GROOVE AREA)	SV / DV	-	-	UT	RT
38	SLAG INCLUSION (ROOT AREA)	FILLET	-	-	UT	RT
39	TUNGSTEN INCLUSION (ROOT AREA)	SV / DV	-	-	-	RT
50	LAMINATION (BASE METAL)	SV	-	-	UT	-
51	LAMINATION (BASE METAL)	WP FACE	-	MT/PT	-	-
52	LACK OF FUSION (SUB-SURFACE)	SV / DV	-	-	UT	-
53	LACK OF FUSION (SURFACE BREAKING)	SV / DV	-	MT/PT	UT	-
54	LACK OF FUSION (SURFACE BREAKING)	FILLET	-	MT/PT	-	-
55	LACK OF FUSION (ROOT AREA)	SV	-	MT/PT	UT	-
56	INCOMPLETE ROOT PENETRATION	SV	VT	MT/PT	UT	RT
57	INCOMPLETE ROOT PENETRATION	DV	-	-	UT	RT
58	INCOMPLETE ROOT PENETRATION (BRIDGING)	FILLET	-	-	UT	-
59	INCOMPLETE GROOVE WELD (CROWN AREA)	SV / DV	VT	MT/PT	UT	RT
70	ROOT CONCAVITY	SV	VT	-	-	RT
71	EXCESS ROOT PENETRATION	SV	VT	-	-	RT
72	MISALIGNMENT (ROOT & CROWN AREA)	SV	VT	-	-	RT
73	UNEVEN LEG LENGTH	FILLET	VT	-	-	-
74	EXCESS CROWN	SV / DV	VT	-	-	-
75	EXCESS CROWN	FILLET	VT	-	-	-
76	CONCAVE CROWN	SV / DV	VT	-	-	-
77	CONCAVE CROWN	FILLET	VT	-	-	-
78	UNDERCUT	SV / DV	VT	-	-	-
79	UNDERCUT	FILLET	VT	-	-	-
80	OVERLAP	FILLET	VT	MT/PT	-	-
90	WELD SPATTER	SV / DV	VT	-	VT	RT
91	WELD SPATTER	FILLET	VT	-	VT	RT
92	CHIPPING HAMMER MARKS	SV / DV	VT	-	VT	RT
93	CHIPPING HAMMER MARKS	FILLET	VT	-	VT	-

HOW TO REQUEST A CUSTOM SPECIMEN

1ST	2ND	3RD
SELECT A TOLERANCE	SELECT YOUR FLAWS	SELECT THE MATERIAL
STANDARD +/-0.150" (4MM)	FROM THE ABOVE TABLE	TYPE, WELD PREP GEOMETRY
ADVANCED +/-0.080" (2MM)	OR SPECIFY YOUR	AND THE REQUIRED NDT
CRITICAL +/-0.040" (1MM)	SPECIAL REQUIREMENTS	METHOD OF INSPECTION

GE
Measurement & Control

Mentor EM

More experience in every inspection.

Remotely collaborate with experts in real time. Introducing Mentor EM for eddy current weld inspection.



imagination at work

This powerful new technology makes eddy current weld inspections easier, more accurate, and faster. By allowing the workflows to be instantly accessible on the device, Mentor EM helps to ensure strict compliance with codes, guidelines, and standard practices.



Transforming Nondestructive Testing

- Portable eddy current testing instrument with industry-defining signal-to-noise ratio
- Reduces need for paper and manuals
- Large, bright, high-definition touchscreen that can be used while wearing gloves
- No knobs, dials, or switches to mistakenly adjust during use
- Superior IP rating and rugged cast magnesium housing to withstand harsh work environments
- Multiple alarm gates, which can be set to color or sound, to warn of possible defects

Specifications

Battery Size	62 watt-hours/air transport compliant
Battery Life	4 hours for most conditions 90-minute charge time Extended battery pack adds 6 hours
Generators	2 generators and 2 connectors 2 time slices max per generator 4 frequency simultaneous injection
Display	10.4" XGA 1024 x 768 Projected capacitive touch
Frequency Range	10 Hz–6 MHz
Sample Rate (max)	50 kHz
Receiver Gain	0–34 dB
Gain	0–120 dB in 0.1 dB steps
Drive Voltage	0.5, 1, 2, 4, 8, and 16 VPP
Gates Output	2 per channel
Alarm Outputs	2 total, TTL levels, one per input One LED on instrument face, audio through Bluetooth (headset protocol)
Operating Temperature	-20 to 55°C
Storage	8 GB SSD
Connectivity	Wi-Fi; 6 Bluetooth channels
Dimensions	2.5 kg without modules; 295 mm x 230 mm x 60 mm 2.9 kg with 2-probe connector module and connectivity module
Image Formats	BMP, JPG
Video Formats	MPEG 4, Type 10

Workflow-On-Device



Workflow Launcher



Workflow Description



Equipment Used



Picture/Video Instruction



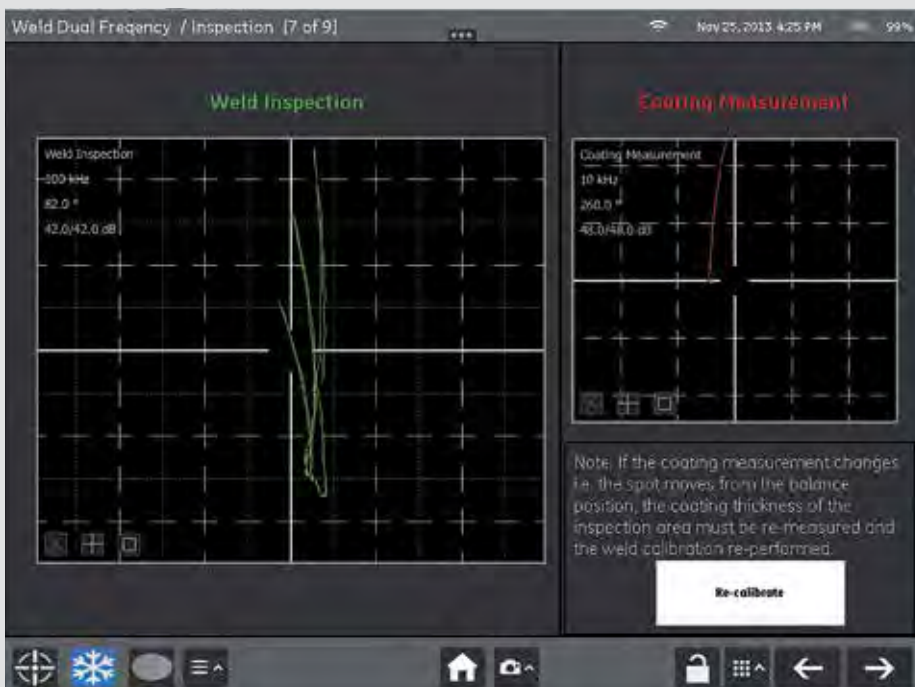
Calibrate for Weld



Calibrate for Paint Layer

Instantly Collaborate and Access Information

- Connect to local network to share data and collaborate remotely with experts in real time
- Immediately download the most up-to-date procedures and workflows
- Bluetooth enabled



Perform Inspection

Mentor Create Software

- Tailor on-device inspection workflow applications for technicians of all levels
- Aid inspectors by placing photos, procedures, and videos on device for reference while setting up, acquiring data, or analyzing data
- Limit range of adjustments available to the operator; and therefore limit the opportunity to make errors
- Use in “Expert Mode” as well as “Workflow-on-Device” mode



Weld Probes for All Use Conditions

Straight Probes		Frequency	Cable Length		Disconnect
7/32" Straight		450 kHz–2.5 MHz	6"	632-267-002	Probe
			12"	632-267-012	
3/8" Straight		60 kHz–1.2 MHz	6"	632-266-002	632-266-008
			12"	632-266-012	
5/8" Straight		60 kHz–700 kHz	6"	632-265-002	632-266-009
			12"	632-265-012	
90° Tipped Probes					
7/32" inline, 1/4" drop		450 kHz–2.5 MHz	6"	632-267-102	632-267-108
			12"	632-267-112	
3/8" inline, 1/4" drop		60 kHz–1.2 MHz	6"	632-266-102	632-266-108
			12"	632-266-112	
5/8" inline, 1/4" drop		60 kHz–700 kHz	6"	632-265-102	
			12"	632-265-112	
5/8" 90°, 1/4" drop		60 kHz–700 kHz	6"	632-265-102	
			12"	632-265-112	
High-Wear Straight Probes					
3/8" High-wear (ceramic tip)		60 kHz–1.2 MHz			632-266-011
5/8" High-wear (ceramic tip)		60 kHz–700 kHz	6"	632-265-003	632-265-011
5/8" High-wear (SST)		60 kHz–700 kHz			632-265-018
High-Temperature Probes					
5/8" Straight Handle Length 6"		60 kHz–700 kHz			632-265-008

Complete Line of Wide-Frequency Probes

Standard, high-wear, high-temperature, and cableized models for all job requirements



Straight

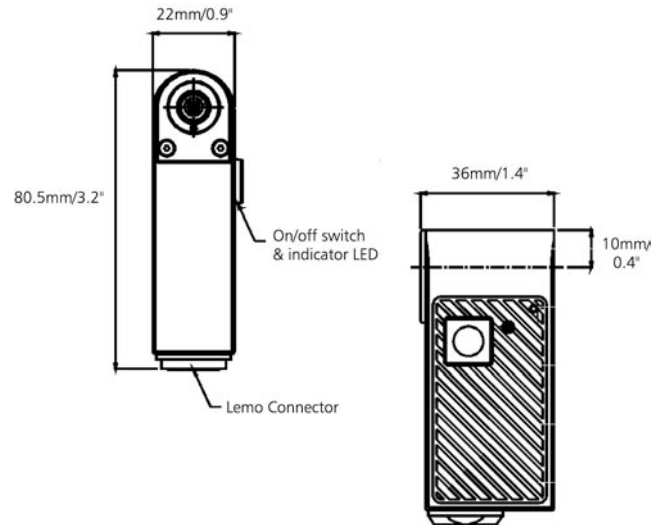


90° Inline Tip



90° Right Angle Tip

Hocking MiniDrive Lightweight Rotating Probe Drive



Flexibility

The GE Hocking MiniDrive is a small, lightweight, rotating eddy current probe drive. It has been designed to make the inspection of fastener holes in confined spaces simple and accurate. Its lightweight design (only 150 g/5 oz) prevents fatigue when a large number of fastener holes need to be inspected.

The MiniDrive utilizes a rotary transformer to allow transference of signals between the instrument and probe. Probe type used is generally a reflection differential.

Operating at a range of speeds from 600 rpm to 3000 rpm, over a frequency range of 200 kHz to 2.5 kHz, the MiniDrive offers the flexibility needed to satisfy a wide range of inspection requirements.

Compatibility

The MiniDrive is compatible with the following Hocking instruments:

- Phasec 2200
- Phasec D62 and D62s
- Phasec 2s
- Phasec 2d

It can also be used with a range of eddy current instrument made by other manufacturers providing the correct adapter and cable is used.

Specifications

Weight:

150 g (5 oz)

Power:

Supplied by instrument

Dimensions:

82 x 22 x 36 mm
3.2 x 0.9 x 1.4"

Clearance:

11 mm/0.4" (Distance from top of case to centre of probe)

Speeds:

600, 1000, 1500, 2200, 3000 rpm

Motor:

12 V



SIGMACHECK

FULLY FEATURED EDDY CURRENT CONDUCTIVITY METER



SIGMACHECK

APPLICATIONS

- Material Verification / Metal Sorting.
- Heat Treatment Verification.
- Heat or Fire Damage Investigation.
- Non-conductive Coating Thickness Measurement.
- Determining the Purity Composition of Materials. I.e. Gold Bullion and Coins, Bar Stock.
- Aircraft Structures. E.g. Paint Thickness Measurement
- Assessment of Ageing of Aluminium Profiles.

The SIGMACHECK Eddy Current Conductivity Meter is designed to give accurate conductivity measurements while offering the user the very best in reliability, usability, technology and cost-effectiveness.

The SIGMACHECK is extremely user friendly and can just as easily be operated by a semi-skilled Operator as by Experts. It will be equally at home in the Aerospace, Metals Processing, Casting, Maintenance and Quality Assurance industries as well as appealing to Heat Treatment Specialists and those determining the purity of materials such as gold bullion and coins.

1:1 IMAGE

SIGMACHECK

This image shows the SIGMACHECK at its actual size.





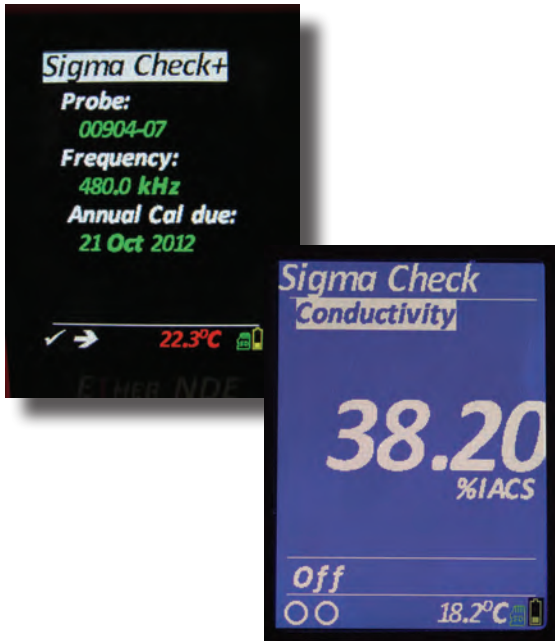
ADVANTAGES

- High Resolution Colour Display (2.8", 320 pixels by 240 pixels).
- Accurate Conductivity Range (0.5% IACS to 110% IACS, 0.28-64 MS/m).
- Wide range of Frequencies for testing thin materials (60kHz, 120kHz, 240kHz, 480kHz). Option of 960kHz.
- Non-conductive Coating Thickness Measurement display up to 0.5mm.
- Lightweight (350 grams / 12 oz). Ergonomic Slim-Line Case design and easy to hold Probe with adjustable finger-grip.
- Two-Year Warranty on Instrument (excludes batteries).

KEY BENEFITS

- User programmable display.
- 2GB of data storage. Able to store over one million data points.
- Uploaded data can be viewed using MS Excel.
- Intelligent charger via USB Port or AC Supply.
- Multiple languages available. E.g. English, German, French, Spanish.
- Excellent resistance to "edge effect".
- Rapid Display of Conductivity Results.
- Battery life (upto 6 hours).
- Firmware can be upgraded in field.
- Different probes may be configured by loading the appropriate probe map from SD Card.
- Real-time clock for time and date so that readings can be "stamped".
- Real-time PC control via USB or optional RS232 link.

SIGMACHECK



HIGH RESOLUTION DISPLAY

The full colour 2.8" LCD display screen is 320 x 240 pixels providing excellent resolution and displaying conductivity and lift-off results with up to three decimal places precision. The display features an adjustable LED backlight allowing the Operator to set their required screen brightness. The Operator can also customise both the background colours and text colours to meet their personal preference.

RAPID DISPLAY OF CONDUCTIVITY RESULTS

The SIGMACHECK offers a choice of five frequencies (60, 120, 240, 480 and 960kHz) to allow the testing of a wide range of material thicknesses. The SIGMACHECK is noted for rapid display of conductivity results.

EXCELLENT DATA REPORTING AND BATTERY LIFE

ETher NDE also offer Field Exchangeable Probes with their configuration provided via micro SD Card or PC download via USB for the SIGMACHECK. This removes the need for the Instrument to be sent back for matching with the Probe. By using a card reader or our PC Software, the new data for the Probe can simply be copied onto the SD Card in the Instrument, speeding up this process even further.

USB PC Connectivity is built into the SIGMACHECK for remote control and data logging. The USB Connection also offers real time data acquisition as well as eliminating any complicated driver installation. In addition, the USB Connection allows easy charging of the Instrument without having to swap the batteries.

LIGHTWEIGHT AND ERGONOMICALLY DESIGNED

Weighing 350 grams (0.77 pounds) including batteries and measuring 163mm Long, 80mm Wide and 25mm Deep, the SIGMACHECK is compact and extremely lightweight. Housed in a sculpted case with a detachable flexible open-faced removable silicon rubber boot, the SIGMACHECK is designed to be fully hand-held. Further, the standard Probe has been designed to fit the hand well. Not only is the SIGMACHECK very accurate, its ergonomic design makes it a delight to use.



Electrical conductivity is the measurement of a materials ability to conduct an electric current. This is the inverse of electrical resistivity, measuring a materials ability to resist an electric current.

Conductivity in metal is established using Ohm's Law, which states that current through a conductor between two points, is directly proportional to the potential difference across the two points. The resistance of the material, which is a constant for that material, allows the usual mathematical equation for this relationship to be true.

Ohms Law Equation:

$$I = \frac{V}{R}$$

I = Current (Amps)
V = Voltage (Volts)
R = Resistivity (ohms)

Electrical Conductivity Equation:

$$\sigma = \frac{l}{RA}$$

l = length (cm)
A = Area (cm²)
R = Electrical Resistance of a uniform specimen of the material (ohms)
 σ = Conductivity (ohm⁻¹ cm⁻¹)

OR

$$R = \frac{l}{\sigma A}$$

Conductivity Test Block Holder.

Holds 5 Conductivity Test Blocks and 1 Dual Conductivity Reference Standard (Part number: ASIG003).



Conductivity is widely used to indicate material type and determine the state of heat treatment.

In order to give accurate readings the SIGMACHECK uses a three-point reference method. The first measurement with the probe in the air and then two further measurements are required which span the range of interest.

The SIGMACHECK is supplied with a detachable reference piece with two standards that span the range of commonly used metals.

ETher NDE also manufacture individual conductivity test blocks which may be used to match the clients own testing requirements. We can also provide a handy test block holder that can house up to five of these test blocks at any one time as shown above.

SIGMACHECK

STANDARD KIT

Detachable, Durable Rubber Boot with Useful Belt Strap.

Calibration Blocks.

Mains Charger.

Detachable Back Stand.

Ergonomically Designed Probe.



OPTIONAL EXTRAS AVAILABLE

High-quality rugged transit case.



Small Probe (7mm) available.

Inspection Technology	Eddy Current.
Operating Frequencies	60 kHz, 120 kHz, 240 kHz, 480 kHz, 960 kHz.
Conductivity Range	0.5 % IACS to 110 % IACS, 0.28-64 MS/m
Accuracy	At 20 °C. At 10 % IACS: ± 0.1 % IACS. At 100 % IACS: ± 0.5 % IACS Over Range 0-40°C: At 10% IACS: ± 0.2 % IACS. At 100% IACS: ± 0.8 % IACS Probe in thermal equilibrium with metal.
Display Resolution	Up to 3 decimal places
Lift Off	13 mm probe compensated to 0.020" (0.5mm) 7 mm probe compensated to 0.010" (0.25 mm)
Temperature Measurement	In-probe sensor (accurate to 0.5 °C) Range 0 °C to + 50 °C
Automatic Temperature Compensation	Conductivity measurements are corrected to the 20°C value.
Environmental Range	0 to 95% relative humidity, 0°C to + 50°C for reliable operation
Display	2.8" (70mm) 320 x 240 pixels colour display. LCD with selectable backlight.
Construction & Storage	High impact, splash-proof, moulded UL94-5VA flame-retardant ABS case. Protective rubber boot to protect the unit, probes, probe cable, operator manual on USB, and removable stand.
Conductivity Standards	On top of unit. Removable for value verification, and when attached ensures thermal equilibrium.
Power	2 x 1.5 V AA NiMH Batteries, Approx up to 6 hrs life. Can also use non-rechargeable AA cells.
Size	163mm Long x 80mm Wide x 25mm Deep
Weight	350g (0.77 pounds) including batteries
Data Logger Memory	Removable 2GB micro SD Card allowing over 1 million readings to be stored.
PC Connectivity	USB port for charger and PC communications
Probes	12.7 mm diameter for 60 kHz to 480 kHz. 7 mm probe operates at 480 kHz & 960 kHz. Probes are interchangeable with simple operator resetting procedure. Probes are field exchangeable and do not require return to manufacturer for calibration.
Accessories	Settings Reference Blocks - A range of conductivity references standards traceable to US and European standards are available for in-field use. Up to five can be mounted on an aluminium anodised holding plate.

PRODUCT PART NUMBERS

KISIG001: Kit, Instrument, SIGMACHECK Conductivity Meter.

ASIG001: Accessory, Dual Conductivity Reference Standards, Nominal Values 2.5% and 102% IACS (SIGMACHECK).

ASIG002: Accessory, Instrument Stand (SIGMACHECK).

ASIG004: Accessory. Hard Peli 1400 Case with custom shaped foam inserts (SIGMACHECK).

PSIG001: Probe, Conductivity, Dia 13.00mm, Straight, Lemo 5-Way (SIGMACHECK).

ALL05-L05-012-SIG: Accessory, Lead, 5-Way Lemo to 5-Way Lemo, 1.2m (SIGMACHECK).

PSIG002: Probe, Conductivity, Dia 7.00mm, Straight, Lemo 5-Way (SIGMACHECK)

EDDY CURRENT FLAW DETECTORS

AEROCHECK SINGLE FREQUENCY

AEROCHECK+ DUAL FREQUENCY



AEROCHECK - SINGLE FREQUENCY



AEROCHECK+ - DUAL FREQUENCY PLUS

- Large, Crisp Daylight Readable Display
- User Friendly Interface and Ergonomic Lightweight Design
- Rotary Capabilities As Standard
- Industry Standard Probe Connectors
- Eight Hour Battery Life
- Rapid 2.5 hour charging time
- Two-Year Warranty
- Advanced Features 'Loop', 'Guides' and 'Auto-mix' (AEROCHECK+ only)

AEROCHECK AEROCHECK+

“ The AEROCHECK Flaw Detector offers the very best in Eddy Current performance with rotary inspection capabilities as standard. ”

INDUSTRY STANDARD PROBE CONNECTORS

The AEROCHECK is able to use a wide range of eddy current probes meeting all the needs of the Aerospace Eddy Current Inspector. Absolute, bridge and reflection connected probes can use the industry standard 12 Way LEMO Connector and a LEMO 00 Connector is also provided for simpler connection of absolute probes.

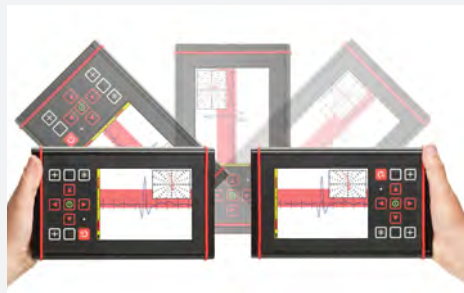


WIDE FREQUENCY RANGE

The single frequency AEROCHECK has a frequency range of 20Hz to 20MHz, whereas the dual frequency AEROCHECK+ offers 10Hz -12.8MHz, ensuring a diverse range of real world applications can be met.

Area of Inspection: Fasteners
Probe: Low Frequency, Slider

WORKS THE WAY YOU DO!



The AEROCHECK has the ability to work in left and right-handed mode; thanks to the “Auto Flip” function. This is not only helpful for left-handed

technicians but especially useful if the operator is inspecting in a restricted area like the Engine Mounts.

Area of Inspection: Engine Mounts
Probe: Surface



Window Frames
Probe: High & Low
Frequency, Rotary

Engine Blades & Discs
Probe: High Frequency

Area of Inspection: Wing Surface & Hinges
Probe: High & Low Frequency

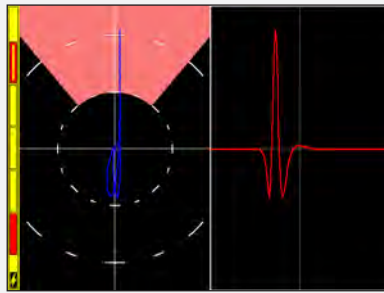
LIGHTWEIGHT, RUGGED, “SURE GRIP” & ENHANCED PROTECTION

Weighing just 1.2kg (2.7lbs), housed in a tough aluminium alloy Mg Si 0.5 powder-coated outer case and fitted with rubber feet to aid grip, the AEROCHECK is as stable on a wing of an aircraft as it is on a laboratory bench.

Both Instruments have two integrated moulded “Sure Grip” handles on the rear of the case.

The AEROCHECK+ has enhanced durability through a fully-fitted, custom-designed outer “protective boot” and integral hand-strap for even greater ruggedness and easier grip in use (this is an Option on AEROCHECK).





ROTARY CAPABILITIES AS STANDARD

The AEROCHECK includes rotary capabilities as standard and can be used with the ETHER Mercury (mini) ARD002, Hocking 33A100 or the Rohmann MR3/SR1 and SR2 Drives (with special adapter cable).

Area of Inspection: Door Access Points & Window Frames

Probe: Rotary

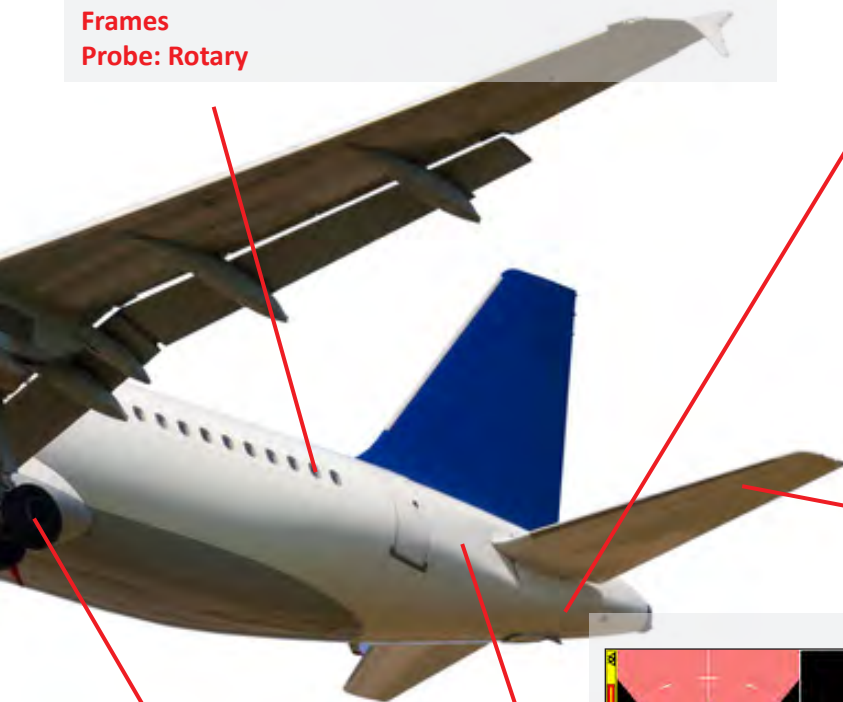
DAYLIGHT READABLE, CLEAR, LARGE, CONFIGURABLE COLOUR SCREEN

The AEROCHECK has a large 14.5cm (5.7 Inches) LCD Colour Screen of 640 x 480 pixels providing the Operator with excellent signal resolution and presentation and with the choice of configuring their own colour schemes and display types. It is easy to optimise the screen presentation regardless of the light conditions and it is possible to view a choice of up to two spot, time-base, waterfall or meter display types.

Not all NDT inspection on aircraft takes place in the comfort of an aircraft hangar so the daylight readable display is readily viewable outdoors.

Area of Inspection: Bulkhead

Probe: Low Frequency

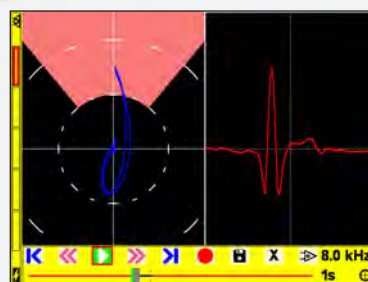


Area of Inspection: Horizontal Stabilisers

Probe: High & Low Frequency

Wheels, Wheel Brakes, Landing Gear

Probe: High Frequency, Rotary



RECORD AND REPLAY

Up to 164 seconds of live data may be recorded in real-time and then played back either on the instrument or on a PC. Using the desktop application ETHERAnalyser for subsequent analysis and review. The recorded data may be further optimised by adjusting many settings including phase, gain, filters, display and spot position.

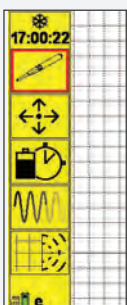
Area of Inspection: Fuselage

Probe: Surface & Sub-Surface

EASY TO USE MENU & ICON SYSTEM

The AEROCHECK menu system is simple and fast to navigate with the ability to add individually selectable soft key menu items to the sidebar as recognisable icons for rapid function access and a quick setting menu for easy set-up, review and adjustment.

With four operator-selectable soft keys and a fifth slot for the last menu function used, Technicians can quickly set up the system with their preferences. Each saved instrument setting can be associated with a unique, single press set of quick access soft keys. There are also two front panel hard keys that can be readily programmed for rapid single press access to frequently used functions.



Both the AEROCHECK and AEROCHECK+ are supplied with a standard "Two-Year Manufacturers Warranty". This covers all components of the Instruments and only excludes customer damage or misuse.

The "Two-Year Warranty" can be extended to "Five Years" through purchase of "ETHERCover" extended warranty protection.

SPECIFICATIONS

		AEROCHECK	AEROCHECK+
Probe	Connectors	12 Way Lemo 2b (Absolute, Bridge and Reflection) and Connection Lemo 00 (for single element absolute probes).	Simultaneous probe operation possible using Lemo 12 way and Lemo 00.
	Rotary	600-3000 rpm - ETher Mercury Drive (ADR002), Hocking 33A100, Rohmann MR3, SR1 and SR2 Drive (special adapter needed)	
Frequency		Single Freq. = 20Hz – 20MHz with range variable resolution.	Dual Freq. = 10Hz - 12.8MHz
Gain	Overall Input Drive	-18 to + 100 dB, 0.1, 1 and 6dB steps (100dB maximum) 0dB or 12dB	
	Max X/Y Ratio	0dB or 6dB (0dB reference 1mW into 50 ohm).	0dB, 6dB and 10dB (0dB reference 1mW into 50 ohm). +/-100.0 dB
Phase	Range	0.0-359.9°, 0.1° steps	
	Auto Phase	Allows phase angle to be automatically set to a pre set angle	
Filters	Normal High Pass	DC to 2kHz or Low Pass Filter, which ever is the lower in 1 Hz steps. Plus variable adaptive balance drift compensation 0.01 - 0.5 Hz (6 steps).	
	Normal Low Pass	1Hz to 2kHz or a quarter of the lowest test frequency, which ever is lower in 1 Hz steps.	
Balance	Manual	14 internal balance loads; 2.2µH, 5.0µH, 6.0µH, 6.5µH, 7.0µH, 7.5µH, 8.2µH, 12µH, 15µH, 18µH, 22µH, 30µH, 47µH, 82µH	
	Automatic	Optimised balance load selection.	
Alarms	Box	Fully configurable, Freeze, Tone or visual.	
	Sector Output	Fully configurable, Freeze, Tone or visual. Open collector transistor (50v dc at 10mA max) available on 12 way lemo.	
Display	Type	5.7" (145mm), 18 bit Colour, daylight readable.	
	Viewable Area	115.2mm (Horizontal) x 86.4mm (Vertical)	
	Resolution	640 x 480 pixels	
	Flip	Manual or automatic screen orientation change to enable left or right handed use.	
	Colour Schemes	User configurable Dark, Bright and Black & White	
	Configurable Screen	Full Screen, Single, Dual Spot or Dual Pane with variable size and location and function e.g. XY, Timebase, Waterfall and Meter.	
	Display Modes	Spot, Time base (0.1-20 seconds x 1-200 sweeps and up to 55 seconds), Waterfall and Meter with peak hold and % readout.	
Graticules		None, Grid (4 sizes 5, 10, 15 and 20% FSH), Polar (4 sizes 5, 10, 15 and 20% FSH)	
	Offset	Spot Position: Y = -50 to +50, X = -65 to +65%	
	Digital Spot	Display in X,Y or R,θ	
Position Readout		Display of all settings in Legacy Format	
	Summary		
Removable Data Storage	Setup Storage	microSD up to 2GB, holding over 500 saves.	micro SD up to 32GB, holding over 10,000 settings)
	Stored Screen Shots	microSD up to 2GB, holding over 500 saves.	micro SD up to 32GB, holding over 10,000 screen shots)
	Record Replay	Comprehensive Record Replay and Storage Real-time recording of trace data and Replay on instruments and desktop PC up to 164 seconds	
Outputs	PC Connectivity	USB (Full PC remote control plus Real Time data)	
	Digital volt free alarm	On Lemo 12 way Open collector transistor (36v dc at 10mA max).	
	VGA	Full 15 way VGA output	
Languages		English, French, Spanish, Russian, Japanese, Chinese, Turkish.	
Verification Level		The system includes on delivery a 2 year validity Verification Level 2 detailed functional check and calibration as per ISO 15548-1:2013	
Power on Self Test		The system performs a self test on start up of external ram, sd ram, accelerometer, Micro SD card, LCD screen buffer.	
Power	External Battery	100-240 v 50-60Hz 30 Watts	
	Running Time	Internal 7.2V nominal @ 3100mAh = 22.32 watt.hr Up to 8 hours with a 2MHz Pencil Probe 30% Back Light and up to 6 hours with a Rotary Drive at 3000rpm 50% duty cycle.	
	Charging Time	2.5 hrs. charge time, Simultaneous charge and operation.	
Physical	Weight	1.2 kg, 2.7 lbs.	
	Size (w x h x d)	223 x 141 x 50 mm / 8.8 x 5.6 x 2.0 inches	237.5mm x 144mm x 52mm / 9.4" x 5.7" x 2.1"
	Material	Aluminium alloy Mg Si 0.5 powder-coated	
	Operating Temp	-20 to +60 °C	
Storage Temp	Storage for up to 12 months -20 to +35 °C Nominal +20 °C		
IP Rating	54		

AEROCHECK+ ADVANCED FEATURES

Advanced Features	Guides	Create and display a slide show containing instructions, tutorials and procedures using Microsoft PowerPoint.
	Attachments	Screenshots and Data Recordings are saved in a folder with the name of the Settings.
	Loop	Capture a live repetitive signal and then optimise the instrument settings (Phase, Gain, Filters) to simplify optimising the parameters
	Trace	Allows a calibration reference signal to be stored on the screen and then compared with the live signal
	Data Output	6 channel real-time post processed over USB at 8kHz overall for all 3 data pairs (X, Y and Mix) with DLL for embedding functionality into software.

CONDUCTIVITY SPECIFICATION (AEROCHECK+ ONLY)

Frequency	One frequency only 60kHz standard (choice of 120, 240 and 480kHz)
Accuracy	0.5%-10% IACS better than +/-0.05% IACS 10%-25% IACS better than +/-0.25% IACS 25%-60% IACS better than +/-0.5% IACS 60%-110% IACS better than +/-1% IACS Lift Off corrected to 1.0mm No temperature compensation All Errors at 90% Confidence Level
Resolution	3 decimal points max Auto Resolution Mode AutoS = Legacy Instrument, Auto = SigmaCheck

EQUIPMENT KITS

STANDARD AEROCHECK SERIES KIT

IAER001 Instrument, AeroCheck, Single Frequency (20Hz-20MHz), Hand Held Portable Flaw Detector, Software + Manual on USB Stick
AWEL002 AeroCheck, Power Adapter + Input Plugs (UK, EU, US & Australia)
AWEL003 Adjustable Shoulder Strap, Padded with Quick-Release
AC006 Instrument Soft Carry Case
A090 USB Cable, A to MIN B
40449 Quick Reference Card – AeroCheck
ALLCX-M02-015A Lead, Lemo 00 to Microdot, 1.5m (Absolute)
ALL12-L04-015R Lead, Lemo 12-Way - Lemo 4-Way (Reflection)

OPTIONAL ACCESSORIES

AWEL004 Hard Transit Case
AWEL005 Protective Splash Proof Cover / Rope Access (AEROCHECK only)
AWEL006 External, 8 x AA Battery Holder with On/Off Switch
AWEL007 Wrist Strap
AWEL008 In car Power Adapter
ALL12-L04-015R Lead, Lemo 12-Way - Lemo 4-Way, 1.5m (Reflection)
ALL12-L04-015B Lead, Lemo 12-Way - Lemo 4-Way, 1.5m (Bridge)
ALLCX-M02-015A Lead, Lemo 00 to Microdot, 1.5m (Absolute)
ALLCX-B02-015A Lead, Lemo 00 to BNC, 1.5m (Absolute)
ARD002 Mercury (mini) Rotary Drive
ALL12-L12-020M Lead to connect Mercury (mini - ARD002) Rotary Drive, Lemo 12-Way, 2m
ALL12-F08-020ETH Adapter, lead to connect Rohmann Rotary Drive MR3, SR1 and SR2, Lemo 12-Way, 2m.
40470 Tripod Bracket To fit 1/4" Camera Tripod Mount with Male Screw
AAER003 Enhanced protection kit with hand strap(AEROCHECK+ only)
A244 Hand Strap for Enhanced Protection Kit (AEROCHECK+ only)

PROBE KITS

KASUR001 KIT Surface Inspection (4 probes, lead and Al and Fe Test Block)
KASUBS001 KIT Sub Surface Inspection, Low Frequency (2 probes, lead and test piece)
KAROT001 KIT Mercury Rotary Drive and Cable Only
KACON001 KIT Conductivity Kit (Probe, Calibration and Cable) - (AEROCHECK+ only)



AEROCHECK AEROCHECK+

“ The AEROCHECK offers the right mix for features for any Eddy Current application need in an easy-to-use package designed entirely with the end user in mind. ”

ALL POSSIBLE APPLICATIONS COVERED!

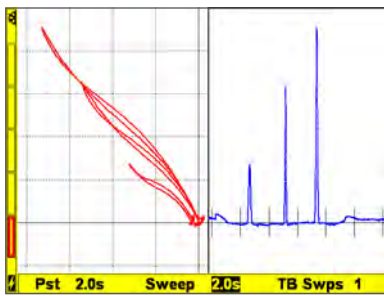
The AEROCHECK and AEROCHECK+ offers maximum flexibility when deciding which features are needed for your application. As well as the hand-held WELDCHECK, AEROCHECK and AEROCHECK+ instruments, the range also includes the VICTOR 2.2D for inline component testing solutions.

KEY DIFFERENCES

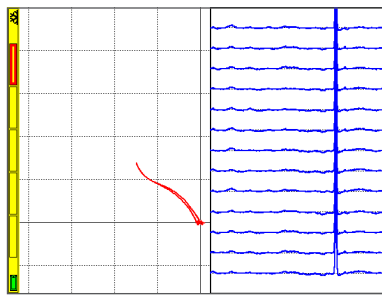
EQUIPMENT	FEATURES								
	ROTARY	DATA RECORDING	DUAL FREQUENCY WITH AUTO-MIX	CONDUCTIVITY	GUIDES	LOOP	TRACE	ENHANCED PROTECTION	FREQUENCY
AEROCHECK	●	●						✳	20Hz-20MHz
AEROCHECK+	●	●	●	●	●	●	●	●	10Hz-12.8MHz

● = As Standard ✳ = Optional Extra

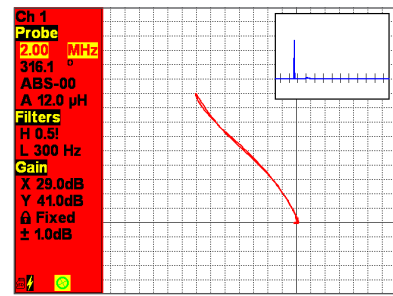
EXCEPTIONAL SCREEN CLARITY FOR ANY APPLICATION



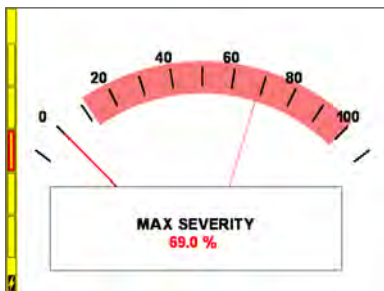
50/50 XY & Timebase



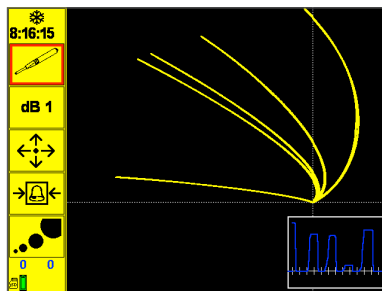
50/50 XY Waterfall with 12 2s time sweeps



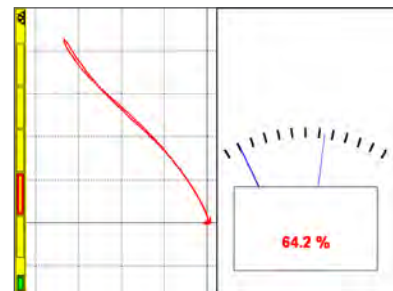
XY with small timebase and Quick Menu



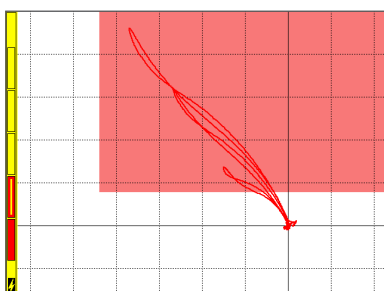
Meter Full Screen



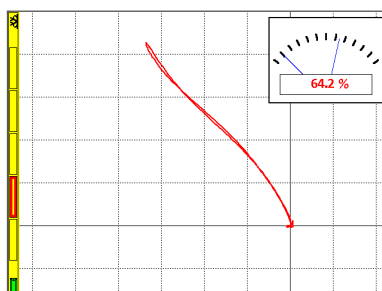
Dark background polar graticule and soft-keys



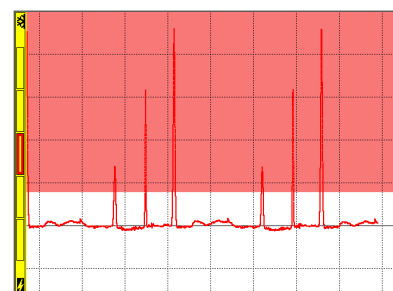
XY and Meter 50/50



XY Full screen with Box Alarm



XY with Small Meter



Timebase Full Screen with level arm

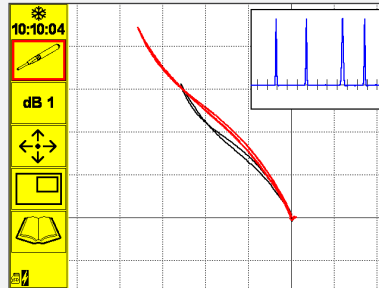
“ The AEROCHECK+ offers all the great features of the AEROCHECK plus Dual Frequency and Conductivity Measurement, with useful additions such as Auto-Mix, Guides, Loop and Trace. ”

ADDITIONAL FEATURES AVAILABLE ON THE AEROCHECK+



GUIDES FEATURE: “Guides”, allows the user to display a slide show that can be created easily with commonly used desktop software. The benefit of this

feature is that instructions, tutorials and procedures for an inspection can be added to the AEROCHECK+ very quickly and the NDT inspector can easily switch between the inspection itself and the “Guides” while performing a live test.

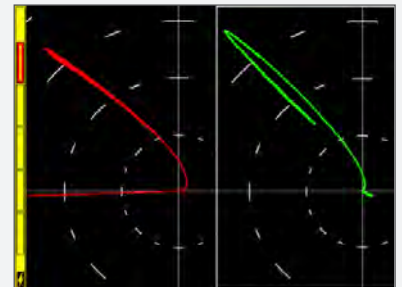


TRACE FEATURE: The trace function allows a reference waveform to be stored on the screen and appears along with the live spot. This allows the operator to readily compare the live data with the reference calibration.

“LOOP” FEATURE: “Loop” is a convenient way of capturing a short live repetitive signal and then optimizing the instrument settings through real time adjustments of the Phase, Gain, Balance, Filters and Display Configuration in order to simplify the task of optimising the parameters.

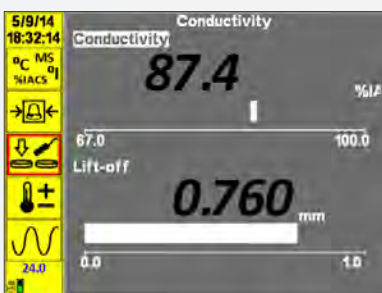
The “Loop” function is excellent for calibration set up especially for setting the filters for Rotary and Dual Frequency mix.

DUAL FREQUENCY FEATURE: At different frequencies, different signal indications (e.g. lift off and defect) have a different relative phase and amplitude response. By means of phase rotation and Gain change of the X Y signal components one of these indications can be manipulated to be almost identical in phase and amplitude as the other and then by subtraction (mixing), the unwanted component is minimised, giving an improved detection of the wanted signal.



AUTO-MIX FEATURE: A dual frequency mix exploits the phase and sensitivity change between two different types of indication to suppress one and enhance the other.

Auto-mix simplifies the sometimes complex procedure of mixing two different frequency signals and can be achieved on the AEROCHECK+ through a series of easy steps. Ultimately once set up, the Auto-mix itself is as simple as pressing one key.



CONDUCTIVITY MEASUREMENT: Many of the Aerospace procedures require that Conductivity Measurement is available on the designated Eddy Current Flaw Detector.

When connecting the Conductivity Probe, the AEROCHECK+ auto-detects the probe and seamlessly switches into conductivity mode. Removal of the probe switches the instrument back to flaw detection mode.

NB: The Conductivity Measurement Option is available through the purchase of the KACON001 KIT.

VEESCAN

EC WHEEL INSPECTION SYSTEMS



“ Our VEESCAN product range offers our clients the choice of systems for both optimised productivity and value for money or maximum flexibility combined with lowest capital cost. ” John Hansen, MD



ETHER NDE is pleased to offer a range of solutions for aircraft wheel inspection. We understand that the key criteria for Aircraft Wheel Inspection Systems are the need to guarantee detection of defects, the requirement to operate reliably for twenty-four hours per day, 365 days per year, the demand for a simple and user-friendly interface and the business need to maximize speed of inspection and output. Balancing these objectives can be difficult, but we believe the VEESCAN measures up to the task.

The VEESCAN is available in a choice of models and can be configured with a wide choice of probes. This allows any Wheel Shop to select the system most compatible with their workload. The “Model H” is a proven design allowing maximum flexibility, while the “Model R” (Rapid) offers the potential for greater throughput due to the incorporation of the special WideScan probe with a scanning helix of 5mm.

CUSTOMER BENEFITS:

- Proven mechanical design with established record of breakdown-free operation for 365 days or more.
- Choice of two probe configurations: “Model H” or “Model R” (Rapid) offering choice of maximum flexibility or optimised productivity.
- Adjustable-height Control Station on “Model H” - Allows Operator the most flexible and comfortable usage.
- Full choice of Operation Modes maximising Probability of Detection.
- Easy to operate with basic training.
- Easy to service - Manufactured from heavy-duty aluminum extrusion and incorporating standard readily available branded control and automation products.
- Intuitive set-up - A “teach and learn” system allows the machine to be trained to inspect a wheel, then manually adjust values to fine tune the setup and then save the setup for similar / the same wheels in the future.
- Versatile - the VeeScan has been designed to test the widest range of Aircraft Wheels from Helicopter Nose Wheels to A380 Main Wheels.
- Rapid and Reliable - Automated inspection allows the wheel to be inspected much more quickly than for a manual inspection whilst ensuring the required area of inspection is scanned 100%.
- Reporting - The fully digital reporting system archives the data for analysis and review either on the VEESCAN itself or remotely over a network. A simple 1 page A4 report may be saved and printed.
- Safety - A separate control plinth with dual push button activated start means the operator is not near the rotating wheel during the test. Both the “Model H” and “Model R” versions use systems of Wheel Clamping that are proven in the field over extended periods of time.

VEESCAN H is designed to lift the wheel and fix it with an automatic adaptor that uses the wheel inertia to centre it. VEESCAN H offers an integrated roller tray for easy manoeuvrability and integration into a conveyor system and also features an automatic hub size adaptor. VEESCAN H can test wheels up to 900mm diameter.

The H is designed with an adjustable-height Control Panel for operator comfort and can be positioned at a convenient distance from the main machine. Open on three sides, the VEESCAN H offers easy wheel loading as standard.

A circular absolute probe is positioned perpendicular to the surface to ensure uniform sensitivity regardless of wheel surface profile as the probe progresses through the wheel bead seat area. Recommended frequency is 200kHz.



MAIN CHARACTERISTICS OF MODEL H

- Extruded aluminium structure covered with black Perspex panels.
- Separate Control Panel that may be positioned at a convenient distance from the main machine, which is height and angle adjustable.
- Teflon rotating table with three open sides for easy wheel loading.
- Roller tray to facilitate the wheel movement.

Veescan Model H ISO with wheel in place



Veescan Model H with moveable control panel



Veescan Model H Control Panel

SPECIFICATION

Unit Size	112.5cm x 120cm x 95cm
Instrument	ViCTor 1 Channel WI
Probe	Differentially connected absolute (integral balance load) with circular head. Recommended Frequency 200kHz option 100kHz, 500kHz and 1.5 MHz. Recommended diameter 6mm (mm also available and narrow shaft for large wheels)
Max Wheel Diameter	900mm
Typical Inspection Helix	1.5mm
Probe Position	Adaptive contour following using dual axis pressure sensors
Max Wheel Height	400mm
Power Supplies	110- 240v ac 50/ 60Hz
Max Load	150Kg
Pneumatic Pressure	None (electric wheel raise) 250mm stroke
Alarms	Acoustic and visual
Rotation Speed	15-120 rpm, via surface speed control eg 250mm/s
Frame	Extruded Aluminium
Wheel Position	The wheel is lifted clear of the roller tray using a 250mm stroke electric actuator and then held under its own weight by an adaptive automatic grip mechanism
Data Recording and Storage	Yes
Manual Hand-Held Inspection	Yes, probe socket and switch on control station
Automatic Calibration	Yes, by means of dynamic standard option
Automatic Stop on Defect	Yes
Turntable	Roller Tray / Outer stainless steel, inner plastic. Easily adjustable end stops at both ends to prevent wheel falling off.
Control Station	External free standing. Height adjustable with machine and eddy current control. 7" screen. Use Uses virtual keyboard. Touch Pad 750 - 900mm adjustable.
Operation Modes	Automatic, Stop on defect and full manual



The VEESCAN R clamps the wheel with a pneumatic cylinder. With pneumatic control and electronics incorporated within the frame it allows access to the rotating table from three open sides. On the rotating table, three rollers assist the wheel movement. It is designed to be used with probes with both high and low inspection frequencies simultaneously.

The R is easily adaptable for use with the eddy current instrument plus an auxiliary computer for data storage and further evaluation.

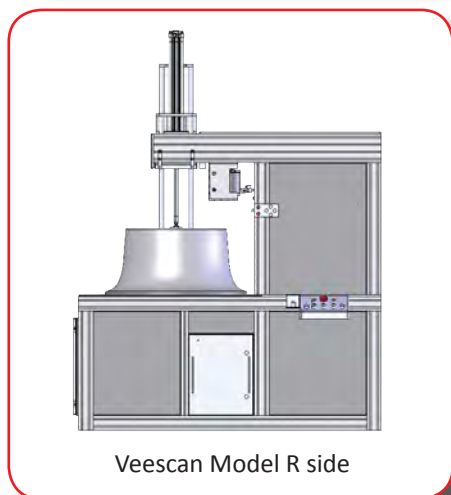
The Model R is manufactured in two sizes to accommodate two different wheel size categories; for wheels under 600mm in diameter and for wheels under 900mm in diameter.

MAIN CHARACTERISTICS OF MODEL R

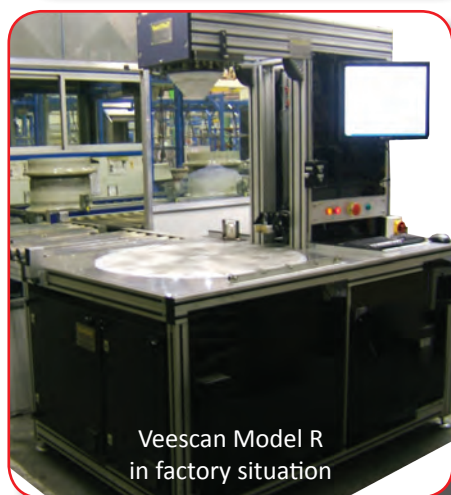
- Extruded aluminium structure and outer black Perspex panels.
- Compact design with pneumatic control and electronics fitted in a frame with complete access to the rotating table from three open sides.
- The control/handling post can be installed on the lateral sides or on the front side.
- Rotating table with three rollers to help wheels to move from the three open sides.
- Four bar guided wheel-centring device with removable Teflon cone (standard size) and stiffened support structure (horizontal) on top of the tower.
- Possibility to install encoders for vertical and turning movements in order to facilitate the synchronisation with software applications.
- Safety elements include two emergency stops (one fixed, the second free, positions to be fixed by the user), dual push button for safe activation of wheel centring movement and probe protection (emergency arm retraction).



Veescan Model R



Veescan Model R side



Veescan Model R in factory situation

SPECIFICATION

Unit Size	a) 85cm x 220cm x 145cm or b) 120cm x 230cm x145cm*
Instrument	ViCTor 1 Channel WI
Probe	Differential - High Frequency multi-purpose bead seat
Max Wheel Diameter	a) 600mm or b) 900mm*
Typical Inspection Helix	5mm
Probe Position	Touching the wheel
Max Wheel Height	400mm
Power Supplies	110 - 240V AC 50 / 60Hz
Max Load	150Kg
Pneumatic Pressure	40 - 150 psi
Alarms	Acoustic and visual
Rotation Speed	5 - 50 rpm
Frame	Extruded Aluminium
Wheel Position	The wheel is clamped against the turntable face during the inspection by a pneumatically actuated cone
Data Recording and Storage	Yes
Manual Hand-Held Inspection	Yes, probe socket and switch on control station
Automatic Calibration	Yes, by means of dynamic standard option
Automatic Stop on Defect	Yes
Turntable	Option - Spring loaded ball rollers on the rotating plate to allow the inspection of wheels in trays.
Control Station	Control panel, integrated with main unit
Operation Modes	Automatic, Stop on defect and manual

Please note:

*** highlights that a) represents Model R with 600mm max wheel diameter and b) represents Model R 900mm max wheel diameter.**

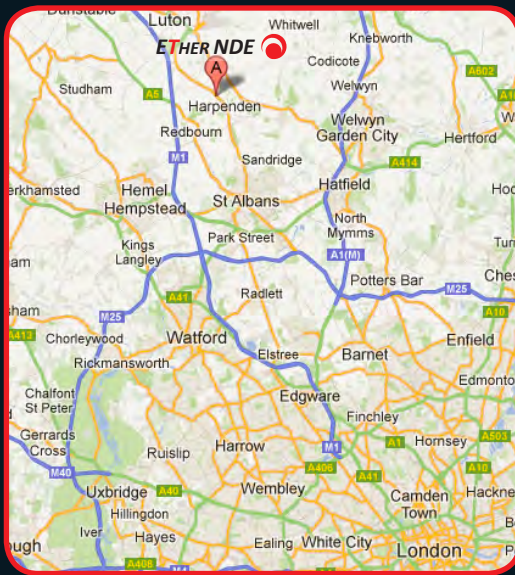
ETHER NDE continually strives to provide innovative solutions to eddy current testing in all possible inspection conditions.

Offering a range of innovative eddy current testing instruments and probes, **ETHER NDE** will endeavour to find the solution that best fits our clients specific needs.

At **ETHER NDE** we pride ourselves on our ability to remain client focussed, conducting our business with three simple promises to you:

1. The ability to speak to someone who understands our products and your application.
2. Industry leading delivery on goods and the ability to respond to your challenges.
3. That our products are second to none in both performance and quality.

Founded by John Hansen and Mike Reilly and supported by a skilled team, **ETHER NDE** boasts over 150 years of collective experience in non-destructive testing. Forward thinking and client responsive, **ETHER NDE** is the wise choice for all your eddy current testing needs.



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email: sales@ethernde.com

www.ethernde.com



PosiTector® 6000 Series

Coating Thickness Gages for
ALL Metal Substrates



Available on the
App Store



DeFelsko®

The Measure of Quality

PosiTector® 6000 Series

All Gages Feature...

Simple

- Ready to measure—no adjustment required for most applications
- Enhanced one-handed menu navigation
- Flashing display—ideal in a noisy environment
- RESET feature instantly restores factory settings

Durable

- Solvent, acid, oil, water and dust resistant—weatherproof
- Wear-resistant probe tip
- Shock-absorbing, protective rubber holster with belt clip
- Two year warranty on gage body AND probe

Accurate

- Certificate of Calibration showing traceability to NIST included
- Built-in temperature compensation ensures measurement accuracy
- Hi-RES mode increases displayed resolution for use on applications that require greater precision
- Conforms to national and international standards including ISO and ASTM

Versatile

- PosiTector body universally accepts all PosiTector 6000, 200, SPG, DPM and UTG probes easily converting from a coating thickness gage to a surface profile gage, dew point meter or ultrasonic wall thickness gage
- Multiple calibration adjustment options including 1 point, 2 point, known thickness, average zero
- Selectable display languages
- Hi Contrast backlit display for bright or dark environments
- Flip Display enables right-side-up viewing
- Extended cables available (up to 75 m/250 ft) for remote measuring
- Uses alkaline or rechargeable batteries (built-in charger)

Powerful

- Continually displays/updates average, standard deviation, min/max thickness and number of readings while measuring
- Screen Capture—save screen images for record keeping and review
- HiLo alarm audibly and visibly alerts when measurements exceed user-specified limits
- FAST mode—faster measurement speed for quick inspection
- USB port for fast, simple connection to a PC and to supply continuous power. USB cable included
- PosiSoft USB Drive—stored readings and graphs can be accessed using universal PC/Mac web browsers or file explorers. No software required
- Every stored measurement is date and time stamped
- Software updates via internet keep your gage current
- Connects to PosiSoft.net (see far right panel)

Probes available for a variety of applications



For measuring paint, powder, etc. on all metals...



...and for measuring galvanizing, plating, anodizing and more.

Gage Selection...

Select Substrate

- F — for ferrous metals (steel and cast iron)
- N — for non-ferrous metals (aluminum, copper, etc.)
- FN — for all metal substrates—Gage automatically recognizes the substrate and takes a measurement

Select Standard or Advanced Features

Standard Models

Includes ALL features as shown on left plus...

- Monochrome display with transreflective technology enhances sunlight readability
- Storage of 250 readings—stored readings can be viewed or downloaded

Advanced Models

Includes ALL features as shown on left plus...

- Hi Contrast reversible color LCD
- Storage of 100,000 readings in up to 1,000 batches and sub-batches
- Onscreen help, real time graphing, picture prompting and more
- Batch annotation—add notes and change batch names with onscreen QWERTY keyboard
- WiFi technology wirelessly synchronizes with PosiSoft.net, downloads software updates and connects with mobile devices for expanded functionality
- Data transfer via USB to a PC or via Bluetooth® Wireless Technology to a PC or printer
- Scan mode—take continuous readings without lifting the probe
- Multiple stored calibration adjustments for measuring on a variety of substrate conditions
- SSPC-PA2 feature determines if film thickness over a large area conforms to user-specified min/max levels
- PSPC 90/10 feature determines if a coating system complies with an IMO performance standard for protective coatings

Select from a variety of measurement ranges and probe styles

(see back page ordering guide)

Heavy-duty, gold-plated locking connector for industrial environments



Separate Probe Style

Removable Probes can be detached and replaced with any one of our wide variety of probes including separate probes and microprobes



Built-in Probe Style



FKS

90°

0°

45°

Regular

Rugged Features...

Sealed USB Port
for communicating
with a PC or Mac

Water and dust
resistant

WEATHERPROOF

Hi resolution color LCD

Scratch/solvent/impact
resistant lens

Multi-function
navigation button

Solvent, acid, oil
resistant, hi-grade,
industrial strength
housing

**Advanced
Model shown
in Memory Mode**

Quality high-flex
cable and strain relief

Stainless steel probe
with knurled finger grip

Strong wear-resistant
ruby-tipped probe

All Regular Separate Probes
are suitable for underwater use



Standard model shown in Statistics Mode with shock-absorbing, protective rubber holster



FHXS Probe with Alumina wear face and braided cable for hot or rough surfaces



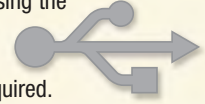
Flip Display enables right-side-up viewing



Microprobe series for small parts and hard-to-reach areas

PosiSoft® ... FREE SOLUTIONS for viewing, analyzing and reporting data:

PosiSoft USB Drive Connect to a PC/Mac using the supplied USB cable to access and print stored readings, graphs, photos, notes and screen captures. No software or internet connection required.



PosiSoft.net A web-based application offering secure centralized management of PosiTector readings. Access your data from any web-connected device.



PosiSoft Software Newly updated version 3.0 desktop software for PC or Mac. Available as a free download.

PosiSoft Mobile Access readings, graphs, capture photos and update annotations using WiFi enabled devices such as tablets, smart phones and computers. (Advanced models only)



Available on the
App Store



Universal gage
body accepts
all PosiTector
6000, 200, SPG,
DPM and
UTG probes

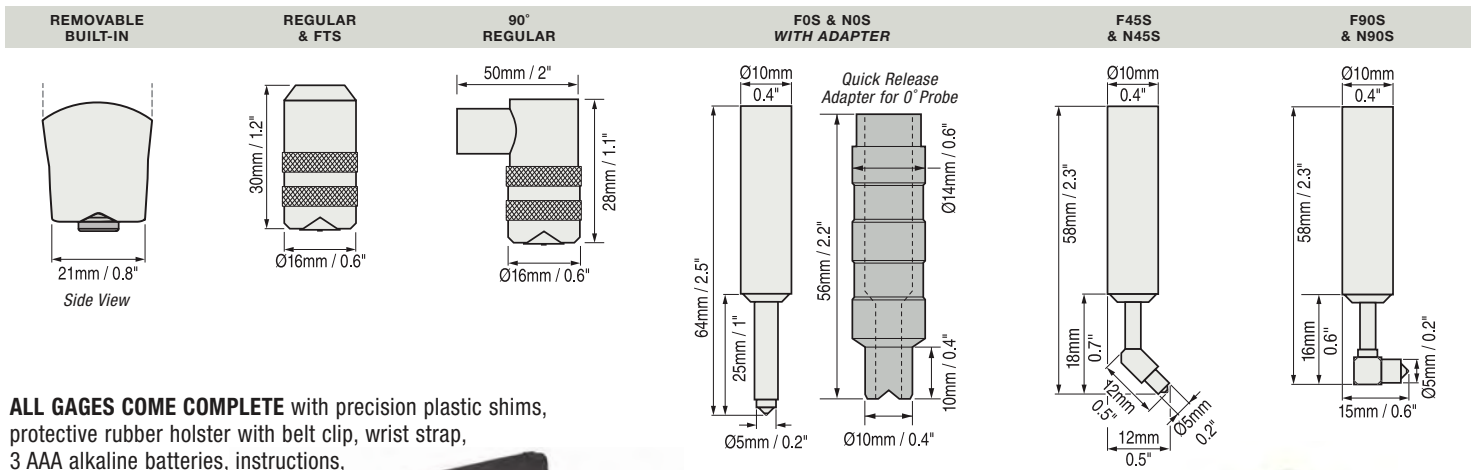


PosiTector® 6000 Series ORDERING GUIDE		Our most popular Removable Built-in and Regular Separate probe models			90° Regular probe for tight spots			Ideal for anodized aluminum			Microprobes – Our smallest probes for small parts or hard-to-reach areas			Removable Built-in and Separate probes for thick protective coatings; epoxy, rubber, intumescent fire proofing and more				
FERROUS METALS	Standard	F1	FS1	FRS1		FOS1	F45S1	F90S1	FT1	FTS1	FHXS1**	FKS1						
	Advanced	F3	FS3	FRS3		FOS3	F45S3	F90S3	FT3	FTS3	FHXS3**	FKS3						
NON-FERROUS METALS	Standard	N1	NS1	NRS1	NAS1	NOS1	N45S1	N90S1				NKS1						
	Advanced	N3	NS3	NRS3	NAS3	NOS3	N45S3	N90S3				NKS3						
COMBINATION ALL METALS	Standard	FN1	FNS1	FNRS1						FNTS1				FNGS1				
	Advanced	FN3	FNS3	FNRS3						FNTS3				FNGS3				
Range		0–60mils 0–1500µm			Ferrous: 0–45mils and 0–1150µm Non-Ferrous: 0–25mils and 0–625µm			0–250mils 0–6mm		0–400mils 0–10,000µm		0–500mils 0–13mm		0–2.5inches 0–63.5mm				
Accuracy*		±(0.05mil+1%) 0–2mils ±(0.1mil+1%) >2mils ±(1µm+1%) 0–50µm ±(2µm+1%) >50µm			±(0.02mil+1%) 0–4mils ±(0.1mil+3%) >4mils ±(0.5µm+1%) 0–100µm ±(2µm+3%) >100µm			±(0.5mil+1%) 0–100mils ±(0.5mil+3%) >100mils ±(0.01mm+1%) 0–2.5mm ±(0.01mm+3%) >2.5mm		±(0.1mil+3%) ±(2µm+3%)		±(1mil+3%) ±(0.02mm+3%)		±(0.01in.+3%) ±(0.2mm+3%)				
Matching DeFelsko Calibration Standards		STDS1 STDA1			STDS2 STDA2			STDP1		STDP7		STDP5		STDP8 (included)				

Ferrous probes measure non-magnetic coatings on ferrous metals. **Non-Ferrous probes** measure non-conductive coatings on non-ferrous metals. **Combination probes** measure coatings on all metals. **FHXS probe** measures non-conductive coatings on steel. **FNGS probe** measures non-conductive coatings on all metals and includes STDP8 standards.

*Accuracies are stated as a fixed value plus a percentage of the gage's actual reading. **Xtreme probe with Alumina wear face and braided cable. Ideal for rough or hot surfaces up to 250° C (500° F).

Probe Details (All probe details can be found online at www.defelsko.com/p6000/probes)



ALL GAGES COME COMPLETE with precision plastic shims, protective rubber holster with belt clip, wrist strap, 3 AAA alkaline batteries, instructions, nylon carrying case with shoulder strap, protective lens shield, Long Form Certificate of Calibration traceable to NIST, USB cable, PosiSoft.net account, two (2) year warranty.

SIZE: 137 x 61 x 28 mm (5.4" x 2.4" x 1.1")

WEIGHT: 140 g (4.9 oz.) without batteries

Conforms to ISO 2178/2360/2808, ISO 19840, ASTM B499/D1186/ D1400/D7091/E376/G12, BS3900-C5, SSPC-PA2 and others



Options

Bluetooth Printer receives data from Advanced models

AC Power Kit for continuous operation or battery charging—works in any country

Coating Thickness Standards to fulfill both ISO and in-house quality control requirements

Rechargeable Batteries—a set of eneloop NiMH AAA batteries

Extended Cables for under-water or remote measuring. Specify length when ordering.



PosiSoft® Solutions

Suite of Software

The PosiSoft suite of software solutions offers 4 FREE ways to view and report your data, ranging from dedicated desktop software for PC and Mac computers to cloud-based PosiSoft.net.

PosiSoft® 3.0 Desktop Software

Newly updated version 3.0 desktop software for PC or Mac computers

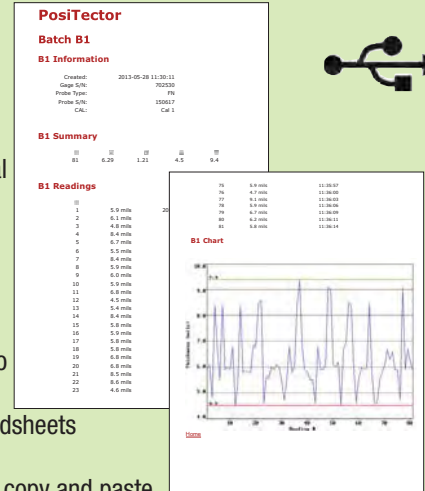
- Import (download) measurement data via USB (all gages) or WiFi (PosiTensor Advanced models only)
- Customize reports by adding pictures, logos, screen captures, notes and more
- Measurement data is copied (imported) from the instrument to a user selectable location — ideal for storing and sharing data on a network or cloud drive
- Create custom layouts using a simple drag and drop Template Design toolbox; save layouts for future use
- Downloaded data is stored in comma-separated text files which can be easily imported into supporting applications such as documents, spreadsheets and databases



PosiSoft® USB Drive

Access your PosiTensor as a flash drive

- View and print readings and graphs using universal PC/Mac web browsers or file explorers
- Measurement data is stored in comma-separated text files which can easily be imported into supporting applications such as documents, spreadsheets and databases
- Simple file management - copy and paste data from the PosiTensor to a local folder on your computer, network or cloud-drive



Preformatted HTML reports are stored in the gage.

PosiSoft®.net (formerly PosiTensor.net)

A cloud-based application offering secure centralized management of PosiTensor readings. Access your data from any web-connected device anywhere in the world.

- Synchronize measurement data when connected via USB, Bluetooth or WiFi wireless technology
- Generate reports with graphs, annotations and images
- Share measurement data with authorized users via a secure login from any computer or web-enabled device
- Export data to popular formats such as XML, .CSV (comma-separated values), and CQATK for further analysis



PosiSoft® Mobile

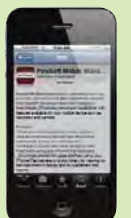
Gage-based software application featured in all PosiTensor Advanced instruments. Access readings, graphs, capture photos and update notations using WiFi enabled devices such as tablets, smart phones and computers

- Browse stored measurement data including notes, images, statistics and charts
- Update batch names/notes using your mobile device's keyboard
- Insert images directly into gage batches using your mobile device's camera or image library
- Remotely view the live display of a working PosiTensor
- Email measurement data as PDF reports or .CSV comma-separated files
- Accessible from any WiFi enabled computer or smart device using a standard web browser including PC/Mac, Windows Phone/Mobile, Blackberry, Android, Apple iOS and more



PosiSoft Mobile Manager is a discovery tool that searches your local area WiFi network for enabled PosiTensor Advanced instruments.

- Available for *Apple iOS* and *Android* users



DETEK

6805 Coolridge Drive
 Temple Hills, MD 20748-6940
 301-449-7300 FAX 301-449-7011
www.detek.com email: sales@detek.com



DeFelsko Coating Thickness Standards

Certified coating thickness standards are ideal for verifying the accuracy and operation of coating thickness gages and are an important component in fulfilling both ISO and in-house quality control requirements.

Many organizations require verification of gage accuracy at the test site each time a coating thickness gage is put into service and at frequent intervals during use. Ideal for this purpose, DeFelsko certified coating thickness standards have measured values traceable to a National Metrology Institution.

Certified Coated Metal Plates and Polystyrene Blocks

- Used to verify the accuracy and operation of any Type 1 (mechanical) and Type 2 (electronic) magnetic, eddy-current or ultrasonic coating thickness gage
- Ideal for use in the calibration lab, in the field or on the factory floor
- Standards with steel or aluminum substrates consist of 4 plates mounted in a protective binder
- Polystyrene thickness standards consist of 4 blocks supplied in a rugged acrylic storage box
- Individually serialized for traceability to NIST or PTB - includes a Certificate of Calibration
- Certified and labeled in both Metric and Imperial units

Plate Diameter: 38 mm (1.5") **Measurement Diameter:** 25 mm (1")

Polystyrene Blocks: 38 x 70 mm (1.5" x 2.75")
P8: 76 x 76 mm (3.0" x 3.0")



S1 Ferrous



A1 Non-Ferrous



Individual plates are available



P1 Polystyrene

Order Code	Ideal for	Approximate Thickness				Coating/Substrate	Accuracy
		Plate 1	Plate 2	Plate 3	Plate 4		
S1	PosiTector 6000 F, FS, FRS, FN, FNS, FNRS PosiTest F & FM	0	75 µm 3 mils	250 µm 10 mils	1500 µm 60 mils	Epoxy on Steel (Ferrous)	+/- 0.43 µm +/- 0.017 mil
S2	PosiTector 6000 F0S, F45S, F90S PosiTest DFT Ferrous & Combo	0	75 µm 3 mils	250 µm 10 mils	1000 µm 40 mils		
S3	PosiTest G & GM PosiPen A, B & C	0	15 µm 0.6 mils	40 µm 1.6 mils	100 µm 4 mils		
A1	PosiTector 6000 N, NS, NRS, FN, FNS, FNRS	0	75 µm 3 mils	250 µm 10 mils	1500 µm 60 mils	Epoxy on Aluminum (Non-Ferrous)	+/- 0.43 µm +/- 0.017 mil
A2	PosiTector 6000 NAS, NOS, N45S, N90S PosiTest DFT Combo	0	75 µm 3 mils	250 µm 10 mils	500 µm 20 mils		
A3	PosiTector 100B, 200, 200B	75 µm 3 mils	125 µm 5 mils	250 µm 10 mils	500 µm 20 mils		
P1	PosiTector 6000 FT, FTS, NTS, FNST PosiTector 200 D	375 µm 15 mils	2 mm 80 mils	4.5 mm 185 mils	6.5 mm 250 mils	Polystyrene Blocks	+/- (2.5 µm + 0.05% of thickness) +/- (0.1 mil + 0.05% of thickness)
P2	PosiTector 6000 FHS, NHS, EOC	2.5 mm 100 mils	6.5 mm 250 mils	13 mm 500 mils	19 mm 750 mils		
P3	PosiTector 100C	375 µm 15 mils	1.5 mm 60 mils	2.5 mm 100 mils	4.5 mm 185 mils		
P4	PosiTector 100D	1.5 mm 60 mils	2.5 mm 100 mils	4.5 mm 185 mils	6.5 mm 250 mils		
P5	PosiTector 6000 FKS, NKS	1.5 mm 60 mils	2.5 mm 100 mils	6.5 mm 250 mils	12 mm 480 mils		
P6	PosiTector 200C	375 µm 15 mils	1.5 mm 60 mils	2.5 mm 100 mils	3 mm 125 mils		
P7	PosiTector 6000 FHXS	1.5 mm 60 mils	4.5 mm 185 mils	6.5 mm 250 mils	9.5 mm 375 mils		
P8	PosiTector 6000 FNCS	13 mm 500 mils	13 mm 500 mils	13 mm 500 mils	19.5 mm 750 mils		

Select the Standard that most closely matches the measuring range of your gage.
 All certified standards are supplied with a Certificate of Calibration traceable to NIST or PTB.



PosiTest[®] DFT

Coating Thickness Gage

New

Ideal for...

- Powder Coaters
- Paint Applicators
- Coating Inspectors
- Painting Contractors
- Automotive Refinishers

2 Models...

Ferrous for STEEL

Combo for ALL METALS



simply
measures

DeFelsko[®]
The Measure of Quality

PosiTest[®] DFT

Coating Thickness Gage

Actual Size

Two Models

- **PosiTest DFT Ferrous**
measures non-magnetic coatings on steel.
- **PosiTest DFT Combo**
measures both non-magnetic coatings on steel AND non-conductive coatings on aluminum, brass, etc. **Automatically** recognizes the substrate and takes a measurement.



Features

- Fast, repeatable measurements
- No calibration required for most applications
- ZERO feature for rough or curved surfaces
- Handy RESET feature when no zero reference is available
- Strong, wear-resistant, ruby-tipped probe
- Audible and visible measurement indication
- V-groove in probe for positioning on cylindrical parts
- Mils/Microns switchable
- Basic instructions on the back of each gage

Specifications

Measurement Range	0 – 40 mils	0 – 1000 μ m
Accuracy	$\pm(0.1 \text{ mils} + 3\%)$	$\pm(2\mu\text{m} + 3\%)$
Size	4 x 1.5 x 0.9 in.	100 x 38 x 23 mm
Weight	2.5 oz.	70 g



Gage Comes Complete with built-in probe, plastic shims, hard shell storage case, AAA battery, instructions and one (1) year warranty.

Conforms to: ISO 2178/2360/2808, prEN ISO 19840, ASTM B244/B499/B659/D1186/D1400/E376/G12, BS3900-C5, SSPC-PA2 and others. *Certificate of Calibration traceable to NIST available.*

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PosiTector® 200 Series

NEW

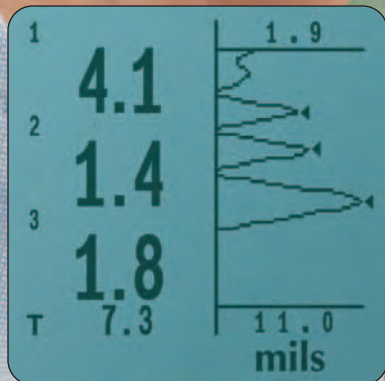
**Coating Thickness
Gages for Measuring
on Wood, Concrete,
Plastic and more...**



Standard Model



*Advanced
Model
measures
up to 3
layers with
graphics*



DeFelsko®

The Measure of Quality

PosiTector® 200 Series

Non-destructively measures a wide variety of applications using proven ultrasound technology. Measures the thickness of coatings over concrete, wood, composite materials and more.

All Gages Feature...

Simple

- Ready to measure – no adjustment required to measure most coatings
- One-handed menu navigation
- Bi-color indicator light – ideal in a noisy environment
- RESET feature instantly restores factory settings

Durable

- Solvent, acid, oil, water and dust resistant – meets or exceeds IP5X
- Scratch/Solvent resistant display suitable for harsh environments
- Shock-absorbing, protective rubber holster with belt clip
- Two year warranty on both gage body and probe

Accurate

- Responsive transducers provide fast, accurate readings (up to 40 readings/minute)
- Proven non-destructive ultrasonic technique conforms to ASTM D6132 and ISO 2808
- Certificate of Calibration showing traceability to NIST included

Versatile

- Continually displays/updates average, standard deviation, and number of readings while measuring
- Internal memory stores up to 10,000 readings in up to 1000 batches
- Built-in clock to date and time stamp each stored measurement
- USB, IR and serial output options for simple communication with printers and PCs
- Backlit display for dim or dark environments
- Mils/Microns switchable
- Selectable display languages

Select Standard or Advanced

Standard models measure the total thickness of a coating system.

Advanced models measure total thickness of a coating system or up to 3 individual layer thicknesses in a multi-layer system. Also features graphic readout for detailed analysis of the coating system.

Advanced Model Graphic Display

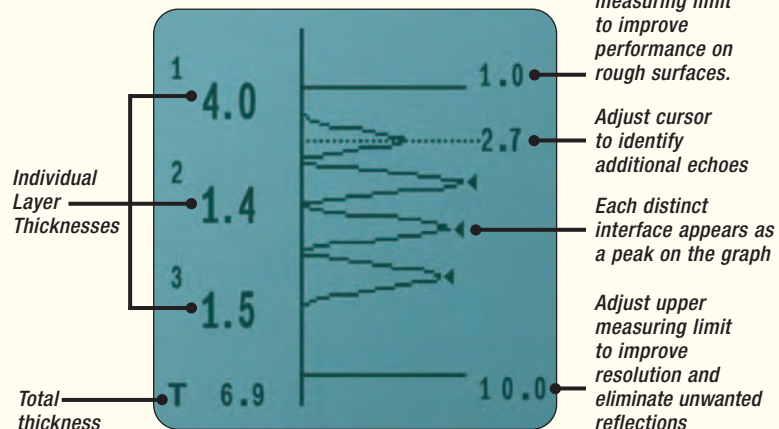


Advanced models toggle between graphic readout and statistical data displays.



Standard model measuring total coating thickness on wood

Easy-to-read graphic format provides clear, detailed analysis of coatings



Tough **NEW** Features

- USB/Serial/IR Ports for downloading to a PC, printer or data collector

- Solvent, acid, oil, water and dust resistant—meets or exceeds IP5X

- Scratch and solvent resistant lens

Standard model shown in Memory Mode

- Thick impact-resistant Lexan® display

- Bi-color indicator light

- Hi-grade, industrial strength housing

- Shock-absorbing, protective rubber holster

- Quality high-flex cable and strain relief

- Comfortable ergonomic finger grip reduces operator fatigue

- Plastic-tipped probe will not scratch surface



Easily measure single or multiple layer coating thickness on a variety of substrates.



Measure paint, varnish, lacquer, etc. on wood products including cabinetry, furniture, flooring, windows and more.



Measure thick protective coatings on concrete flooring, pipes, containment structures and more.

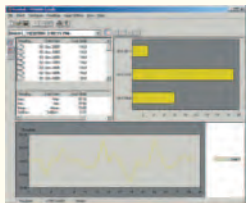


Advanced model

Measure protective finish topcoats over epoxy resin – commonly found in automotive, marine and aviation applications.

Options

PosiSoft® for Windows® analysis software



- Allows entry of notes and annotations
- Prints and displays basic charts and histograms
- Exports to a document or spreadsheet
- Includes USB cable
- Free updates

IR Printer receives data from all models via wireless infrared.



Coating Thickness Standards fulfill both ISO and in-house quality control requirements.

AC Power Cable for continuous operation.

Serial Output Cable to connect to a data collector.

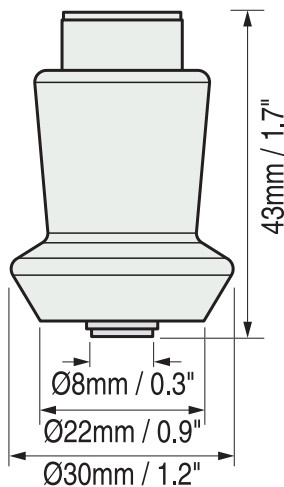
Visit www.defelsko.com/applications.htm to view Coating Inspection Application Notes.

SPECIFICATIONS

PosiTector [®] 200 Model	B/Std	B/Adv	C/Std	C/Adv
Measures Total Thickness	✓	✓	✓	✓
Measures Individual Layers		✓		✓
Graphic Display		✓		✓
Typical Applications	Polymer coatings on wood, plastic, etc.		Thicker coatings on concrete, fiberglass, etc.	
Range*	13 – 1000 microns 0.5 – 40 mils		50 – 3800 microns 2 – 150 mils	
Accuracy	±(2 microns + 3% of reading) ±(0.1 mils + 3% of reading)			
Minimum Individual Layer Thickness**	_____	13 microns 0.5 mils	_____	50 microns 2 mils
Calibration Standard	DeFelsko CAL-A4		DeFelsko CAL-P6	

*Range limits apply to polymer coatings only. **For multiple layer applications only. Dependent on material being measured.

Probe Details



ALL GAGES COME COMPLETE with probe, precision plastic shims, protective rubber holster with belt clip, couplant, 3 AAA batteries, instructions, nylon carrying case with shoulder strap, Certificate of Calibration traceable to NIST, two (2) year warranty.

SIZE: 146 x 64 x 31 mm
(5.75" x 2.5" x 1.2")

WEIGHT: 165 g (5.8 oz.)
without batteries

Conforms to ASTM D6132
and ISO 2808



DeFelsko[®]
The Measure of Quality

DEFELSKO CORPORATION
802 Proctor Ave., P.O. Box 676, Ogdensburg, NY 13669 USA
Toll Free 1-800-448-3835 Phone: 315-393-4450
Fax: 315-393-8471 E-mail: techsale@defelsko.com
Web: www.defelsko.com


Made in U.S.A.

PosiTest®

Worldwide Leader in Coating Thickness Gages



Accurate and Dependable



For the non-destructive measurement of non-magnetic coatings such as (paint, enamel, plastic, galvanizing, metalizing, plating, etc.) on STEEL.

▲ Easily measures small parts of almost any shape

Stable design with additional tail-end support. No annoying rocking during measurement. ►



Accurate &
Dependable

PosiTest®



For the non-destructive measurement of non-magnetic coatings (paint, enamel, plastic, galvanizing, metalizing, plating, etc.) on STEEL.

ACCURACY

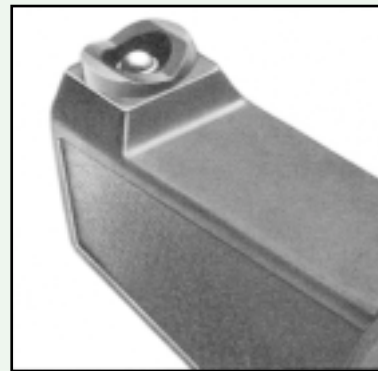
- Permanently calibrated
- Highly wear resistant Carbide Probe for longest life and continuous accuracy
- Remove center of dial cover for easy recalibration adjustment
- Modern and up-to-date Scale Ranges fit all applications

DURABILITY

- Extra rugged housing, not affected by mechanical shock, water, acid or solvents
- Unique overall design, fully supported, positive positioning, no pivoting tendencies during measurement
- Can be used fully supported or with only the front probe area contacting the surface
- Functions on a permanent rare-earth cobalt magnet, no battery
- Explosion Proof – Refinery safe
- 1 year warranty

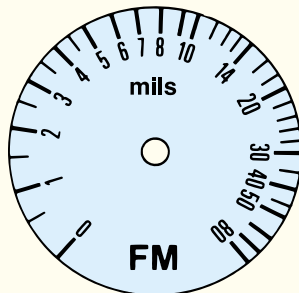
EASY TO USE

- Positive visual and audible indicators to designate when thickness reading is established
- “V” grooves in probe housing and Gage base allow correct positioning on cylindrical objects
- Compact, lightweight, precisely balanced, independent of gravity – can be used in any position
- GO/NO-GO button can be pre-set for rapid measurement
- Probe contact and dial rotation all in a one-finger operation
- Furnished with wrist strap, neck strap and instructions in a high quality leather case with belt loops for your convenience



Carbide measuring probe for long life.

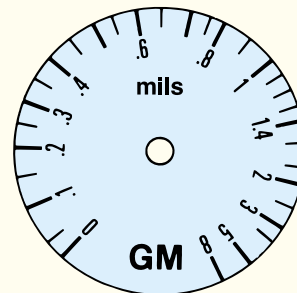
For: Hot dip galvanizing, hard chrome metalizing, paint, enamel, plastic coatings on steel



Scale FM 0–80 mils
Tolerance: ±0.2 mils up to 4 mils
±5% of the reading over 4 mils

Scale F 0–2000 microns
Tolerance: ±5 microns up to 100 microns
±5% of the reading over 100 microns

For: Electroplating, thin paint films, phosphating on steel



Scale GM 0–8 mils
Tolerance: ±0.04 mils up to 0.8 mils
±5% of the reading over 0.8 mils

Scale G 0–200 microns
Tolerance: ±1 micron up to 20 microns
±5% of the reading over 20 microns

†Based on N.I.S.T. (NBS) Standards • Conforms to ASTM and international standards

DeFelsko®
CORPORATION

802 Proctor Avenue, P.O. Box 676, Ogdensburg, New York 13669-0676
315-393-4450 or Toll Free 1-800-448-3835 (U.S.A.) Fax: 315-393-8471
E-Mail: techsale@defelsko.com

PosiPen®

Measures Coating Thickness



Measures non-magnetic coatings such as paint, enamel, plating, hot-dip galvanizing on steel.

Ideal for measuring on small, hot or hard-to-reach surfaces.



PosiPen[®] Coating Thickness Gage



Measures non-magnetic coatings such as paint, enamel, plating, hot-dip galvanizing on steel.

PosiPen can be placed with pin-point accuracy on any location of the part to be measured which other Gages are not able to reach. **PosiPen** measures:

- on hot surfaces
- on small surfaces
- in different positions

PosiPen has a very small, unique magnet and therefore can measure on extremely small parts, on peaks and valleys.

Each **PosiPen** has two scales, mils (inch) and microns (metric)

Range: 0.25 to 20 mils (inch) Tolerance $\pm 10\%$ and 0.1 mil
5 to 500 microns (metric) Tolerance $\pm 10\%$ and 2.5 microns

Each **PosiPen** is calibrated to NIST calibration standards.

PosiPen is manufactured in two versions:

PosiPen Model A for measurements on surfaces with normal temperatures.

PosiPen Model B for measurements on surfaces with extreme temperatures.

(between -150°F and $+450^{\circ}\text{F}$ • between -100°C and $+230^{\circ}\text{C}$)

Triple Indicator:

1. Use the **red/silver joining line** when the Gage is horizontal (walls).
2. Use the **green line** when the Gage is pointing straight down (green/ground).
3. Use the **blue line** when the Gage is pointing straight up (blue/sky).



Easy to Use:

Place the tip of the **PosiPen** on the coated surface and allow the magnet to contact. Pull the **PosiPen** straight from the object to be measured while keeping close watch on the appropriate indicator. Note the reading when the magnet releases.

Easy to Carry:

Just like a ball point pen, it is always there when you need it!



DEFELSKO CORPORATION

802 Proctor Ave., P.O. Box 676, Ogdensburg, NY 13669

Toll Free 1-800-448-3835 Phone: 315-393-4450

FAX: 315-393-8471 E-mail: techsale@defelsko.com

Web: <http://www.defelsko.com>

GE

Inspection Technologies

Eddy Current
Probes
and
Accessories
Catalogue



GE imagination at work

Eddy Current Probes and Accessories Catalogue

This catalogue features the standard range of GE Eddy Current Probes and Accessories. For ease of use, it is divided into four sections: General Surface probes, Aerospace probes, Dedicated Inspection probes and Accessories.

If you cannot find a probe or accessory to meet your inspection requirements, please contact your local GE Approved Dealer or visit the GE Inspection Technologies Website at: www.ge.com/inspectiontechnologies

Content:

General Surface Applications



- Surface Inspection – shielded (absolute).
- Surface Inspection – unshielded (absolute).

Aerospace Applications



- Fastener Hole probes and Mini Drive Unit.
- Sub-Surface Inspection - Low Frequency probes.
- Engine Blade Inspection.
- Aircraft Wheel Inspections.

Dedicated Applications



- Weld Inspection.
- ID Tube Inspection (Absolute and Differential).
- Broad Band probes (Absolute).
- Thread Inspection.
- Metal Sorting (Absolute).
- Conductivity Measurement.
- Encircling Coils.
- Differential Scanning probes.

Accessories



- Reference Blocks.
- Balance Loads.
- Adapters.
- Probe Tip Protectors.
- Probe Starter Packs.

Please Note: The measurements shown in the tables are metric with the equivalent imperial size in brackets i.e. mm (inches). The illustrations shown are for reference only and may not be to scale. Specifications are liable to change without notice.

General Surface Applications

Surface Inspection – Shielded

These probes are used to inspect for surface breaking defects.

Technical notes:

- Probes identified with a single frequency (Centre Frequency), may be operated over an extended range when used in conjunction with impedance plane instruments. Normal accepted operating range = $1/3$ of Centre Frequency to $3 \times$ Centre Frequency.
- Probes identified with Fe, NFe or Fe/NFe may be used on any suitable conductive material when used in conjunction with an Impedance plane instrument.
- Shielded surface inspection probes with delrin handles are colour-coded to indicate their centre frequency as follows:

Red = 200kHz

Yellow = 500kHz

Blue = 2MHz

Green = 6MHz

Straight – Delrin Handle (Absolute)

Part No	Tip Ø 'D'	Length 'L'	Centre Frequency	Material
104P4	4.45	114 (4.5)	200kHz	Fe/NFe
104P4F	3.30	114 (4.5)	200kHz	Fe/NFe
105P4	4.45	114 (4.5)	500kHz	Fe/NFe
105P4F	3.30	114 (4.5)	500kHz	Fe/NFe
106P4	3.30	114 (4.5)	2MHz	NFe
106P4F	2.34	114 (4.5)	2MHz	NFe
107P4	2.34	114 (4.5)	6MHz	NFe



90° Tip - Delrin Handle (Absolute)

Part No	Tip Ø 'D'	Tip Length 'TL' *	Length 'L'	Centre Frequency	Material
308P24	4.45	6.4 (0.25)	114 (4.5)	200kHz	Fe/NFe
309P24	4.45	6.4 (0.25)	114 (4.5)	500kHz	Fe/NFe
309P34	4.45	12.7 (0.5)	114 (4.5")	500kHz	Fe/NFe
310P14	3.30	2.7 (0.11)	114 (4.5)	2MHz	NFe
310P34	3.30	12.7 (0.5)	114 (4.5")	2MHz	NFe
310P24	3.30	6.4 (0.25)	114 (4.5)	2MHz	NFe
310P14F	2.34	2.7 (0.11)	114 (4.5)	2MHz	NFe
311P24	2.34	6.4 (0.25)	114 (4.5)	6MHz	NFe

* Inside tip lengths available from 5mm (0.19") to 25mm (0.98") on all probes.



45° Crank - Delrin Handle (Absolute)

Part No	Tip Ø 'D'	Crank Length	Length 'L'	Centre Frequency	Material
204P4	4.45	19.5 (0.75)	114 (4.5)	200kHz	NFe/Fe
205P4	4.45	19.5 (0.75)	114 (4.5)	500kHz	NFe/Fe
206P4	3.30	19.5 (0.75)	114 (4.5")	2MHz	NFe
206P4F	2.34	19.5 (0.75)	114 (4.5")	2MHz	NFe
207P4	2.34	19.5 (0.75)	114 (4.5")	6MHz	NFe



15° Crank, 90° Tip – Delrin Handle (Absolute)

Part No	Tip Ø 'D'	Tip Length 'TL' *	Length 'L'	Centre Frequency	Material
312P24	4.45	6.4 (0.25)	114 (4.5)	200kHz	Fe/NFe
313P24	4.45	6.4 (0.25)	114 (4.5)	500kHz	Fe/NFe
313P24F	3.30	6.4 (0.25)	114 (4.5)	500kHz	Fe/NFe
314P24	3.30	6.4 (0.25)	114 (4.5)	2MHz	NFe
315P24	2.34	6.4 (0.25)	114 (4.5)	6MHz	NFe

* Inside tip lengths available from 5mm (0.19") to 25mm (0.98") on all probes.



Straight – Metal Handle (Absolute)

Ideal for systems scanning or limited access areas.

Part No	Tip Ø 'D'	Length 'L'	Centre Frequency	Material
100P3	4.45	76 (3)	200kHz	Fe/NFe
101P3	4.45	76 (3)	500kHz	Fe/NFe
102P1	3.30	38 (1.5)	2MHz	NFe
102P3	3.30	76 (3)	2MHz	NFe
103P3	2.34	76 (3)	6MHz	NFe



These probes are fitted with a 25.4mm (1") x 6.4mm (1/4") diameter stainless steel handle to facilitate good clamping. They are similar to the probes described in the previous sections and are available with the same frequencies and shank geometries.

Adjustable Copper Shaft – Delrin Handle (Absolute)

Part No	Tip Ø	Length	Centre Frequency	Material
106P8C	3.30	203.2 (8.0)	2MHz	NFe



The flexible copper shaft makes this probe very versatile, giving it the ability to adapt its shape as required, avoiding geometry obstacles and getting to those hard to reach inspection areas.

Surface Inspection - Unshielded

Straight (Absolute)

Part No	Length	Centre Frequency	Material
120P1A	100 (4)	200kHz	Fe/NFe
121P1A	100 (4)	500kHz	Fe/NFe
122P1A	100 (4)	2MHz	NFe
123P1A	100 (4)	2MHz	Fe



Angle Tip (Absolute)

Part No	Length	Centre Frequency*	Material	Angle
350P1A	133 (5.2)	200kHz	Fe/NFe	65°
351P1A	133 (5.2)	500kHz	Fe/NFe	65°
352P1A	133 (5.2)	2MHz	NFe	65°
353P1A	133 (5.2)	2MHz	Fe	65°

* All the above probe types are also available in 6MHz in Fe.



Cables to suit the above probes:

Instrument	Part No	Cable Type
Vector 22	29A001	BNC/ Microdot
Locator 2/2s	39A002	7-way Lemo/ Microdot
Locator 3s, Phasec 2s/2d	40A001	12-way Lemo/ Microdot

Note: All probes in this section are fitted with Microdot sockets. Locator 3s, Phasec 2s/2d

Aerospace Applications

Fastener Hole Probes

These probes inspect the inner surface of fastener holes for defects.

Dynamic Rotating Metal (Differential Reflection)

Part No	Working Length	Frequency	Hole Diameter*
615P012F035	35	200kHz – 2MHz	4.76 (3/16")
615P016F035	35	200kHz – 2MHz	6.35 (1/4")
615P020F035	35	200kHz – 2MHz	7.94 (5/16")
615P024F035	35	200kHz – 2MHz	9.53 (3/8")
615P028F035	35	200kHz – 2MHz	11.11 (7/16")
615P032F035	35	200kHz – 2MHz	12.70 (1/2")

* Probes available from 1.6mm (1/16") to 25.4mm (1") for GE, Rohmann or Forster 8mm diameter fitting. All probes are shielded. These probes are available in standard working lengths of 35mm and 65mm, non-standard working lengths are available on request.

Requires Mini Drive Unit.



Dynamic Rotating Plastic (Differential Reflection)

Part No	Working Length	Frequency	Hole Diameter*
619P016F051	51	200kHz – 2MHz	6.0 – 7.0 (1/4")
619P024F051	51	200kHz – 2MHz	9.5 – 10.5 (1/4")
619P032F051	51	200kHz – 2MHz	12.5 – 13.5 (1/2")

For more options please see the data sheet on our website or contact your local GE provider.

* Probes available from 2.4mm (3/16") to 38mm (1 1/2"). Probes larger than 4.4mm (11/64") in diameter have a split tip to accommodate nominal hole sizes + 1mm. Probes available to suit GE, Rohmann or Forster 8mm diameter fittings. These probes are available in a standard working length of 51mm, non-standard working lengths are available on request.

Requires Mini Drive Unit.



For more options please see coding system.

Coding system for more options

Imperial Coding System

Please specify nominal diameter of probe (hole) in 1/64" increments.

Note: Probe/Hole clearance adjustments will be taken into account during manufacturing.

615P
Metal Rotating
Probe → **615P016F035** ← Working Length
35mm
65mm

↑
F = Imperial Ø
016F = Ø16/64" (Ø1/4")
029F = Ø29/64"

Metric Coding System

Please specify nominal diameter of probe (hole) in mm.

Note: Please **subtract 0.1 mm** from the nominal hole diameter to take into account Probe/Hole clearance.

615P
Metal Rotating
Probe → **615P063M035** ← Working Length
35mm
65mm

↑
M = Metric Ø
063M = Ø6.3mm
115M = Ø11.5mm

Mini Drive Unit

The GE Mini Drive Unit is a small, lightweight, rotating eddy current probe drive and is used in conjunction with the probes on page 8. It has been designed to make the inspection of fastener holes accurate and quick. Its size allows inspections to be performed in confined space and the lightweight design helps prevent fatigue when a large number of fastener holes need to be inspected. The Mini Drive Unit can be used with Rohmann or Forster 8 mm diameter fitting probes.

Specification:

Weight: 150 g (5 oz)

Dimension: 82 x 22 x 36 mm

(3.2" x 0.9" x 1.4")

Mini Drive Unit - Part No 33A100



Cables to suit Mini Drive Unit:

Instrument	Part No	Cable Type
Locator 3s, Phasec 2s/2d	33A103	12-way Lemo/12-way Lemo

Note: Adapter leads are available to run Rohmann, Zetec and Staveley Drive Units on Phasec 2s and 2d.

Manual Fastener Hole Probes (Absolute)

These probes inspect the inner surface of fastener holes for defects.

Part No.	Frequency	Hole Diameter	Material
504P12	2 MHz	4.5 (3/16")	NFe
501P16	200 kHz	6.4 (1/4")	Fe/NFe
504P16	2 MHz	6.4 (1/4")	NFe
504P20	2 MHz	7.5 (5/16")	NFe
504P24	2 MHz	9.5 (3/8")	NFe
504P32	2 MHz	12.7 (1/2")	NFe
504P40	2 MHz	15.5 (5/8")	NFe



Note: Probes available from 3.2mm (1/8") to 38mm (1 1/8") in all frequencies. Probes larger than 4.5mm (3/16") in diameter have a split tip, which accommodates hole sizes nominally of:

+1mm (1/24") on probes <7mm (9/32") in diameter.

+1.6mm (1/16") on probes >7mm (9/32") in diameter.

These probes have a standard working length of 76mm, non-standard working lengths are available on request.

Sub-Surface Inspection - Low Frequency Probes

These probes are used to detect sub-surface defects.

Spot Face (Reflection)

Part No.	Frequency	Diameter	Height	Body
700P07A	1kHz-100 kHz	7 (0.28)	48 (1.89)	Steel
700P11A	300Hz-100 kHz	11 (0.44)	45 (1.77)	Delrin
700P16A	300Hz-100 kHz	16 (0.62)	45 (1.77)	Delrin
700P24A	80Hz-60 kHz	24 (0.93)	58 (2.28)	Delrin
700P32A	80Hz-30 kHz	32 (1.25)	60 (2.36)	Delrin



Dual Element Sliding Probes (Absolute - Reflection)

These probes are designed to slide along rows of fasteners to detect flaws.



Part No	Frequency
851P001	400Hz - 50 kHz

Note: All probes are fitted with a 4-way Lemo socket.

Cables to suit the above probes:

Instrument	Part No	Cable Type
Locator 2/2s	39A005	7-way Lemo/4-way Lemo
Locator 3s, Phasec 2s/2d	33A130	12-way Lemo/4-way Lemo
Vector 22	45A005	16-way Lemo/4-way Lemo

Dual Element Sliding Probe (Absolute – Reflection)

This probe is designed to slide over rows of fasteners to detect flaws; it comes with 1.5, 2.5 and 3.5mm shims allowing it to accommodate different fastener sizes.

Part No	Frequency
851P002	100Hz – 500 kHz

Note: The probe is fitted with 2 Microdot sockets.



Cables to suit the above probe:

Instrument	Part No	Cable Type
Locator 2/2s	39A021	7-way Lemo/x2 Microdots
Locator 3s, Phasec 2s/2d	33A192	12-way Lemo/x2 Microdots

Low Frequency Ring (Doughnut) Probe (Absolute – Reflection)

Designed to detect surface and sub-surface flaws around aircraft fastener holes without removing the fastener, these absolute reflection probes will penetrate several layers of non-ferrous material with good sensitivity.

Note: The probe is fitted with a 4-way Lemo.



Please contact your local GE Approved Dealer for information and for our full range of sizes.

Cables to suit the above probe :

Instrument	Part No	Cable Type
Locator 2/2s	39A005	7-way Lemo/4-way Lemo
Locator 3s, Phasec 2s/2d	33A130	12-way Lemo/4-way Lemo
Vector 22	45A005	16-way Lemo/4-way Lemo

Engine Blade Inspection

GE has developed a range of special probes for compressor and turbine blade trailing and leading-edge inspection. Probes suitable for both aerospace and power generation gas turbines are available. Due to specific rotor access requirements and differences in blade profile, these types of probe are generally defined for a particular engine and stage. Please contact your local GE Approved Dealer for information about probes for specific engines.

Aircraft Wheel Inspections

Manual Inspections

GE has a large selection of aircraft bead seat probes, each of which is designed to fit the contour of each specific type of aircraft wheel. Due to the number of different types of aircraft wheels, please contact your local GE Approved Dealer for more information about probes available.

Automated Inspections (Absolute)

The requirements for aircraft wheel inspections are constantly being increased and becoming more varied. The WheelScan 5 is ready to meet all these requirements. It has a user-friendly design and incorporates a teach and learn facility. It is capable of storing instrument set-ups, recording and storing data. The unique SLIC Clamping System allows aircraft wheels to be held during inspection, eliminating the use of adapters for individual aircraft wheel types. Please contact your local GE Approved Dealer for more information.

Part No	Frequency	Diameter
50PA16/100k	100kHz	6.0 (1/4")
50PA16/200k	200kHz	6.0 (1/4")
50PA16/500k	500kHz	6.0 (1/4")
50PA16/1.5M	1.5MHz	6.0 (1/4")
50PA24/200k	200kHz	9.5 (3/8")
50PA24V1/200k*	200kHz	9.5 (3/8")

* = With thin centre shaft for use on large diameter wheels.



Dedicated Applications

Weld Inspection

WeldScan (Differential Bridge)

WeldScan probes offer a cost-effective alternative to Magnetic Particle Inspection for in-service inspection of ferrous welds. WeldScan probes are also available for non-ferrous welds.

Straight



Part No	Frequency	Diameter	Connector	Length	Body
800P01MD1P	100kHz	9.5	12-way Lemo	5.0m	Straight
800P01ND1P	100kHz	9.5	7-way Lemo	5.0m	Straight
800P04MD1P	100kHz	16	12-way Lemo	5.0m	Straight
800P04ND1P	100kHz	16	7-way Lemo	5.0m	Straight
800P06MD1P	100kHz	32	12-way Lemo	5.0m	Straight

90° Inline Tip



Part No	Frequency	Diameter	Connector	Length	Body
801P01MD1P	100kHz	9.5	12-way Lemo	5.0m	90° Inline
801P04MD1P	100kHz	16	12-way Lemo	5.0m	90° Inline
801P06MD1P	100kHz	32	12-way Lemo	5.0m	90° Inline

90° Right Angle Tip



Part No	Frequency	Diameter	Connector	Length	Body
802P01MD1P	100kHz	9.5	12-way Lemo	5.0m	90° Right angle
802P04MD1P	100kHz	16	12-way Lemo	5.0m	90° Right angle
802P06MD1P	100kHz	32	12-way Lemo	5.0m	90° Right angle

Note: Waterproof WeldScan probes are also available.

Broad Band Probe [Paint Probe] (Absolute)

This probe is used to estimate the coating thickness prior to weld inspections.



Part No	Frequency	Material	Inductance
130P3	35kHz - 250kHz	Fe/NFe	82 μ H

Cables to suit the above probe:

Instrument	Part No	Cable Type
Vector 22	5A011	BNC/BNC
Locator 2/2s	39A002	7-way Lemo/BNC
Locator 3s, Phasec 2s/2d	40A002 + 5A011	12-way Lemo Adapter/ BNC-BNC
Locator 3s, Phasec 2s/2d	40A504	12-way Lemo/BNC

WeldScan Reference Block

This Reference Block is used in conjunction with the above probes to set sensitivity levels and calibrate the instrument prior to weld inspections.



Part No	Slots	Material	Plastic Shims
31A008	0.5mm/1.0mm/2.0mm	Fe	0.5mm x4

ID Tube Inspection (Absolute and Differential.Bridge)

A comprehensive range of ID tube inspection probes and cables are available, including disconnectable and integral cable probes.



Part No	Diameter	Probe Type	Frequency
IDP138L-18k	13.8	Disconnect	18k

Example Cable:

Part No	Length	Cable	Connection
LMC-1P	10m	Rigid Push/Pull	12-way Lemo

Probe Transport System cables are available with integral end stop sprint. Cables and probes are available with switchable absolute to differential facility, balance load BNC socket for absolute operation. For special ID probe requirements, please contact your local GE Approved Dealer.

Broad Band (Absolute)

This is a range of probes for heavier industrial use with impedance plane instruments. Uses include estimates of coating thickness prior to weld inspection and measurement of crack depth.



Part No	Frequency	Material	Inductance
130P1	500kHz - 4MHz	Fe/NFe	5.6uH
130P2	150kHz - 1MHz	Fe/NFe	22uH
130P3	35kHz - 250kHz	Fe/NFe	82uH
130P4	7kHz - 60kHz	Fe/NFe	390uH
130P5	2kHz - 15kHz	Fe/NFe	1500uH

Note: Only available in 100 mm (4") length.

Cables to suit the above probes:

Instrument	Part No	Cable Type
Vector 22	5A011	BNC/BNC
Locator 2/2s	39A002	7-way Lemo/BNC
Locator 3s, Phasec 2s/2d	40A002 + 5A011	12-way Lemo Adapter/ BNC-BNC
Locator 3s, Phasec 2s/2d	40A504	12-way Lemo/BNC

Thread Inspection

Two styles of probes are available for the inspection of external (bolts) and internal (nuts) threads. Each probe has a pointed tip, which will fit into the thread root to detect cracks in the root area. They can also be used to inspect splined shafts.

Internal (Absolute)

Part No	Frequency	Material	Length
822P1B	2MHz	NFe	131 (5.2)
819P1B	200kHz	Fe	131 (5.2)
821P1B	500kHz	Fe	131 (5.2)



External (Absolute)

Part No	Frequency	Material	Length
820P1A	500kHz	NFe	100 (4)
822P1A	2MHz	NFe	100 (4)
819P1A	200kHz	Fe	100 (4)
821P1A	500kHz	Fe	100 (4)
823P1A	2MHz	Fe	100 (4)

Note: All probes are fitted with a Microdot socket



Cables to suit the above probes:

Instrument	Part No	Cable Type
Vector 22	29A011	BNC/Microdot
Locator 2s	39A002	7-way Lemo/Microdot
Locator 3s, Phasec 2s/2d	40A001	12-way Lemo/Microdot

Note: Saddle and Plug probes are available to fit the exact profile of external (saddle) or internal (plug) threads. Please contact your local GE Approved Dealer for further information.

Metal Sorting (Absolute)

These probes provide a method for general metal sorting. They have a sprung core assembly fitted to a double "V" block to provide constant perpendicular pressure onto either flat or curved surfaces.

Part No	Frequency	Material
809P1	2MHz	NFe
809P1	500kHz	Fe
809P1	200kHz	Fe/ NFe

Note: All probes are fitted with a Microdot socket.



Cables to suit the above probes:

Instrument	Part No	Cable Type
Vector 22	29A011	BNC/Microdot
Locator 2s	39A002	7-way Lemo/Microdot
Locator 3s, Phasec 2s/2d	40A001	12-way Lemo/Microdot

Conductivity Measurement

Measuring electrical conductivity is an accurate and repeatable method for checking non-ferrous metals and alloys for identity, grade and material condition.

Part No	Frequency	Diameter
47P001	60kHz - 500kHz	12.7 (1/2")
47P002	500kHz	8.0 (5/16")



Cables to suit the conductivity probes:

Instrument	Part No	Cable Type
AutoSigma 3000	47A001	5-way Lemo/5-way Lemo
Locator 2s	39A170	7-way Lemo/5-way Lemo
Locator 3s, Phasec 2s/2d	33A170	12-way Lemo/5-way Lemo

Conductivity Reference Blocks

A wide range of different Conductivity Reference Blocks are available , complete with Calibration Certificates to ensure accuracy of the inspection.



Part No	% IACS	MS/m	Material
47A012	2	1.2	Stainless Steel - 303S
47A015	24	14	Brass- LM5681
47A017	34	20	Aluminium - 7075 - TF
47A019	47	27	Aluminium - 6082 - TF
47A022	100	58	Copper
47A023	9 & 58	5 & 34	Dual Reference Sample

3 (Part No 47A025) and 5 (Part No 47A010) Sample Holders are available to house the Conductivity Reference Blocks and Dual Reference Sample.



47A010 Conductivity Sample Holder

Note: Please contact your local GE Approved Dealer for the full range of Conductivity Reference Blocks.

Encircling Coils

Cost-effective Encircling Coils (Absolute – Differential Reflection)

GE offers a cost-effective range of Encircling Coils either Absolute or Differential. They are ideally suited to inspecting small lengths of tube, wire or bar, principal applications being detecting surface cracks and metal sorting. Please contact your local GE Approved Dealer for more information.

Other diameters and frequencies available to order.



Part No	Type	Frequency	Hole Diameter
840P050G1	Absolute	5kHz – 50kHz	5.00 (0.196)
841P050G1	Differential	5kHz – 50kHz	5.00 (0.196)

Cables to suit the above probes:

Instrument	Part No	Cable Type
Locator 2/2s	39A008	7-way Lemo/x2 BNC Sockets
Locator 3s, Phasec 2s/2d	33A120	7-way Lemo/x2 BNC Sockets
Use in conjunction with x2 BNC to BNC cables 5A011		

Galaxy Encircling Coils (Differential Reflection)

GE offers a highly cost-effective and flexible range of Encircling Coils for use with the In-Line or Off-Line high-speed inspection of tubes, wires, bars, etc.

Encircling Coils within the same size range can be exchanged in a matter of seconds to suit variations in manufactured products. Please contact your local GE Approved Dealer for more information.



Instrument	Part No	Cable Type
Locator 3s, Phasec 2s/2d	GALPJL5	12-way Lemo/4-way Lemo
Vector 22	GALPJM5	16-way Lemo/4-way Lemo

Differential Scanning Probes

GE offers a range of differential probes to be used in conjunction with the inspection of the rotation of bearings houses, steering components, pins, bushes, automotive valves, bars, tubes etc.

Part No 5P501/502/503



Part No 5P495/469

Part No	Frequency	Type	Tip Dimension	Length
*5P469	400kHz - 3MHz	Bridge - Shielded (Ungrounded)	Ø 5 (0.19)	100 (4)
*5P495	400kHz - 3MHz	Bridge - Shielded (Ungrounded)	Ø 4 (0.16)	100 (4)
**5P501	200kHz - 3MHz	Reflection - Unshielded	Ø 2.5 (0.09)	91 (3.6)
**5P503	200kHz - 3MHz	Reflection - Unshielded	Ø 4.7 (0.18)	91 (3.6)
**5P502	200kHz - 3MHz	Reflection - Unshielded	2.5x4.7 (0.09x0.18)	91 (3.6)

All probes are fitted with 4-way Lemo Connector.

* Cables to suit the above differential bridge probes:

Instrument	Part No	Cable Type
Locator 2/2s	39A004	7-way Lemo/4-way Lemo
Locator 3s, Phasec 2s/2d	33A132	12-way Lemo/4-way Lemo
Vector 22	45A004	16-way Lemo/4-way Lemo

** Cables to suit the above differential reflection probes:

Instrument	Part No	Cable Type
Locator 2/2s	39A005	7-way Lemo/4-way Lemo
Locator 3s, Phasec 2s/2d	33A130	12-way Lemo/4-way Lemo
Vector 22	45A005	16-way Lemo/4-way Lemo

Accessories

Reference Blocks

GE provides a range of Reference Blocks to enable the correct sensitivity levels to be set during calibration.



Part No	Description	Material	Slot Depths
29A028	Ferrous	EN1A	0.2/0.5/1.0 mm
29A029	Aluminium	7075-T6	0.2/0.5/1.0 mm
29A032	Titanium	Ti6Al4V	0.2/0.5/1.0 mm
29A049	Stainless Steel	304	0.2/0.5/1.0 mm

Note: For the full range of Reference Blocks including Rotating Reference Blocks please contact your local GE Approved Dealer.

Balance Loads

Balance loads are necessary for using absolute probes on many differential Eddy Current Instruments.

Part No	Inductance	Centre Frequency*
5A084	1.3 μ H	6 MHz
5A083	8.2 μ H	2 MHz
5A058	47 μ H	150 kHz
5A089	120 μ H	70 kHz
5A001	5.6 μ H	1.5 MHz
5A003	82 μ H	100 kHz
5A104	390 μ H	20 kHz



* = 50 ohm Bridge Impedance.

Note: For the full range of Inductive Balance Loads please contact your local GE Approved Dealer.

Adapters

The following adapters can be used to connect cables between different types of GE instrument.

Part No	Description	Adapter Type
40A002	For connecting Locator absolute probes to Locator 3s, Phasec 2s/2d	12-way Lemo to BNC
40A003	For connecting Locator 2/2s probes to Locator 3s, Phasec 2s/2d	12-way Lemo to 7-way Lemo Socket
45A101	For connecting Phasec 2d probes and Mini-drive to Vector 22	16-way Lemo/12-way Lemo Socket

A range of adapters is available for using Rohmann, Forster, Zetec and Nortec probes on GE Eddy Current instruments, please contact your local GE Approved Dealer.

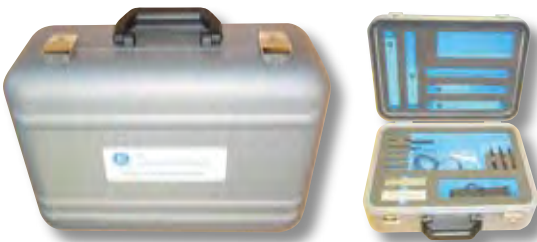
Probe Tip Protectors

Tape used to protect probe tips from wear.

Part No	Description
29A031	Shaped Teflon adhesive tape to protect probe tips from wear (packs of 30)
50A020	7mm wide by 1m long tape to protect WheelScan probe heads

Probe Starter Packages

GE provides a range of Initial Application Starter Packages, to assist in selecting probes and accessories for various inspections tasks.



Part No	Description
ASP1L2	Weld Inspection Starter Package for Locator 2s includes: 800P01NB1P Weld probe, straight, 100kHz, Ø 9.5mm 800P04NB1P Weld probe, straight, 100kHz, Ø 16mm 130P3 Broad Band probe, 35 kHz – 250 kHz 31A008 Reference Block, Fe 39A002 Cable, 7-way Lemo/BNC 29A031 Probe tip protectors 5A043V1 Hard case, with moulded inserts
ASP1P2	Weld Inspection Starter Package for probes to Locator 3s, Phasec 2s/2d includes: 800P01MB1P Weld probe, straight, 100kHz, Ø 9.5mm 800P04MB1P Weld probe, straight, 100kHz, Ø 16mm 130P3 Broad Band probe, 35 kHz – 250 kHz 31A008 Reference Block, Fe (EN1A) 5A011 Cable, BNC/BNC 40A002 Adapter, 12-way Lemo/BNC 29A031 Probe tip protectors 5A043V1 Hard case, with moulded inserts
ASP2L2	Surface Crack Detection Package for Locator 2s includes: 121P1A Unshielded Surface probe, 500kHz, straight 106P4 Shielded Surface probe, 2MHz, straight 313P24 Shielded Surface probe, 500kHz, 15° crank 90° tip 314P24 Shielded Surface probe, 2MHz, 15° crank 90° tip 352P1A Unshielded Knife probe, 2MHz, 65° tip 39A001 Cable, 7-way Lemo/Microdot 29A028 Reference Block, Fe (EN1A) 29A029 Reference Block, NFe (Al Alloy) 29A031 Probe tip protectors 5A043V2 Hard case, with moulded inserts 29A044 Probe tool roll
ASP2P2	Surface Crack Detection Package for Locator 3s, Phasec 2s/2d includes: 121P1A Unshielded Surface probe, 500kHz, straight 106P4 Shielded Surface probe, 2MHz, straight 313P24 Shielded Surface probe, 500kHz, 15° crank 90° tip 314P24 Shielded Surface probe, 2MHz, 15° crank 90° tip 352P1A Unshielded Knife probe, 2MHz, 65° tip 40A001 Cable, 12-way Lemo/Microdot 29A028 Reference Block, Fe (EN1A) 29A029 Reference Block, NFe (Al Alloy) 29A031 Probe tip protectors 5A043V2 Hard case, with moulded inserts 29A044 Probe tool roll
ASP3L2	Conductivity Measurement Package for Locator 2s includes: 47P001 Conductivity probe, 500kHz 33A136 Dual Conductivity Reference Block, 8.9% & 57.5% IACS 39A170 Cable, Conductivity 7-way Lemo/5-way Lemo 5A043V3 Hard case, with moulded inserts
ASP3P2	Conductivity Measurement Package for Locator 3s, Phasec 2s/2d includes: 47P001 Conductivity probe, 500kHz 33A136 Dual Conductivity Reference Block, 8.9% & 57.5% IACS 33A170 Cable, Conductivity 12-way Lemo/5-way Lemo 5A043V3 Hard case, with moulded inserts

Galaxy Encircling Coils

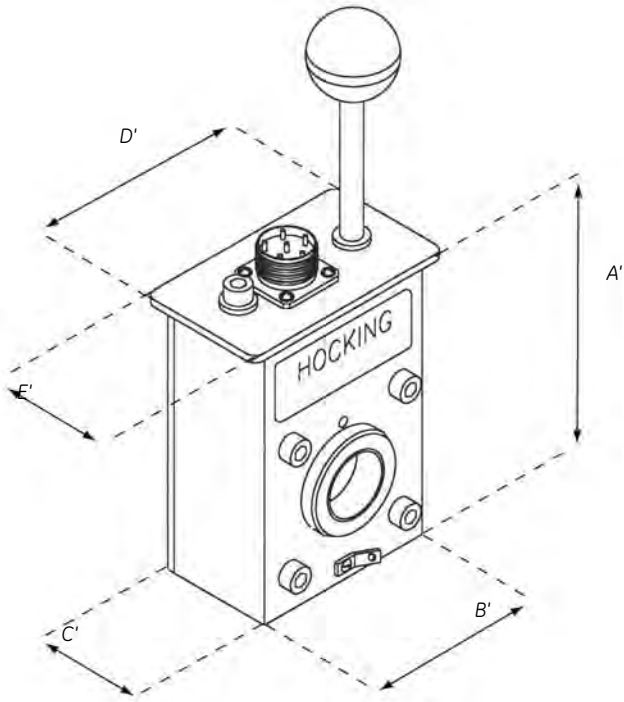
External Diameter Tube Inspection



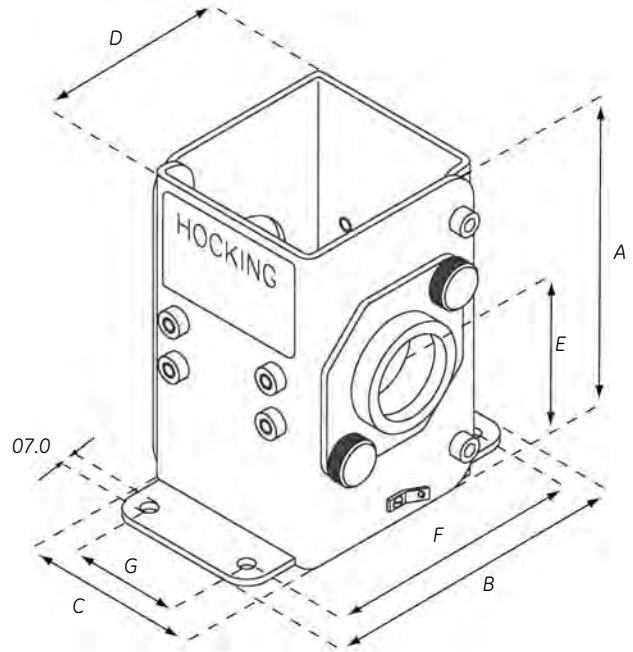
In-Line and off-line high speed inspection of tube, wire, bar etc.
Highly cost-effective and flexible
Rapid change for product size variation
Choice of hard or soft product guides
User machinable guides
Suits circular and non-circular products



Coil and Holder Dimensions



Encircling Coil



Encircling Coil Holder

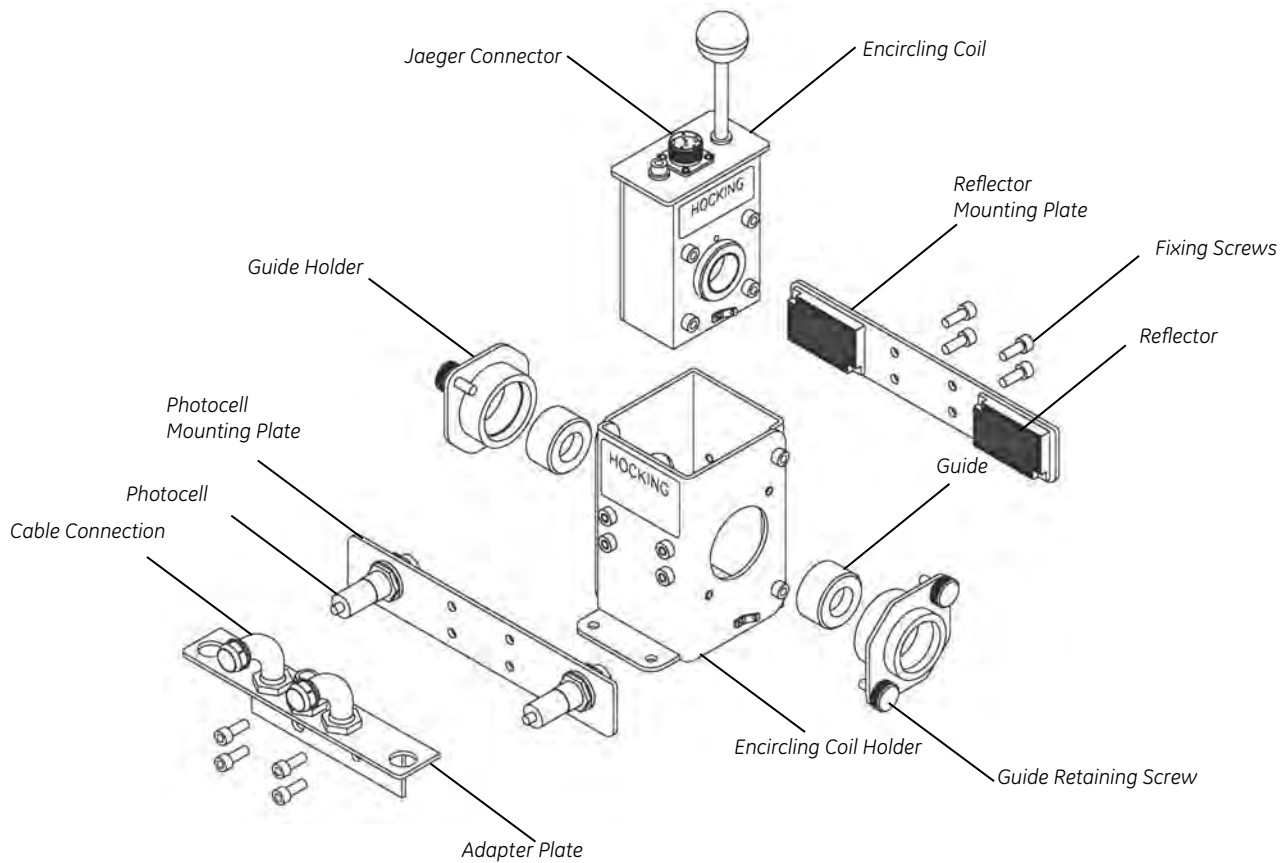
Encircling Coil Dimensions

	Size 1	Size 2	Size 3	Size 4
Aperture range (mm)	1 to 26	20 to 51	40 to 77	60 to 102
A'	115	140	TBA	TBA
B'	75	106	TBA	TBA
C'	46	46	TBA	TBA
D'	90	120	TBA	TBA
E'	52	52	TBA	TBA

Encircling Coil Holder Dimensions

	Size 1	Size 2	Size 3	Size 4
Aperture range (mm)	1 to 26	20 to 51	40 to 77	60 to 102
A	138	163	TBA	TBA
B	139	169	TBA	TBA
C	84	84	TBA	TBA
D	85	119	TBA	TBA
E	69	84	TBA	TBA
F	119	149	TBA	TBA
G	50	50	TBA	TBA

Components of a Galaxy System



Components of this system may be ordered individually.
The diagram illustrates all the components that might be assembled to form a system.

Name	PRN	Notes
Encircling Coil	GAL1CCNNN	NNN indicates the size in millimetres required for the coil aperture. e.g. if a 26mm ID was required for the coil the PRN would be GAL1CC026.
Jaeger Connector	N/A	The six way Jaeger connector is standard for all Galaxy coils. This is a standard part of the Encircling Coil above.
Encircling Coil Holder	GAL1H	One coil holder will take all coils from that size range. e.g. for a GAL2 series coil a GAL2H holder would be required.
Guide	GAL1GNNN	As for the encircling coil above NNN indicates the size in millimetres required for the product. These can be ordered in a range of materials such as Nylon or Stainless Steel in order to suit the product handling requirements.
Guide Holder	N/A	Quick release plates that hold the guides in position.
Guide retaining screw	N/A	Part of the guide assembly that allows quick exchange of guides.
PhotoCell Assembly	N/A	For detection of start and end of product entering and leaving the coil. Comprises two photo-cells, photocell mounting plate, two reflectors and reflector mounting plate.
Cable Management	N/A	Allows tidy management of all leads associated with the coil assembly. Comprises cable connection conduit, adapter plate and cable trunking as required.

Design and Performance

Modular design for rapid change

The design of the Galaxy range of probes allows the operator to rapidly switch any component of the assembly as required. Encircling coils within the same size range can be exchanged in a matter of seconds to suit manufactured product variation.

Coil holders are available in 4 sizes that can house the full range of coils for product of less than 1mm up to 500 mm in diameter (see table for sizes).



Modular Galaxy Encircling Coil

One Tool Toolkit

The whole system is assembled using an allen key allowing a simple and rapid way of modifying equipment setup. This means there is no requirement for special tools, and only simple personnel training is required for maintenance operations.



Allen key for simple set-up

Low Cost of ownership

A unique aspect of the Galaxy range is the rapidly interchangeable guides. This allows guides in a wide range of materials for specific handling of different products.

This approach means that the unit can be extremely cost effective over its lifetime due to the low cost of consumables, and it is extremely flexible for inspecting a wide range of product.



Range of interchangeable guides

Precise Eddy Current performance

At the heart of the system lies the Hocking Eddy Current coil. Manufactured to exacting standards it delivers superb signal to noise ratio and again is a modular component that can be replaced as required by the operator without disposing of the entire assembly.



Replaceable Eddy Current coil

Tubing Inspection Probes

Eddy Current and Remote Field

Tubing Inspection Probes for Power Generation, Oil & Gas, and HVAC Applications

GE Sensing & Inspection Technologies tubing probes are designed to meet the stringent inspection needs of Balance-of-Plant applications in the Power Generation, Oil & Gas, and Air Conditioner industries for non-ferrous and ferrous tubing. GE is a dedicated manufacturer, providing customers with high-quality and cost-effective probes for their inspection needs.

Features and Benefits

- ID tubing probes are made with high performance materials and adhesives for excellent abrasion resistance and long life.
- Proprietary long-life kink resistant poly shafts increase probe life, improve durability, and ensure inspection ease.
- Many common eddy current and remote field probe are on the shelf and ready for shipment; rapid turn-around time for orders of up to 10 probes.



Eddy Current Probes for Balance-of-Plant Non-Ferrous Tubing

- Designed for inspection of non-ferrous tubing in balance-of-plant applications in the Oil & Gas and Power Generation industries.
- Probe diameters from 0.380 inch to 1.5 inch (9.65 mm to 38.1 mm) in 0.010 inch (0.254 mm) increments.
- Small diameter probes also; diameters from 0.270 inch (6.86 mm) to 0.370 inch (9.40 mm); probes on 0.25 inch poly shaft in 50 ft length.
- Probes available with standard poly shaft lengths of 65 ft, 80 ft, 100 ft and 120 ft (19.8 m, 24 m, 30.5 m and 36.5 m).
- All probes have industry standard four-pin Amphenol® connectors.
- ID probes available in Barnacle Scraper (BS) and Chamfered Barnacle Scraper designs.
- Magnetically biased versions of both probe configurations are available.
- Probes available in low, mid, and high frequency ranges:
 - Low range center frequency: 150 kHz
 - Mid range center frequency: 300kHz
 - High range center frequency: 600kHz



Eddy Current ID probes for balance-of-plant non-ferrous tubing

For Help in Determining your ID Probe Diameter...

Log on to the www.geinspectiontechnologies.com/en/products/eddy_current/probes/calculator.html to use our ID probe calculator to custom design your ID probe and generate a part number.

Organize probe request per inspection information

Tube OD (Inch)	2.000
Tube Wall (Inch)	0.028
Tube ID (Inch)	1.944
Pick Tube Material	304 SS
Resistivity (Ω-in/inch)	72
Prime Freq. (kHz)	318
Frequency Range (HFM/LF)	HF
Pick Fill Factor	65%
Probe Size	1.570

GE Inspection Technologies

PROBE ENTRY FORM | PURCHASE ORDER FORM

Instructions:

Please enter Quantity and the Probe Options to place your order.
If you do not know the Probe Size, click the Probe Size Calculator link to calculate. [\[Probe Size Calculator \]](#)

Click Delete icon to delete an incorrect entry. To add a new row, click Add row.

Upon consulting the Order Entry Form, click the Purchase Order Form tab to place the Order.

Note:

- BS - Barnacle Scraper
- CBS - Chamfered Barnacle Scraper
- MBS - Mag Biased Barnacle Scraper
- MCBS - Mag Biased Chamfered Barnacle Scraper
- UFP - U-Based Hex with Hex Centering

Pick probe options and place order

Item	Quantity	Component Name	Pick Probe Size (Inch)	Pick Probe Model	Pick Freq. Range	Pick Poly Length	Pick Poly OD & Type	GE Probe Model #	GE Part #
			0.380	BS	HF	65	3/8-Type G	0.380-254-65-HF-G	000-000-000

Probe size calculator

Probe order entry form

Remote Field Probes (RFT) for Ferrous Tubing

- Designed for inspection of ferrous tubing in the Oil & Gas and Petrochemical industries
- All probes encased in a stainless steel sleeve.
- Probe diameters from 0.312 inch (7.92 mm) to 0.750 inch (19.1 mm).
- Probes available with standard poly shaft length of 65 ft (19.8 m).
- Probes come with three- and six- pin Amphenol® connectors.

Available probes and part number table on back cover



Eddy Current RFT probes

Eddy Current Probes for Air Conditioner Tubing

- Designed for inspection of non-ferrous tubing in industrial HVAC units.
- All probes are encased in a stainless steel sleeve.
- Cross-wound coil design for detection of omni-directional defects.
- Probe sizes: 0.409 inch (10.4 mm) to 0.800 inch (20.32 mm)
- Probes available with standard poly shaft length of 35 ft (10.7 m).
- Probes come with standard 4-pin Amphenol connectors.

Available probes and part number table on back cover



Eddy Current ID probes for air conditioner tubing

Enhance durability and lifespan

Probes are manufactured using superior wear-resistant materials to achieve extended overall probe life and added durability. All probes are constructed with our proprietary kink-resistant shafts.

Dedicated manufacturing facility provides rapid turnaround

We manufacture all ID tubing probes in our Lewistown, PA, USA facility. We have a dedicated manufacturing cell designed to enable high quality, rapid manufacturing with short delivery times. Many common probe sizes are stocked for quick delivery. For probe sizes not in inventory, GE Inspection Technologies offers rapid turnaround time for orders of up to ten probes.

Custom builds and special applications

Our facility contains an in-house applications lab to provide custom solutions for special applications. Backed by over 75 years of experience, our talented Applications team can provide solutions for standard tubing and surface inspection applications with traditional eddy current or eddy current array technologies.

Available RFT Probe Part Numbers

Switchable Dual Exciters (SDE)

Size	Model	Part Number
0.375 inch (9.52 mm)	0.375-SDE-LF-65-3/8G	666-623-037
0.400 inch (10.2 mm)	0.400-SDE-LF-65-3/8G	666-623-040
0.440 inch (11.2 mm)	0.440-SDE-LF-65-3/8G	666-623-044
0.470 inch (11.9 mm)	0.470-SDE-LF-65-3/8G	666-623-047
0.500 inch (12.7 mm)	0.500-SDE-LF-65-3/8G	666-623-050
0.560 inch (14.2 mm)	0.560-SDE-LF-65-3/8G	666-623-056
0.625 inch (15.9 mm)	0.625-SDE-LF-65-3/8G	666-623-063
0.690 inch (17.5 mm)	0.690-SDE-LF-65-3/8G	666-623-069
0.750 inch (19.1 mm)	0.750-SDE-LF-65-3/8G	666-623-075

Dual Exciters (DE)

Size	Model	Part Number
0.375 inch (9.52 mm)	0.375-DE-LF-65-3/8G	665-623-037
0.400 inch (10.2 mm)	0.400-DE-LF-65-3/8G	665-623-040
0.440 inch (11.2 mm)	0.440-DE-LF-65-3/8G	665-623-044
0.470 inch (11.9 mm)	0.470-DE-LF-65-3/8G	665-623-047
0.500 inch (12.7 mm)	0.500-DE-LF-65-3/8G	665-623-050
0.560 inch (14.2 mm)	0.560-DE-LF-65-3/8G	665-623-056
0.625 inch (15.9 mm)	0.625-DE-LF-65-3/8G	665-623-063
0.690 inch (17.5 mm)	0.690-DE-LF-65-3/8G	665-623-069
0.750 inch (19.1 mm)	0.750-DE-LF-65-3/8G	665-623-075

Single Exciters (SE)

Size	Model	Part Number
0.312 inch (7.92 mm)	0.312-SE-LF-65-5/16T	667-323-031

Available Air Conditioner Probe Part Numbers

Differential

Probe Diameter	35 ft (10.7 m) Amphenol 4p	50 ft (15.2 m) Amphenol 4p
0.409 inch (10.4 mm)	622-352-012	623-352-012
0.495 inch (12.6 mm)	622-352-013	623-352-013
0.516 inch (13.1 mm)	622-352-014	623-352-014
0.560 inch (14.2 mm)	622-352-015	623-352-015
0.620 inch (15.8 mm)	622-352-016	623-352-016
0.650 inch (16.5 mm)	622-352-017	623-352-017
0.800 inch (20.3 mm)	622-352-033	623-352-033

Cross Axis

Probe Diameter	35 ft (10.7 m) Amphenol 4p	50 ft (15.2 m) Amphenol 4p
0.409 inch (10.4 mm)	622-352-018	623-352-018
0.495 inch (12.6 mm)	622-352-019	623-352-019
0.516 inch (13.1 mm)	622-352-020	623-352-020
0.560 inch (14.2 mm)	622-352-021	623-352-021
0.620 inch (15.8 mm)	622-352-022	623-352-022
0.650 inch (16.5 mm)	622-352-023	623-352-023
0.800 inch (20.3 mm)	622-352-034	623-352-034



www.geinspectiontechnologies.com/en

GEIT-50019EN (05/08)

GE
Inspection Technologies

WeldScan Probes

Designed for Inspections of Ferrous,
Non-Ferrous Weld and Steel Structures



GE imagination at work

The WeldScan Application

WeldScan is an eddy current technique for detecting and sizing fatigue cracks in ferrous, non-ferrous welds and steel structures. WeldScan is the trade name of GE Hocking range of probes dedicated to this task.

Ferrous Welds

WeldScan probes detect surface-breaking fatigue cracks through non-conductive surface coatings up to 2 mm. This approach is much less expensive and quicker to use than alternative methods that require paint removal, such as MPI.

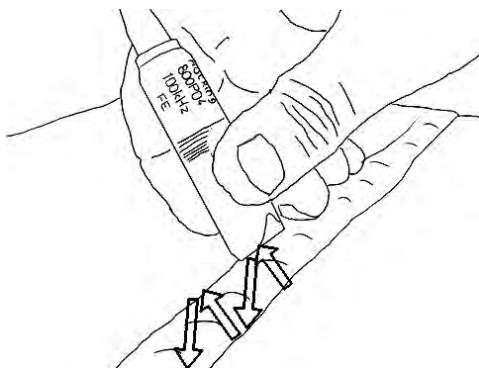
This design of probe greatly reduces the problems of inspecting uneven and undressed weld surfaces where there may also be changes in coating thickness.

The illustrations below show typical scan patterns for the cap of the weld, the toe of the weld and the Heat Affected Zone (HAZ).

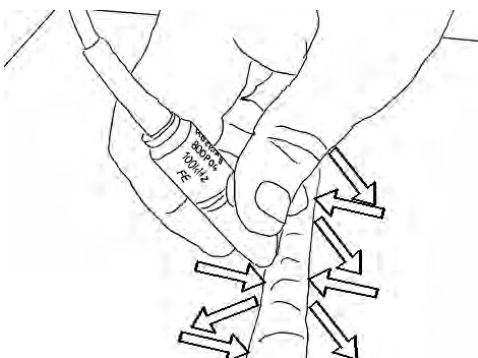
The application is set up so that the probe is driven at a frequency of 100kHz, and a Steel Reference Block is used to set the sensitivity required, using the three EDM slots and the relevant thickness of shims (to take into account coating (paint) variations). In the majority of applications the 1mm slot in the reference block is set to vertical by rotating the phase and having an amplitude of 100% FSH.

For the best results the operator should be trained in the probe handling technique as the angle of approach and scan pattern influence the best flaw detection. This is due to the directional eddy current field, designed to optimise the eddy current field for this type of inspection.

WeldScan probes can also be used to inspect ferrous welds through metallic protective coatings, which are sometimes used for additional protection of the structure.



Scanning Weld Cap



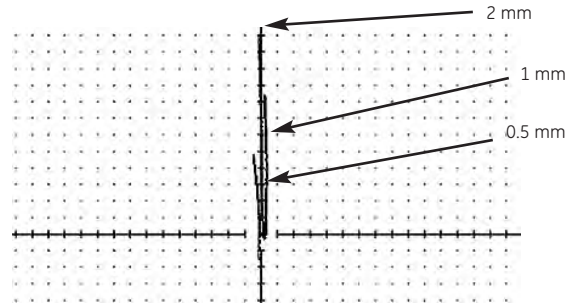
Scanning Weld Toe and HAZ

Other Applications

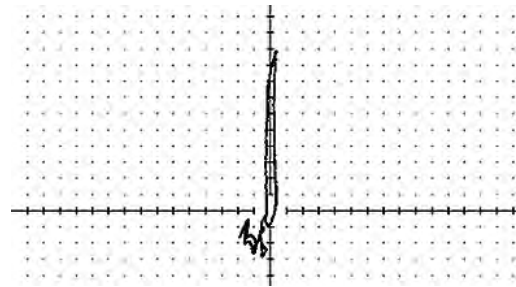
GE Hocking also provide WeldScan probes, which can be used to inspect Aluminum and Stainless Steel Welds.

WeldScan probes are utilized on other steel structures and are commonly used in Shipping, Rail and Civil Engineering Industries.

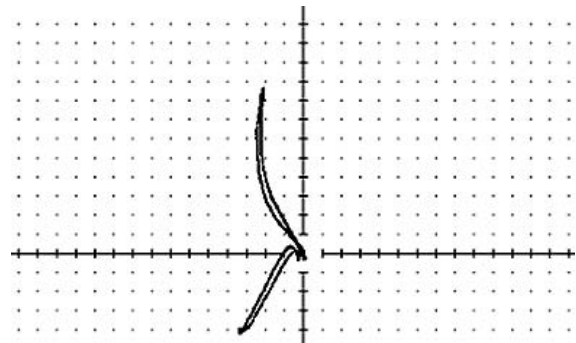
- The traces below show typical responses from the reference block and actual cracks in the weld.



Reference block with 0.5, 1.0 & 2.0 mm notches



Probe traversed along toe of weld with defect (positive signal)



Scan of weld Toe & HAZ. Negative signal is from toe of weld and HAZ & positive signal is from defect



Probe traversed along toe of weld with defect (positive signal)

Approval Bodies

Many certifying authorities in the oil industry accept WeldScan and recommend their use with a GE Hocking.

Hocking phase plane instrument, such as Locator 2s/3s or Phasec 2s/2d. These bodies include Lloyds Register, Det Norsk Veritas, BureauVeritas and the PCN body.

Training of the individual in the WeldScan technique is carried out by a number of commercial organisations worldwide, and individuals can become NDT qualified in either the PCN or ASNT schemes.

The WeldScan probe is standardised by BS EN 1711:2000 "Eddy Current Examination of Welds by Complex Plane Analysis"

Benefits:

- Reduce Costs
- Quick and easy to use
- Approved method for replacing MPI of welds - has approval from many certifying authorities & operating training certification schemes
- Method can be used by Rope Access Inspectors - No Scaffolding required
- Limited Surface Preparation - WeldScan Probes can detect surface-breaking fatigue cracks through coatings
- Sub sea compatible - waterproof versions allow easy inspection via driver or ROV
- Unique probe design allows best access to Heat Affected Zone
- Prolonging Structures Life

Typical Dimensions

Typical Dimensions for an 800P style probe:
PRN example: 800P01NB1P
Tip radius - 5 mm
Handle diameter - 11 mm
Total Length - 88 mm Length from tip to rear of handle - 47.5 mm
PRN example: 800P04NB1P
Tip radius - 8 mm
Handle PRN example: 801P04JD1P
to rear of strain relief - 95 mm



Straight WeldScan 800P Style Probe

Typical Dimensions for an 801P and 802P style probes:
PRN example: 801P04JD1P
Tip radius - 8 mm
Tip diameter - 15.9 mm
Handle diameter - 15.9 mm
Total tip length - 20 mm Length to rear of strain relief - 170 mm
Length from tip to rear of handle - 129.5 mm
PRN example 802P01JD1P
Tip radius - 5.5 mm
Tip diameter - 11 mm
Handle diameter - 12.7 mm Total tip length - 23 mm
Length to rear of strain relief - 77.5 mm
Length from tip to rear of handle - 37 mm



90° Tip Inline 801P Style Probe

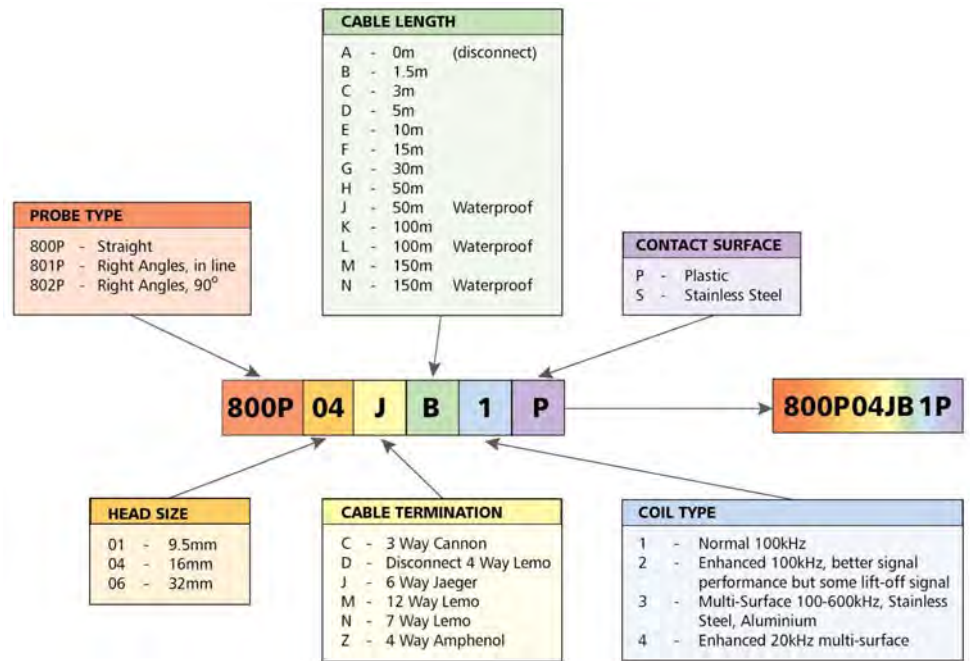


90° Tip Angle 802P Style Probe



Selecting the Right Probe

Example For standard inspections GE Hocking recommend WeldScan Probe PRN 800P04MB1P. The 800P04MB1P probe is straight, has a 16 mm head, an integral 12 way lemo connector suitable for Locator 3s, Phasac 2s/2d, a 1.5m integral lead, 100 kHz test frequency, and is made of Acetal plastic. The 800P04NB1P is identical in all respects except that it has a 7 way lemo connector which is compatible with the Locator 2s Instruments



Suggested Equipment

- Instrument: Locator 3s: PRN 39K100 or Phasac 2d PRN 40K200
 - WeldScan probe: GE Hocking PRN 800P04MB1P. 100kHz probe with 16mm head and 1.5m integral cable with connector for Locator 3s/Phasac 2d.
 - Broad Band Probe: for measuring Coating Thickness Hocking PRN 130P3, unshielded absolute probe relevant cable PRN 40A504.
 - WeldScan Reference Block: Ferrous EN1A Steel PRN 31A008 containing 3 EDM slots, 0.5 mm, 1 mm and 2 mm, attached are 4 x 0.5 mm plastic coating thickness shims.
 - Weld Inspection Starter Package for Locator 3s/Phasac 2s & 2d PRN ASP1P2 comprising of;
 - WeldScan Probe: PRN 800P01MB1P – 100 kHz, Straight, 9.5 mm diameter. Integral cable, 12 way lemo connector.
 - WeldScan Probe: PRN 800P04MB1P – 100 kHz, Straight, 16 mm diameter. Integral cable, 12 way lemo connector.
 - Broad Band (Paint) Probe: PRN 130P3 – 35 kHz to 250 kHz. Cable BNC to BNC: PRN 5A011.
 - Adapter 12 way lemo to BNC: PRN 40A002.
 - Reference Block Fe: PRN 31A008.
 - Probe Tip Protectors: PRN 29A031.
 - Hard Case with molded inserts: PRN 5A043V1.
 - Weld Inspection Starter Package for Locator 2s: PRN ASP1L2 comprising of;
 - WeldScan Probe: PRN 800P01NB1P – 100 kHz, Straight, 9.5 mm diameter. Integral cable, 7 way lemo connector.
 - WeldScan Probe: PRN 800P04NB1P – 100 kHz, Straight, 16 mm diameter. Integral cable, 7 way lemo connector.
 - Broad Band (Paint) Probe: PRN 130P3 – 35 kHz to 250 kHz. Cable 7 way lemo to BNC: PRN 39A002.
 - Reference Block Fe: PRN 31A008.
 - Probe Tip Protectors: PRN 29A031.
 - Hard Case with molded inserts: PRN 5A043V1.
- Note: WeldScan Probes are available to suit other Instruments*



GE Inspection Technologies: productivity through inspection solutions

GE Inspection Technologies provides technology-driven inspection solutions that deliver productivity, quality and safety. We design, manufacture and service ultrasonic, remote visual, radiographic and eddy current equipment and systems. We offer specialized solutions that will help you improve productivity in your applications in the aerospace, power generation, oil & gas, automotive or metals Industries.

www.ge.com/inspectiontechnologies

Reference Blocks

Conductivity Operating Reference Standards

Accuracy

The Hocking branded range of Operating Reference Blocks are derived, certified and traceable to national standards (NIST, USA and NPL, UK), conductivity references ideal for laboratory and field use. Up to five blocks can be clipped into a sample holder plate to bring them quickly into thermal equilibrium with each other and the test piece when the plate is placed upon it. The instrument can then be set for optimum accuracy using the dual setting block (PRN 47A023). All operating reference blocks are rigorously tested to meet high standards of accuracy and reliability. The blocks are calibrated to be accurate to $\pm 1.2\%$ of the value or $\pm 0.4\%$ IACS, whichever is less.



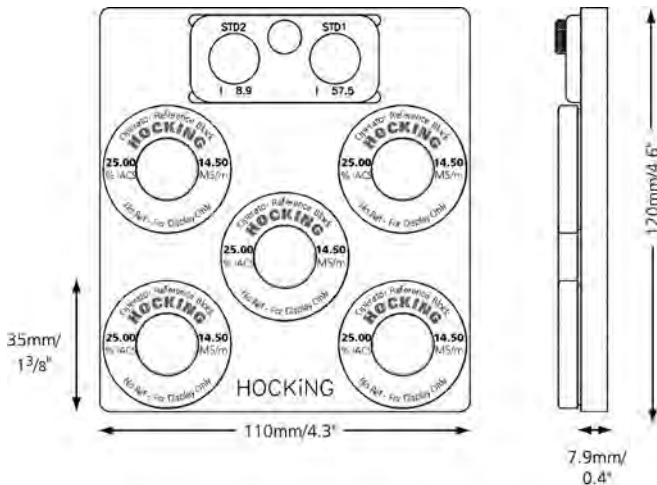
Reference block with 5 standards

All blocks are calibrated at 20 °C, and at the industry standard 60 kHz frequency. Blocks are supplied with calibration certificates, and a recalibration service is available.

Conductivities

Table values are nominal. Precise values will be shown on the blocks.

%IACS	Msm-1	Material	PRN
9 & 58	5 & 34	Dual Setting Block	47A023
1	0.6	Ti 2TA7	47A011
2	1	Stainless Steel 303S	47A012
9	5	Nickel Silver LC1291	47A013
17	10	P/Bronze	47A014
24	14	Brass LM5681	47A015
28	16	AL 5083	47A016
34	20	AL 7075-TF	47A017
37	21	AL 2014A-T6	47A026
38	22	AL 2014A-T6	47A024
43	25	AL 6061-TF	47A018
47	27	AL 6082-TF	47A019
60	35	AL 1200-H4	47A020
89	52	CuCr/Zirc LC639	47A021
100	58	Cu	47A022
N/A	N/A	Sample Holder 5+1	47A010
N/A	N/A	Sample Holder 3	47A025



Reference block dimensions





EDDY CURRENT PROBE SYSTEMS

NONDESTRUCTIVE TESTING EQUIPMENT

DETEK Eddy Current Probe Systems are designed to provide coverage of a wide frequency range in a variety of configurations for use on virtually all manufactures instruments.

Individual components allow an unlimited number of different probe configurations to be used with a single cable and reference coil. System expansion or component replacement is both economical and efficient without unnecessary duplication of individual parts.

FREQUENCY SELECTION

The choice of operating frequency depends on the electrical and magnetic properties of the material to be inspected, as well as type and location of the defects.

Lower frequencies penetrate materials to a greater extent and are sensitive to sub-surface defects, corrosion on a inaccessible surface, and variations in sheet or plating thickness. Higher frequencies penetrate less and are more sensitive to surface breaking defects.

The center frequency indicated on our probes is based on use with 100 OHM bridge instruments. Some manufactures use a 50 OHM bridge; and when used on these instruments, the center frequency will be approximately half the value indicated.

The operating frequency range for each of our probes is generally one-third to three times the center frequency without appreciable gain losses.

The following standard components are readily available, but we also welcome specials. Please call or write to discuss your unique requirements.

FREQUENCY VS PENETRATION

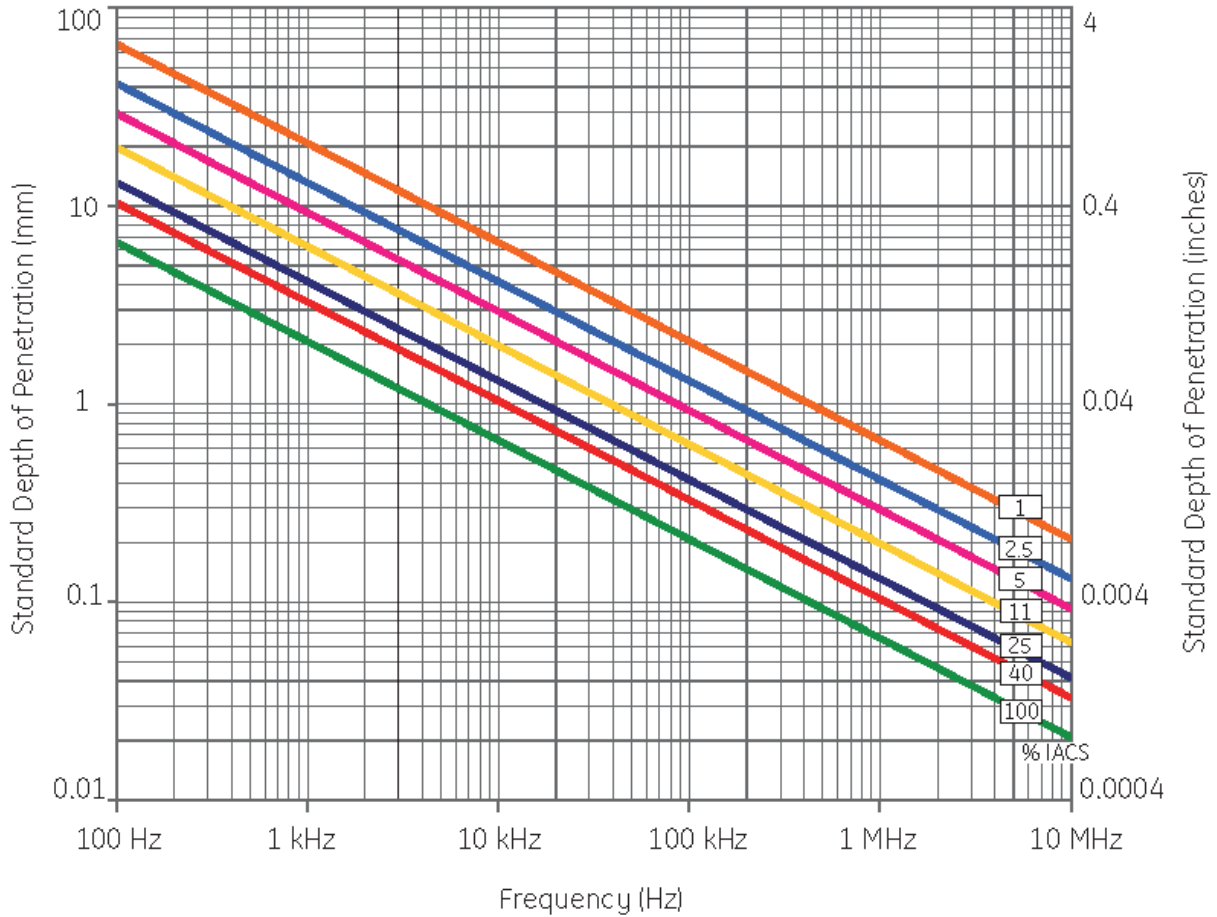
The relationship between the operating frequency and the standard depth of penetration of the eddy currents in a variety of different metals is illustrated on the following chard. It can be said that as the frequency increases, the depth of the penetration decreases.

The standard depth of penetration is defined as the depth at which the eddy current density is reduced to approximately 37% of the density at the surface.

We are happy to discuss your applications and help in selecting the right probe for your inspection.

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EMAIL: sales@detek.com

Depth of Penetration



Conductivities

Note: Conductivity values shown are approximate and depend on material condition, hardness, heat treatment, temperature and other factors.

Metal Type	% IACS	MSm ⁻¹
Aluminium Alloy, 1100	57-62	33-36
Al Alloy, 2014-T3 & -T4	32-35	18.5-23.2
Al Alloy, 2014-T6	38-40	22-23.2
Al Alloy 2024-T3	28-37	16.2-21.5
Al Alloy 2024-T4	28-31	16.2-18
Al Alloy, 7075-T6	32	18.5
Aluminium (pure)	61	35.4
Beryllium	34-43	19.7-24.9
Beryllium Copper	17-21	9.9-12
Brass, 61Cu 37Zn 2Pb	26	15.1
Brass, 61Cu 38Zn 1Sn	26	15.1
Brass, 70Cu 29Zn 1Sn	25	14.5
Brass, 70Cu 30Zn	28	16.2
Brass, 76Cu 23 2Al	23	13.3
Bronze 40Cu 23 2Sn	44	25.5
Bronze 92Cu 8Al	13	7.5
Cadmium	15	14.5
Chromium	13.5	7.8
Copper (pure)	100	58
Cupro Nickel 70/30	5	2.9

Metal Type	%IACS	MSm ⁻¹
Cupro Nickel 90/10	11.9	6.9
Gold	73.4	42.6
Graphite (pyrolytic)	0.43	0.25
Hastelloy	1.3-1.5	0.75-0.87
Inconel 600	1.7	0.99
Lead	8	4.6
Lithium	18.5-20.3	10.7-11.8
Magnesium	37	21.5
Magnesium (Cast Alloys)	9	5.2
Molybdenum	33	19.1
Nickel	25	14.5
Phosphor Bronze	11	6.4
Silver (pure)	105-117	60.9-67.9
Silver (Tin Solder)	16.6	9.6
Silver, 18 % Nickel Alloy A	6	3.5
Steel, Stainless (300 series)	2.3-2.5	1.3-1.5
Tin	15	8.7
Titanium	1-4.1	0.6-2.4
Titanium 6914v	1	0.6
Zinc	26.5-32	15.4-18.6
Zirconium	4.2	2.4



ABSOLUTE – SINGLE COIL PROBES

NONDESTRUCTIVE TESTING EQUIPMENT

These probes contain a single test coil and require the use of matching reference coil and the appropriate bridge instrument cable assembly. They are also suitable for use of the Locator UH instruments at the indicated frequencies and all 200 KHz. Probes are useable on the ED520/530 instruments.



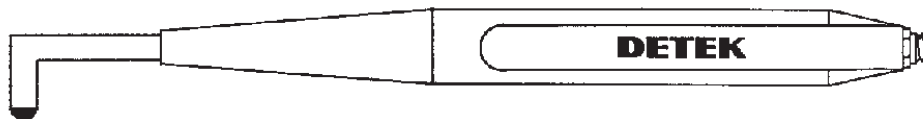
UNSHIELDED PENCIL PROBES

EP11ACM - 200 KHz.	EP11AEM - 2 MHz.
EP11ADM - 500 KHz.	EP11AFM - 6 MHz.



SHIELDED PENCIL PROBES

EP12ACM - 200 KHz.	EP12AEM - 2 MHz.
EP12ADM - 500 KHz.	EP12AFM - 6 MHz.



RIGHT ANGLE SHIELDED PROBES

EP22ACM - 200 KHz.	EP22AEM - 2 MHz.
EP22ADM - 500 KHz.	EP22AFM - 6 MHz.

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ABSOLUTE – SINGLE COIL PROBES

NONDESTRUCTIVE TESTING EQUIPMENT



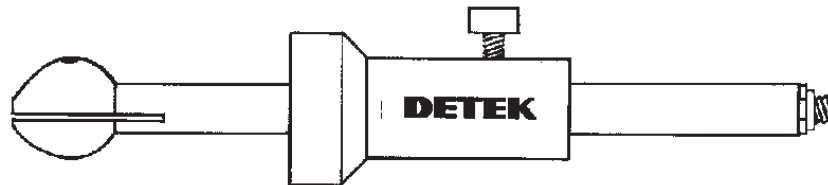
CRANKED RIGHT ANGLE SHIELDED PROBES

EP32ACM - 200 KHz.

EP32AEM - 2 MHz.

EP32ADM - 500 KHz.

EP32AFM - 6 MHz.



BOLT HOLE PROBES

(SPECIFY DIAMETER)

EP41ACM - 200 KHz.

EP41AEM - 2 MHz.

EP41ADM - 500 KHz.

EP41AFM - 6 MHz.



SPRING LOADED SORTING PROBES

EP51ACM - 200 KHz.

EP51AEM - 2 MHz.

EP51ADM - 500 KHz.

EP51AFM - 6 MHz.

REFERENCE COILS

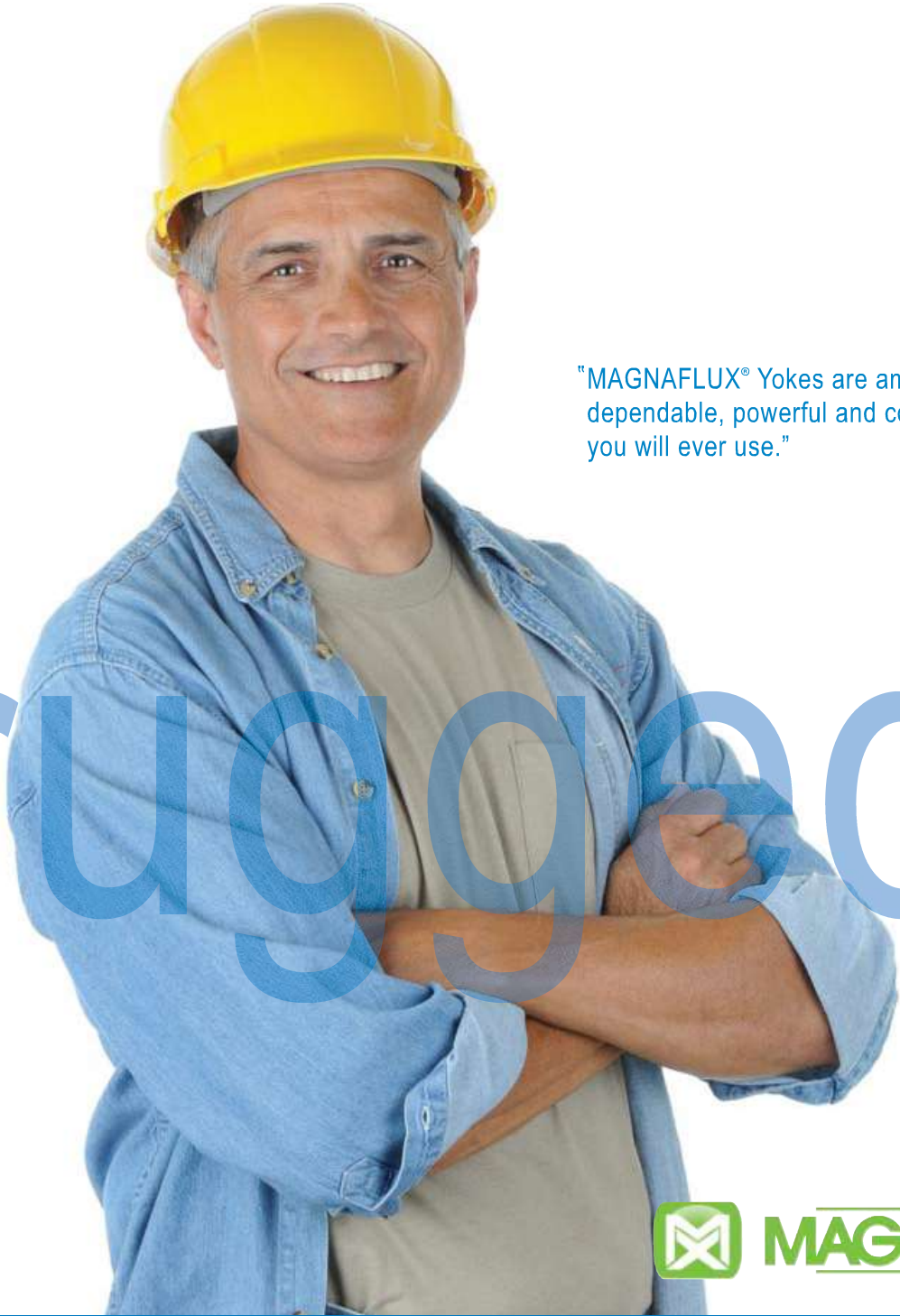
EPRC-C - 200 KHz.

EPRC-E - 2 MHz.

EPRC-D - 500 KHz.

EPRC-F - 6 MHz.

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"MAGNAFLUX® Yokes are among the most dependable, powerful and comfortable yokes you will ever use."

rugged



Magnaflux® Magnetic Yokes are built rugged to withstand years of shop and field inspection abuse, yet are among the most ergonomically and technically advanced yokes on the market today.

Technology Driven

MAGNETIC YOKES

Y-1 AC Magnetic Yoke

The Magnaflux® Y-1 AC Magnetic Yoke is a new generation of lightweight, ergonomic yoke designed to improve job performance and productivity by reducing operator arm and wrist fatigue when testing for prolonged periods or in tight, confined spaces. The Y-1 is easier and more comfortable to operate than standard yokes and comes with a rugged chemical and impact resistant outer shell that will stand up to years of inspection abuse. Each unit is individually serial numbered and certified for performance prior to shipment.

- 25% increase in lift strength
- Improved cord strength
- Wider legs for better contact
- Shields for better leg protection
- Sealed core to resist corrosion
- Durable, rugged construction

General Specifications:

- Elec. Requirements - 115V/50-60hz/1ph or 230V/50-60hz/1ph
- Max. Line Current Draw - 3.7 amp 115V or 1.6 amp 230V
- Weight - 5.35 lb. (2.43 kg)
- Leg Span - Up to 11in. (20 cm)
- Cord Length - 10 ft. (3.05 m)
- Warranty - 1 year

Part Number:

- 623502 Y-1 115V Yoke
- 623503 Y-1 230V Yoke



Y-1 AC Magnetic Yoke Kit

The Magnaflux® Y-1 AC Magnetic Yoke Kit contains all key elements necessary to perform visible magnetic particle inspections:

- Y-1 Magnetic Yoke 115V/50-60hz/1ph or 230V/50-60hz/1ph
- 1 lb. #1 Gray Magnetic Powder
- 1 lb. #8A Red Magnetic Powder
- Powder Spray Bulb
- Paint Marker
- SCRUBS™ Hand Cleaner
- Portable Carrying Case and Instructions

Part Number:

- 623529 Y-1 115V Yoke Kit
- 623530 Y-1 230V Yoke Kit



MAGNETIC YOKES

Magnaflux Magnavis® brand magnetic yokes lead the industry in design innovation and magnetic particle inspection performance. From the lightweight ergonomic design and increased lifting power of our recently enhanced Y-1 AC Yoke to the 100% field portability of the battery powered Y-8, you will find every yoke we manufacture to be built as tough as you work.

Y-7 AC/DC Magnetic Yoke

The Magnaflux® Y-7 AC/DC Magnetic Yoke is designed for portable testing of ferrous parts and is ideal for the inspection of welds and other remote testing applications.

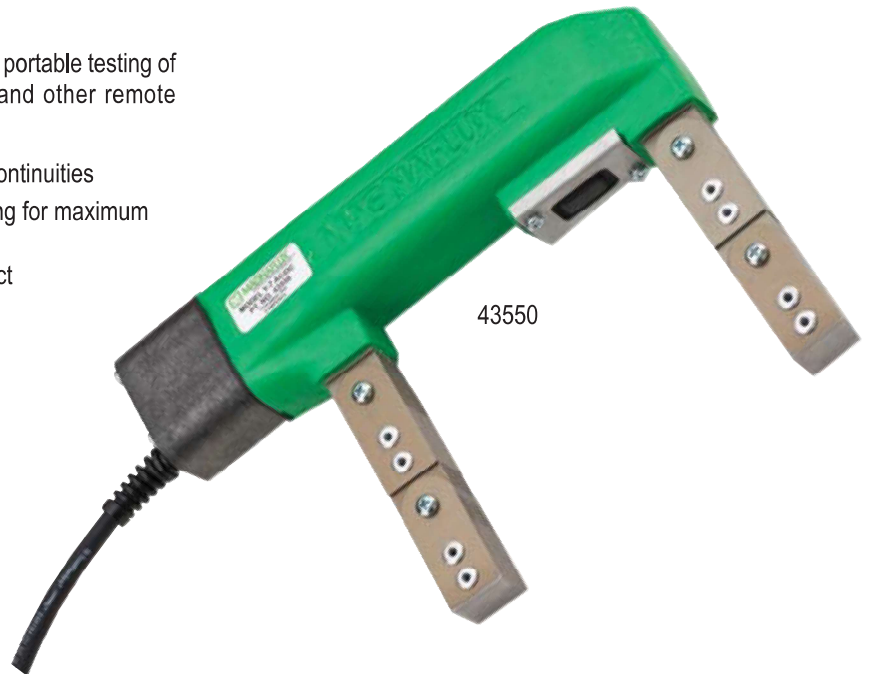
- Can be used to find both surface and near-surface discontinuities
- Solid state controls located in the interior of yoke housing for maximum safety and reliability
- Articulating, double-jointed legs assure good part contact

General Specifications:

- Elec. Requirements - 115V/50-60hz or 230V/50-60hz
- Max. Line Current Draw - 9 amp 115V AC or 4 amp 230V
- Weight - 7.4 lb. (3.36kg) 115V or 7.2 lb. (3.27kg) 230V
- Leg Span - 0" - 12" (0 - 30cm)
- Cord Length - 12 ft. (3.66 m)
- Warranty - 1 year

Part Number:

- 43550 Y-7 AC/DC Magnetic Yoke 115V/50-60hz
- 43560 Y-7 AC/DC Magnetic Yoke 230V/50-60hz



Y-7 AC/DC Magnetic Yoke Kit

The Magnaflux® Y-7 AC/DC Magnetic Yoke Kit contains all key elements necessary to perform visible magnetic particle inspections:

- Y-7 AC/DC Magnetic Yoke 115V/50-60hz or 230V/50-60hz
- 1 lb. #1 Gray Magnetic Powder
- 1 lb. #8A Red Magnetic Powder
- Powder Spray Bulb
- Paint Marker
- SCRUBS™ Hand Cleaner
- Portable Carrying Case and Instructions

Part Number:

- 43509 Y-7 AC/DC Magnetic Yoke Kit 115V/50-60hz
- 620741 Y-7 AC/DC Magnetic Yoke Kit 230V/50-60hz





Y-8 Battery Operated Magnetic Yoke Kit

The Magnaflux® Y-8 Battery Operated Magnetic Yoke Kit is ideal for remote testing applications. The kit allows for 100% portability in field inspections of ferrous parts with the use of the battery operated Y-8 Yoke.

- 100% portable for field inspections
- Battery pack comes with convenient shoulder strap
- Solid state controls located in the interior of yoke housing for maximum safety and reliability
- Articulating, double-jointed legs assure good part contact

General Specifications:

- Yoke Current Draw - 1.4 amp @ 6 Volts
- Weight - 7.75 lb. (3.52kg)
- Leg Span - 0" - 12" (0 - 30cm)
- Cord Length - 12 ft. (3.66 m)
- Warranty - 1 year
- Battery:
 - 6V, 12 amp hr.
 - 5.25 lb. (2.38kg)
 - 4.25" x 2.75" x 5.5" (10.8cm x 7 cm x 14cm)
 - Battery Operating Temp. Range -40°C to 60°C (-40°F to 140°F)
- Battery Charger Current Draw - 0.2 amp @ 115V or 230V

Kit Part Number:

- 611710 Y-8 Magnetic Yoke Kit 115V
- 611710-01 Y-8 Magnetic Yoke Kit 230V

611710



YOKE ACCESSORIES

Yoke Light Kits

The Magnaflux® Yoke Light Kits provide enhanced visible method detection of flaws and discontinuities under low and no light conditions.

Part Number: 623745 - Light Kit for Y-1 AC Yoke

Part Number: 621785 - Light Kit for Y-6/Y-7 Yokes



623745

10 lb. Test Weight for Y-1 Yoke

The Magnaflux® 10 lb. Test Weight is designed specifically for use with the Y-1 Yoke. It provides balanced weight distribution and comes with a built-in leg positioning guide to assure accurate test results every time. Each weight measures 9" x 2" x 2", is individually serialized, and comes with a certificate stating that it meets ASTM E1444.

Part Number:

- 624115 10 lb. Y-1 Yoke Test Weight



624115

PARKER

MAGNETIC PARTICLE INSPECTION INSTRUMENTS



DA400 - Contour Probe. Most popular A.C./D.C. Yoke. Available in various Kit forms. Y400 Yoke Light additional.



B300 - A.C. Contour Probe. Available with Y300 Yoke Light. Also available with GFI Plug.



A210 - Heavy Duty A.C. Contour Probe. Strongest A.C. Field Yoke available. Model DA200 available for A.C./D.C. Operation.



UW115 & UW12 Underwater A.C. and D.C. Yokes.



PL8 & PL10 - Magnetizing Coils. 8" & 10" I.D. Complete with Carrying Case.



BAC310 - Portable, Stand alone Battery Inverted 115VAC Power Supply. Operate A.C. Yokes or other Instruments where normal power sources are unavailable.



DA750 & DA1500 - Portable Mag units. Heavy duty 750 or 1500 AMP. Available with all accessories.



B100 - Our most economical A.C. Contour Probe. Available in 115VAC and 230VAC. May be ordered with the Y400 Yoke Light at extra cost.



B310PDC - Portable 12VDC Contour Probe. Very Lightweight (6.5 lbs.) Available with 7.2 or 14.4 Ah Battery Pack with shoulder strap.



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PARKER

FIND DEFECTS *ELECTRONICALLY* WITH THE DA-400 SERIES CONTOUR PROBES® *FROM* PARKER RESEARCH




- (1) Versatility and powerful performance in a lightweight (8-pound) instrument.
- (2) Constant AC or pulsed DC fields with the flip of a switch; for the location of surface and some sub-surface defects.
- (3) Apply continuous or residual magnetic fields and demagnetize too.
- (4) Use with dry powder, wet fluorescent or visible.
- (5) High impact molded housing.
- (6) Y400 Yoke Light available at additional cost.

The DA-400 Contour Probe is a portable, self-contained instrument designed to produce a magnetic field on or within ferro-magnetic materials.

The selective AC and pulsed DC functions are built into a single reliable instrument. The AC mode produces an intense AC field for detection of surface defects and demagnetizing after inspection. The DC mode produces an intense pulsed DC field for detection of some sub-surface defects.

Controls and solid-state electronics are contained within the high impact molded housing.

Articulating legs allow the AC or DC field to be applied to the precise area of inspection on nearly any part or surface shape...in the lab, factory or field site.

All Parker Contour Probes comply with the requirements of applicable specifications. Certified for European  requirements.



DA-400 SHOWN WITH "A" KIT ITEMS

Kit items are available with dry powder and Wet Fluorescent inspection mediums. Including Black Light and Steel Carrying Case.



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FIND DEFECTS FAST WITH THE DA-400 SERIES CONTOUR PROBES® FROM PARKER RESEARCH...

Completely portable one-man package for fast, positive, reliable electronic location of defects in ferrous metals

The DA-400 Contour Probe is a rugged high-performance instrument for magnetic inspection to accepted standards of common practice...will quickly locate surface cracks in ferrous materials that can be brought between the pole pieces...**and some sub-surface defects, too!** Finds defects from metal fatigue...wear...stress...overloading... and other causes.

AEROSPACE RELIABILITY This instrument combines advanced techniques in the forming and application of induced magnetic fields...so widely used today in critical industries where reliability and test results are a must.

FAST POSITIVE WITH NO ARC BURNS Selective high energy AC or pulsed DC fields, induced into the work, provide fast positive indications, eliminating high-amperage-arc-burning of work surfaces. **Arc burns often become failure defects.**

ONE-MAN PACKAGE The **Contour Probe Kit** is a complete magnetic package that one man takes to the work and easily performs a thorough and reliable inspection in a fraction of the time consumed by large bulky equipment.

PRECISE AREA INSPECTION Powerful magnetic fields are concentrated and applied at the precise area to be inspected.

WIDE VERSATILITY Mechanical flexibility plus selectively controlled solid state electronic features permit a vast field of applications. Mechanically, the **Probe** will conform to practically any surface configuration. The unique electronic circuitry contained in the molded handle permits selection of a strong constant AC magnetic field, or high intensity pulsed DC field.



DA-400 SHOWN WITH "A/B" KIT ITEMS

SPECIFICATIONS

	DA400	DA400S	A410	A410S
PHYSICAL	8.5 (216) x 10.25 (260) x 2.25 (57 mm)			
LINE VOLTAGE	115 VAC	230 VAC	115 VAC	230 VAC
SINGLE PHASE	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
LINE CURRENT	4 A	3 A	4 A	3 A
DUTY CYCLE	2 MINUTES ON – 2 MINUTES OFF			
WEIGHT	8.5 LBS (3.8 kg)			
CONSTRUCTION	GLASS FILLED NYLON HOUSING 10 FOOT (3 M) 3 WIRE POWER CORD			
SPAN	12 IN (305 mm) ACROSS POLES			
FIELD	AC / DC	AC / DC	AC	AC

"A" Kit Items Include:

One pound each of Red & Gray Mag Powder, PB-1 Powder Blower, Steel Carrying Case

"A/B" Kit Items Include:

Same as above, plus one EA140 UV Light and one 12 oz. Aerosol Can Fluorescent Particles

OPTIONAL ACCESSORIES

MG25 Magnetometer (certified)
RB1 Powder Removal Bulb
MG50 Magnetic Pie Gauge
Y400 Yoke Light



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PARKER

B-100 CONTOUR PROBE®

MOST ECONOMICAL
Parker A.C. YOKE

DURABLE MOLDED
CONSTRUCTION

POWERFUL A.C.
MAGNETIC FIELD

AVAILABLE WITH
OPTIONAL Y400 YOKE LIGHT

ONE YEAR GUARANTEE

TOTALLY REPAIRABLE

The construction of the Parker
B100 allows for the replacement
of all internal components.



THE INSTRUMENT THAT DOES SO MUCH, SO WELL If you do any work with ferrous metals...shipyard... aerospace...steel mill...foundry...weldment or vehicle overhaul, you need the performance advantage of the B-100 Contour Probe.

WIDE VERSATILITY Mechanically, the B-100 Probe will conform to practically any surface configuration. Strong, constant AC fields or high intensity pulsed DC fields, using the DC-300 power supply.

ONE-MAN PACKAGE The B-100 Contour Probe is a complete Magnetic package that one man takes to the work and easily performs a thorough and reliable inspection.

PRECISE AREA INSPECTION Powerful magnetic fields are concentrated and applied to the precise area to be inspected.



B100 SHOWN WITH OPTIONAL "A" KIT

Contour Probe Kits - are available with Dry Powder and Wet Fluorescent inspection mediums including UV Light. A truly portable one-man inspection package. The Y400 Yoke Light is optional on the B100 at extra charge.



Ask for a demonstration and find out how one of the Parker Contour Probes can save time and money in your operation.

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SPECIFICATIONS				REPLACEMENT PART NUMBERS			
MODEL	VOLTS Ac	AMPS	WEIGHT	COIL	SWITCH	CORD	BUTTON BOOT
B-100	115 V, 50/60 Hz	4 A	6.5 lbs.	2037-1	2038-1	2591-3	2318-1
B-100S	230 V, 50/60 Hz	3 A	2.95 kg	2042-1	2038-1	2140-4	2318-1

INSTRUMENT DESCRIPTION

In overall design and performance, the Contour Probe comprises a coil wound on a laminated steel leg assembly contained within the rugged molded housing. Flexibility of the legs allows the field to be “focused” at the precise area of inspection.

Basically the Contour Probe is an electromagnet producing a strong AC magnetic field. Placement of the two poles (legs) upon ferrous materials merely provides a path for the intense magnetic field to pass from one pole to the other. The part completes the flux path and becomes highly magnetized.

OPTIONAL PULSED DC POWER SUPPLY



DC-300 115VAC, 50/60 Hz INPUT
DC-300S 230 VAC, 50/60 Hz INPUT

The DC300 contains an electronic circuitboard assy. completely sealed within the housing. The B-100 Probe should be connected to the output power cord, while the input plug of the power supply should be connected to a Grounded power source.

PULSED DC MAGNETIZATION: A DC field induced into a small work piece penetrates a larger cross section of the part. DC provides greater penetration for the detection of near-surface defects in small parts. However, on some small parts, it is possible that an excessive amount of field will saturate the part and cause a masking effect to the point where it is impossible to define a defect.



OPTIONAL CONTOUR PROBE KITS

“A” KIT INCLUDES: Steel Carrying Case, One pound Each of Red and Gray Magnetic Powder and One Parker PB-1 Powder Blower.

“A/B” KIT INCLUDES: All “A” Kit items and One EA140 4W UV Light and One 9.5 oz. Aerosol Can Fluorescent Particles.

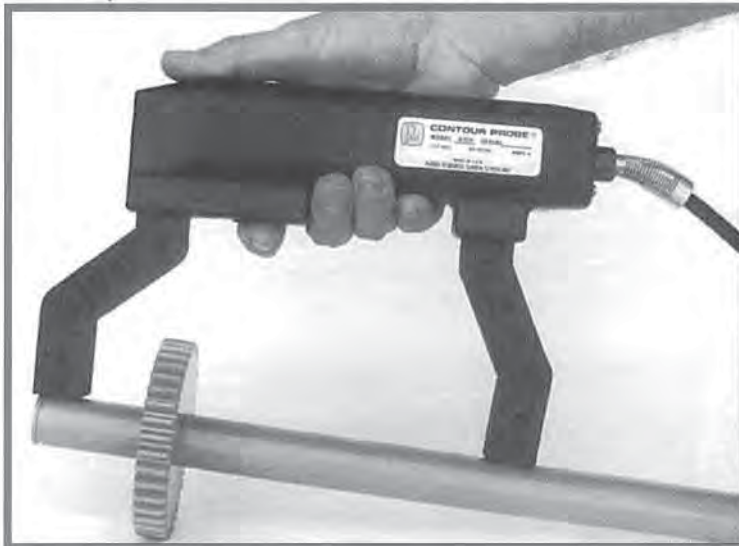
B100 SHOWN WITH OPTIONAL “A/B” KIT



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PARKER

THE PARKER B-300 CONTOUR PROBE®



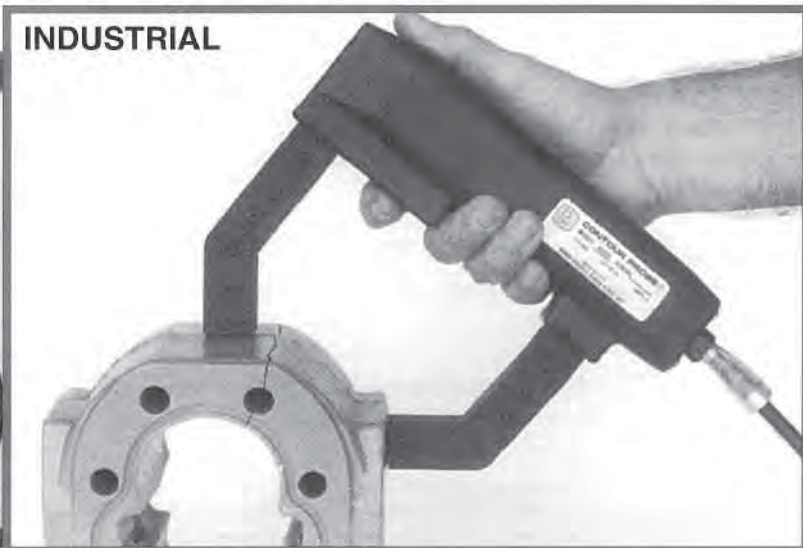
PRODUCTION



FIELD MAINTENANCE



AUTOMOTIVE



INDUSTRIAL

Big Performance in a Small Package

THE B-300 CONTOUR PROBE® FROM PARKER RESEARCH... THE ORIGINATORS OF THE FLEXIBLE LEG ELECTROMAGNETIC YOKE QUICKLY LOCATES SURFACE CRACKS... USING DRY POWDER, WET VISIBLE OR FLUORESCENT MATERIALS...

The B-300 Contour Probe is a lightweight (7 1/2 pounds), Magnetic Inspection Yoke designed to perform Magnetic Particle inspections quickly and reliably.

As with the other popular Parker Probes the B-300 has fully adjustable legs which allow the strong AC field to be applied directly to the precise area to be inspected, regardless of part size or mass.

The rugged body/handle assembly is injection molded of the same material used in most heavy duty hand power tools. It is shaped to fit the hand comfortably to reduce operator fatigue.

UNITS ARE AVAILABLE IN 115, 230, 42-48 VAC AND 4-12 VDC. ALL UNITS ARE © COMPLIANT.

When required, the B-300 may be operated from the optional DC-300 pulsed DC power supply to provide intense DC magnetic fields.

All B-300 Kits include carrying case, one pound each of red and gray inspection powder, a PB-1 Powder Blower and Y 300 Yoke Light.

The Parker Research Contour Probe Kits, accessories and supplies are available from factory stock or local distributors throughout the U.S. and major foreign countries.



DETEK

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Completely portable one-man package for fast, positive, reliable location of defects in ferrous metals

B-300 SHOWN WITH Y300 HIGH INTENSITY YOKE LIGHT



ONE-MAN PACKAGE The B-300 Contour Probe is a complete Magnetic package that one man takes to the work and easily performs a thorough and reliable inspection in a fraction of the time consumed by large bulky equipment.

PRECISE AREA INSPECTION Powerful magnetic fields are concentrated and applied to the precise area to be inspected.

WIDE VERSATILITY Mechanically, the B-300 Probe will conform to practically any surface configuration. Strong,

constant AC fields or high intensity pulsed DC fields, using the DC-300 power supply.

THE INSTRUMENT THAT DOES SO MUCH, SO WELL If you do any work with ferrous metals...in the shipyard...aerospace...steel mill...foundry...weldment or vehicle overhaul, you need the performance advantage of the B-300 Contour Probe.



Contour Probe Kits — are available with Dry Powder and Wet Fluorescent inspection mediums, including Black Light, all in one easy to carry case. A truly portable one-man inspection package.

SPECIFICATIONS

	B300	B300S	B48	B12D
PHYSICAL	7 ³ / ₈ H x 9 ¹ / ₄ W x 2 ¹ / ₈ D			
LINE VOLTAGE	115 VAC	230 VAC	42-48 VAC	4-12 VDC
SINGLE PHASE	50/60 HZ	50/60 HZ	50/60 HZ	—
LINE CURRENT	4 A	3 A	6.5 A	2.5 A
DUTY CYCLE	2 MINUTES ON – 2 MINUTES OFF			
WEIGHT	7 ¹ / ₂ LBS			
CONSTRUCTION	POLYURETHANE FILLED GLASS/NYLON HOUSING. 8 FOOT/3 WIRE POWER CORD			
SPAN	0-12 IN. ACROSS POLES			

CONTOUR PROBE KITS

B-300-A INSTRUMENT WITH

1 lb. ea. Red & Gray Powder
PB1 Applicator & Carrying Case 16 lbs.

B-300-AB same as above
Plus EA140-Hand Held UV Light and 778A-9.5 oz. aerosol can Fluorescent Particles 19 lbs.

OPTIONAL ACCESSORIES

MG25 Magnetometer (certified)
RB1 Powder Removal Bulb
MG50 Magnetic Pie Gauge
DC300 Pulsed DC Power Supply

DC 300 POWER SUPPLY AVAILABLE FOR PULSED DC OPERATION ON THE B300 AND B300S MODELS.



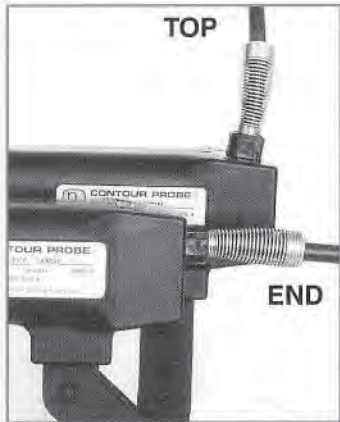
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PARKER

MODEL B-310 MINI CONTOUR PROBE®



The reversible power cord strain relief allows for access to confined work areas.



SMALLEST OF THE SMALL

The B-310 Mini Contour Probe® from PARKER RESEARCH provides greater flexibility and reduced size.

The B-310 Contour Probe is a lightweight (six pounds) Magnetic Inspection Yoke designed to perform Magnetic Particle inspections quickly and reliably, and with greater versatility. The reversible strain relief feature allows the power cord to enter from the rear or top of the unit permitting greater access to small work areas. The overall length of the unit is only 7.25".

As with all the Parker Contour Probes, the B-310 has fully adjustable legs permitting the AC magnetic field to be applied to the precise area of inspection.

The rugged body assembly is injection molded of the same material used in most heavy duty hand power tools. It is shaped to fit the hand comfortably to reduce operator fatigue.

The B-310 is a completely portable inspection instrument that performs countless on-the-spot inspections quickly and reliably, at minimum cost.

UNITS ARE AVAILABLE IN 115, 230 AND 42-48 VAC. ALL UNITS MAY BE  CERTIFIED.

When required, the B-310 may be operated from the optional DC-300 pulsed DC power supply to provide intense DC magnetic fields.

The B-310 Kit includes carrying case, one pound each of red and grey powder, a PB-1 Powder Blower and operating instructions.

Parker Research Contour Probe Kits, accessories and supplies are available from factory stock or local distributors throughout the U.S. and major foreign countries.



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THE PARKER B-310 MINI CONTOUR PROBE®

Completely portable one-man package for fast, positive, reliable location of defects in ferrous metals

EXCLUSIVELY from Parker Research... the Mini Contour Probe. A rugged high performance instrument for Magnetic Inspection to accepted standards of common practice... will quickly locate surface cracks in ferrous materials that can be brought between the pole pieces. Find cracks from metal fatigue... wear... stress... over-loading... welds... heat-treating, etc.

FAST POSITIVE WITH NO ARC BURNS

Selective high energy AC or pulsed DC Fields (with optional DC 300 Power Supply) induced into the work, provides fast positive indications, eliminating the high-amperage arc-burning of work surfaces. Arc burns often become failure defects.

ONE-MAN PACKAGE The B-310 Contour Probe is a complete Magnetic package that one man takes to the work and easily preforms a thorough and reliable inspection in a fraction of the time consumed by large bulky equipment.

PRECISE AREA INSPECTION Powerful magnetic fields are concentrated and applied to the precise area to be inspected.

WIDE VERSATILITY Mechanically, the B-310 Probe will conform to practically any surface configuration.

THE INSTRUMENT THAT DOES SO MUCH, SO WELL If you do any work with ferrous metals... in the shipyard... aerospace... steel mill... foundry... weldment or vehicle overhaul, you need the performance advantage of the B-310 Contour Probe.



Contour Probe Kits – are available with Dry Powder and Wet Fluorescent inspection mediums, including Black Light, all in one easy to carry package. A truly portable one-man inspection package.

SPECIFICATIONS

	B310	B310S	B142
PHYSICAL	7 ³ / ₄ H x 7 ¹ / ₄ W x 2 ¹ / ₈ D		
LINE VOLTAGE	115 VAC	230 VAC	42-48 VAC
SINGLE PHASE	50/60 Hz	50/60 Hz	50/60 Hz
LINE CURRENT	4 A	3 A	7 ¹ / ₂ A
DUTY CYCLE	2 MINUTES ON – 2 MINUTES OFF		
WEIGHT	6 LBS		
CONSTRUCTION	POLYURETHANE FILLED GLASS/NYLON HOUSING. 8 FOOT/3 WIRE POWER CORD		
SPAN	0-9 IN. ACROSS POLES		

DC 300 POWER SUPPLY AVAILABLE FOR PULSED DC OPERATION

CONTOUR PROBE KITS

B-310-A INSTRUMENT WITH
1 lb. ea. Red & Gray Powder
PB1 Applicator & Carrying
Case 15lbs.
B-310-AB same as above
Plus EA140-Hand Held UV Light
and 778A-9.5 oz. aerosol can
Fluorecent Particles 18lbs.

OPTIONAL ACCESSORIES

MG25 Magnetometer (certified)
RB1 Powder Removal Bulb
MG50 Magnetic Pie Guage
DC300 Pulsed DC Power Supply



DETEK

6805 Coolridge Drive
Temple Hills, MD 20748-6940
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www.detek.com email: sales@detek.com

PARKER

AC YOKE INSPECTION AT REMOTE WORKSITES WITH NO OUTSIDE POWER SOURCE, NO GENERATOR...WITH THE *NEW* PARKER BAC310 PORTABLE, BATTERY OPERATED AC POWER SUPPLY...



- STAND ALONE BATTERY POWERED AC POWER SUPPLY – FOR AC YOKES
- ON THE SPOT AC POWER – INDEPENDENT OF ANY OUTSIDE POWER SOURCE
- TOTALLY PORTABLE FOR SHOP OR FIELD APPLICATIONS
- PROVIDES FOR COMPLIANCE WITH APPLICABLE SPECIFICATIONS



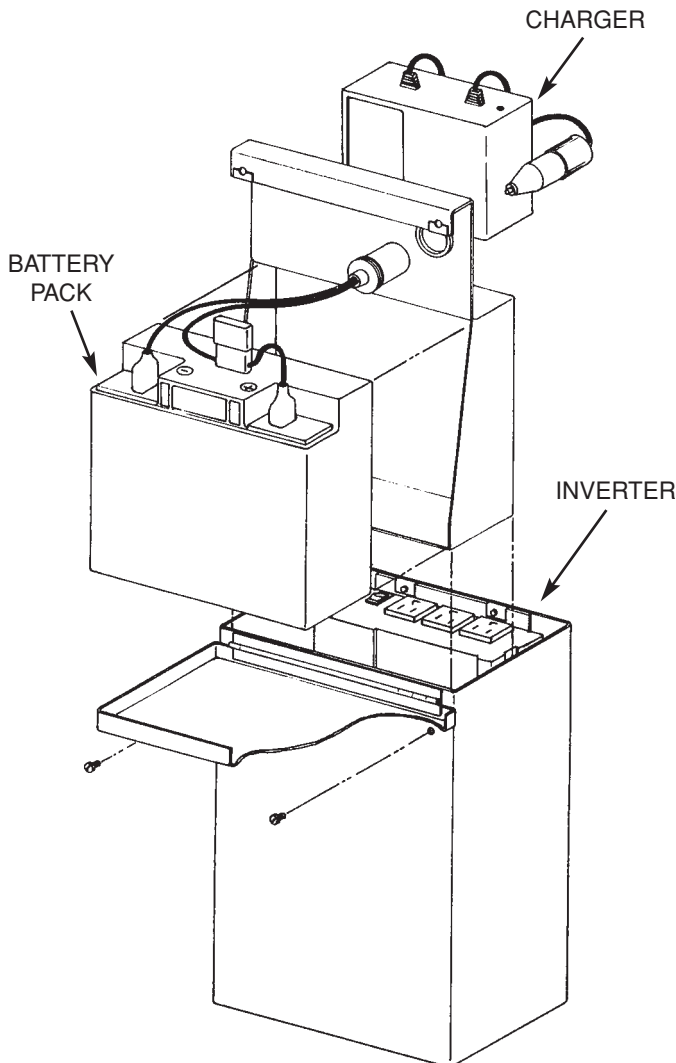
6805 COOLRIDGE DR ■ TEMPLE HILLS MD 20748
301-449-7300 ■ 800-638-0554 ■ FAX 301-449-7011

EMAIL: sales@detek.com

INSTRUMENT DESCRIPTION: The BAC310 battery operated Inverter/Power Supply is a totally portable, stand alone, 110VAC power source. It will operate any of the Parker or other A.C. Yokes. In addition, the Parker B310PDC (12V) battery operated Contour Probe will operate from the BAC310 by direct connection to the female battery plug.

The BAC310 operates independently from any outside power source. Power is derived from the internal 12VDC battery, which is inverted to 110VAC output through the inverter circuitry. A separate battery charger is provided for overnight charging of the battery. The entire unit is contained within a heavy duty steel case 11-1/2"H x 7-1/2"W x 5-1/2"D and weighs only 28 pounds. The unit may be used in any shop or field application and is ideal in areas where normal A.C. line power is not available or where outside power sources may present a safety concern.

Plug any of the Parker A.C. Contour Probes (yokes) in to the standard BAC310 110V outlet. Be sure that the 12V battery is fully charged. There is nothing else to do. The Contour Probes will function as they would normally from any A.C. power source. Follow operating instructions and procedures for normal A.C. Yoke inspection. All Parker Contour Probes exceed applicable Magnetic Particle inspection requirements.



BAC310 AC POWER SUPPLY ASSEMBLY	
DEDICATED USE.....	AC YOKES
CURRENT DRAW.....	7.5A (B310)
APPROXIMATE RUNNING TIME.....	2 HOURS
TOTAL WEIGHT	28 LBS (12.7 KG)

BAC310-600 INVERTER	
MAXIMUM CONTINUOUS POWER	600 WATTS
SURGE CAPACITY (PEAK POWER)	1200 WATTS
MAXIMUM EFFICIENCY	APPROX. 90%
NO LOAD CURRENT DRAW	0.8A
LOW VOLTAGE SHUTDOWN ACTIVATION ..	10.0 VOLTS
LOW VOLTAGE ALARM ACTIVATION.....	10.6VOLTS
WAVE FORM	MODIFIED SINE WAVE
FUSE	THREE 25 AMP (SPADE TYPE)
WEIGHT	4.25 LBS (1.9 KG)

BP20 BATTERY PACK	
TYPE	RECHARGEABLE SEALED LEAD ACID
RATING.....	12V. 20Ah/20 HR
FUSE	20A INLINE SPADE TYPE
WEIGHT	14.3 LBS (6.5 KG)

BC310 CHARGER	
TYPE	FULLY AUTOMATIC
INPUT	115VAC
OUTPUT	12VDC, 1.5A
WEIGHT	1.9 LBS (.87KG)



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PARKER



PORTABLE MAGNETIZING COILS

Parker's new portable magnetizing coils are designed for magnetic particle inspection of ferrous metal parts. The new coils allow for the use of either dry powder or wet fluorescent inspection media and may be used for demagnetizing as well.

The coils are molded in a tough black polyurethane material and comes equipped with a foot switch and 10' yellow neoprene power cord. (PDC versions use a thumb switch) The sealed electrical connection box has a 2" X 4.5" flat base allowing the coil to stand in a vertical position. The coils are designed for a 50% duty cycle and are equipped with thermal overload protection. Both the PL-8 and PL-10 operate from a standard 115VAC, 60Hz power source, but may also be operated from a 12V battery. 230VAC coils are also available. (PL-8S and PL-10S)

PL-8PDC and PL-10PDC (pulsed DC) operate from a standard 115VAC input, but produce a powerful pulsed DC magnetic field.



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MAGNETIZING COIL OPERATING INSTRUCTIONS

OPERATION:

Plug the power cord of the coil into the appropriate outlet. Depress the foot switch. A definite magnetic pull will be felt by insertion of a ferrous metal object into the center of the coil. Inspection is accomplished by placing the part longitudinally parallel to the axis of the coil, within the center of the coil nearer to the outer circumference. (Fig. 1) Activate the foot switch and apply the inspection medium while the coil is energized. This is referred to as the continuous method and will reveal defects at right angles to the coil axis.

When using the wet method, allow the coil to remain energized for approximately two seconds after applying the wet medium. Remove the part for inspection.

To demagnetize a part after inspection, simply place the part within the coil near the outer circumference. While the coil is energized, remove or pull the part approximately two feet away from the coil before turning the coil off. Larger parts may be demagnetized by placing the coil directly over the part and withdrawing the coil in the same manner.

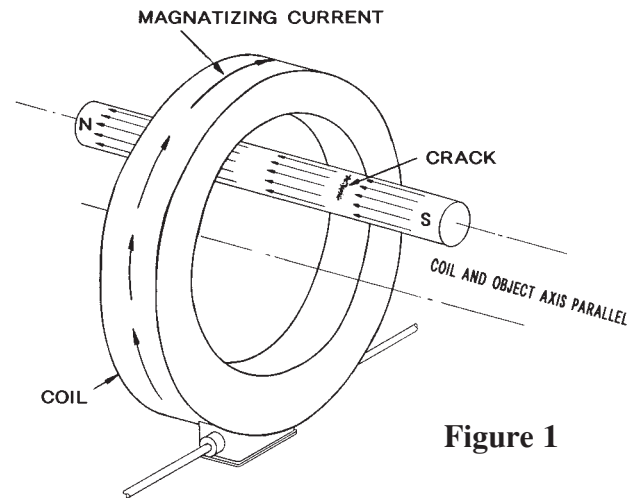


Figure 1

CAUTION: The coils are designed for a 50% duty cycle, or approximately two minutes on and two minutes off. If a slightly longer on-time is required, be sure the time off is the same length of time. Continuous operation may cause overheating and damage the coil. The coils are equipped with an internal thermal switch.

SPECIFICATIONS:

MODEL NO	PL-10	PL-10S	PL-10PDC	PL-8	PL-8S	PL-8PDC
INSIDE DIA.	9 7/8"	9 7/8"	9 7/8"	8"	8"	8"
OUTSIDE DIA.	14 1/2"	14 1/2"	14 1/2"	11 1/2"	11 1/2"	11 1/2"
WIDTH	2 1/2"	2 1/2"	2 1/2"	2 1/4"	2 1/4"	2 1/4"
LINE VOLTAGE (50-60Hz)	115 VAC	230 VAC	115 VAC	115 VAC	230 VAC	115 VAC
LINE CURRENT (AIR)	12 A	9 A	4 A	10 A	7 A	3.2 A
AMP-TURNS (AIR)	2,875	2,825	2,975	3,000	3,600	2,990
WEIGHT TOTAL:	14 7/8 LB	14 7/8 LB	13 7/8 LB	9 7/16 LB	9 7/16 LB	8 7/16 LB



PL-10 WITH CASE



PL-8 PDC



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PARKER

FIND DEFECTS ELECTRONICALLY WITH THE PARKER CONTOUR PROBE®

- (1) Versatility and powerful performance in a rugged reliable instrument.
- (2) Constant AC or pulsed DC fields with the flip of a switch; for the location of surface and some sub-surface defects.
- (3) Apply continuous or residual magnetic fields and demagnetize too.
- (4) Use with dry powder, wet fluorescent or visible.
- (5) High impact molded housing.
- (6) One year repair/replacement guarantee.

- The DA-200 Contour Probe is a portable, self-contained instrument designed to produce a magnetic field on or within ferro-magnetic materials.
- The selective AC and pulsed DC functions are built into a single reliable instrument. The AC mode produces an intense AC field for detection of surface defects and demagnetizing after inspection. The DC mode produces an intense pulsed DC field for detection of some subsurface defects.
- Combined with the flexibility of articulating legs and a rugged molded housing, the Contour Probe can be used on nearly any part or surface contour... in the lab, factory or field site.



DA-200 Contour Probe (115 VAC)
Federal Stock No. 6635-00-022-0372
DA-200S Contour Probe (230 VAC, 50 Hz)
Federal Stock No. 6635-01-073-6844

MODEL DA-200

- Your Magnetic Particle Applications need the versatility and reliable performance advantages of the Parker Contour Probe. An industry standard with 35 years of NDT service.

DA200-AB KIT SHOWN

Contour Probe Kits – are available with Dry Powder and Wet Fluorescent inspection mediums, including Black Light, all in one easy to carry case. A truly portable one-man inspection package.



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THE PARKER CONTOUR PROBE

Completely portable one-man package for fast, positive, reliable electronic location of defects in ferrous materials

The Parker Research... **Contour Probe** is a rugged high-performance instrument for magnetic inspection to accepted standards of common practice... will quickly locate surface cracks in ferrous materials that can be brought between the pole pieces... **and some sub-surface defects, too!** Finds defects from metal fatigue... wear... stress... overloading.

AEROSPACE RELIABILITY This instrument combines advanced techniques in the forming and application of induced magnetic fields... so widely used today in critical industries where reliability and test results are a must.

FAST POSITIVE WITH NO ARC BURNS Selective high energy AC or pulsed DC fields, induced into the work, provide fast positive indications, eliminating the usual high-amperage-arc-burning of work surfaces. **Arc burns often become failure defects.**

ONE-MAN PACKAGE The **Contour Probe Kit** is a

complete magnetic package that one man takes to the work and easily performs a thorough and reliable inspection in a fraction of the time consumed by large bulky equipment.

PRECISE AREA INSPECTION Powerful magnetic fields are concentrated and applied at the precise area to be inspected.

WIDE VERSATILITY The mechanical flexibility opens a vast field of applications, allowing **the Probe** to conform to nearly any surface configuration. The electronic circuitry contained within the molded housing permits selection of a strong constant AC magnetic field, or high intensity pulsed DC field.

The magnetic inspection instrument that does so much, so well. If you work with ferrous metals... in a scientific lab... aerospace... welding... vehicle overhaul, you need the performance advantage of the **DA-200 Contour Probe.**

SPECIFICATIONS

	DA200	DA200S	A210	A210S
PHYSICAL	10.5 (266) x 11.0 (280) x 2.75 (70 mm)			
LINE VOLTAGE	115 VAC	230 VAC	115 VAC	230 VAC
SINGLE PHASE	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
LINE CURRENT	6 A	4 A	8 A	3 A
DUTY CYCLE	2 MINUTES ON – 2 MINUTES OFF			
WEIGHT	13 LBS (5.9 kg)			
CONSTRUCTION	GLASS FILLED NYLON HOUSING 10 FOOT (3 M) 3 WIRE POWER CORD			
SPAN	18 IN (457 mm) ACROSS POLES			
FIELD	AC / DC	AC / DC	AC	AC

CONTOUR PROBE KITS

DA 200-A INSTRUMENT WITH
1 lb. ea. Red & Gray Powder
PB1 Applicator & Carrying
Case 21 lbs.
DA 200-AB same as above
Plus EA140-Hand Held UV Light
and 778A-9.5 oz. aerosol can
Fluorescent Particles 23 lbs.

OPTIONAL ACCESSORIES

MG25 Magnetometer (certified)
RB1 Powder Removal Bulb
MG50 Magnetic Pie Gauge



DRY MAGNETIC
INSPECTION POWDER
AVAILABLE IN 5, 25
AND 50 POUND CANS

GP5 - GRAY POWDER
RP6 - RED POWDER
YP10-YELLOW POWDER



PB1



MG25



RB1



MG50



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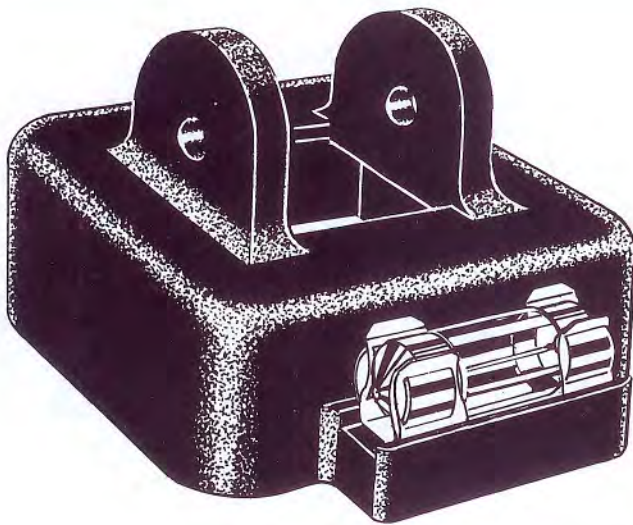
Y-300 AND Y-400 PARKER PROBE LIGHTS

NONDESTRUCTIVE TESTING EQUIPMENT

The Parker Y-300 and Y-400 Probe Lights are molded inspection lights designed to fit the B-300 and DA-400 Contour Probes. The lights produce substantial close-in illumination for magnetic testing.

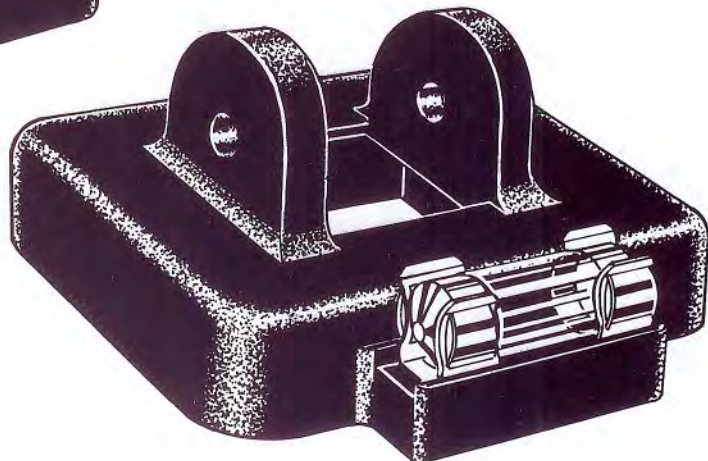
The Parker Probe Lights operate from the induction of the AC magnetic field produced by the Yokes. A small coil wound within the molded light housing produces 12 volts AC which operates the small cylindrical shaped bulb. There are no wiring connections necessary for installation. It should be noted that the lights operate in the AC mode only.

The Y-300 Probe Light is designed to fit the rear leg housing of the Parker B-300 Contour Probe while, the Y-400 is designed to fit the rear leg housing of the DA-400 Contour Probe. Both are molded from durable glass filled nylon which is extremely resistant to shock, wear and chemicals. The bulbs are an automotive dome light bulb which may be available from local sources. Replacements are also available from Parker at minimal cost.



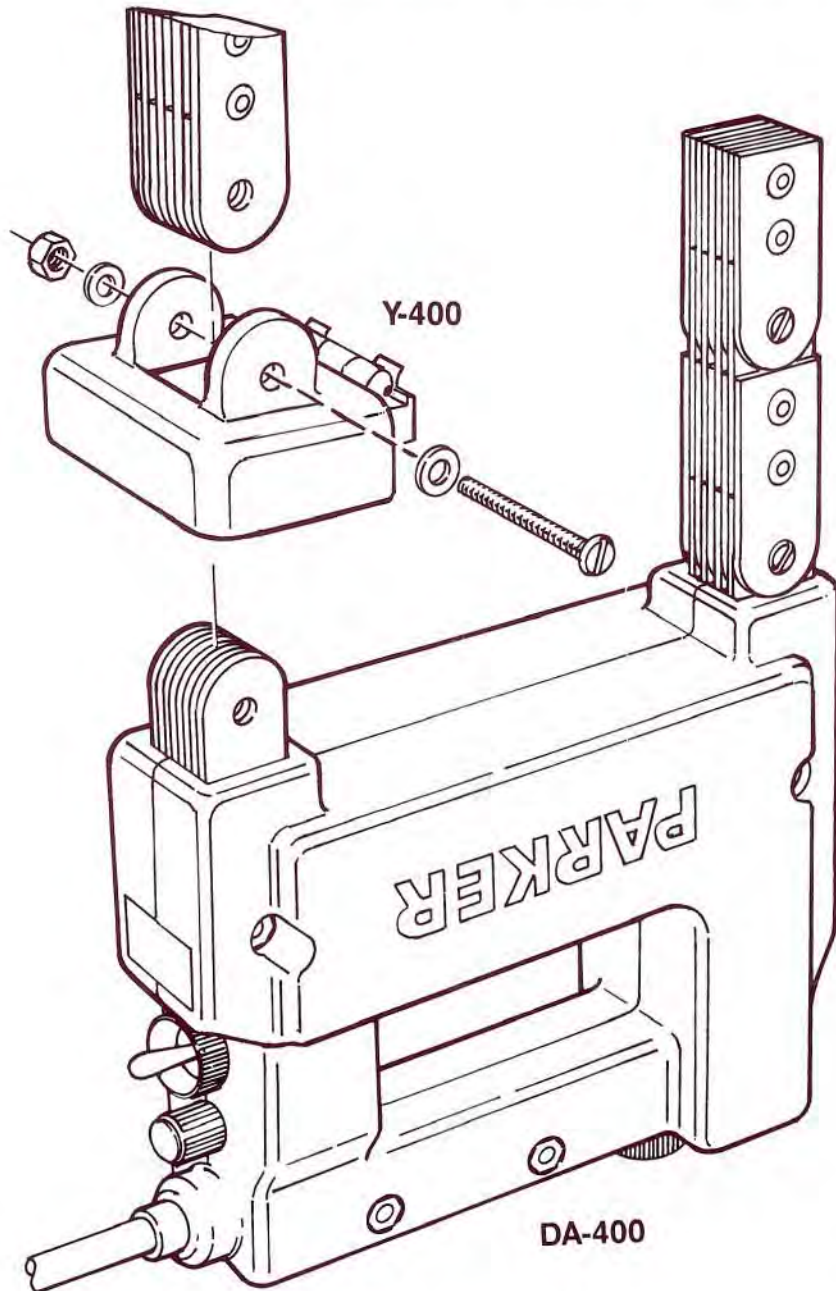
Y-300 PARKER PROBE LIGHT
Fits B-300 Contour Probe

Y-400 PARKER PROBE LIGHT
Fits DA-400 Contour Probe



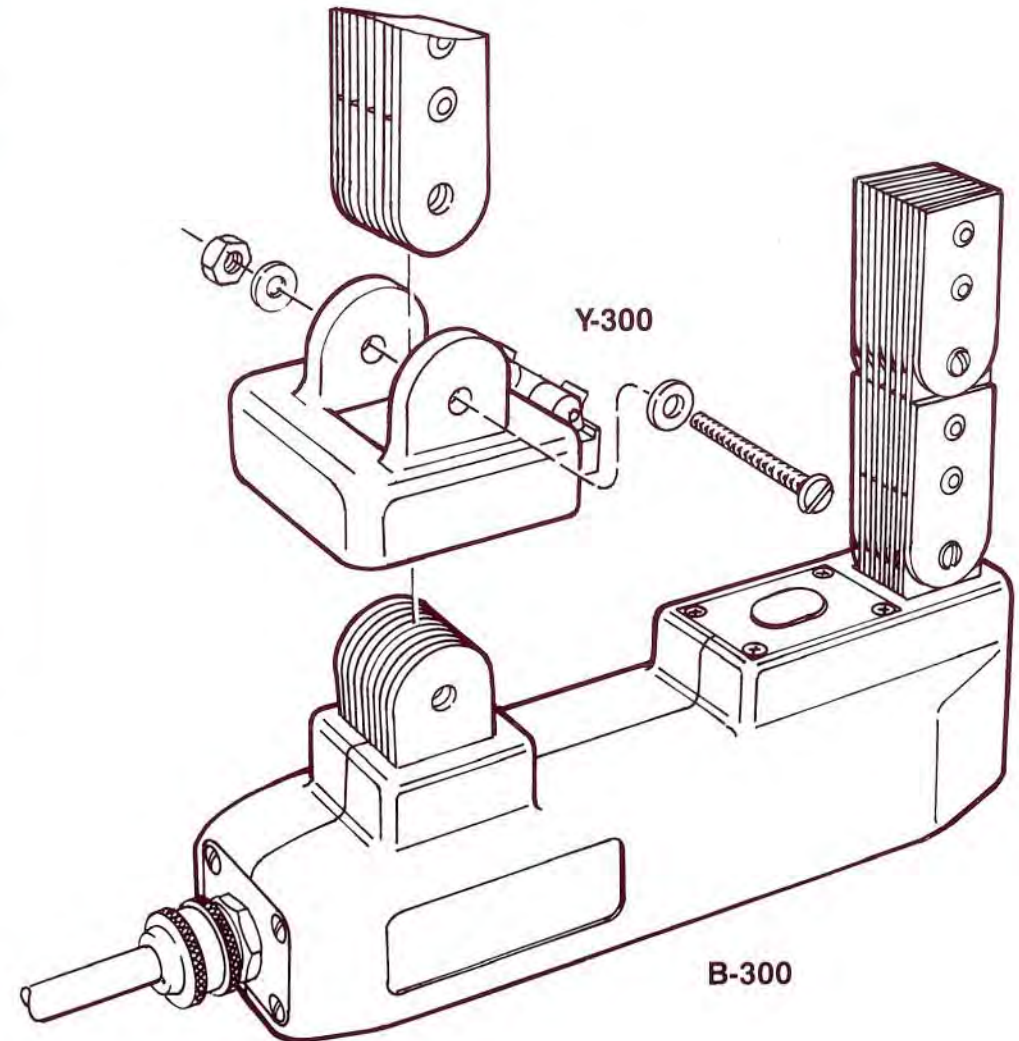
See reverse side for installation instructions.

Y-400 and Y-300 Parker Probe Light
(For the Parker DA-400 and B-300 Contour Probes)



INSTALLATION INSTRUCTIONS:

1. Remove existing screw and nut from rear Probe leg (closest to power cord).
2. Remove Probe leg.
3. Install Probe Light over leg attachment with light facing forward.
4. Reinstall rear Probe leg.
5. Insert new 1-3/4" screw using the washers on either side.
6. Attach nut and tighten.



PARKER



DA-1500 PORTABLE MAGNETIC INSPECTION UNIT

The Parker Research DA-1500 portable magnetic inspection unit provides high output AC or HWDC fields for magnetic particle inspection. Field selection is determined by using the appropriate field cable connector. Current output is infinitely variable from zero to maximum by use of the current control located on the front panel, and is indicated by the panel meter. Actual current output is determined by cable size and length.

AC magnetic fields offer the best sensitivity for detection of surface defect indications. The AC field is also beneficial for demagnetizing after inspection.

Half-Wave DC magnetic fields provide for the detection of certain subsurface defect indications. DC fields penetrate a cross section of the test area rather than just the surface.

Optional magnetizing cables can be equipped with prods for circular magnetization. The cables can be wrapped around parts to form a coil for longitudinal magnetization. Demagnetization is accomplished in a similar manner.

TR700 TRANSPORT TRUCK



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PARKER

DA-1500 PORTABLE MAGNETIC INSPECTION UNIT SPECIFICATIONS

Length	21 5/32 " (54.9 cm)
Width	9 11/32" (23.7 cm)
Height	9 17/32" (24.2 cm)
Maximum output current ratings based on the use of two 15-foot lengths of 4/0 cable	1500 amps, AC or HWDC
Line Voltage single phase	230 VAC, 50/60 Hz; 460 VAC, 50/60 Hz
Line current	45 amps @ 230 VAC; 23 amps @ 460 VAC
Maximum duty cycle	2 minutes ON 2 minutes OFF
Unit weight	93 lbs. (42.2 kg)



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PARKER



NEW FROM PARKER

DA-750 PORTABLE MAGNETIC INSPECTION UNIT

The Parker Research DA-750 portable magnetic inspection unit provides high output AC or HWDC fields for magnetic particle inspection. Field selection is determined by using the appropriate field cable connector. Current output is infinitely variable from zero to maximum by use of the current control located on the front panel, and is indicated by the panel meter. Actual current output is determined by cable size and length.

AC magnetic fields offer the best sensitivity for detection of surface defect indications. The AC field is also beneficial for demagnetizing after inspection.

Half-Wave DC magnetic fields provide for the detection of certain subsurface defect indications. DC fields penetrate a cross section of the test area rather than just the surface. Optional magnetizing cables can be equipped with prods for circular magnetization. The cables can be wrapped around parts to form a coil for longitudinal magnetization. Demagnetization is accomplished in a similar manner.

TR700 TRANSPORT TRUCK

Low cost folding hand truck for transporting the DA-750 or DA-1500 around the inspection area. Hang the cables on the convenient peg, store inspection media in the lower tray and you're off to the next job. The folding legs can be retracted for storage or used as a hand truck for rough terrain.

TR700BR CABLE EXTENSION BRACKET

Can be attached to the truck to raise the cables overhead for ease of inspections.



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PARKER

SPECIFICATIONS

Length	17 ¹ / ₄ " (43.8 cm)
Width	9 ³ / ₈ " (23.8 cm)
Height	8" (20.3 cm)
Maximum Output* Current	750 A, AC or HWDC
Line Voltage Single Phase	115 VAC, 50/60 Hz; 230 VAC, 50/60 Hz
Line current	27 A @ 115 VAC; 14 A @ 230 VAC
Maximum Duty Cycle	2 minutes ON 2 minutes OFF
Unit Weight	40 lbs. (18.1 kg)

*Current ratings based on the use of two 15-foot lengths of 4/0 cable



TR-700BR

DA-750 PORTABLE MAGNETIC INSPECTION UNIT

TR700 TRANSPORT TRUCK

ACCESSORY ITEMS

MA-7000	INDIVIDUAL PRODS (SET OF 2)
MA-7001	DUAL HORIZONTAL PROD ASSEMBLY
MA-7003	BRAIDED CONTACT CLAMP
MA-7EC	4/0 EITHEREND CONNECTOR
MA-7EL	4/0 EITHEREND/LUG ADAPTER
MA-7RC	20' REMOTE CONTROL CABLE ASSY
MA-7ST	REPLACEMENT PROD TIP (5 5/8")
MC-1540	15' 4/0 CABLE SET (W/LUG & EITHEREND)
MC-1541	15' 4/0 CABLE SET (W/EITHERENDS)
TR-700BR	CABLE EXTENSION BKT

ACCESSORY ITEMS



MA-7000
Individual Prods
(set of 2)



MA-7RC
Remote Switch Assembly
(20')



MA-7EL
4/0 Eitherend/Lug Adapter



MA-7EC
4/0 Eitherend Connector



MA-7001
Dual Horizontal Prod Assy
(adjustable tips)



MA-7003
Braided Contact Clamp
(3 inch Grip)



MA-7ST
Replacement Prod Tips
(aluminum or copper)



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NONDESTRUCTIVE TESTING EQUIPMENT

Gould Bass Magne-Tech Models 1500, 1515, 1515D



FEATURES/BENEFITS

- Meets Military & Industrial Specifications
- More output per unit weight & size
- Advanced modular design
- Simple to operate
- Rugged duty cycle
- Highly portable/transportable
- Ideal for use in limited access areas
- Protected recessed front control panel
- HWDC & AC magnetizing power
- 1515D provides auto AC demagnetization
- Thermal overload protection
- For prod or cable wrap use
- Infinity variable current control
Remote control feature

The Gould-Bass line of Magne-Tech[®] portable magnetic particle inspection units can be used for a wide variety of applications to quickly and reliably detect surface and near surface discontinuities in both circular and longitudinal modes. Because of their small size and light weight, the Models 1500 & 1515 can be easily transported by one person to the inspection site. This compact feature is particularly valuable in limited access areas, such as those found on ships, bridges, pipeline, aircraft, petro chemical plants as well as other close quarter applications.

Key Applications for Magne-Tech[®] Portables:

Preventative maintenance in testing weldments on bridges, railroads, pipeline, pressure vessels, tubing, bar stock, forgings, castings, aircraft, ships and anywhere that ferrous metals must be inspected for cracks.

Simple to Operate

All operating controls and indicators are located on the recessed front panel. The easily read ammeter shows magnetizing current in either AC or half-wave DC operating modes. The AC mode minimizes background interference, permitting high sensitivity, speed, and accuracy of surface defect identification. The DC mode provides increased magnetic field penetration for detection of near surface discontinuities. A current adjustment control permits precise adjustment of the magnetizing current. The ammeter is protected against damage from rough handling, and all units are protected against overheating.

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NONDESTRUCTIVE TESTING EQUIPMENT

Available Models			
Model Number	1500	1515	1515D
Part Number	N520530001	N520545001	N520546001
Magnetizing Current	AC or HWDC	AC or HWDC	AC or HWDC
Max Output HWDC	1000 Amps	2000 Amps	2000 Amps
AC	900 Amps	1800 Amps	1800 Amps
Demagnetization	AC (Manual)	AC (Manual)	AC (Push Button)
Infinitely Variable Current Control	Standard	Standard	Standard
Duty Cycle	Heavy Duty	Heavy Duty	Heavy Duty
Thermal Overload Protection	Standard	Standard	Standard
Modular Plug-in Electronics	Standard	Standard	Standard
Recessed Front Panel	Standard	Standard	Standard
Cable Output Fittings	Camlocks	Either Ends	Either Ends
Remote Energize Switch	Standard	Standard	Standard
Dimensions	6" X 9" X 17"	9.5" x 11" X 24.5"	9.5" x 11" X 24.5"
Weight	58.5 lbs.	90 lbs.	90 lbs.
Electrical	115/230/60/1	230/460/60/1	230/460/60/1
Line Amp Draw	40/20	70/35	70/35

ACCESSORIES AND MATERIALS

Gould-Bass Company offers a complete line of process control instrumentation and related accessories, such as field strength indicators, clamps, connectors, prods, sprayers, and powder applicators.

All materials necessary for magnetic particle inspection are also available, including dry powders and materials for fluid suspension.

SPECIFICATION COMPLIANCE

ASTM E1444 & E-709
Navships 250-1500

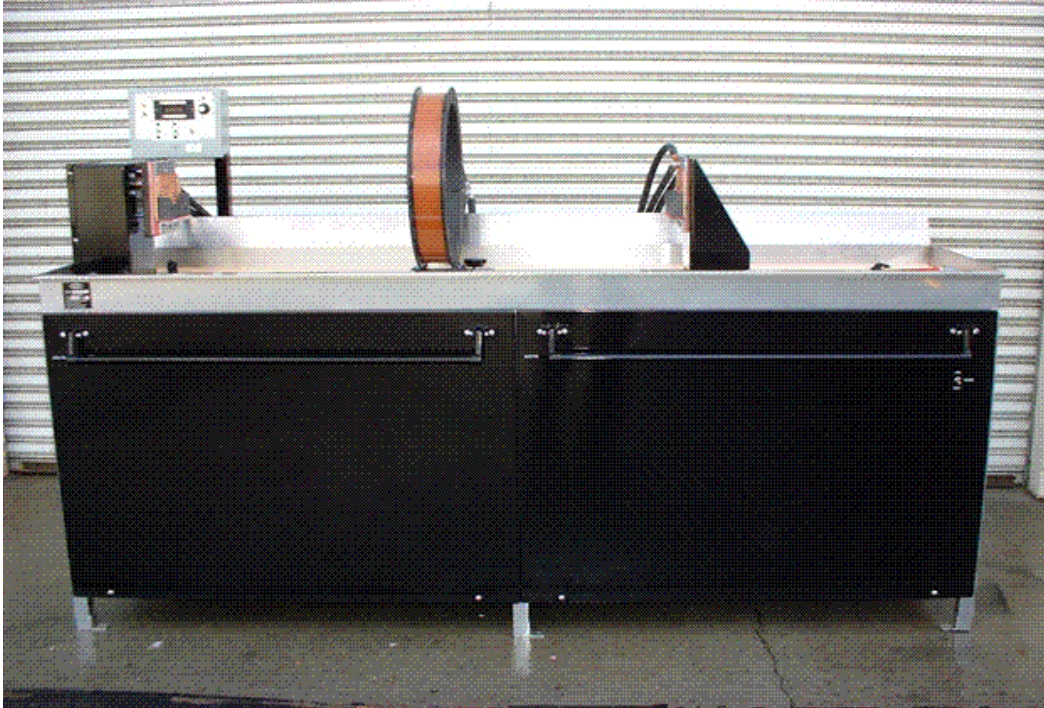
ASME Section III (Latest Rev.)
Mil-STD-271 (Latest Rev.)

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NONDESTRUCTIVE TESTING EQUIPMENT

M.P.I. WET HORIZONTAL BENCH MODELS WHM-3000, WHM-3400, & WHM-3600



The WHM-3000, WHM-3400 and WHM-3600 are 3000 AMP AC/HWDC full featured bench style M.P.I. wet horizontal. Designed for surface and subsurface flaw detection and demagnetization in small to medium size parts.

BENCH FEATURES:

- Mag. Push button Hip Bar
- Head Stock air cylinder footswitch
- Air pressure regulator
- Tail Stock with lock
- 12”(30cm) ID 5 turn coil on rail rollers
- 6x6”(15x15cm) Head-Tail stock contact area
- Replaceable copper pads
- Replaceable lead plates
- Head-Tail stock “V” groove supports
- Front and Back hardwood grills
- Stainless steel tank
- Water or oil bath compatible
- Bath agitator and circulation pump with ON-OFF switch
- Hand hose bath applicator
- Gloss black panels on silver cabinet.

ELECTRONIC FEATURES:

- Eye level control box
- Digital LED output current AC/DC meter with hold
- Infinitely variable current control
- Quick Break
- Switchable AC or DC output with LED indicators
- Switchable Coil and Direct current direction with LED indicators
- Automatic Demag switch
- Power ON-OFF switch
- Internal 0.5 to 1.5 second Mag shot duration timer
- Mag shot LED Indicator
- Replaceable Electronic Control Box
- Circuit Boards acrylic coated for protection.

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MODEL WHM-3000, WHM-3400, WHM-3600 SPECIFICATIONS:

1. MAX OUTPUT CURRENT AC/HWDC AMPS

Direct (inline) = 3400

Coil 12" (30cm) = 1400

16" (41cm) = 1000

2. DUTY CYCLE @ 3000 0.5 second ON 4 seconds OFF

@ 1500 0.5 second ON 2 seconds OFF

3. LINE INPUT = 230/460 VAC 50/60 single phase 100/50 amp

4. DEMAG = Slow decay 3-6 seconds

5. PART LENGTH MAX = WHM-3000 - 31" (80cm)

WHM-3400 - 42" (107cm)

WHM-3600 - 72" (183cm)

6. PART WEIGHT MAX = 200 lbs. (90kg)

7. NET WEIGHT = 595 lbs. (270kg)

8. CABINET DIMENSIONS =

Control Box Height = 62" (158cm)

Bench Height = 40" (102cm)

Width = 32" (81.3cm)

Cabinet Length = WHM-3000 50" (153cm)

WHM-3400 60" (229cm)

WHM-3600 90" (229cm)

9. HEAD STOCK AIR CYLINDER = 1" Stroke (25mm) 3 x Head Pressure

10. AIR SUPPLY = Dry filtered 50-150 PSI (3.4-10.4 kg/cm) ¼" Industrial Connector

11. TANK CAPACITY = 10 Gal. Min. 40 Gal. Max.

OPTIONS

Hood enclosure = Features black nylon with Velcro closures, flip back design, large work space with Light and Fan box.

Dimensions:

Hood Length = WHM-3000 53" (135cm)

WHM-3400 65" (165cm)

WHM-3600 93" (236cm)

Width = 63" (160cm) Height = 82" (208cm) Weight = 40 lbs. (18kg)

OPTIONS

1) 16" (41cm) 5 turn AC/DC rail mounted coil

2) Full Guarded Footswitch

3) Low output current alarm shot duration

4) Panel mounted variable shot duration

5) Different input line voltage

HOOD OPTION



CONTROL BOX OPTION (3 & 4)





NONDESTRUCTIVE TESTING EQUIPMENT

Gould Bass Magne-Tech Model 1560



FEATURES/BENEFITS

- Meets Military & Industry Specifications
- More output per unit weight & size
- 6,000 amp HWDC and AC
- Infinitely variable current control
- Digital ammeter with hold feature
- Fast, effective automatic AC demagnetization
- Thermal overload protection
- Rugged duty cycle
- Ideal for overall magnetization applications
- Simple to operate
- All controls recessed for damage control
- Ideal for localized prod and cable use
- Remote control feature operation available
- Storage well on top for cables and materials
- Convenient 115V outlet

The Gould-Bass line of Magne-Tech® mobile magnetic particle inspection units are ruggedly constructed for long, maintenance free service. The advanced solid state circuitry greatly reduces the size and weight of the 1560 model.

The Model 1560 weighs only 550 pounds, producing excellent output per unit weight . This unit can be easily rolled around on their 8-inch heavy duty swivel casters, or can be maneuvered with a forklift. The Model 1560 is equipped with four lifting rings for overhead crane transport.

Remote Option

A special remote-control unit is available for use with the Model 1560. It provides control of the magnetizing and demagnetizing current from a convenient hand-held unit. A remote On-Off switch on the front panel of the machine provides for quick selection of local or remote-controlled operation.

Key Applications for Magne-Tech® Mobiles:

These self-contained, mobile units can be moved or rolled anywhere in shop, foundry, refinery, petrochemical plant or manufacturing facilities to detect surface and near surface cracks by the MPI method.

The Magne-Tech® Model 1560 provides 6,000 amperes of alternating or half-wave direct current. Both localized and overall magnetization can be employed when inspecting diverse magnetic materials. The demagnetizing process is as simple as pushing a button with cables in place.

6805 COOLRIDGE DR ■ TEMPLE HILLS MD 20748
301-449-7300 ■ 800-638-0554 ■ FAX 301-449-7011

EMAIL: sales@detek.com



NONDESTRUCTIVE TESTING EQUIPMENT

Simple to Operate

All operating controls and indicators are located on the recessed front panel. The easily read ammeter shows magnetizing current in either AC or half-wave DC operating modes. The AC mode minimizes background interference, permitting high sensitivity, speed, and accuracy of surface defect identification. The DC mode provides increased magnetic field penetration for detection of near surface discontinuities. A current adjustment control permits precise adjustment of the magnetizing current. The ammeter is protected against damage from rough handling, and all units are protected against overheating.

Available Models	
Model Number	1560
Part Number	N520565001
Magnetizing Current	AC or HWDC
Max Output HWDC	6000 Amps
AC	6000 Amps
Demagnetization	Push button Auto AC
Infinitely Variable Current Control	Standard
Duty Cycle	Heavy Duty
Digital Ammeter with Hold Feature	Standard
Thermal Overload Protection	Standard
Advanced Circuitry with Modular Plug-in Electronics	Standard
Recessed Front Panel	Standard
Remote Control Feature	Option
Storage Well	Standard
Dimensions	32" x 25" X 42"
Weight	550 lbs.
Electrical	230/460/60/1
Line Amp Draw	250 amp

ACCESSORIES AND MATERIALS

Gould-Bass Company offers a complete line of process control instrumentation and related accessories, such as field strength indicators, clamps, connectors, prods, sprayers, and powder applicators.

All materials necessary for magnetic particle inspection are also available, including dry powders and materials for fluid suspension.

SPECIFICATION COMPLIANCE

ASTM E1444 & E-709 ASME Section III (Latest Rev.)

Navships 250-1500 Mil-STD-271 (Latest Rev.)

* Meets other Mil & Industry Standards. Contact Gould-Bass for details.

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NONDESTRUCTIVE TESTING EQUIPMENT

Gould Bass Magne-Tech® Retro Pak™



FEATURES/BENEFITS

- Replace Inadequate Power Packs
- Replace Outdated Power Packs
- Upgrade to State of the Art Circuitry
- Add Multidirectional Capability
- Add AC or DC Mag Capability
- Add AC or HWDC Demag Capability
- Eliminates Costly Downtime for Repairs
- Full Manufacturer's Warranty
- Better Than a "Patchwork Rebuild"
- Includes Infinitely Variable Current Controls
- New Master Control Panel
- Eliminates Large Amp Increments at Low End
- Ideal as Stand Alone/Stationary Power Pak

Magne-Tech® Retro Paks™ are supplied as stand alone units. They are intended for use as replacements for outdated, worn out, inadequate power packs where the tank and frame unit is still serviceable.

The Retro Pak is ideal for use as a stand alone power pack for use with cables and prods and can be fitted with optional casters for ease of mobility.

Magne-Tech® Retro Paks™ enable the user to upgrade, replace or extend the life of wet horizontal magnetic bench units. All Retro Paks have a complete, independent control console which can be mounted, as show, or be placed anywhere within the length of the flexible conduit supplied.

A noteworthy features that a conventional magnetic bench can be converted to a MULTI-MAG® multidirectional unit at a minimal cost.

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NONDESTRUCTIVE TESTING EQUIPMENT

Available Models							
Model Number	3004R	3005R	3009R	3009R-01	3009R-10	3053R	3068R
Catalog Number	8	N520738001	N520735001	N520736001	N520737001	N520740001	N520741001
Conventional Maximum Current	4000 AC 5000 FWDC	6000 FWDC	6000 FWDC	6000 AC 6000 FWDC	10,000 FWDC	4000 AC 4000 HWDC 5000 FWDC	5000 AC 5000 HWDC 6000 FWDC
Multi-Mag Maximum Current	N/A	N/A	N/A	N/A	N/A	2000 AC 2000 HWDC	3000 AC 5000 HWDC
AC Demag Ramp	Standard	N/A	N/A	Standard	N/A	Standard	Standard
DC Demag	N/A	N/A	Standard	Standard	Standard	N/A	Standard
Infinitely Variable Current Control	Standard	Standard	Standard	Standard	Standard	Standard	Standard
Digital Ammeter with Hold Feature	Standard	Standard	Standard	Standard	Standard	Standard	Standard
Induction Fixtures	N/A	N/A	N/A	N/A	N/A	Available	Available

ACCESSORIES AND MATERIALS

Gould-Bass Company offers a complete line of process control instrumentation and related accessories, such as field strength indicators, clamps, connectors, prods, sprayers, and powder applicators.

All materials necessary for magnetic particle inspection are also available, including dry powders and materials for fluid suspension.



NONDESTRUCTIVE TESTING EQUIPMENT

Gould Bass Magne-Tech® 3509 Models



FEATURES/BENEFITS

- AC and FWDC magnetizing currents
- Infinitely variable current control
- Digital Ammeter with Hold Feature
- Secondary Solid State Controls
- Silicon Rectifiers
- Reversing DC demag on all models
- AC demag on -01 models
- Quick Break Feature Standard on All Systems
- Thermal Overload Protection
- Current Assurance Indicator
- Heavy Duty Head/Tailstock Rails
- Electronic plug-in control modules
- Maximum ampere output up to 6,000 AC, 10,000 FWDC (see table for details)
- Unique agitation system maintains bath strength to within 3% of theoretical level
- Stainless steel tank

The Gould-Bass Magne-Tech® systems feature the most advanced circuitry in the industry providing ease of operation, assured safety for test parts, increased test speeds, and maximum repeatability and dependability of tests.

The 3509 models are available in 6000 & 10,000 amperes. They offer FWDC variations with built-in reversing DC push-button demagnetization. Various bench lengths are available.

The 3509-01 models offer magnetizing output in both 6000 Amps AC and 6000 Amps FWDC. Demagnetization is both AC and reversing DC. Various bench lengths are available.

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NONDESTRUCTIVE TESTING EQUIPMENT

Available Models				
Model Number	3509	3509-10	3509-01	1/10/3509
Head/Tailstock Opening	3509 - 54" 3509A - 100" 3509B - 144"	3509-10 - 54" 3509A-10 - 100" 3509B-10 - 144"	3509-01 - N/A 3509A-01 - 100" 3509B-01 - 144"	3509-01-10 - N/A 3509A-01-10 - 100" 3509B-01-10 - 144"
Maximum Magnetizing Current	6000 FWDC	10,000 FWDC	6000 AC 6000 FWDC	6000 AC 10,000 FWDC
Demagnetization	Reversing DC	Reversing DC	AC Reversing DC	AC Reversing DC
Standard Voltage	230 V or 460V 50-60 Hz / 3 Phase	230 V or 460 V 50-60 Hz / 3 Phase	230 V or 460 V 50-60 Hz / 3 Phase	230 V or 460 V 50-60 Hz / 3 Phase
12" Rail Mounted Moveable Coil	Standard	Standard	Standard	Standard
16", 20", 25", 30" Coil Sizes	Optional	Optional	Optional	Optional
Infinitely Variable Current Control	Standard	Standard	Standard	Standard
Digital Ammeter with Hold Feature	Standard	Standard	Standard	Standard
Quick Break	Standard	Standard	Standard	Standard
Current Assurance Indicator	Standard	Standard	Standard	Standard
Heavy Duty Head/Tail Stock with crank	Standard	Standard	Standard	Standard
Hip/Push Bar for Mag Shot	Standard	Standard	Standard	Standard
Footswitch Headstock Activation	Standard	Standard	Standard	Standard
Stainless Steel Tank	Standard	Standard	Standard	Standard
Front/Rear Hardwood Grilles	Standard	Standard	Standard	Standard
Recirculation / Agitation System	Standard	Standard	Standard	Standard
Blacklight Hood with Fan & Light Console	Optional	Optional	Optional	Optional
Steady Rests	Optional	Optional	Optional	Optional
Rotating Head/Tailstocks	Optional	Optional	Optional	Optional
Overall Dimensions L = Length W = Width H = Working Height	3509 -L = 78" 3509A - L=124" 3509B - L=168" W=30", H=42"	3509-10 -L = 78" 3509A-10 - L=124" 3509B-10 - L=168" W=30", H=42"	3509-01 -L = N/A 3509A-01 - L=124" 3509B-01 - L=168" W=30", H=42"	3509-01-10 -L = N/A 3509A-01-10 - L=124" 3509B-01-10 - L=168" W=30", H=42"
Nominal Line Amp Draw 230V/460V-60 Hz.	220/110	440/220	220/110	440/220

ACCESSORIES AND MATERIALS

Gould-Bass Company offers a complete line of process control instrumentation and related accessories, such as field strength indicators, clamps, connectors, prods, sprayers, and powder applicators.

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NONDESTRUCTIVE TESTING EQUIPMENT

Gould Bass Magne-Tech® Multi-Mag® Models



FEATURES/BENEFITS

- Magnetizes in 1, 2 or 3 directions
- Individually controllable outputs
- Infinitely variable current control
- Adjustable shot timer
- Three magnetizing currents available: AC, HWDC, FWDC
- Two modes available - Multi-mag® and conventional
- Demagnetization - auto AC and/or reversing DC
- Electronic plug-in control modules
- Thermal overload protection
- Digital ammeters with hold feature
- Maximum ampere output up to 6,000 amperes
- Unique agitation system maintains bath strength to within 3% of theoretical level
- Stainless steel tank
- "Quick Break" incorporated in all machines
- Auto-flood / auto sequencing (optional)
- Centralized control panel provides operator ergonomics
- Powered conveyor with inspection booth (optional)

The Gould-Bass Multi-Mag® systems provide outstanding defect detection and provide major time and cost savings over conventional magnetic testing methods. By providing for magnetization of the part in multiple directions in one firing sequence, virtually all defects can be revealed without having to process the part with a separate head shot and coil shot, which is the case with conventional magnetization techniques.

In the multidirectional (Multi-Mag®) mode, each power pack delivers current to the test part, with switching occurring at 0.003-second intervals. During a 0.5-second shot, some 90 directional switches will be made, that is, thirty in each direction occurring over the full 0.5-second. Thus the system appears to provide simultaneous magnetization while separating the application of field in all three directions. Current flows for a duration of 0.000 to 0.009 second based on the current control setting, and will repeat itself every 0.009 second for the full duration of the magnetizing shot. This switching sequence occurs in all three of the power packs on an individual basis. The multidirectional magnetization mode can be carried out with the choice of alternating current (AC), half-wave direct current (HWDC), or full-wave direct current (FWDC).

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NONDESTRUCTIVE TESTING EQUIPMENT

Available Models					
Model Number	3453	3553	3553A	3568	3568A
Part Number	N520628001	N520622001	N520629001	N520630001	N520631001
Head/Tailstock Opening with Induction fixtures	36" 24"	54" 42"	100" 88"	54" 42"	100" 80"
Two Phase Multi-Mag -- Contacts & 12" Coil -- Induction Fixture	2 Directional Standard Optional	2 Directional Standard Optional	2 Directional Standard Optional	N/A	N/A
Max Magnetizing Current Conventional Multi-Mag	4000 AC 5000 HWDC 5000 FWDC 4000 AC 5000 HWDC	4000 AC 5000 HWDC 5000 FWDC 4000 AC 5000 HWDC	4000 AC 5000 HWDC 5000 FWDC 4000 AC 5000 HWDC	5000 AC 5000 HWDC 6000 FWDC 5000 AC 5000 HWDC 6000 FWDC	5000 AC 5000 HWDC 6000 FWDC 5000 AC 5000 HWDC 6000 FWDC
Demagnetization	Auto AC	Auto AC	Auto AC	AC / REV DC	AC / REV DC
12" Rail Mounted Moveable Coil	Standard	Standard	Standard	Standard	Standard
16", 20", 25", 30" Coil Sizes	Optional	Optional	Optional	Optional	Optional
Induction Fixtures	Optional	Optional	Optional	Standard	Standard
Infinitely Variable Current Control	Two	Two	Two	Three	Three
Digital Ammeters with Hold Feature	Two	Two	Two	Three	Three
Quick Break	Standard	Standard	Standard	Standard	Standard
Current Assurance Indicator	Standard	Standard	Standard	Standard	Standard
Heavy Duty Head/Tail Stock with crank	N/A Push & Lock	Standard	Standard	Standard	Standard
Motorized Tailstock	N/A	N/A	Optional	N/A	Optional
Hip/Push Bar for Mag Shot	Standard	Standard	Standard	Standard	Standard
Footswitch Headstock Activation	Standard	Standard	Standard	Standard	Standard
Stainless Steel Tank	Standard	Standard	Standard	Standard	Standard
Front/Rear Hardwood Grilles	Standard	Standard	Standard	Standard	Standard
Recirculation / Agitation System	Standard	Standard	Standard	Standard	Standard
Auto Flood / Auto Sequencing Selectable Programs	Optional	Optional	Optional	Optional	Optional
Blacklight Hood with Fan & Light Console	Optional	Optional	Optional	Optional	Optional
Powered Conveyor Inspection Booth	Optional	Optional	Optional	Optional	Optional

ACCESSORIES AND MATERIALS

Gould-Bass Company offers a complete line of process control instrumentation and related accessories, such as field strength indicators, clamps, connectors, prods, sprayers, and powder applicators.

All materials necessary for magnetic particle inspection are also available, including dry powders and materials for fluid suspension.

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MAGNETIC PARTICLE TESTING MATERIALS



MPI Fluorescent
Materials



MPI Non-Fluorescent
(Visible) Materials



"MAGNAFLUX Magnaglo® fluorescent and Magnavis® visible magnetic particle testing materials provide vivid, superior indications under black light and daylight inspection conditions."

brilliant



Magnaflux® certified fluorescent and visible magnetic particle inspection materials offer NDT professionals superior detection capabilities in the identification of surface and slightly subsurface discontinuities in ferrous materials under daylight and black light conditions.

Vivid Performance

MAGNAGLO® FLUORESCENT PARTICLE INSPECTION MATERIALS

FLUORESCENT WET METHOD PARTICLES

Magnaglo® 14A Fluorescent Magnetic Powder

Magnaglo® 14A is intended for use in high sensitivity, wet method magnetic particle inspection and may be suspended in either a petroleum-based vehicle (oil) such as Carrier II or water.

Specification Compliance: ASTM E 1444, ASME B&PV Code, Sec. V, NAVSEA 250-1500-1, ASTM E-709 (E-138), MIL-STD-271, AMS-3044, Cummins IS-16048-13, MIL-STD-2132, Boeing PS 21201, British Std. B.S. 4069.

Applications: Magnaglo® 14A is used to locate fine surface and slightly sub-surface discontinuities such as inclusions, seams, shrink cracks, tears, laps, flakes, welding defects, grinding cracks, quenching cracks, and fatigue cracks.

Part Number & Container Size:

- 01-0130-57 1 lb. Plastic Jar
- 01-0130-71 1 lb. Plastic Jar (6)
- 01-3130-69 20 lb. Plastic Pail



Magnaglo® 14AM Prepared Oil Bath

Magnaglo® 14AM is a fluorescent prepared bath of 14A powder mixed with Carrier II (a high flash point petroleum vehicle). It comes ready to use without measuring and mixing.

Specification Compliance: ASTM E 1444, ASTM E 709 (E-138), Cummins IS-16048-13, MIL-STD-2132, Boeing PS 21201, British Std. B.S. 4069, DOD-F-87935, AMS-3045, AMS-3046 (aerosol package only).

Applications: Magnaglo® 14AM is used to locate fine surface and slightly subsurface discontinuities such as inclusions, seams, shrink cracks, tears, laps, flakes, welding defects, grinding cracks, quenching cracks and fatigue cracks.

Part Number & Container Size:

- 01-0145-40 5 Gal. Pail
- Also available in 16 oz. aerosol cans.



MAGNETIC PARTICLE TESTING MATERIALS

Magnaflux Magnaglo® fluorescent and Magnavis® visible magnetic particle testing materials are two of the industry's most widely used and trusted NDT product lines. Their superior, finely controlled particles deliver maximum sensitivity to produce vivid indications that are unmatched in their detection of surface and slightly subsurface discontinuities across a range of ferrous materials. Backed by more than 80 years of magnetic particle experience and an expansive line-up of accessories and equipment, Magnaglo® and Magnavis® products are designed to support your NDT inspection process both in the field and in the shop with the level of performance that only Magnaflux® can provide.

Magnaglo® 14A Redi-Bath

Magnaglo® 14A Redi-Bath is a prepared liquid concentrate of 14A Fluorescent Powder, wetting agents, anti-foaming agents, and long lasting rust inhibitors.

Specification Compliance: ASTM E 1444, ASTM E 709, NAVSEA 250-1500-1, MIL-STD-271, MIL-STD-2132, ASME B & PV Code, Sec. V.

Applications: Magnaglo® 14A Redi-Bath is used to locate fine surface and slightly subsurface discontinuities such as inclusions, seams, shrink cracks, tears, laps, flakes, welding defects, grinding cracks, quenching cracks and fatigue cracks.

Part Number & Container Size:

- 01-9130-35 Case of (4) 1 Gal. Jugs
- 01-9130-41 Case of (6) 27 oz. Containers



Magnaglo® 14A Aqua-Glo®

Magnaglo® 14A Aqua-Glo® is a prepared liquid solution of 14A Fluorescent Powder, water, conditioning agents, corrosion inhibitors and carbon dioxide propellant. It is designed to offer the benefits of a water bath in a convenient ready to use aerosol form. Magnaglo® 14A Aqua-Glo® is ideally suited for applications where portability is required, and flammability is a concern.

Specification Compliance: ASTM E 1444, ASTM E 709, NAVSEA 250-1500-1, ASME.

Applications: Magnaglo® 14A Aqua-Glo® is used to locate fine surface and slightly subsurface discontinuities such as inclusions, seams, shrink cracks, tears, laps, flakes, welding defects, grinding cracks, quenching cracks and fatigue cracks.

Part Number & Container Size:

- Available in 16 oz. aerosol cans.



Magnaglo® 20B

Magnaglo® 20B is a dry mix formula of 14A Fluorescent Powder and WA-2B water conditioner containing wetting agents and corrosion inhibitors designed to be added to a water bath.

Specification Compliance: ASTM E 1444, ASTM E 709 (E-138), NAVSEA 250-1500-1, MIL-STD-271, MIL-STD-2132, ASME B & PV Code, Sec. V.

Applications: Magnaglo® 20B is used to locate fine surface and slightly subsurface discontinuities such as inclusions, seams, shrink cracks, tears, laps, flakes, welding defects, grinding cracks, quenching cracks and fatigue cracks.

Part Number & Container Size:

- 01-0179-71 Case of (6) 1 lb. Containers
- 01-0179-70 15 lb. Pail
- 01-0179-84 30 lb. Pail





Magnaglo® MG-410 Wet Method Fluorescent Magnetic Powder

Magnaglo® MG-410 Wet Method Fluorescent Magnetic Powder is a dry, free flowing magnetic powder that fluoresces bright yellow-green under black light (wavelength of 365 nm). Its fluorescent yellow-green color provides a vivid contrast against metal parts when viewed under black light in a darkened area but does not require total darkness for viewing.

MG-410 is closely controlled to assure optimum batch to batch consistency and inspection reliability and can be used with either water or oil vehicles.

Specification Compliance: ASME B & PV Code, Sec. V, NAVSEA 250-1500-1, MIL-STD-2132, ASTM E 709, NAVSEA T9074-AS-GIB-010/271.

Applications: Magnaglo® MG-410 is used for general purpose wet method magnetic particle inspection of inclusions, seams, cracks, tears, laps, flakes and welding defects.

Part Number & Container Size:

01-0191-59 2 lb. Jar



OIL VEHICLE

Magnaglo® Carrier II Oil

Magnaglo® Carrier II Oil is used to suspend wet (oil) method magnetic particles when water is not used as a suspension vehicle. It has virtually no odor or fluorescence and possesses a flash point in excess of 200°F allowing it to meet OSHA requirements for a Class III B liquid.

Specification Compliance: ASTM E 1444, ASTM E 709, Pratt & Whitney PMC 1887, A-A-59230, ASME B & PV Code, Sec. V, AMS-2641.

Part Number & Container Size:

01-2122-40 5 Gal. Pail
 01-2122-30 20 Gal. Drum
 01-2122-45 55 Gal. Drum



WATER BATH ADDITIVES

Magnaglo® AX-52 Corrosion Inhibitor

Magnaglo® AX-52 is a pale yellow to amber colored liquid corrosion inhibitor that mixes in and quickly dissolves in the water bath. It is an outstanding corrosion inhibitor for wet method magnetic particle inspection.

Part Number & Container Size:

01-2190-40 5 Gal. Jug



Magnaglo® WA-2B Water Conditioner

Magnaglo® WA-2B is a white granular powder water conditioner used in wet method magnetic particle testing when water is used as the bath vehicle. It is an excellent general-purpose water conditioner that gives a water bath good surface wetting and magnetic particle dispersion capabilities, along with a blend of wetting agents, corrosion inhibitors and anti foaming agents.

Part Number & Container Size:

01-2148-63 5 lb. Pail



Magnaglo® WC-1 Water Conditioner

Magnaglo® WC-1 is used in wet method magnetic particle testing when water is used as the bath vehicle. It is more rapidly dispersed than powdered conditioners and its unique blend of wetting agents, corrosion inhibitors and anti foaming agents eliminates the need for additional water conditioners. WC-1 provides good surface wetting and magnetic particle dispersion capabilities.

Part Number & Container Size:

01-2173-40 5 Gal. Pail



Magnaglo® ZAF-2 Non-Silicone Anti-Foam

Magnaglo® ZAF-2 Non-Silicone Anti-Foam is a clear, colorless liquid used to eliminate foaming in aqueous developer baths, water based magnetic particle baths and hydrophilic remover baths. A few drops of ZAF-2 sprinkled around on the surface of a bath is all that is required to eliminate most foaming.

Part Number & Container Size:

01-9410-20 1 Gal. Plastic Bottle



PORTABLE FLUORESCENT INSPECTION KITS

Magnaglo® Portable Fluorescent Inspection Kits

Magnaglo® Portable Fluorescent Inspection Kits come with a ZB-100F Ultraviolet Black Light and materials used to perform magnetic particle inspection. (No magnetic yoke is included with kit.)

Part Number:

600088 - Magnaglo® Kit with 115V - 60 Hz ZB-100F Black Light

Each kit contains:*

- (1) ZB-100F Fan-Cooled Ultraviolet Black Light
- (2) Cans of 14AM
- (2) Cans of SKC-S Cleaner
- Paint Marker
- SCRUBS® Hand Towels
- Plastic Carrying Case and Instructions

600089 - Magnaglo® Kit with 230V - 60 Hz ZB-100F Black Light

Each kit contains:*

- (1) ZB-100F Fan-Cooled Ultraviolet Black Light
- (2) Cans of 14AM
- (2) Cans of SKC-S Cleaner
- Paint Marker
- SCRUBS® Hand Towels
- Plastic Carrying Case and Instructions

* Note: No magnetizing device is supplied with this kit.



600088



MAGNAVIS® VISIBLE PARTICLE INSPECTION MATERIALS

VISIBLE WET METHOD PARTICLES

Magnavis® 7C Black Visible Wet Method Dry Powder Concentrate

Magnaglo® 7C Black Visible Wet Method Dry Powder Concentrate is ideally suited for use on light colored surfaces where optimum color contrast is needed. Magnaglo® 7C is composed of compounded magnetic powder and may be suspended in either Carrier II Oil Vehicle or in water.

Specification Compliance: ASME B & PV Code, Sec. V, ASTM E 709 (E-138), ASTM E 1444, AMS 3042, MIL-STD-271, MIL-STD-2132, NAVSEA 250-1500-1.

Applications: Magnaglo® 7C Black Visible Wet Method Dry Powder Concentrate is used to locate inclusions, seams, shrink cracks, tears, laps, flakes, welding defects, grinding cracks, quenching cracks and fatigue cracks.

Part Number & Container Size:

01-1116-66 8 lb. Pail



Magnavis® 7HF Black Visible Magnetic Particle Wet Method Prepared Bath

Magnavis® 7HF Black Visible Magnetic Particle Wet Method Prepared Bath is designed for spot inspections of parts that, because of their size or location, must be inspected in the field.

Magnavis® 7HF is composed of 7C Black Magnaflux® magnetic powder suspended in a low volatility mineral oil. It offers significant advantages in situations where bulk processing is found to be impractical and is often used in combination with WCP-2 White Contrast Paint.

Specification Compliance: ASME B & PV Code, Sec. V, ASTM E 709, ASTM E 1444, AMS 3041, AMS 3043, Boeing PS-21201, MIL-STD-2132.

Applications: Magnavis® 7HF is ideal for remote inspection of tubes, piping, and other large structures.

Part Number & Container Size:

Available in 16 oz. aerosol cans.



WHITE CONTRAST PAINT

Magnavis® WCP-2 Contrast Paint

Magnavis® WCP-2 Contrast Paint provides a white background that enhances magnetic particle indications. It is composed of acetone and inorganic pigments and utilizes a carbon dioxide aerosol propellant for ease of application.

Specification Compliance: BS 5044.

Applications: Magnavis® WCP-2 is designed for use in applications where the contrast in color between the part being tested and the magnetic particles being used is insufficient for reliable identification of flaws. WCP-2 can be used with both dry and wet-method magnetic particles.

Part Number & Container Size:

Available in 16 oz. aerosol cans.



NON-FLUORESCENT (Visible) INSPECTION KITS

Magnavis® Non-Fluorescent Inspection Kit

Magnavis® Non-Fluorescent Inspection Kits come with all materials (Yoke not included) required to perform in-field or in-shop non-fluorescent NDT inspections.

Applications: Portable non-fluorescent NDT inspections.

Part Number:

45295 - Each Magnavis® Non-Fluorescent Inspection Kit Contains:*

- 1 lb. #1 Gray Magnetic Powder
- 1 lb. #8A Red Magnetic Powder
- 1 lb. #3A Black Magnetic Powder
- (2) Cans (16 oz.) 7HF
- (1) Can (16 oz.) WCP
- (2) Cans (16 oz.) SKC-S Cleaner/Remover
- Powder Spray Bulb
- Field Indicator (2480)
- Paint Marker
- SCRUBS® Hand Towels
- Plastic Carrying Case and Instructions

* Note: No magnetizing device is supplied with this kit.



45295



VISIBLE DRY METHOD PRODUCTS

Magnavis® Dry Method Non-Fluorescent Magnetic Powders

Magnavis® Dry Method Non-Fluorescent Magnetic Powders produce clear, sharp indications across a variety of surfaces and background colors. Available in #1 Gray, #2 Yellow, #3A Black and #8A Red, Magnavis® magnetic powders are ready to use, free flowing, general purpose magnetic powders designed to produce, superior indications of surface and slightly subsurface discontinuities in ferrous materials.

Specification Compliance: ASME B & PV Code, Sec. V, ASTM E 709, NAVSEA 250-1500-1, NAVSEA T9074-AS-GIB-010/271, MIL-STD-2132, AMS-3040.

Applications: Magnavis® Dry Method Non-Fluorescent Magnetic Powders are used to identify indications in welds, large forgings and castings.

Part Number & Container Size:

- 01-1716-69 #1 Gray Magnetic Powder - 10 lb. Pail
- 01-1716-87 #1 Gray Magnetic Powder - 45 lb. Pail
- 01-1732-69 #2 Yellow Magnetic Powder - 10 lb. Pail
- 01-1732-87 #2 Yellow Magnetic Powder - 45 lb. Pail
- 01-1748-87 #3A Black Magnetic Powder - 45 lb. Pail
- 01-1780-69 #8A Red Magnetic Powder - 10 lb. Pail
- 01-1780-87 #8A Red Magnetic Powder - 45 lb. Pail



SPECIFICATIONS

MAGNAGLO® MAGNETIC PARTICLES

Magnaglo® Fluorescent Wet Method Magnetic Particles									
SPECIFICATIONS	14A	14AM	14 Aqua Glo	14A Redi-Bath	208	MG-410	7C Black	7HF Black	Carrier II
NAVSEA T9074-AS-GIB-010/271	X		X	X	X	X	X	X	X
MIL-STD-2132	X	X	X	X	X	X	X	X	X
AMS 2641									X
AMD 3041								X	
AMS 3042							X		
AMS 3043								X	
AMS 3044	X		X	X	X				
AMS 305		X							
AMS 3046		X							
ASME B & PV Code, Sec. V	X	X	X	X	X	X	X	X	X
ASTM E 709	X	X	X	X	X	X	X	X	X
ASTM E 1444	X	X	X	X	X		X	X	X
A-A-59230		X							X
Boeing PS-21201	X	X	X	X	X		X	X	X
NAVSEA 250-1500-1	X		X	X	X	X	X		
Pratt & Whitney PMC 1887									X

MAGNAVIS® MAGNETIC PARTICLES

Magnavis® Visible Dry Method Magnetic Particles				
SPECIFICATIONS	1 Gray	2 Yellow	8A Red	3A Black
NAVSEA T9074-AS-GIB-010/271	X	X	X	X
MIL-STD-2132	X	X	X	X
NAVESEA 250 -1500-1	X	X	X	X
AMS 3040	X	X	X	X
ASME B & PV Code, Sec. V	X	X	X	X
ASTM E 709	X	X	X	X
ASTM E 1444	X	X	X	X



MAGNETIC PARTICLE TESTING ACCESSORIES



MPI Accessories

"MAGNAFLUX® Magnetic Particle Testing Accessories have allowed us to streamline and simplify our NDT process, while simultaneously boosting inspection speed and reducing cost."

simplify



Magnaflux® Magnetic Particle Testing Accessories are designed to help improve the speed, detection capabilities, and cost effectiveness of your MPI system.

Simplifying Inspection

CABLES, CONNECTORS & REMOTE DEVICES

Cables

Rubber covered flexible cables are available in standard lengths of 15 ft. (4.57m) and 20 ft. (6.09m) with a choice of either-end or lug connectors. Custom cables and replacement connectors are also available.

Part Number:

- 11306 15 ft. (4.57m) lugs at both ends
- 11307 15 ft. (4.57m) lug and either-end
- 11308 15 ft. (4.57m) either-ends at both ends
- 11312 20 ft. (6.09m) lugs at both ends
- 11313 20 ft. (6.09m) lug and either-end
- 11314 20 ft. (6.09m) either-ends at both ends



Connectors

Connectors for attaching 4/0 cables to Magnaflux® magnetizing equipment, including wet benches, powerpacks and mobile units.

Part Number:

- 1238 Either-end connector (allows quick cable disconnect for maximum flexibility)
- 1238A Connector boot only
- 1574 Either-end lug adapter (changes lug terminal to either-end terminal)
- 1576 90° either-end lug adapter (same as lug adapter 1574 but 90°)
- 2590 4/0 lug for permanent attachment to magnetizing equipment



Remote Control Cable

15' (4.57m) cable allows for remote energizing of portable power packs. Comes standard with 3 PTL plug.

Part Number:

- 157657 Remote Control Cable

Remote Palm Button

Remote palm button that mounts on side of Mag Kit for energizing current from power pack. Comes standard with 3 PTL plug.

Part Number:

- 169621 Mag Kit Remote Palm Button



MAGNETIC PARTICLE TESTING ACCESSORIES

Quality experts the world over count on Magnaflux® Magnetic Particle Testing Accessories to maintain their manufacturing standards and to help simplify, expand and improve their magnetic particle inspection processes. If you are looking to add to, or replace outdated MPI test components, you will find that Magnaflux offers an impressive line-up of accessories designed to meet your exact needs. From coils and prod sets, to field indicators, monitoring devices and spray applicators, Magnaflux® brand MPI accessories will help keep your process control operations performing at peak productivity and quality levels.

CENTRIFUGE TUBES & STANDS

Magnaflux® centrifuge tubes are individually calibrated to monitor the precise concentrations of Magnaglo® and Magnavis® particles in baths, as well as the contamination levels of their solutions.

Part Number: 8493 - Centrifuge Tube for Magnaglo® 14A, 14AM and 20B Fluorescent Particles. Measures in increments between 0 and 1.0 ml in 0.05 increments.

Part Number: 507923 - Centrifuge Tube for Magnaglo® MG-410 Fluorescent Particles. Measures in increments between 0 and 0.2 ml in 0.01 increments.

Part Number: 2461 - Centrifuge Tube for Magnavis® 7C and 9C Visible Particles. Measures in increments between 0 and 1.5 ml in 0.10 increments.

Part Number: 1837A - Aluminum Centrifuge Stand. Safely holds centrifuge tubes when checking bath concentrations.



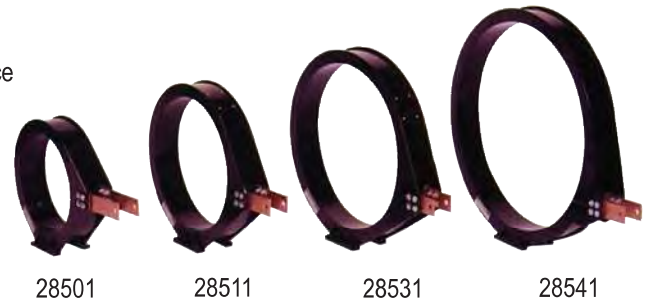
COILS

Coils for Bench Units

Five-turn coils in sizes from 12" to 25" that conform to most parts and produce optimal magnetic field applications.

Part Number:

- 28501 12" (30 cm) Coil
- 28511 16" (41 cm) Coil
- 28531 20" (51 cm) Coil
- 28541 25" (64 cm) Coil



Flat Magnetic Coil

For non-contact magnetic particle inspection of small parts such as fasteners and ring-like parts. Can be used with any magnetic particle unit or power pack to allow for the quick, easy processing of multiple parts at one time.

Part Number:

- 611700 Flat Magnetic Coil



611700

L-10 Coil

Portable AC coil for use in the detection of surface cracks.

Part Number:

- 50651 Coil size 10" (25 cm) I.D. / 15" (38 cm) O.D. Comes with durable carrying case, flexible 10' (3 m) power cord. 115v, 50/60hz, 1-phase power source required to operate. 2,800 amp. turns.
- 620983 Coil size 10" (25 cm) I.D. / 15" (38 cm) O.D. Comes with durable carrying case, flexible 10' (3 m) power cord. 230V, 50/60hz, 1-phase power source required to operate. 2,800 amp. turns.



50651

Clam Shell Coil Assembly

Three-turn split coil that allows for examination of large parts.

Part Number:

- 623031 19.7" (50 cm) Clam Shell Coil Assembly



623031



CONDUCTORS & ADAPTERS

Central Conductors

Solid copper rods in diameters of .50" to 1.00" that provide circular magnetization of hollow parts.

Part Number:

- 622632 0.50" Diameter x 15.875" Length
- 622633 0.75" Diameter x 15.875" Length
- 622634 1.00" Diameter x 15.875" Length



Small Parts Adapters

Magnaflux® small part adapters allow standard wet horizontal MPI test units to be used for inspecting small parts such as bolts, screws and pins. *Not for use with 12 x 12 contacts.*

Part Number: 28470 - Headstock Adapter. Made of solid copper and mounts directly to headstock.

Part Number: 28471 - Tailstock Adapter. Made of solid copper and mounts directly to tailstock.



CONTACT CLAMPS

Magnaflux® spring-loaded and heavy-duty contact clamps facilitate the easier, more accurate inspection of tubing, bars, and tubular assemblies such as aircraft engine mounts, fuselage sections and large welded structures.

Part Number: 1865A - Spring-Loaded Contact Clamp. For 1.25" to 2.50" diameter parts. Replacement copper braid (Part Number: 14710) also available.

Part Number: 169802 - Heavy-Duty Contact Clamp. For parts up to 7.00" diameter.

Part Number: 54975 - Magnetic Leech. Permanent magnet with 4/0 either end connector for attaching to parts.



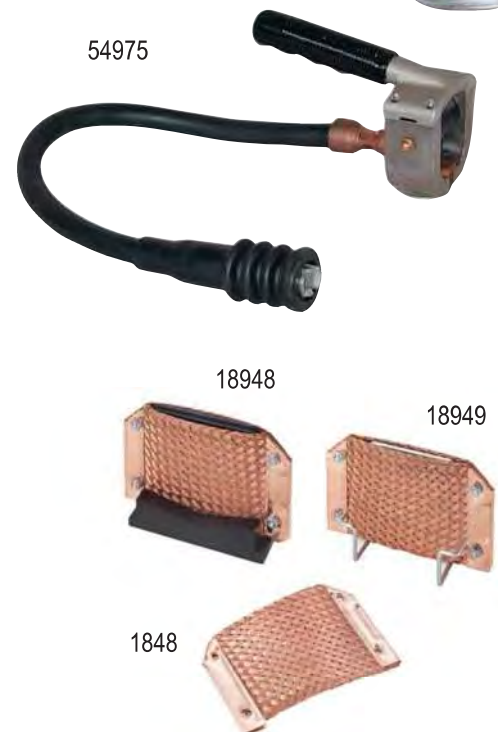
CONTACT PADS & PLATES

Magnaflux® long lasting copper braided contact pads and lead contact plates prevent arc burn by helping to maintain proper electrical contact between test parts and contact heads. Available in a variety of sizes to fit most MPI units.

Part Number: 1848 - Replacement Copper pad for 18948 and 18949. 4.75" (120.65mm) x 7.5" (190.5mm).

Part Number: 18948 - Double-Braided Pad with V-Block. Heavy copper braid provides contact over a larger surface area. Built with neoprene, the V-Block base centers and supports test parts. Can be reversed to provide two wear faces. Fits all units except A-915 and smaller Mag Series units.

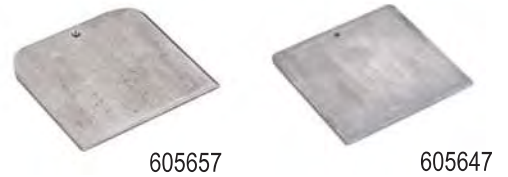
Part Number: 18949 - Double-Braided Pad with Clip. Offers the same performance features as the 18948 but clips over the headstocks of A-915 and smaller Mag Series units.



Contact Pads & Plates Continued -

Part Number: 605647 - Lead Contact Plate. Soft lead plate provides excellent contact with test parts and duplicates original headstock/tailstock contact plates. Fits all units except the A-915 and smaller Mag Series units. Size: 6.75" (171.45mm) x 6.635" (168.275mm) x .25" (6.35mm) thick.

Part Number: 605657 - Heavy Duty Lead Contact Plate. Copper impregnated lead contact plate that lasts 10 times longer than standard lead contact plates. Fits all units except A-915 and smaller Mag Series units.



FIELD INDICATORS

Field Indicators

Magnaflux® rugged, pocket-size 10 and 20 gauss field indicators are used to measure residual magnetism remaining in parts after de-magnetization.

Part Number: 2480 - Field Indicator. Inexpensive and disposable non certified 10 gauss field indicator.

Part Number: 505056 - 10 Gauss Calibrated Field Indicator. 10 gauss certified field indicator accurate to ± 0.5 gauss with a scale range of 10-0-10. Certification is provided with meter.

Part Number: 105645 - 20 Gauss Calibrated Field Indicator. 20 gauss certified field indicator accurate to ± 1 gauss with a scale range of 20-0-20. Certification is provided with meter.



Digital Hall Effect Meter Probe Gaussmeter

Magnaflux® digital hall effect meter measures AC and DC field strength. Includes meter, traverse probe, zero gauss chamber, batteries, manual, and case.

Part Number:

- 622604 Hall Effect Meter
- 622606 Axial Probe for Digital Hall Effect

622604



Pie Field Indicator

The Magnaflux® magnetic particle pie gauge is used as an aid in determining the direction of magnetic fields used in the detection of discontinuities in ferrous metal parts.

Part Number:

- 169799 Pie Field Indicator

169799



PORTABLE HAND SPRAYERS

Magnetic Particle Spray System

30 Gallon portable MPI spray system with 15 ft. recirculation hose and fan-pattern spray gun for inspection of large parts. May be used with water or oil based solutions. Continuous agitation for even particle suspension and fully portable with casters for easy mobility.

Part Number:

- 621778 Magnetic Particle Spray System

621778





Portable Pressure Sprayer

Easy to use, heavy-duty pressure sprayer for spot application of magnetic particle bath.

- 1 quart capacity
- Easy disassembly for cleaning
- Pressurize with compressed air to 80 - 200 psi

Part Number:

625774 Portable Pressure Sprayer



625774

Powder Spray Bulb

Lightweight, easy to use spray bulb for applying Magnavis® dry powders. Cap removes for easy refilling.

Part Number:

501232 Powder Spray Bulb



501232

MONITORING DEVICES

Quick Break Tester (QB-1)

The Magnaflux Quick Break Tester (QB-1) quickly and accurately confirms function status of "quick break" circuitry in the three phase FWDC magnetic particle units.

Part Number:

148335 Quick Break Tester (QB-1)



148335

Quick Break Tester (QB-2) + Shot Timer

The Magnaflux® Quick Break Tester (QB-2) and Shot Timer displays peak quick break voltage in a quantitative way to facilitate detection of possible degradation of quick break.

Part Number:

622646 Quick Break Tester (QB-2) + Shot Timer

Shot Timer

The Magnaflux® Shot Timer provides universal shot time detection for all MPI equipment.

- Reads shot time with 10ms resolution on digital display
- Microprocessor controlled for accurate signal capture and peak detection
- Low battery detection

Part Number:

622901 Shot Timer



622646

622901

Digital Amperage Meter Kit

The Magnaflux® Digital Amperage Meter Kit is designed for NDT applications and will certify the amperage on all MPI equipment manufactured by Magnaflux® up to 10,000 amps. Checks AC, HWDC, 1 Phase FWDC, and 3 Phase FWDC.

Part Number:

622350 Digital Amperage Meter Kit



622350

PROD SETS

Magnaflux® prod sets are convenient handheld electrodes used for conducting sectional inspections of welds, casting, forgings and other large and complex part shapes. Comfortable, pistol style grips and out-of-the-way cable hookups make it easy for testing parts that are not wet-bench friendly.

Standard Prod Sets

Part Number: 622088 - For use with M-2000 Series units

Part Number: 157662 - For use with P-70 and P-1500 units

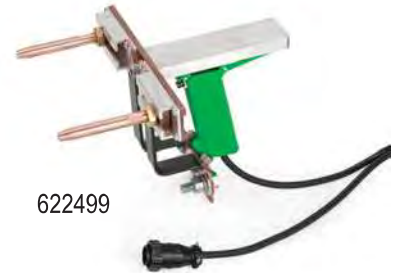


157662

Dual Horizontal Prod Assemblies

Part Number: 622499 - For use with M-2000 Series units

Part Number: 157781 - For use with P-70 and P-1500 units



622499

STEADYRESTS & CONTACT BLOCKS

Steadyrests

Used to support and stabilize long or heavy parts during the inspection process.

Part Number: 1857 - Rail Mounted Roller Type Steadyrest. Mounts and moves on rails with adjustable height to accommodate various part lengths. Fits all units except A-915 and small Mag Series units. Weight capacity up to 1,500 lbs.

Part Number: 605750 - Headstock Mounted Roller Type Steadyrest. Mounts on headstock to support one end of part (use rail-mounted Part Number 1857 to support other end). Speeds up part loading as coil may be retracted past the headstock. Fits all units except A-915, small Mag Series units and units with oversized contact plates.

Part Number: 621658 - Tailstock Steadyrest. Designed for mounting on the tailstock and will work with either headstock or rail mounted steadyrests.



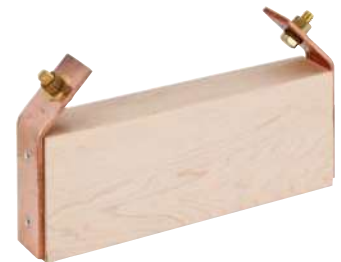
1857

Contact Block

Permits remote testing of parts that are too heavy for processing on a unit. When clamped between head and tailstock, the block supplies magnetizing current to remote prods or clamps through flexible cables (cables not included, see cables & connectors).

Part Number:

1830 Contact Block



1830

TEST BLOCKS

Continuous Method Test Block

The Magnaflux® Continuous Method Test Block is used to check for proper magnetizing techniques on wet horizontal MPI units. Crack indications form on the test block when current flow and bath concentrations are at proper levels.

Part Number:

75130 Continuous Method Test Block



75130



TEST PIECES

Magnetic Particle Test Bar

The Magnaflux® Magnetic Particle Test Bar contains coarse and fine surface and subsurface defects in both directions. It meets or exceeds most industry and military standards for artificial test specimens.

Part Number:

189838 Magnetic Particle Test Bar



189838

Quantitative Quality Indicator Test Pieces

Quantitative Quality Indicators (QI) are magnetic particle test pieces with artificial defects that are used to verify field direction and relative strength. They are also used to balance multi-directional fields and to increase productivity by minimizing magnetizing shots.

Part Number: 625551 - Shim Type #CX-230 (Set of 5). Basic circular and cross bar flaw configuration suitable for longitudinal and circular fields. Flaw depth of 30% of shim thickness, .002" thick.

Part Number: 625552 - Shim Type #CX4-230 (Set of 5). Similar to CX-230 except miniature design for small areas on test part. The 4 circles may be cut apart for individual use. Flaw depth of 30% of shim thickness, .002" thick.

Part Number: 625553 - Shim Type #CX-430 (Set of 5). Basic circular and cross bar flaw configuration suitable for longitudinal and circular fields. Flaw depth of 30% of shim thickness, .004" thick.

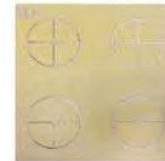
Part Number: 625554 - Shim Type #3C2-234 (Set of 5). Used for more quantitative work, the 3C2-234 contains 3 concentric circular flaws of varying depths. Flaw depths of 20%, 30% and 40% of shim thickness, .002" thick.

Part Number: 625555 - Shim Type #3C4-234 (Set of 5). Used for more quantitative work, the 3C4-234 contains 3 concentric circular flaws of differing depth. Flaw depths of 20%, 30% and 40% of shim thickness, .004" thick.

625551



625552



625553



625554



625555



Tool Steel Test Ring

The Magnaflux® AS 5282 Tool Steel Test Ring is a magnetic particle test piece with pre-drilled holes to simulate subsurface discontinuities. It provides a reliable method of verifying magnetic particle system performance when actual test parts with discontinuities are not available. Meets AS 5282.

Part Number:

159999 Tool Steel Test Ring

159999



Magnetic Flux Indicators

Magnaflux® Type G (General use) magnetic flux indicators come in a packet of 5 and are used to detect appropriate levels of magnetic field strength. These flexible indicators also assist in determining directional orientation of the magnetic field.

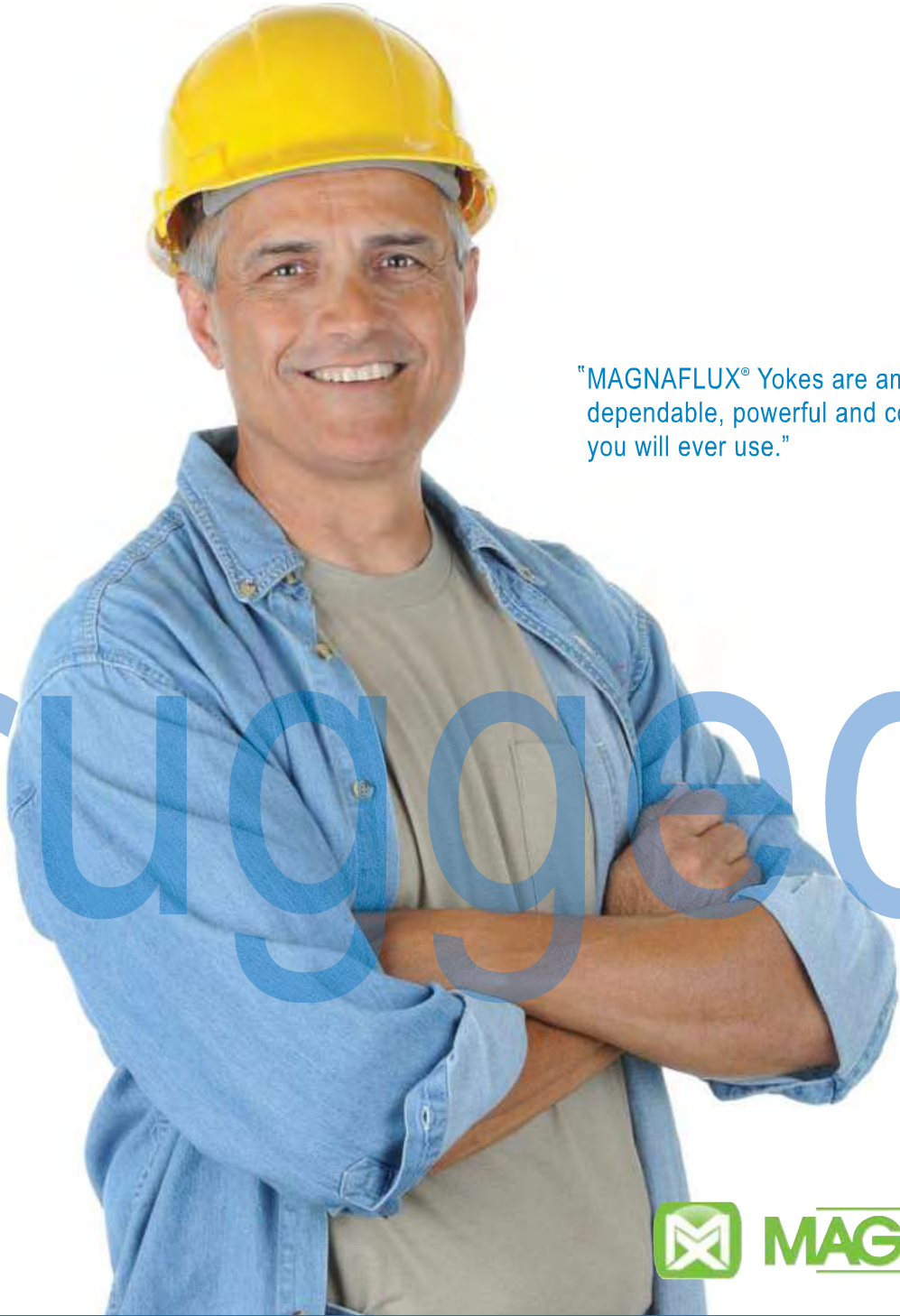
Part Number:

008M004 Magnetic Flux Indicators (set of 5)

Specifications Compliance: ASTM E709-08, E1444-11.

008M004





"MAGNAFLUX® Yokes are among the most dependable, powerful and comfortable yokes you will ever use."

rugged



Magnaflux® Magnetic Yokes are built rugged to withstand years of shop and field inspection abuse, yet are among the most ergonomically and technically advanced yokes on the market today.

Technology Driven

MAGNETIC YOKES

Y-1 AC Magnetic Yoke

The Magnaflux® Y-1 AC Magnetic Yoke is a new generation of lightweight, ergonomic yoke designed to improve job performance and productivity by reducing operator arm and wrist fatigue when testing for prolonged periods or in tight, confined spaces. The Y-1 is easier and more comfortable to operate than standard yokes and comes with a rugged chemical and impact resistant outer shell that will stand up to years of inspection abuse. Each unit is individually serial numbered and certified for performance prior to shipment.

- 25% increase in lift strength
- Improved cord strength
- Wider legs for better contact
- Shields for better leg protection
- Sealed core to resist corrosion
- Durable, rugged construction

General Specifications:

- Elec. Requirements - 115V/50-60hz/1ph or 230V/50-60hz/1ph
- Max. Line Current Draw - 3.7 amp 115V or 1.6 amp 230V
- Weight - 5.35 lb. (2.43 kg)
- Leg Span - Up to 11in. (20 cm)
- Cord Length - 10 ft. (3.05 m)
- Warranty - 1 year

Part Number:

- 623502 Y-1 115V Yoke
- 623503 Y-1 230V Yoke



Y-1 AC Magnetic Yoke Kit

The Magnaflux® Y-1 AC Magnetic Yoke Kit contains all key elements necessary to perform visible magnetic particle inspections:

- Y-1 Magnetic Yoke 115V/50-60hz/1ph or 230V/50-60hz/1ph
- 1 lb. #1 Gray Magnetic Powder
- 1 lb. #8A Red Magnetic Powder
- Powder Spray Bulb
- Paint Marker
- SCRUBS™ Hand Cleaner
- Portable Carrying Case and Instructions

Part Number:

- 623529 Y-1 115V Yoke Kit
- 623530 Y-1 230V Yoke Kit



MAGNETIC YOKES

Magnaflux Magnavis® brand magnetic yokes lead the industry in design innovation and magnetic particle inspection performance. From the lightweight ergonomic design and increased lifting power of our recently enhanced Y-1 AC Yoke to the 100% field portability of the battery powered Y-8, you will find every yoke we manufacture to be built as tough as you work.

Y-7 AC/DC Magnetic Yoke

The Magnaflux® Y-7 AC/DC Magnetic Yoke is designed for portable testing of ferrous parts and is ideal for the inspection of welds and other remote testing applications.

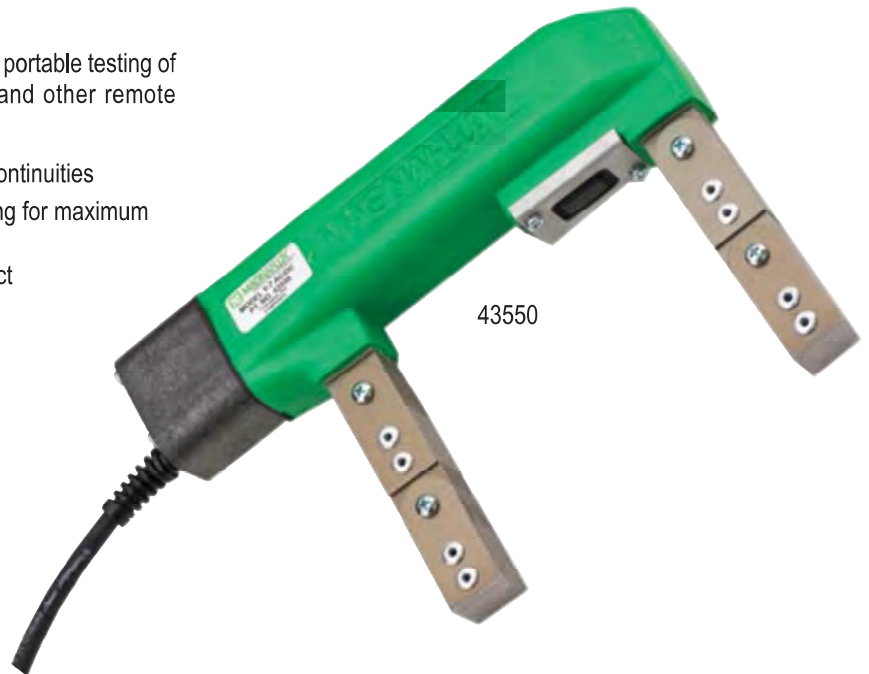
- Can be used to find both surface and near-surface discontinuities
- Solid state controls located in the interior of yoke housing for maximum safety and reliability
- Articulating, double-jointed legs assure good part contact

General Specifications:

- Elec. Requirements - 115V/50-60hz or 230V/50-60hz
- Max. Line Current Draw - 9 amp 115V AC or 4 amp 230V
- Weight - 7.4 lb. (3.36kg) 115V or 7.2 lb. (3.27kg) 230V
- Leg Span - 0" - 12" (0 - 30cm)
- Cord Length - 12 ft. (3.66 m)
- Warranty - 1 year

Part Number:

- 43550 Y-7 AC/DC Magnetic Yoke 115V/50-60hz
- 43560 Y-7 AC/DC Magnetic Yoke 230V/50-60hz



Y-7 AC/DC Magnetic Yoke Kit

The Magnaflux® Y-7 AC/DC Magnetic Yoke Kit contains all key elements necessary to perform visible magnetic particle inspections:

- Y-7 AC/DC Magnetic Yoke 115V/50-60hz or 230V/50-60hz
- 1 lb. #1 Gray Magnetic Powder
- 1 lb. #8A Red Magnetic Powder
- Powder Spray Bulb
- Paint Marker
- SCRUBS™ Hand Cleaner
- Portable Carrying Case and Instructions

Part Number:

- 43509 Y-7 AC/DC Magnetic Yoke Kit 115V/50-60hz
- 620741 Y-7 AC/DC Magnetic Yoke Kit 230V/50-60hz





Y-8 Battery Operated Magnetic Yoke Kit

The Magnaflux® Y-8 Battery Operated Magnetic Yoke Kit is ideal for remote testing applications. The kit allows for 100% portability in field inspections of ferrous parts with the use of the battery operated Y-8 Yoke.

- 100% portable for field inspections
- Battery pack comes with convenient shoulder strap
- Solid state controls located in the interior of yoke housing for maximum safety and reliability
- Articulating, double-jointed legs assure good part contact

General Specifications:

- Yoke Current Draw - 1.4 amp @ 6 Volts
- Weight - 7.75 lb. (3.52kg)
- Leg Span - 0" - 12" (0 - 30cm)
- Cord Length - 12 ft. (3.66 m)
- Warranty - 1 year
- Battery:
 - 6V, 12 amp hr.
 - 5.25 lb. (2.38kg)
 - 4.25" x 2.75" x 5.5" (10.8cm x 7 cm x 14cm)
 - Battery Operating Temp. Range -40°C to 60°C (-40°F to 140°F)
- Battery Charger Current Draw - 0.2 amp @ 115V or 230V

Kit Part Number:

- 611710 Y-8 Magnetic Yoke Kit 115V
- 611710-01 Y-8 Magnetic Yoke Kit 230V

611710



YOKE ACCESSORIES

Yoke Light Kits

The Magnaflux® Yoke Light Kits provide enhanced visible method detection of flaws and discontinuities under low and no light conditions.

Part Number: 623745 - Light Kit for Y-1 AC Yoke

Part Number: 621785 - Light Kit for Y-6/Y-7 Yokes



623745

10 lb. Test Weight for Y-1 Yoke

The Magnaflux® 10 lb. Test Weight is designed specifically for use with the Y-1 Yoke. It provides balanced weight distribution and comes with a built-in leg positioning guide to assure accurate test results every time. Each weight measures 9" x 2" x 2", is individually serialized, and comes with a certificate stating that it meets ASTM E1444.

Part Number:

- 624115 10 lb. Y-1 Yoke Test Weight



624115

MAGNETIC PARTICLE INSPECTION EQUIPMENT



MPI Equipment

"MAGNAFLUX® Magnetic Particle Testing Equipment was completely scalable to our needs, allowing us to start small and add more capabilities as our business grew."

scalable



Magnaflux® Magnetic Particle Testing Equipment has been value engineered to meet or exceed government and industry inspection standards while remaining sensitive to the operating cost, speed and volume requirements of NDT customers.

Modular Capabilities

P-SERIES

The Magnaflux® P-Series is an extremely compact, lightweight portable magnetizing unit designed for use in a wide range of magnetic particle inspection applications that require only moderate power to perform.

Perfect for in-service inspections demanding maximum portability, the P-Series is built tough to take job-site abuse and offers many of the features and convenience of our larger units.

The current control potentiometer of P-Series P-70 and P-1500 units provides infinitely variable magnetizing and demagnetizing current control. A power transformer, supported by fan cooled silicon diodes, transforms the high voltage, low amperage line input to low voltage, high amperage half-wave D.C. for magnetizing. Low voltage, high amperage A.C. is also provided for magnetizing and demagnetizing.

P Series Features:

- Locate surface discontinuities using AC current. Switch cable connections to halfwave DC (HWDC) to locate near surface defects
- Locate discontinuities in any direction using prods, central conductor or coil wrap
- Infinitely variable current control
- Demagnetize parts in AC mode by slowly turning current dial to zero
- Built-in automatic-reset circuit breaker

P Series Benefits:

- Either-end terminals for quick changeover
- Unit comes with control cable with activation button

General Specifications:

	MODEL P-70	MODEL P-1500
Dimensions	17.5"L x 9"W x 8"H 44.5 x 22.9 x 20.3 cm	22"L x 9.5"W x 9.5"H 55.8 x 24.1 x 24.1 cm
Weight	35 lbs (15.9 kg)	93 lbs (42.2 kg)
Max Output ¹	750 Amps AC or HWDC	1500 Amps AC or HWDC
Current Input ² (single phase)	115 VAC 50/60 hz 230 VAC 50/60 hz	230 VAC 50/60 hz 460 VAC 50/60 hz
Line Current	26 Amps @ 115 VAC 13 Amps @ 230 VAC	42 Amps @ 230 VAC 21 Amps @ 460 VAC
Max Duty Cycle	2 Minutes ON 2 Minutes OFF	2 Minutes ON 2 Minutes OFF

¹Current ratings based on use of two 15-foot lengths of 4/0 cable.

²Other voltages available.



MAGNETIC PARTICLE INSPECTION EQUIPMENT

NDT professionals rely on Magnaflux to provide the best solution in Magnetic Particle Inspection Equipment for the detection of surface and near surface discontinuities in manufactured parts of all shapes and sizes. Built to stand up to tough industrial environments, Magnaflux equipment is prized for its ease of operation, rugged dependability and economical performance.

MAG KIT

Magnaflux Mag Kit

The Magnaflux® Mag Kit is a modular mag particle inspection system that allows lower volume NDT users to tailor a fully operational bench unit to their personal application needs by adding only the components that they currently require.

Using a portable power pack as a power supply, the Mag Kit is an economical, easy to operate alternative to more expensive, higher volume bench units when volume processing is not required. It provides the same level of inspection dependability in a lower volume, lower cost equipment package.

Dimensions: 50.5" L x 20.5" W x 50.25" H (Table Height 36")
128cm L x 52.1cm W x 127.6cm H (Table Height 91.4 cm)

Flexibility Features:

- Purchase just the base unit (bench, headstock, tailstock and coil) if you already have a portable power pack
- Purchase the base unit with portable power pack
- Specify recirculating pump spray system with original purchase or add it later (not needed if aerosols are used)
- Conveniently switch magnetizing current from head/tail to coil by changing 2 plug-in cable connections
- Conduct remote inspections of large, heavy parts with the same portable power pack by using cables and prods

General Specifications:

- Coil Diameter - 11" I.D. (28.0cm)
- Max Part Weight - 350 lb. (159kg)
- Max Part Length - 39" (99.1cm)
- Mag Kit Weight - 300 lb. (136kg)

Mag Kit Hood Assembly is available in 115v only - 623830

Shown with optional power pack, pump and ZB-100F UV Black Light.





Mag Kit Pump

The Magnaflux® Mag Kit Pump has been developed for use with Magnaflux Mag Kit units to provide continuous spray and recapture of the Magnaglo® bath. The pump includes hose, nozzle, fittings and 5-gallon pail.

Part Number:

69390 Mag Kit Pump 115V

69395 Mag Kit Pump 230V



69390

DEMAG EQUIPMENT

S-66 Demagnetizing Coil

The Magnaflux® S-66 Demagnetization Coil is a compact tabletop unit designed to be conveniently integrated into existing mag particle inspection systems. Oil and waterproof by virtue of its plastic-impregnated glass coating, the S-66 can be flush mounted to the work surface with supplied angle supports to facilitate easy part insertion by the operator.

Dimensions: 15.5" L x 9.4" W x 14.4" H (39.4cm L x 23.9cm W x 36.6cm H)

General Specifications:

- Elec. Requirements - 115V -12 amp
230V - 6 amp
460V - 3 amp
- Opening Size - 6" x 6" (15.2cm x 15.2cm)
- Shipping Weight - 85 lb. (38.6kg)



S-1212 Demagnetizing Coil

The Magnaflux® S-1212 Demagnetization Coil is a compact tabletop unit designed to be conveniently integrated into existing mag particle inspection systems. Oil and waterproof by virtue of its plastic-impregnated glass coating, the S-1212 can be flush mounted to the work surface with supplied angle supports to facilitate easy part insertion by the operator.

Dimensions: 24" L x 11.75" W x 24" H (61cm L x 29.8cm W x 61cm H)

General Specifications:

- Elec. Requirements - 230V - 30 amp
460V - 14 amp
- Opening Size - 12" x 12" (30.5cm x 30.5cm)
- Shipping Weight - 285 lb. (129.3kg)



UV BLACK LIGHTS & ACCESSORIES



UV Black Light
Equipment



UV Black Light
Accessories



"MAGNAFLUX® UV Black Lights and Accessories helped us stay on budget by improving the detection capabilities of our magnetic particle and liquid penetrant inspection process."

better



Magnaflux® UV Black Lights and Accessories are built to help maximize the detection capabilities of your magnetic particle and liquid penetrant inspection processes by providing UV equipment that performs better, lasts longer and costs less to operate than more conventional UV lights.

Built-in Efficiency

UV BLACK LIGHTS

Vibrance® EV5000 UV LED Black Light

The Vibrance® EV5000 UV LED Black Light may not only be the best UV LED black light you ever buy, but the last as well. Individually tested and certified to a wavelength between 365 - 370 nm, the Vibrance® EV5000 Black Light offers an average LED life of up to 50,000 hours, a radical new lightweight ergonomic design that is 30% lighter and 90% more energy efficient than traditional mercury vapor UV lights.

- Lightweight ergonomic design reduces muscle fatigue and stress
- Average LED life of up to 50,000 hours
- Individually serial numbered and certified to wavelength between 365-370 nm
- Electronically stabilized and certified UV intensity with <10 Lux or 1 ft-candle visible emission
- Rugged aluminum housing assures years of NDT inspection performance

General Specifications:

- Weight - Approximately 2lbs. (1kg)
- Dimensions - 9.5" x 6.5" x 4" (24 x 16.5 x 10 cm)
- UV Source - 4x high performance UV-LED cluster
- UVA Intensity - 5000 $\mu\text{w}/\text{cm}^2$ at 15 in. (38 cm)
- UV LED Life - Approximately 50,000 hrs.
- Wavelength - Certified 365 - 370 nm
- No UVB or UVC radiation generated
- Operating Voltage - 24V DC
- Power Supply - 110-240V AC/50-60Hz/1 Phase
- Power Consumption <15W
- Duty Cycle - Relative duty cycle: 100%

Part Number:

624673 Vibrance® EV5000 UV LED Black Light



Magnaflux® brand UV Black Lights and Accessories provide improved detection and design features not offered by other UV manufacturers, while simultaneously delivering one of the industry's lowest operating cost and longest LED life. Our new Vibrance® EV5000 UV LED Black Light weighs in a full 30% lighter than conventional mercury vapor UV lights, costs considerably less to operate, has a projected LED life of up to 50,000 hrs., and comes with a warranty that includes the use of a FREE loaner light during any warranty approved repairs.¹

ZB-100F® Fan-Cooled UV Black Light

The Magnaflux ZB-100F® Portable Black Light System produces ultraviolet light at 365 nm. A built-in, quiet operating fan located at the rear of the ZB-100F® lamp housing dramatically reduces operating temperatures to under 85°F, for improved operator safety and comfort, while simultaneously expanding bulb life.

- Cool running for increased safety and comfort
- Extended bulb life for greater operating efficiency
- Polycarbonate bezel shields operator hands from lens
- Recessed lens for improved bulb protection
- Rugged aluminum housing assures years of NDT inspection performance

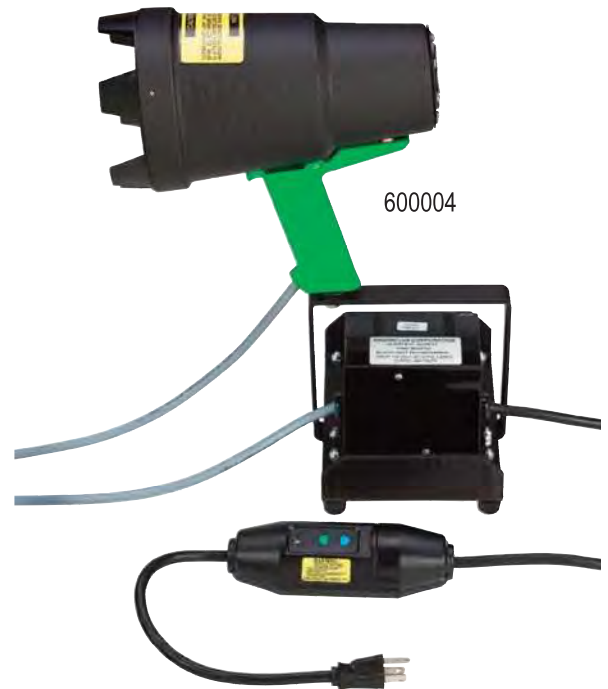
General Specifications:

- Weight - Hand lamp 3 lbs. (1.36 kg), hand lamp with transformer 12 lbs. (5.44 kg)
- Typical Output - 5000 $\mu\text{w}/\text{cm}^2$
- Current Draw - 1.9 amps
- Typical Visible Light - 10 Lux or 1 ft. candle @ 15" (38cm)
- Bulb- 100 Watt
- Running Temperature - 85°F (30°C)
- Cord Length - 10ft. (3.05m) lamp to transformer
- Main Cable Supply - 12ft. (3.66m)

Specification Compliance: Industry and Military Standards @ 15" (38cm).

Part Number:

600005	ZB-100F® 100 Watt, 115V/60Hz/1Phase
621254	ZB-100F® 100 Watt, 220V/50Hz/1Phase
600004	ZB-100F® 100 Watt, 115V/60Hz/1Phase with Portable Cart
621311	ZB-100F® 100 Watt, 220V/50Hz/1Phase with Portable Cart
621312	ZB-100F® 100 Watt, 230V/60Hz/1Phase with Portable Cart



ZB-100F-MB® Remote Mag Shot UV Black Light

The Magnaflux ZB-100F-MB® Remote Mag Shot UV Black Light adds the benefit of being able to energize power packs and wet bench units remotely from your black light, when checking for discontinuities in extra long parts. The ZB-100F-MB® has a remote button integrated into the handle of the black light to eliminate the need for continuously returning to the MPI unit to initiate a mag shot.

- Offers the ability to operate MPI unit remotely
- Cool running for increased safety and comfort
- Extended bulb life for greater operating efficiency
- Polycarbonate bezel shields operator hands from lens
- Recessed lens for improved bulb protection
- Rugged aluminum housing assures years of NDT inspection performance





ZB-100F-MB® Remote Mag Shot UV Black Light Continued.

General Specifications:

- Weight - Hand lamp 3lbs. (1.36kg), hand lamp with transformer - 12.5lbs. (5.67kg).
- Typical Output - 5000µw/cm²
- Current Draw - 1.9 amps
- Typical Visible Light - 10 Lux or 1 ft. candle @ 15" (38cm)
- Bulb- 100 Watt
- Running Temperature - 85°F (30°C)
- Cord Length - 10ft. (3.05m) lamp to transformer
- Main Cable Supply - 12ft. (3.66m)

Specification Compliance: Industry and Military Standards @ 15" (38cm).

Part Number:

600086 ZB-100F-MB® 100 Watt, 115V/60Hz/1Phase

ZB-150F-SB® Self-Ballasted UV Black Light

The Magnaflux ZB-150F-SB® Self-Ballasted UV Black Light offers the same outstanding performance as our popular ZB-100F® fan cooled UV black light but is self-ballasted to avoid the need to pull along a transformer as inspections are being performed.

- No bulky transformer to pull along
- Cool running for increased safety and comfort
- Extended bulb life for greater operating efficiency
- Polycarbonate bezel shields operator hands from lens
- Recessed lens for improved bulb protection
- Rugged aluminum housing assures years of NDT inspection performance

General Specifications:

- Weight - Hand lamp 2.7lbs. (1.22kg)
- Typical Output - 5000µw/cm²
- Current Draw - 1.9 amps
- Typical Visible Light - 10 Lux or 1 ft. candle @ 15" (38cm)
- Bulb- 150 Watt
- Running Temperature - 85°F (30°C)
- Main Cable Supply - 12ft. (3.66m)

Specification Compliance: Industry and Military Standards @ 15" (38cm).

Part Number:

621135 ZB-150F-SB® 150 Watt, 115V/60Hz/1Phase



UV BLACK LIGHT ACCESSORIES

Replacement Bulbs for Standard UV Black Lights

Magnaflux maintains a full inventory of high quality replacement bulbs for all of its standard black light equipment.

Part Number: 507320 - 100 Watt Medium Base Black Light Bulb. Replacement bulb for ZB-100F[®] and ZB-100F-MB[®] UV Black Lights. (Single bulb sold only to USA, Canada and Mexico.)

Part Number: 625550 - Case of 12 100 Watt Medium Base Black Light Bulbs. Replacement bulb for ZB-100F[®] and ZB-100F-MB[®] UV Black Lights. (International customers must order case quantity.)

Part Number: 519296 - 150 Watt Built-In Ballast Bulb. Replacement built-in ballast bulb for ZB-150F-SB[®] UV Black Lights.



507320



519296

UV Black Light Filter

Magnaflux offers a smooth output filter designed to improve the operating range and performance of its UV black lights.

Part Number: 519227 - Smooth Filter Glass. Used with ZB-100F[®], ZB-100F-MB[®], and ZB-150F-SB[®] UV Black Lights.



519227

UV Black Light Ceiling Mount Assembly

The Magnaflux Ceiling Mount Assembly[®] comes with hardware to permanently attach hand-held black lights, such as the ZB-100F[®], ZB-100F-MB[®] and ZB-150F-SB[®], to the solid roof of an inspection area.

When it is important to bring a black light closer to the inspection area, you may purchase one of the extensions shown below.

Part Number: 623367 - Black Light Ceiling Mount Assembly

Part Number: 622596 - Modular Black Light 5.5 Extension

Part Number: 622597 - Modular Black Light 7.5 Extension



623367

UV Black Light Flat Surface Mount Assembly

The Magnaflux Surface Mount Assembly[®] provides an adjustable angle for affixing hand-held black lights, such as the ZB-100F[®], ZB-100F-MB[®] and ZB-150F-SB[®], to any flat surface.

Part Number: 623366 - Black Light Surface Mount Assembly

Part Number: 622596 - Modular Black Light 5.5 Extension

Part Number: 622597 - Modular Black Light 7.5 Extension



623366

UV Black Light Wet Bench Mounting System

The Magnaflux Wet Bench Mounting System[®] provides an adjustable mounting system for affixing hand-held black lights, such as the ZB-100F[®], ZB-100F-MB[®] and ZB-150F-SB[®], to Magnaflux wet bench units.

Part Number: 623365 - Black Light Wet Bench Mounting System

Part Number: 622596 - Modular Black Light 5.5 Extension

Part Number: 622597 - Modular Black Light 7.5 Extension



623365



EV5000 UV LED Black Light Mounting Assembly Adaptor

This mounting assembly adaptor allows the EV5000 to be used with all Magnaflux® black light mounting assemblies.

Part Number:

625667 EV5000 Mounting Assembly Adaptor



625667

UV-A Light Meter

The Magnaflux® UV-A Digital Light Meter is a compact, rugged, easy to operate, multi-function UV meter proven to be highly effective for measuring and calibrating UV-A light sources used in fluorescent magnetic particle and liquid penetrant NDT inspections. It comes with a detachable remote sensor, high-contrast digital LCD display, 9V battery and carrying case.

Part Number:

625024 UV-A Light Meter



625024

White Light Meter

The Magnaflux® White Light Meter accurately measures visible light by foot candles and Lux, and includes white light meter, permanently affixed white light sensor with UV filter, battery and carrying case.

Part Number:

622338 White Light Meter



622338

UV Absorbing Safety Glasses

Magnaflux® UV Absorbing Safety Glasses are designed to protect black light users from repeated, day-long exposure to ultraviolet light sources.

Part Number:

506249 UV Absorbing Safety Glasses



506249

ZB-12® UV Black Light Accessories

Keep your Magnaflux ZB-12® Hands-Free, Portable Battery Powered UV Black Light systems running at peak performance with these long-lasting replacement bulbs, lens filters, battery packs and chargers.

Part Number: 623469 - ZB-12® Replacement Bulb

Part Number: 623470 - ZB-12® Replacement Battery Pack

Part Number: 623471 - ZB-12® Replacement 110/120V Battery Charger

Part Number: 623478 - ZB-12® Replacement Filter Lens/Bezel



UV Absorbing Safety Glasses

Magnaflux® UV Absorbing Safety Glasses are designed to protect black light users from repeated, day-long exposure to ultraviolet light sources.

Part Number:

506249 UV Absorbing Safety Glasses

Magnetic Field Indicator



NONDESTRUCTIVE TESTING EQUIPMENT



Pie Gauge

Magnetic Field Indicator

The Model D250 is intended for use as an aid in the determination of the presence and direction of magnetic fields.

This quality product comes with a sturdy brass handle and leather case with belt clip. It is manufactured to meet the requirements of MIL-STD 271 & 1949, NAVSHIPS 250-1500-1, ASTM E-1444 & E-709, ASME Section V and others.



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MAGNETIC PARTICLE INSPECTION ACCESSORIES



MA7000 - Prod Sets, Prod Replacements, Cables
For all Portable Mag Machines



MG01/MG02 - Magnetic Field Strips
Type 1 (G) and Type 2 (A)



KS100A - Ketos Ring - AS5282
Certified



NA16 - Notch Defect Test Bar.
For Compliance with MIL-STD-271
and NAVSEA-TB-T9074...



MG25 - Magnetometers
(20-0-20), (10-0-10) and
others. W/Certs



PM50 - Permanent Magnet Set.
Available with Optional Kit.



MG50 - Magnetic Pie Gauge W/Certs



Y300/Y400 - Parker Induction Yoke Lights.
Fits Parker B100, B300 and DA400 Contour Probes.



TB10 - Magnetic Weight Lift Test Bars. W/Certs
Available in Single, 3, 4 or 5 Bar Sets.
TB10-SP - 10-Lb Bar with artificial defects



PB5 - Magnetic Powder Blower
Self contained with internal Five Pound
Powder Reservoir and Compressor.
Apply powder evenly to all surfaces.



PB1 - Magnetic Powder
Blower Apply Mag Powder in
any direction.

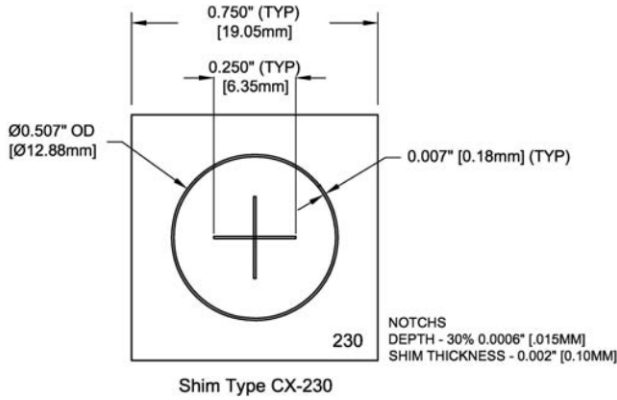


5170 & 5180 Gauss/Tesla Meters

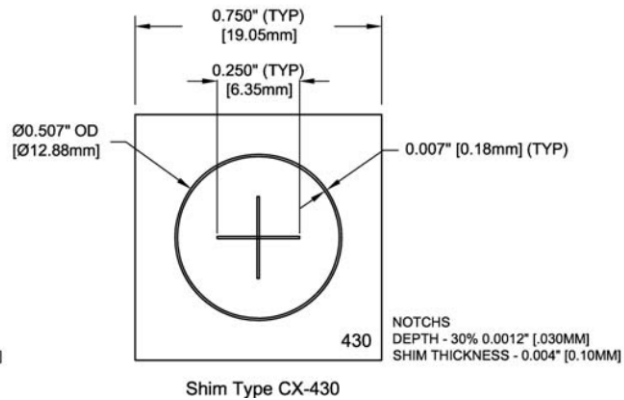


NONDESTRUCTIVE TESTING EQUIPMENT

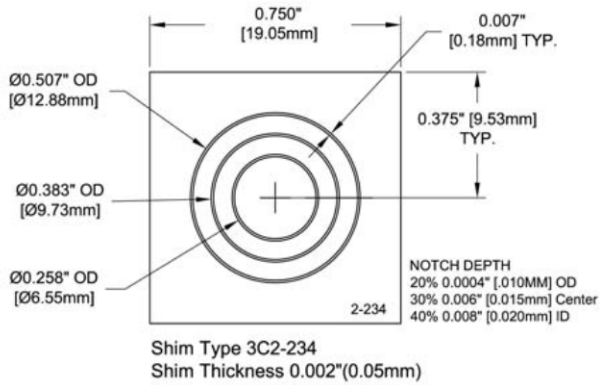
QQI DATA SHEET



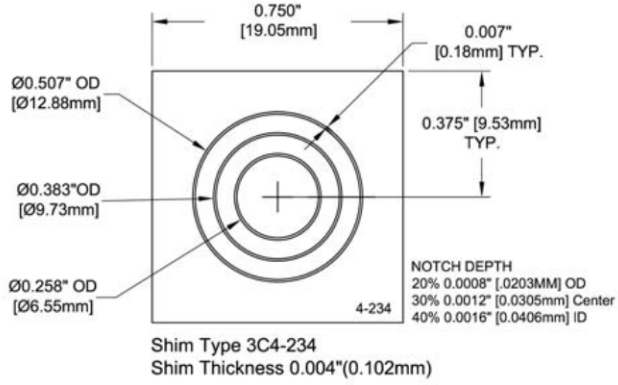
Shim Type CX-230



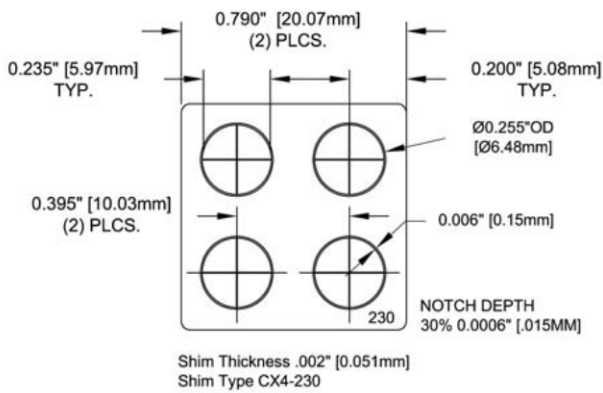
Shim Type CX-430



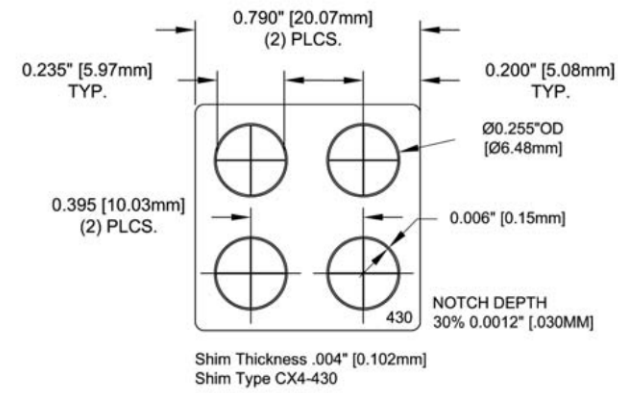
Shim Type 3C2-234
Shim Thickness 0.002"(0.05mm)



Shim Type 3C4-234
Shim Thickness 0.004"(0.102mm)



Shim Thickness .002" [0.051mm]
Shim Type CX4-230



Shim Thickness .004" [0.102mm]
Shim Type CX4-430

QQI ID	Part No.	DESCRIPTION
CX-230	MFI-301-5	.002" Thick Standard Circle and Cross
CX-430	MFI-304-5	.004" Thick Circle and Cross
3C2-234	MFI-306-5	.002" Thick Standard Triple Circle
3C4-234	MFI-307-5	.004" Thick Triple Circle
CX4-230(CM230)	MFI-305-5	.002" Thick Standard Miniatures

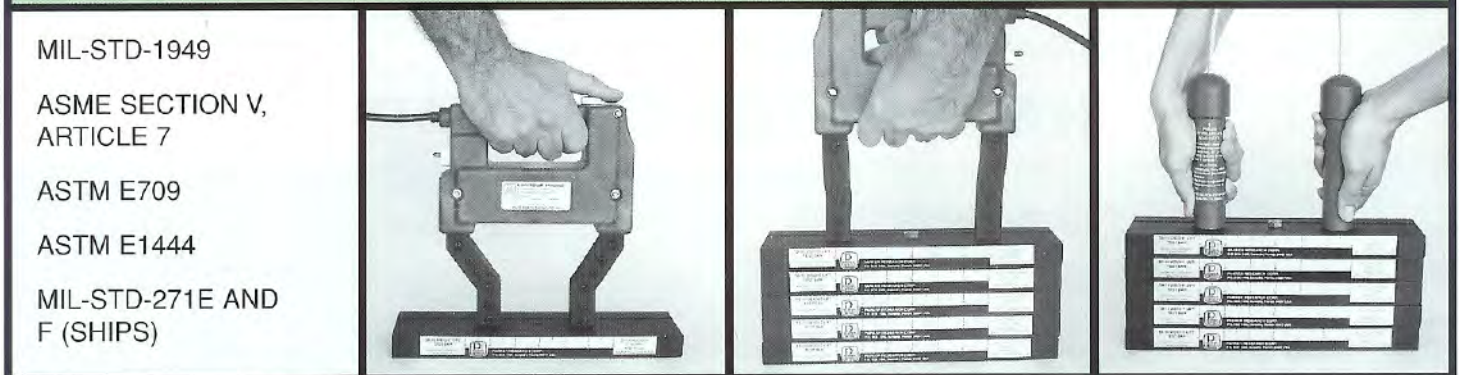
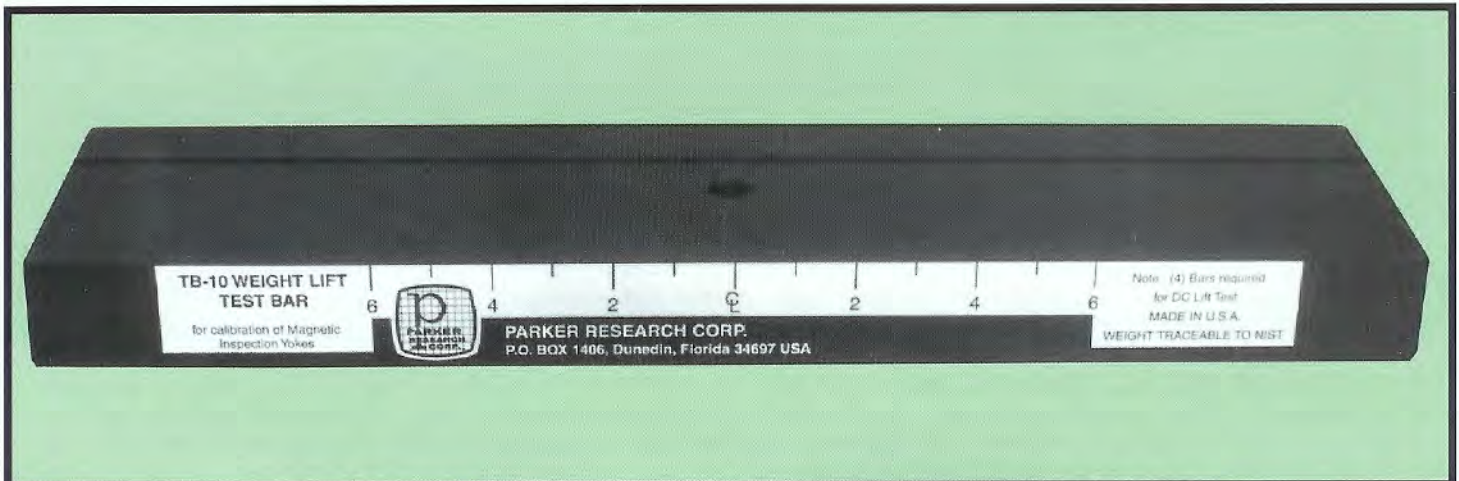
- QQI's are sold in sheets of 5

6805 COOLRIDGE DR ■ TEMPLE HILLS MD 20748
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EMAIL: sales@detek.com

PARKER

TB-10 (10-POUND) WEIGHT LIFT TEST BARS



MIL-STD-1949

ASME SECTION V,
ARTICLE 7

ASTM E709

ASTM E1444

MIL-STD-271E AND
F (SHIPS)

SPECIFICATIONS

AC TEST

DC TEST

PERM. MAGNET TEST

The TB-10 Magnetic Weight Lift Test Bar provides for the calibration and certification of Magnetic Particle Inspection Yokes to the following specifications. Bar weight is stamped on each bar and is traceable to NIST.

INSTRUCTIONS: Place Yoke legs on the test bar at the recommended spacing. In the AC mode, energize Yoke and lift the test bar (10 pounds). For the DC lift test, (30 to 50 pounds) 3 to 5 test bars must be bolted together through the hole located in the center of each bar. With the Yoke set in the DC mode follow the procedure as described above.

All Parker Research Contour Probes (Yokes) comply with and exceed the requirements of these specifications.

Governing Specification	MIL-STD-1949		ASME V ART 7		ASTM E 709		ASTM E1444		MIL-STD-271	
	Weight	Space	Weight	Space	Weight	Space	Weight	Space	Weight	Space
AC Field	10 lb	2-4 in	10 lb	*	10 lb	2-4 in	10 lb	2-4 in	10 lb	3-6 in
DC Field or Permanent Magnet (when allowed)	30 lb	2-4 in	40 lb	*	30 lb	2-4 in	30 lb	2-4 in	40 lb	3-6 in
	50 lb	4-6 in			50 lb	4-6 in	50 lb	4-6 in		
Max Verification Interval	6 months		1 year		6 months		6 months		3 months	

NOTE: Pole spacing is measured from the center line of the pole legs

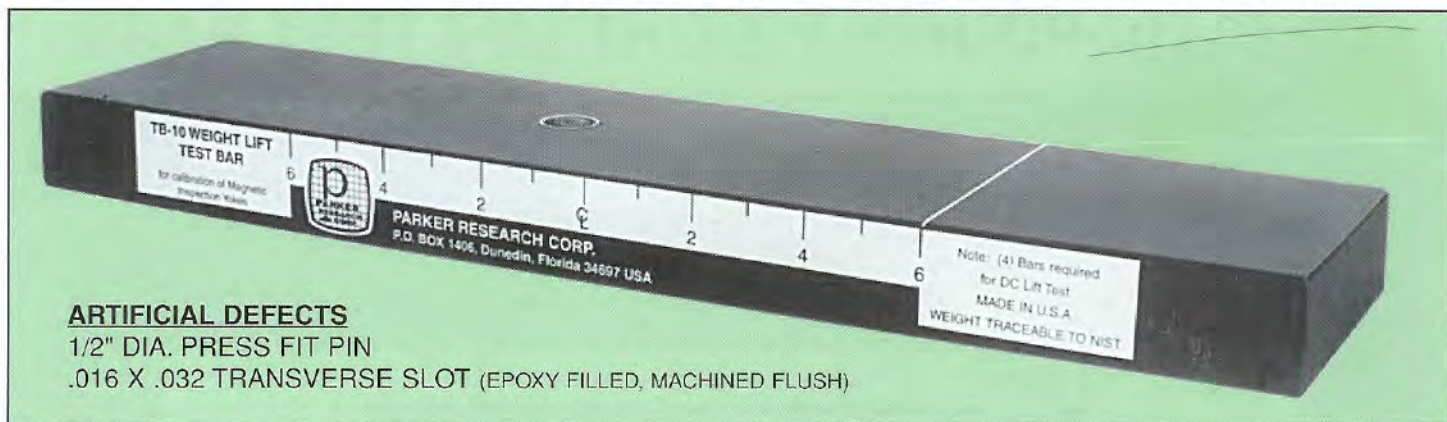
* Maximum pole spacing that will be used.



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TB10-SP WEIGHT LIFT/DEFECT TEST BAR



ARTIFICIAL DEFECTS

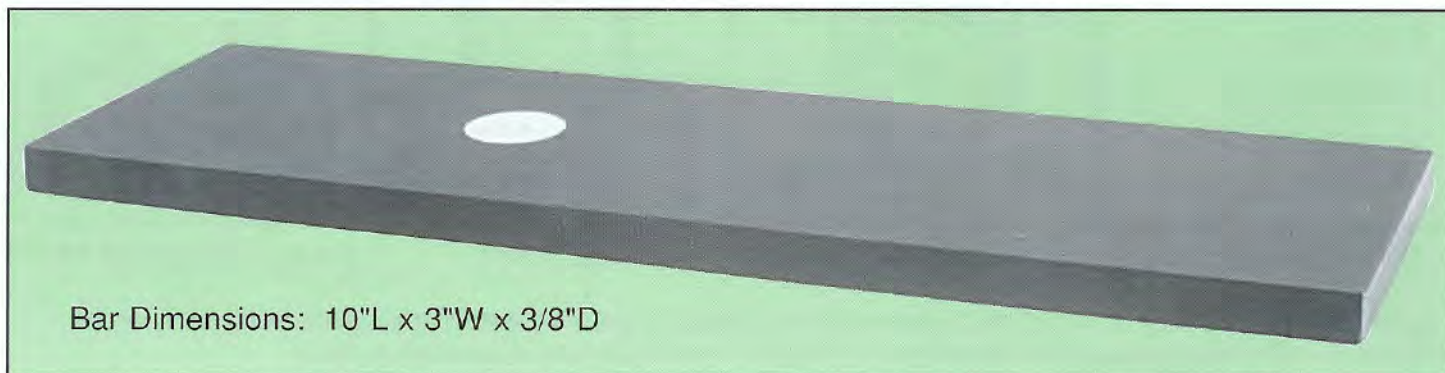
1/2" DIA. PRESS FIT PIN

.016 X .032 TRANSVERSE SLOT (EPOXY FILLED, MACHINED FLUSH)

The NEW **TB10-SP Magnetic Weight Lift / Defect Test Bar** provides for the 10 pound AC weight lift calibration of Magnetic Particle Inspection Yokes, as shown on page 1. Bar weight is certified and traceable to NIST standards. In addition, the reverse side of the TB10-SP bar contains artificial defects as indicated above. Demonstration of actual defect indications is very useful for visual and operational performance purposes.

NOTE: The TB10-SP bar has no center bolt hole for mating with additional TB10 bars.

NA-16 NOTCH TEST BAR



Bar Dimensions: 10"L x 3"W x 3/8"D

The NA16 Notch Test Bar complies with the requirements of MIL-STD-271 E and F (Ships), paragraph 4.3.1.2. The requirement reads as follows.

4.3.1.2. PROCEDURE. Magnetic Particle inspection shall be performed in accordance with a written procedure which has proven ability to detect the smallest rejectable surface defects, artificial or natural, in a test specimen. The Yoke and Prod methods shall have the proven ability to detect a 1/16-inch long by 0.006-inch wide by 0.02-inch deep notch (maximum dimensions) oriented 90 degrees to the magnetic flux. The notch shall be cut in a 3/8-inch low alloy metal steel plate and it shall be filled flush to the surface with a non-conducting material, such as epoxy, to prevent the mechanical holding of the indicating medium. Each activity shall certify the procedure in accordance with this standard, and upon request by the Government inspector, shall make the procedure available and demonstrate its validity by performing inspection on the test specimen.

TESTING: Place the Yoke or Prods upon the test side of the NA16 test bar, indicated by the unpainted circle. Energize the magnetic field and apply the inspection medium.

The test defects as described above are located within the circle. One notch is oriented 90 degrees to the bar parallel for Yoke tests. The second notch is located longitudinally with the bar parallel for Prod tests.

NOTE: Unless specified otherwise, test should be performed with the Yoke or Prods in the AC mode. If Prods are used it may be necessary to remove paint from the test bar at contact points.



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Description

The 5100 Series Hall effect portable gaussmeters represent the most recent design from the world leader in magnetic measuring equipment. This new design incorporates the use of digital signal processing technology making it the world's first hand-held gaussmeter to have a digital signal processor (DSP) on board. F.W. Bell's exclusive Dynamic Probe Connection allows measurements from 0 to 30 kG with a basic accuracy of 1%.

Key features include Auto Zero, Min./Max./Peak Hold, Auto Range and Relative Mode. Both models allow the user to select Gauss or Tesla readings. The Model 5180 also has a selection for readings in Ampere/Meters and features a corrected analog output ($\pm 3V$ FS) and a USB communications port.

The 5100 Series Hand-Held Gaussmeter's built-in software eliminates the need for complex calibration procedures. User prompts on the custom formatted LCD allow fast, simple push button operation. All models come equipped with a detachable transverse probe, zero gauss chamber, instruction manual, hard carrying case, and four AA batteries. Axial and other style probes are available as options.

Applications for the 5100 Series range from the most sensitive laboratory environment to the most rugged industrial setting. All instruments are CE compliant.

Features

- The best accuracy in it's class
- Data logging capability
- 20X lower resolution
- Frequency Response 2X better than competitor
- The only handheld meter with DSP (Digital Signal Processing)
- Auto Zero
- Min/Max/Peak Hold
- Auto Range
- Relative Mode
- Universal Serial Bus Interface



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Rev. date 09/2004

5100 Series Specifications

Model	5170	5180
Basic Accuracy	2%	1%
Frequency Bandwidth	DC-20 kHz	DC-40 kHz
Sampling Rate	5/sec	5/sec
Ranges		
Low Range	200 G	300 G
Mid Range	2 kG	3 kG
High Range	20 kG	30 kG
Resolution		
Low Range	0.1 G (10 μ T)	0.1 G (10 μ T)
Mid Range	1.0 G (100 μ T)	1.0 G (100 μ T)
High Range	10 G (1 mT)	10 G (1 mT)
Display	LCD	LCD
Digits	3 1/2	3 1/2
Readings	Gauss Tesla Amps / Meters	Gauss Tesla Amps / Meters
Analog Output	-	\pm 3V FS
Communication Port	-	USB

General Information

All Models

Temperature	
Operating	0°C to 50°C
Storage	-25°C to 70°C
Power	4 AA batteries
Size	6.9 in x 3.9 in x 1.44 in.

Probes and Accessories

Model Number	Description
Model 5180 Probes	
HTD18-0604	4" Transverse Probe
STD18-0404	4" Transverse Probe (incl. w/5180)
STD18-0402	2" Transverse Probe
SAD18-1904	4" Axial Probe
SAD18-1902	2" Axial Probe
Model 5170 Probes	
HTH17-0604	4" Transverse Probe
STH17-0404	4" Transverse Probe (incl. w/5170)
STH17-0402	2" Transverse Probe
SAH17-1904	4" Axial Probe
SAH17-1902	2" Axial Probe
Models 5170/5180 Gaussmeter Probes	
STB1X-0201	Ultra Thin Transverse Probe (0.020")
MOS51-3204	Low Field Probe (0.020")

Shipping Weight

Domestic 12 lbs 5.5 kgs
 International 17 lbs 8.0 kgs
 Net 11 lbs 5.0 kgs
 International 16 lbs 7.5 kgs

Note: Due to continuous process improvement, specifications subject to change without notice.



Rev. date 09/2004



DETEK

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Hall Effect Gaussmeters



POCKET MAGNETOMETERS

NONDESTRUCTIVE TESTING EQUIPMENT



MAGNETISM IS EVERYWHERE- It is most commonly evident as residual magnetism in iron or steel objects. Determination of the degree of such magnetism is becoming more important for many critical components. Alloy steels, those that are heavily cold worked or heat treated, are especially prone to retain magnetism after having been subjected to strong magnetic fields, such as those created by magnetic chucks, magnetic conveyors, spot welding, magnetized machine tools, or magnetic analysis testing, etc.

RESIDUAL MAGNETISM in steel parts may be readily determined in a few seconds time by checking with a Pocket Magnetometer. Place the lower (test) edge of the Magnetometer Case near or against the object being tested. The Pointer Instantly Deflects to a reading on the scale proportional to the magnetism in the object at that point. The higher the reading, the stronger the magnetic field is. This reading can be compared directly with that produced by other similar objects which are known to be acceptable from a residual magnetism standpoint. Are your parts satisfactorily demagnetized?

MAGNETIC POLARITY of the field being measured is indicated by the direction of pointer deflection on the center zero scale. A plus (+) deflection indicates the test edge of the Magnetometer has been presented to a North (seeking) magnetic pole.

IS DEMAGNETIZING OKAY – Steel components such as video and sound take recorder capstans and guides, that become magnetized, add to background noise and loss of recorded high frequencies. A Pocket Magnetometer will indicate when they are demagnetized to safe levels.

ACCURATE QUANTITATIVE MEASUREMENTS are possible, even under widely varying temperature conditions. As a matter of convenience, instrument calibration is correct at normal room temperatures, but when the occasion demands, readings may be taken at extremes of temperature by applying the indicated percentage corrections to the readings for ambient (instrument) temperature in accordance with the straight-line graph.

CARE SHOULD BE EXERCISED in handling your Pocket Magnetometer; it should not be dropped. Although quite stable under reasonable conditions of handling, scale calibration can be changed by accidental exposure to strong A.C. magnetic fields or by strong unidirectional fields that would tend to deflect the pointer considerably off scale.

CALIBRATION IS TRACEABLE TO N.B.S. and N.I.S.T. on all of our instruments. Serialization and certification is available at an additional cost.

POCKET MAGNETOMETERS ARE HANDY – fast and easy to use, as well as being relatively inexpensive. The quantitative information secured can be extremely valuable to personnel in the tool room, stock room, inspection, engineering and laboratory, as well as in many production processes.

6805 COOLRIDGE DR ■ TEMPLE HILLS MD 20748
301-449-7300 ■ 800-638-0554 ■ FAX 301-449-7011
EMAIL: sales@detek.com



NONDESTRUCTIVE TESTING EQUIPMENT

DRY MAGNETIC PARTICLE POWDER

DETEK offers dry magnetic particle powders in a choice of five colors to enhance any application. Dry powders are generally used on parts with a rough surface or for field inspection. Each color is available in an easy to use 5 pound plastic container with a resealable top or in 100 pound kegs. Quantity pricing is available beginning with 25 pounds.

All powders are sieve tested and certified to meet the following specifications:

- I. ASME Boiler and Pressure Vessel Code, Section V, Articles 7 and 25**
- II. ASTM E 709**
- III. MIL-STD 2132A (SH)**
- IV. MIL-STD 271 E & F (SH)**
- V. SAE – Aerospace Materials Specification – AMS 3040**
- VI. NAVSEA 250-1500-1**
- VII. NTR-1E**
- VIII. MIL-STD 1949A**

We further certify that this material does not contain mercury as a basic element and no mercury bearing equipment was used in its manufacture.

COLORS AVAILABLE ARE:

MPW-110 SERIES	BLUE/BLACK
MPW-210 SERIES	RED
MPW-310 SERIES	GREY
MPW-410 SERIES	YELLOW
MPW-510 SERIES	WHITE

6805 COOLRIDGE DR ■ TEMPLE HILLS MD 20748
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GLO-NETIC™ Spray Cans

FLUORESCENT MAGNETIC PARTICLES



PRODUCT INFORMATION

Description: Glo-Netic™ spray is used in the magnetic particle crack detection process by critical industries, including nuclear power, aerospace, shipbuilding and construction. Glo-Netic™ spray cans contain suspended fluorescent magnetic particles in a highly refined light petroleum oil. The particles respond to magnetic leakage fields created by cracks and other flaws. They rapidly collect at such fields and when viewed under black light, they reveal and profile flaws as bright, glowing yellow-green marks.

Glo-Netic™ spray cans save time and labor. Particles are pre-mixed in proper concentration for high sensitivity inspection. Particle concentration of the pre-mixed suspension gives a 0.25 to 0.30 ml settling (centrifuge) tube reading. Glo-Netic™ is ready when needed, no time-consuming weighing and mixing.

Glo-Netic™ spray cans are a useful and valuable NDT tool. They offer convenience and improve reliability since the pressure spray evenly disperses the particles in a uniform, light oil coating. The coating is free of "clumps".

Companion Materials: Sherwin DR-60 (Class 2)

Container Sizes: case of 12 aerosol cans

Basic Instructions: These instructions describe the basic process. They may need to be amended by the user to comply with applicable specifications and/or inspection criteria provided by the contracting agency.)

1. Clean the test surface with Sherwin DR-60 cleaner-remover or equivalent.
Magnetize the area.
Shake spray can well and spray a generous amount of Glo-Netic™ SC925 over the surface with magnetic equipment in contact. Allow excess oil to run off surface.
2. Inspect surface under ultraviolet lighting. Collections of fluorescent magnetic particles will reveal defects at leakage fields.
Clean and repeat process, changing magnetizing equipment by 90°.

Applicable Specifications:

MIL-STD-271
MIL-STD-2132
ASME B & PV Code, Sec. V

ASTM E 709
AMS3045
NAVSEA 25-1500-1

ASTM E 1444
ASME 3046

PRECAUTIONARY INFORMATION

Glo-Netic™ spray can propellant is flammable. Caution must be used if the Prod Method of magnetism is used as this is a source of ignition

revised Sept 2003

SHERWIN
INCORPORATED

5530 Borwick Ave.
South Gate, CA 90280
(562) 861-6324
FAX (562) 923-8370



Circle Systems, Inc.

Magnetic Particle Inspection



Offering the CircleSafe[®], Mi-Glow[®] & Sir-Chem[®] Product Lines

Better products through chemistry.

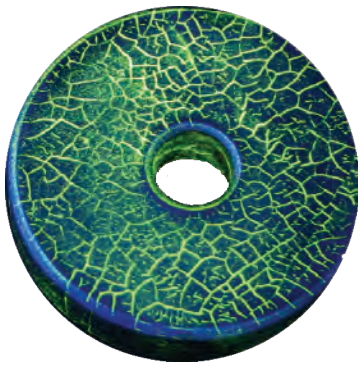
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CIRCLE SYSTEMS, INC.

**Manufacturer of the MiGlow® and
CircleSafe® line of MPI Products.**

Circle Systems, Inc. has been a leading manufacturer of magnetic particles for nondestructive testing for forty-nine years. Starting as a chemical company, its roots are in the chemistry of particle manufacture, wetting agents, anti-foamers, corrosion inhibitors and pH adjusters. From these roots have grown



and developed the first magnetic particles designed specifically for underwater inspection; the first water-based aerosol magnetic particle inspection package; the first magnetic stripe card for quick bath inspection; dual inspection particles; wetting agents and water base carriers that retain all the dispersion benefits of oil, while providing non-toxic and environmentally safe application -- just to name a few.

In addition to the proprietary line, Circle is also a laboratory specialist -- recognizing the need for unique requirements that go beyond its proprietary line. For this reason, Circle has developed special products for the

particular needs of the railroads, underwater inspection and the steel, automotive and aerospace industries. Circle's chemists, technicians and sales personnel stand ready to provide you with the formulations, fluorescent and non-fluorescent, that will meet your individual requirements.

Also, in an ongoing effort to emphasize Circle's commitment to provide high quality products and services to its customers, Circle has been certified to ISO 9001:2000. This certification ensures that Circle meets or exceeds industry recognized quality standards.

All Circle products are certified to Military, ASTM, AMS and other pertinent standards.

With a network of representatives now international in scope Circle can serve you quickly and professionally. Please contact your local distributor or Circle Systems for quantity pricing.



Featured Product



<u>Item #</u>	<u>Package Size</u>
3100	1 pound jar
3102	12 pound pail

MI-GLOW® 800

Ultra-bright, ultra-sensitive, fluorescent yellow particles designed for use in solvent media or for water-base applications when combined with specially formulated conditioners. Long-life particles display sharp, low-background/high contrast indications. These particles target fine, critical defects. Certified to be compliant with the following specifications: AMS 3044; ASME SE-709, B&PV Code, § V, Article 25; ASTM E 709; ASTM E 1444; MIL-STD-2132(SH).

WET METHOD PARTICLE INSPECTION

MI-GLOW® 778

A liquid concentrate with fluorescent yellow Mi-Glow 800 particles and liquid wetting agent, designed for water system use. Contains special corrosion inhibitors, anti-foaming agents, wetting agents and pH buffering agents. For critical applications requiring superior wetting and corrosion resistance. One quart of concentrate, when combined with water, makes ten gallons of suspension agent.



<u>Item #</u>	<u>Package Size</u>
3571	4-1 quart bottles/case



MI-GLOW® 810

Mi-Glow 800 fluorescent yellow particles premixed with dry wetting agent for use in a water-based system. An environmentally friendly and economic solution when wetting and corrosion inhibition are not as critical.

<u>Item #</u>	<u>Package Size</u>
3111	2 pound jar
3114	35 pound pail

MI-GLOW® 820

A liquid concentrate with non-fluorescent black Mi-Glow 106 particles and liquid wetting agent, designed for water system use. Contains special corrosion inhibitors, anti-foaming agents, wetting agents and pH buffering agents.



<u>Item #</u>	<u>Package Size</u>
3611	4 - 1 quart bottles/case



MI-GLOW® 106

Non-fluorescent black particles designed for use in an oil media system with white light.

<u>Item #</u>	<u>Package Size</u>
2431	2 pound jar



MI-GLOW® 600

Dual-light red particles for use in oil. Designed to be used in visible light for revealing defects found in structural fabrications. Ultra-violet light may be used to further highlight defect indications in either a well-lit or darkened area. Preferred for outdoor inspection and on parts too large to hood.

<u>Item #</u>	<u>Package Size</u>
2880	1 pound jar
2882	12 pound pail

MI-GLOW® 850

Dual method Mi-Glow 600 red particles premixed with a dry conditioning agent for use in a water-based system. Can be viewed outdoors in daylight, enhanced with UV lamp, or in hooded area with ultraviolet light.



<u>Item #</u>	<u>Package Size</u>
3641	2 pound jar
3648	30 pound pail



MI-GLOW® 218X

A pre-mix of fluorescent yellow particles and dry wetting agent designed to reveal defects such as those found in billet inspection. For use in a water-based system.

<u>Item #</u>	<u>Package Size</u>
3231	2 pound jar
3238	30 pound pail

MI-GLOW® 800

Ultra-bright, ultra-sensitive, fluorescent yellow particles designed for use in solvent media or for water-base applications with the addition of specially formulated conditioners. Long-life particles display sharp, low-background/high contrast indications. These particles target fine, critical defects.



<u>Item #</u>	<u>Package Size</u>
3100	1 pound jar
3102	12 pound pail

DRY METHOD PARTICLE INSPECTION

SIR-CHEM® DUSTING POWDER 61

Highly refined gray magnetic powder for use in natural light. Detects minute discontinuities on fabricated or welded surfaces such as bridges, pipes, tanks, machinery and equipment.



<u>Item #</u>	<u>Package Size</u>
2551	10 pound jar
2555	50 pound pail



SIR-CHEM® DUSTING POWDER 63

Highly refined red magnetic powder for use in natural light. Detects minute discontinuities on fabricated or welded surfaces such as bridges, pipes, tanks, machinery and equipment.

<u>Item #</u>	<u>Package Size</u>
2571	10 pound jar
2575	50 pound pail

SIR-CHEM® DUSTING POWDER 66

Highly refined yellow magnetic powder for use in natural light. Detects minute discontinuities on fabricated or welded surfaces such as bridges, pipes, tanks, machinery and equipment.



<u>Item #</u>	<u>Package Size</u>
2621	10 pound jar
2625	50 pound pail



SIR-CHEM® DUSTING POWDER 68

Highly refined blue magnetic powder for use in natural light. Detects minute discontinuities on fabricated or welded surfaces such as bridges, pipes, tanks, machinery and equipment.

<u>Item #</u>	<u>Package Size</u>
2631	10 pound jar
2635	50 pound pail

SIR-CHEM® DUSTING POWDER 73

Highly refined dual light red magnetic powder for use in natural and ultraviolet light. Under natural light this powder appears purple and under black light it fluoresces red. Detects minute discontinuities on fabricated or welded surfaces such as bridges, pipes, tanks, machinery and equipment.



<u>Item #</u>	<u>Package Size</u>
2601	10 pound jar
2605	50 pound pail



SIR-CHEM® DUSTING POWDER 75

Highly refined dual light yellow-green magnetic powder for use in natural and ultraviolet light. Under natural light this powder appears yellow-green and under black light it fluoresces yellow-green. Detects minute discontinuities on fabricated or welded surfaces such as bridges, pipes, tanks, machinery and equipment.

<u>Item #</u>	<u>Package Size</u>
2641	10 pound jar
2645	50 pound pail

SIR-CHEM® DUSTING POWDER 93

Highly refined dual light bonded magnetic powder for use with a blue light. Detects minute discontinuities on fabricated or welded surfaces such as bridges, pipes, tanks, machinery and equipment.



<u>Item #</u>	<u>Package Size</u>
2671	10 pound jar
2675	50 pound pail

AEROSOLS

CIRCLESAFE® 778A

A pre-proportioned combination of Mi-Glow 800 fluorescent particles and a specifically formulated wetting agent in water, packaged in carbon dioxide charged aerosol cans. Designed to detect very fine defects found in finished products and other critical applications. Environmentally safe, non-flammable and user friendly.



<u>Item #</u>	<u>Package Size</u>
3590	12 - 12 oz. cans/case



CIRCLESAFE® 800A

A pre-proportioned combination of Mi-Glow 800 fluorescent particles and an odorless inspection oil vehicle, packaged in carbon dioxide charged aerosol cans. Designed to detect very fine defects found in finished products and other critical applications.

<u>Item #</u>	<u>Package Size</u>
3130	12 - 12 oz. cans/case

CIRCLESAFE® 820A

A pre-proportioned combination of non-fluorescent black particles and a specifically formulated wetting agent in water, packaged in carbon dioxide charged aerosol cans. Designed to be used in white light inspection for detecting very fine defects found in finished products and structural fabrications. Environmentally safe, non-flammable and user friendly.



<u>Item #</u>	<u>Package Size</u>
3600	12 - 12 oz. cans/case



CIRCLESAFE® 850A

A pre-proportioned combination of Mi-Glow 600 red dual light particles and a specifically formulated wetting agent in water, packaged in carbon dioxide charged aerosol cans. Designed to be used in white light inspection for detecting defects found in structural fabrications. Ultra-violet light may be used to further highlight defect indications in either a well-lit or darkened area. Environmentally safe, non-flammable and user friendly.

<u>Item #</u>	<u>Package Size</u>
3630	12 - 12 oz. cans/case



CIRCLESafe® 820AX

A pre-proportioned combination of non-fluorescent black particles and an odorless inspection oil vehicle, packaged in carbon dioxide charged aerosol cans. Designed to be used in white light inspection for detecting very fine defects found in finished products and structural fabrications.

<u>Item #</u>	<u>Package Size</u>
3609	12 - 16 oz. cans/case

MI-GLOW® WCP

A specially formulated white contrast paint, packaged as an aerosol, used to create a consistent background on the component surface in a visible magnetic particle inspection scenario. When dry, the white contrast paint is resistant to the wet method baths used for inspection, but is easily removed from the demagnetized component surface with acetone.



<u>Item #</u>	<u>Package Size</u>
3740	12 - 16oz. cans/case

READY-TO-USE SPRAYS

MI-GLOW® 778S RTU

A Ready-to-Use water bath used for magnetic particle inspection, packaged in a hand-held spray bottle. The water bath contains fluorescent particles and special water chemistry, which consists of corrosion inhibitors, anti-foaming agents, wetting agents and pH buffering agents. Designed for revealing very fine defects on both machined and unfinished ferro-magnetic materials.



Item #

Package Size

3572

6-1 quart bottles/case



MI-GLOW® 820S RTU

A Ready-to-Use water bath used for magnetic particle inspection, packaged in a hand-held spray bottle. The water bath contains non-fluorescent particles and special water chemistry, which consists of corrosion inhibitors, anti-foaming agents, wetting agents and pH buffering agents. Designed for revealing very fine defects on both machined and unfinished ferro-magnetic materials.

Item #

Package Size

3612

6-1 quart bottles/case

MI-GLOW® 850S RTU

A Ready-to-Use water bath used for magnetic particle inspection, packaged in a hand-held spray bottle. The water bath contains fluorescent particles and special water chemistry, which consists of corrosion inhibitors, anti-foaming agents, wetting agents and pH buffering agents. This is a red water system used for visible and fluorescent magnetic particle inspection. Designed to be used in visible light for revealing defects found in structural fabrications and with ultra-violet light to further enhance defects in a well-lit or darkened area.



Item #

Package Size

3642

6-1 quart bottles/case



MI-GLOW® 600LS RTU

A Ready-to-Use oil bath used for magnetic particle inspection, packaged in a hand-held spray bottle. The red oil system is used for visible and fluorescent magnetic particle inspection. Designed to be used in visible light for revealing defects found in structural fabrications and with ultra-violet light to further enhance defects in a well-lit or darkened area.

<u>Item #</u>	<u>Package Size</u>
2890	6-1 quart bottles/case

MI-GLOW® 800LS RTU

A Ready-to-Use pre-proportioned combination of fluorescent particles and odorless inspection oil vehicle, packaged in a hand-held spray bottle. Designed for revealing very fine defects, such as those found in finished products for the aerospace industry and other critical applications.



<u>Item #</u>	<u>Package Size</u>
3145	6-1 quart bottles/case



MI-GLOW® 820LS RTU

A Ready-to-Use pre-proportioned combination of non-fluorescent black particles and odorless inspection oil vehicle, packaged in a hand-held spray bottle. Designed for revealing very fine defects on both machined and unfinished ferro-magnetic materials.

<u>Item #</u>	<u>Package Size</u>
3622	6-1 quart bottles/case

WATER BATH SUPPLEMENTS

WETTING AGENT 771

Contains special corrosion inhibitors, anti-foaming agents, wetting agents and pH buffering agents.



<u>Item #</u>	<u>Package Size</u>
3501	4 - 1 quart bottles/case



ANTI-FOAM 3

A concentrated foam reducing agent.

<u>Item #</u>	<u>Package Size</u>
2950	4 - 1 quart bottles/case

CORROSION INHIBITOR 7

An additive used to boost the corrosion inhibition properties of the MPI bath.



<u>Item #</u>	<u>Package Size</u>
3510	4 - 1 quart bottles/case
3515	55 gallon drum



CLEANER 500

Mild alkaline cleaner excellent for use in cleaning out an oil-base or water-base system prior to going to the water-based system or in between baths.

<u>Item #</u>	<u>Package Size</u>
3851	1 gallon bottle

MAGNETIC STRIPE CARDS



TYPE 2000

A Magnetic Stripe Card used for instantly evaluating the performance of magnetic particle inspection materials. This card can be used to quantitatively evaluate the performance of MPI materials by displaying the number of indications that can be observed after the material has been applied to the stripe. Magnetic Stripe Cards are recognized as a tool for evaluation of magnetic particle inspection materials in ASTM E-709-01 “Standard Guide for Magnetic Particle Examination”, Paragraph 20.6.8 and Appendix X2.

Item #	Package Size
2800	Each

TYPE A

A high coercivity magnetic stripe card that assists in evaluating the quality of magnetic particle baths, suspension and dry powders. The card acts as a test piece and supplement to the ASTM D-96 settling tube, Ketos ring and other tests for MPI Materials.



Item #	Package Size
2850	Each

UNDERWATER MAGNETIC PARTICLE INSPECTION



MI-GLOW® UNDERWATER 1

This product is a premix of dual-light red particles and wetting agent for use in underwater inspection. Designed to be used in a variety of underwater applications, including offshore structural welds, pipeline inspection and ship husbandry in shallow as well as deep water. It is a versatile particle with a broad particle size range and the ability to be used in both black light and natural light systems.

Item #	Package Size
2701	2 pound jar
2703	25 pound pail

MI-GLOW® UNDERWATER 528

A combination of water conditioners and fluorescent magnetic particles that fluoresces orange-red under black light and is visible red under white light. Designed for use in a variety of underwater inspections, including offshore structural welds, pipeline inspection and ship husbandry. Especially designed to enhance photographic recording of underwater inspections.



Item #	Package Size
2771	2 pound jar
2773	25 pound pail

CARRIER SOLUTIONS

CIRCLESOL M

A solvent specifically designed for use in magnetic particle inspection. Its high clarity, low fluorescence and no odor combination make it ideal for use as a carrier media in a variety of applications.



<u>Item #</u>	<u>Package Size</u>
3880	55 gallon drum
3883	5 gallon pail



MI-GLOW® 800L

A pre-proportioned combination of Mi-Glow 800 fluorescent particles and odorless inspection oil vehicle packaged ready-for-use in five-gallon cans. Designed for revealing very fine defects, such as those found in finished products for the aerospace industry and other critical applications.

<u>Item #</u>	<u>Package Size</u>
3143	5 gallon pail

Specification Guide

Wet Method Magnetic Inspection Particles

SPECIFICATION COMPLIANCE	MI-GLOW® 800	MI-GLOW® 810	MI-GLOW® 778	MI-GLOW® 820	CIRCLESOL M
AMS 2641					X
AMS 3042				X	
AMS 3044	X	X	X		
AMS 3161					X
API RP 5A5	X	X	X		
ASME B&PV	X	X	X	X	
ASTM E709	X	X	X	X	
ASTM E1444	X	X	X	X	X
DOD-F-87935					X
MIL-STD-271	X	X	X	X	X
MIL-STD-1949	X	X	X	X	X
MIL-STD-2132	X	X	X	X	
NAVSEA 250-1500-1	X	X	X	X	
NTR-1E	X	X	X	X	
Bell Helicopter-Textron	X	X	X		
Boeing Aircraft BAC 5424	X	X	X		
Boeing (Douglas Aircraft)	X	X	X		
General Electric Aircraft	X	X	X		
Pratt & Whitney MPM	X	X	X		
Pratt & Whitney PMC-1887					X

Specification Guide cont.

Aerosol Magnetic Inspection Particles

SPECIFICATION COMPLIANCE	CIRCLESAFE® 800A	CIRCLESAFE® 778A	CIRCLESAFE® 820A	CIRCLESAFE® 820AX	CIRCLESAFE® 850A
AMS 2641	X			X	
AMS 3042			X	X	X
AMS 3044	X	X			
AMS 3045	X				
AMS 3161	X			X	
ASME B&PV	X	X	X	X	X
ASTM E709	X	X	X	X	X
ASTM E1444	X	X	X	X	X
DOD-F-87935	X			X	
MIL-STD-271	X	X	X	X	X
MIL-STD-1949	X	X	X	X	X
MIL-STD-2132	X	X	X	X	X
NTR-1E	X	X	X	X	X

Dry Method Magnetic Inspection Particles

SPECIFICATION COMPLIANCE	DP 61 Gray	DP 63 Red	DP 66 Yellow	DP 68 Blue-Black	DP 73 Fluorescent Red	DP 75 Fluorescent Yellow	DP 93 Blue Light Red
AMS 3040	X	X	X	X	X	X	X
API RP 5A5	X	X	X	X	X	X	X
ASME B&PV	X	X	X	X	X	X	X
ASTM E709	X	X	X	X	X	X	X
ASTM E1444	X	X	X	X	X	X	X
MIL-STD-271	X	X	X	X	X	X	X
MIL-STD-1949	X	X	X	X	X	X	X
MIL-STD-2132	X	X	X	X	X	X	X
NAVSEA 250-1500-1	X	X	X	X	X	X	X
NTR-1E	X	X	X	X	X	X	X

PENETRANT TESTING MATERIALS



LPI Fluorescent
Materials



LPI Non-Fluorescent
(Visible) Materials



"We trust in MAGNAFLUX Zyglo® fluorescent and Spotcheck® visible brand penetrant testing materials to deliver the level of quality performance that inspires customers to do business with us."

inspire



Magnaflux® certified fluorescent and visible dye penetrant inspection materials deliver unmatched performance in the detection of small defects and discontinuities in almost any non-porous material.

Delivering Quality

ZYGLO® FLUORESCENT PENETRANTS

POST EMULSIFIABLE FLUORESCENT PENETRANTS

Zyglo® ZL-2C Post Emulsifiable Fluorescent Penetrant

Zyglo® ZL-2C is designed to be impervious to water to protect it from over-washing and to allow more penetrant to remain in discontinuities for improved detection of small defects. It and other post emulsifiable penetrants require the application of a lipophilic or hydrophilic emulsifier to render them washable with water.

Zyglo® ZL-2C fluoresces bright greenish-yellow under an ultraviolet light source with a peak wavelength of 365 nm. It possesses a high flash point and meets OSHA requirements for Class III B liquids allowing it to be used in open dip tanks.

Specification Compliance: AMS-2644, AECL, ASME B & PV Code Sec. V, ASTM E1417, MIL-STD-2132, ASTM E165, MIL-STD-271.

Applications: Zyglo® ZL-2C is typically used on castings, forgings, extrusions and rough machined surfaces to find cracks, seams, laps, laminations and porosity.

Classification: Type 1, Method B Penetrant when using ZE-4B emulsifier.
Type 1, Method D Penetrant when using ZR-10B (20%) remover.

Penetrant Sensitivity Level: Level 2 - Normal Sensitivity.

Part Number & Container Size:

01-3123-40 5 Gal. Pail
01-3123-30 20 Gal. Drum
01-3123-45 55 Gal. Drum



PENETRANT TESTING MATERIALS

Magnaflux Zyglo® fluorescent and Spotcheck® visible liquid penetrant testing materials are the industry's most preferred and widely used NDT products employed in the detection of cracks and fine surface discontinuities in ferrous and non-ferrous test materials. Formulated from superior quality dyes and solvents they produce vivid indications in virtually all non-porous materials, and are supported by an expansive line-up of certified penetrants, cleaners, developers, emulsifiers, accessories and equipment.

Zyglo® ZL-27A Post Emulsifiable Fluorescent Penetrant

Zyglo® ZL-27A is designed to be impervious to water to protect it from over-washing and to allow more penetrant to remain in discontinuities for improved detection of small defects. It and other post emulsifiable penetrants require the application of a lipophilic or hydrophilic emulsifier to render them washable with water.

Zyglo® ZL-27A fluoresces bright greenish-yellow under an ultraviolet light source with a peak wavelength of 365 nm. It possesses a high flash point and meets OSHA requirements for Class III B liquids allowing it to be used in open dip tanks.

Specification Compliance: AMS 2644, AECL, ASME B & PV Code Sec. V, ASTM E1417, MIL-STD-2132, ASTM E165, MIL-STD-271, Boeing BAC 5423 PSD 6-46 or 8-4, AECL, Boeing PS 21202.

Applications: Zyglo® ZL-27A is typically used on castings, forgings, extrusions and rough machined surfaces to find cracks, seams, laps, laminations and porosity.

Classification: Type 1, Method B Penetrant when using ZE-4B emulsifier. Type 1, Method D Penetrant when using ZR-10B (20%) remover.

Penetrant Sensitivity Level: Level 3 - High Sensitivity.

Part Number & Container Size:

01-3187-40 5 Gal. Pail

01-3187-30 20 Gal. Drum

01-3187-45 55 Gal. Drum

Also available in 16 oz. aerosol cans.



Zyglo® ZL-37 Post Emulsifiable Fluorescent Penetrant

Zyglo® ZL-37 is designed to be impervious to water to protect it from over-washing and to allow more penetrant to remain in discontinuities for improved detection of small defects. It and other post emulsifiable penetrants require the application of a lipophilic or hydrophilic emulsifier to render them washable with water.

Zyglo® ZL-37 fluoresces bright greenish-yellow under an ultraviolet light source with a peak wavelength of 365 nm. It possesses a high flash point and meets OSHA requirements for Class III B liquids allowing it to be used in open dip tanks.

Specification Compliance: AMS 2644, AECL, ASME B & PV Code Sec. V, ASTM E1417, MIL-STD-2132, ASTM E165, MIL-STD-271, Boeing BAC 5423 PSD 6-46 or 8-4, AECL, Boeing PS 21202.

Applications: Zyglo® ZL-37 is ideal for titanium turbine components, investment castings, and other high stress critical components where detection of fine, tight discontinuities is required.

Classification: Type 1, Method B Penetrant when using ZE-4B emulsifier. Type 1, Method D Penetrant when using ZR-10B (20%) remover.

Penetrant Sensitivity Level: Level 4 - Ultra High Sensitivity.

Part Number & Container Size:

01-3188-40 5 Gal. Pail

01-3188-30 20 Gal. Drum

01-3188-45 55 Gal. Drum

01-3188-75 Penetrant Pens (Case of 12)





WATER WASHABLE FLUORESCENT PENETRANTS

Zyglo® ZL-15B Water Washable Fluorescent Penetrant

Zyglo® ZL-15B is a water washable fluorescent penetrant that is safe for use on most engineering and aerospace alloys including aluminum, steel, nickel and titanium.

Zyglo® ZL-15B fluoresces bright greenish-yellow under an ultraviolet light source with a peak wavelength of 365 nm. It possesses a high flash point and meets OSHA requirements for Class III B liquids allowing it to be used in open dip tanks.

Specification Compliance: AMS 2644, AECL, ASME B & PV Code Sec. V, ASTM E1417, MIL-STD-2132, ASTM E165, MIL-STD-271, Boeing BAC 5423 PSD 6-46 or 8-4, AECL, Boeing PS 21202.

Applications: Zyglo® ZL-15B exhibits excellent rough surface washability and is typically used on castings, forgings, extrusions and rough machined surfaces to find cracks, seams, laps, cold shuts, laminations and porosity.

Classification: Type 1, Method A, Water Washable (Non Water Based) Penetrant.

Penetrant Sensitivity Level: Level 1/2 - Very Low Sensitivity.

Part Number & Container Size:

- 01-3159-40 5 Gal. Pail
- 01-3159-30 20 Gal. Drum
- 01-3159-45 55 Gal. Drum



Zyglo® ZL-19 Water Washable Fluorescent Penetrant

Zyglo® ZL-19 is a water washable fluorescent penetrant that is safe for use on most engineering and aerospace alloys including aluminum, steel, nickel and titanium.

Zyglo® ZL-19 fluoresces bright greenish-yellow under an ultraviolet light source with a peak wavelength of 365 nm. It possesses a high flash point and meets OSHA requirements for Class III B liquids allowing it to be used in open dip tanks.

Specification Compliance: AMS 2644, AECL, ASME B & PV Code Sec. V, ASTM E1417, MIL-STD-2132, ASTM E165, MIL-STD-271, Boeing BAC 5423 PSD 6-46 or 8-4, AECL, Boeing PS 21202.

Applications: Zyglo® ZL-19 exhibits excellent rough surface washability and is typically used on castings, forgings, extrusions and rough machined surfaces to find cracks, seams, laps, cold shuts, laminations and porosity.

Classification: Type 1, Method A, Water Washable (Non Water Based) Penetrant.

Penetrant Sensitivity Level: Level 1 - Low Sensitivity.

Part Number & Container Size:

- 01-3263-40 5 Gal. Pail
- 01-3263-30 20 Gal. Drum
- 01-3263-45 55 Gal. Drum



Zyglo® ZL-60D Water Washable Fluorescent Penetrant

Zyglo® ZL-60D is a water washable fluorescent penetrant that is safe for use on most engineering and aerospace alloys including aluminum, steel, nickel and titanium.

Zyglo® ZL-60D fluoresces bright greenish-yellow under an ultraviolet light source with a peak wavelength of 365 nm. It possesses a high flash point and meets OSHA requirements for Class III B liquids allowing it to be used in open dip tanks.

Specification Compliance: AMS 2644, AECL, ASME B & PV Code Sec. V, ASTM E1417, MIL-STD-2132, ASTM E165, MIL-STD-271, Boeing BAC 5423 PSD 6-46 or 8-4, AECL, Boeing PS 21202.

Applications: Zyglo® ZL-60D exhibits excellent rough surface washability and is typically used on castings, forgings, extrusions and rough machined surfaces to find cracks, seams, laps, cold shuts, laminations and porosity.

Classification: Type 1, Method A, Water Washable (Non Water Based) Penetrant.

Penetrant Sensitivity Level: Level 2 - Medium Sensitivity.

Part Number & Container Size:

01-3272-40 5 Gal. Pail

01-3272-30 20 Gal. Drum

01-3272-45 55 Gal. Drum

Also available in 16 oz. aerosol cans.



Zyglo® ZL-67 Water Washable Fluorescent Penetrant

Zyglo® ZL-67 is a water washable fluorescent penetrant that is safe for use on most engineering and aerospace alloys including aluminum, steel, nickel and titanium.

Zyglo® ZL-67 fluoresces bright greenish-yellow under an ultraviolet light source with a peak wavelength of 365 nm. It possesses a high flash point and meets OSHA requirements for Class III B liquids allowing it to be used in open dip tanks.

Specification Compliance: AMS 2644, AECL, ASME B & PV Code Sec. V, ASTM E1417, MIL-STD-2132, ASTM E165, MIL-STD-271, Boeing BAC 5423 PSD 6-46 or 8-4, AECL, Boeing PS 21202.

Applications: Zyglo® ZL-67 is typically used on critical applications including investment castings, jet engine components, and highly machined surfaces to find cracks, seams and porosity.

Classification: Type 1, Method A, Water Washable (Non Water Based) Penetrant.

Penetrant Sensitivity Level: Level 3 - High Sensitivity.

Part Number & Container Size:

01-3274-40 5 Gal. Pail

01-3274-30 20 Gal. Drum

01-3274-45 55 Gal. Drum





Zyglo® ZL-56 Water Washable Fluorescent Penetrant

Zyglo® ZL-56 is a water washable fluorescent penetrant that is safe for use on most engineering and aerospace alloys including aluminum, steel, nickel and titanium.

Zyglo® ZL-56 fluoresces bright greenish-yellow under an ultraviolet light source with a peak wavelength of 365 nm. It possesses a high flash point and meets OSHA requirements for Class III B liquids allowing it to be used in open dip tanks.

Specification Compliance: AMS 2644, AECL, ASME B & PV Code Sec. V, ASTM E1417, MIL-STD-2132, ASTM E165, MIL-STD-271, Boeing BAC 5423 PSD 6-46 or 8-4, AECL, Boeing PS 21202.

Applications: Zyglo® ZL-56 is typically used on smooth, nonporous, highly machined surfaces to find cracks, seams and scratches on critical parts.

Classification: Type 1, Method A, Water Washable (Non Water Based) Penetrant.

Penetrant Sensitivity Level: Level 4 - Ultra High Sensitivity.

Part Number & Container Size:

- 01-3267-40 5 Gal. Pail
- 01-3267-30 20 Gal. Drum
- 01-3267-45 55 Gal. Drum



WATER BASED FLUORESCENT PENETRANTS

Zyglo® ZL-4C Water Based Penetrant

Zyglo® ZL-4C is a water based penetrant that contains no petroleum based solvents. It fluoresces bright greenish-yellow under an ultraviolet light source with a peak wavelength of 365 nm.

The use of aqueous developers is not recommended with Zyglo® ZL-4C as they tend to wash the penetrant out of discontinuities. Dry powder developer (ZP-4B Dry Powder Developer) is applied after the test surface has been dried.

Specification Compliance: ASME B & PV Code Sec. V, ASTM E165.

Applications: Zyglo® ZL-4C is typically used on plastics and ceramics to find cracks. Zyglo® ZL-4C is also used as a leaker penetrant to detect through leaks. (Use with plastic parts should be tested to confirm Zyglo® ZL-4C compatibility.)

Part Number & Container Size:

- 01-3137-40 5 Gal. Pail
- 01-3137-45 55 Gal. Drum



EMULSIFIERS

Zyglo® ZE-4B Lipophilic Emulsifier

Zyglo® ZE-4B is a lipophilic emulsifier. It is non-corrosive and can be used in open tank operations due to its low volatility and high flash point.

Specification Compliance: AMS 2644, MIL-STD-271, ASME B & PV Code Sec. V, ASTM E165, Boeing BAC 5423 PSD 6-46 or 8-4, MIL-STD-2132, ASTM E1417, Boeing PS 21202, AECL.

Applications: Zyglo® ZE-4B is used as a Method B lipophilic emulsifier for Magnaflux post emulsifiable penetrants.

Classification: Method B - Lipophilic Emulsifier.

Part Number & Container Size:

- 01-3546-40 5 Gal. Pail
- 01-3546-30 20 Gal. Drum
- 01-3546-45 55 Gal. Drum



Zyglo® ZR-10B Hydrophilic Emulsifier

Zyglo® ZR-10B is a hydrophilic emulsifier. It offers the advantages of minimization of fluorescent background on rough surfaces, minimization of bleed-out from hollow parts, and reduced consumption of expendable materials.

Specification Compliance: AMS 2644, MIL-STD-271, ASME B & PV Code Sec. V, ASTM E165, Boeing BAC 5423 PSD 6-46 or 8-4, MIL-STD-2132, ASTM E1417, Boeing PS 21202, AECL, Honeywell EMS 52309, AMS 2647, General Electric P3TF2, Pratt & Whitney.

Applications: Zyglo® ZR-10B is used as a Method D hydrophilic emulsifier for Magnaflux® post emulsifiable penetrants.

Classification: Method D - Hydrophilic Emulsifier.

Part Number & Container Size:

- 01-3620-40 5 Gal. Pail
- 01-3620-30 20 Gal. Drum
- 01-3620-45 55 Gal. Drum



DEVELOPERS

Zyglo® ZP-4B Dry Powder Developer

Zyglo® ZP-4B is a free flowing, white fluffy powder used as a highly sensitive dry powder developer for Zyglo® Penetrants. When applied, ZP-4B forms a thin film on parts, enhancing indications of ultrafine discontinuities. Its high purity allows it to be used in applications where purity is essential to the testing process.

Specification Compliance: AMS 2644, MIL-STD-271, ASME B & PV Code Sec. V, ASTM E165, Boeing BAC 5423 PSD 6-46 or 8-4, MIL-STD-2132, ASTM E1417, Boeing PS 21202, AECL, Honeywell EMS 52309, AMS 2647, General Electric P3TF2, Pratt & Whitney.





Zygro® ZP-4B Dry Powdered Developer Continued.

Applications: Zygro® ZP-4B is typically used on automobile parts, off-road equipment, farm equipment, welds, castings, forgings, leak testing, pressure vessels, aircraft, marine, construction, maintenance, petroleum pipelines, power plant inspections and general metalwork.

Classification: Form a - Dry Powder Developer.

Part Number & Container Size:

01-3328-69 10 lb. Pail

01-3328-75 20 lb. Container

Zygro® ZP-5B Water Suspending Developer

Zygro® ZP-5B Water Suspending Developer disperses quickly in water to form an opaque white suspension. At higher concentrations, Zygro® ZP-5B forms an opaque white coating which provides contrasting background for Spotcheck® penetrant indications.

Specification Compliance: AMS 2644, MIL-STD-271, ASME B & PV Code Sec. V, ASTM E165, Boeing BAC 5423 PSD 6-46 or 8-4, MIL-STD-2132, ASTM E1417, Boeing PS 21202, AECL, AMS 2647, General Electric P3TF2.

Applications: Zygro® ZP-5B is typically used on automobile parts, off-road equipment, farm equipment, welds, castings, forgings, leak testing, pressure vessels, aircraft, marine, construction, maintenance, petroleum pipelines, power plant inspections and general metalwork.

Classification: Form c - Water Suspending Developer.

Part Number & Container Size:

01-3341-81 25 lb. Pail



Zygro® ZP-9F Developer

Zygro® ZP-9F is a dispersion of organic particles in isopropyl alcohol and acetone that produces an opaque white coating which provides an excellent contrasting background for Spotcheck® or Zygro® penetrant indications.

Specification Compliance: AMS 2644, MIL-STD-271, ASME B & PV Code Sec. V, ASTM E165, ASTM E1417, Boeing PS 21202, AECL, AMS 2647, NAVSEA 250-1500-1.

Applications: Zygro® ZP-9F is typically used on automobile parts, off-road equipment, farm equipment, welds, castings, forgings, leak testing, pressure vessels, aircraft, marine, construction, maintenance, petroleum pipelines, power plant inspections and general metalwork.

Classification: Form d - Non-Aqueous Type 1 Fluorescent (solvent based).
Form e - Non-Aqueous Type 2 Visible Dye (solvent based).

Part Number & Container Size:

01-3354-40 5 Gal. Pail

Also available in 16 oz. aerosol cans.



Zyglo® ZP-14A Aqueous Soluble Developer

Zyglo® ZP-14A is used as a water soluble developer for enhancing indications formed by Zyglo® penetrants. It produces a uniform white coating when dry which is easily removed in post inspection cleaning by water spray. Once the developer bath has been prepared, no in use agitation is required to maintain developer uniformity.

Specification Compliance: AMS 2644, MIL-STD-271, ASME B & PV Code Sec. V, ASTM E165, ASTM E1417, Boeing BAC-5423 PSD 6-46 or 8-4, AMS 2647, General Electric P3TF2, AECL.

Applications: Zyglo® ZP-14A is recommended for use with Zyglo® ZL-2C, ZL-27A, and ZL-37 penetrants.

Classification: Form b - Water Soluble Developer.

Part Number & Container Size:

01-3381-75 20 lb. Pail

01-3381-89 50 lb. Container



Zyglo® ZA-70 Portable Fluorescent Penetrant Inspection Kit

The Zyglo® ZA-70 Portable (aerosol) Fluorescent Inspection Kit offers improved sensitivity over our Spotcheck® visible red dye inspection kit.

Each kit contains:

- ZB-100F Ultraviolet Black Light
- 1 Can ZL-27A PE Fluorescent Penetrant
- 1 Can ZP-9F Developer
- 2 Cans SKC-S Cleaner
- Paint Marker
- SCRUBS® Hand Towels
- Plastic Carrying Case
- Instruction Booklet

Applications: The Zyglo® ZA-70 Portable Fluorescent Inspection Kit is typically used on machined surfaces to find cracks, seams, laps, laminations and porosity.

Part Number:

600047 Kit with 115V ZB-100F UV Black Light

600045 Kit with 230V-60Hz ZB-100F UV Black Light



600047

Zyglo® ZA-70R (16 oz.) Refill Kit

Each kit contains:

- 2 Cans ZL-27A PE Fluorescent Penetrant
- 2 Cans ZP-9F Developer
- 4 Cans SKC-S Cleaner
- Heavy Duty Wiping Cloth
- Paint Marker
- SCRUBS® Hand Towels
- Plastic Carrying Case
- Instruction Booklet

Part Number:

01-3930-48 Zyglo® ZA-70R Refill Kit



01-3930-48



SPOTCHECK® VISIBLE PENETRANTS

SOLVENT REMOVABLE VISIBLE PENETRANT

Spotcheck® SKL-SP2 Solvent Removable Penetrant

Spotcheck® SKL-SP2 is a solvent removable, post emulsifiable, red color contrast penetrant with outstanding penetrating characteristics. It offers maximum reliability in locating surface-open flaws and discontinuities and has been successfully used on non-porous ceramics and other similar materials.

Specification Compliance: AMS 2644, AECL, ASME B & PV Code Sec. V, ASTM E1417, MIL-STD-2132, ASTM E165, MIL-STD-271.

Applications: Spotcheck® SKL-SP2 is typically used on welds, forgings, pressure vessels, castings, general metal work, leak testing, power plants and construction.

Classification: Type 2, Method B, C or D.

Part Number & Container Size:

- 01-5155-35 1 Gal. (Case of 4)
- 01-5155-40 5 Gal. Pail
- 01-5155-45 55 Gal. Drum
- 01-5155-75 Penetrant Pen (Case of 12)

Also available in 16 oz. aerosol cans.



WATER WASHABLE VISIBLE PENETRANT

Spotcheck® SKL-WP2 Water Washable Penetrant

Spotcheck® SKL-WP2 is a water washable, red color contrast penetrant with outstanding penetrating characteristics and discontinuity identification. Water wash removable, it eliminates the need for solvent removers or emulsifiers in the elimination of excess surface penetrant.

Specification Compliance: AMS 2644, ASME B & PV Code Sec. V, ASTM E1417, MIL-STD-2132, ASTM E165, MIL-STD-271, Boeing PS 21202, AECL, NAVSEA 250-1500-1, AECL, Boeing BAC 5423 PSD 6-46 or 8-4.

Applications: Spotcheck® SKL-WP2 is typically used on welds, forgings, pressure vessels, castings and general metal work.

Classification: Type 2, Method A.

Part Number & Container Size:

- 01-5190-35 1 Gal. (Case of 4)
- 01-5190-40 5 Gal. Pail
- 01-5190-45 55 Gal. Drum

Also available in 16 oz. aerosol cans.



WATER BASED VISIBLE PENETRANT

Spotcheck® SKL-4C Water Based Penetrant

Spotcheck® SKL-4C is a water based, water washable, red dye penetrant used for leak testing and in the inspection of ceramic and chemically sensitive plastic parts. (Use with plastic parts should be tested to confirm Spotcheck® SKL-4C compatibility.)

Spotcheck® SKL-4C indications appear dark purplish-red under visible light and fluorescent orange under UV Black Light to provide dual range inspection flexibility. It can be diluted infinitely with water, but a dilution of 1:1 is generally recommended.

Specification Compliance: ASME B & PV Code Sec. V, ASTM E165.

Applications: Spotcheck® SKL-4C is typically used for leak testing, and ceramic and plastic part inspection.

Part Number & Container Size:

01-5125-40 5 Gal. Pail
01-5125-45 55 Gal. Drum



CLEANER/REMOVER

Spotcheck® SKC-S Cleaner/Remover

Spotcheck® SKC-S is a non-halogenated material used in the liquid penetrant inspection process. It is used on a moist cloth to remove surface penetrant from the inspection area prior to applying developer.

Specification Compliance: AMS 2644, ASME B & PV Code Sec. V, ASTM E1417, MIL-STD-2132, ASTM E165, MIL-STD-271, Boeing PS 21202, NAVSEA 250-1500-1, AECL, Boeing BAC 5423 PSD 6-46 or 8-4.

Applications: Spotcheck® SKC-S is typically used to remove excess surface penetrant from the inspection area prior to applying developer.

Classifications: Class 2.

Part Number & Container Size:

01-5750-35 1 Gal. (Case of 4)
01-5750-40 5 Gal. Pail
01-5750-45 55 Gal. Drum
Also available in 16 oz. aerosol cans.





DEVELOPER

Spotcheck® SKD-S2 Non-Halogenated Solvent Developer

Spotcheck® SKD-S2 is a non-halogenated solvent developer that meets major requirements for special alloy and nuclear applications. It is a ready to use suspension of white developing particles in a fast drying solvent. It produces an opaque white coating which provides an excellent contrasting background for penetrant indications.

Specification Compliance: AMS 2644, ASME B & PV Code Sec. V, ASTM E1417, MIL-STD-2132, ASTM E165, MIL-STD-271, Boeing PS 21202, NAVSEA 250-1500-1, AECL, Boeing BAC 5423 PSD 6-46 or 8-4.

Applications: Spotcheck® SKD-S2 is used as a developer for the liquid penetrant inspection process.

Classification: Form d - Non-Aqueous Type 1 Fluorescent (solvent based).
Form e - Non-Aqueous Type 2 Visible Dye (solvent based).

Part Number & Container Size:

01-5352-35 1 Gal. (Case of 4)

01-5352-40 5 Gal. Pail

01-5352-45 55 Gal. Drum

Also available in 16 oz. aerosol cans.



VISIBLE PENETRANT INSPECTION KITS

Spotcheck® SK-416 AND SK-816 Penetrant Inspection Kits

Spotcheck® SK-416 and SK-816 penetrant inspection kits contain everything needed to perform visible red dye liquid penetrant inspections. No UV Black Light is required for inspection.

Specification Compliance: AMS 2644, AECL, ASME B & PV Code Sec. V, ASTM E1417, MIL-STD 2132, ASTM E165, MIL-STD 271.

Applications: Spotcheck® SK-416 and SK-816 penetrant inspection kits are used in the inspection of automobile parts, off-road equipment, farm equipment, welds, castings, forgings, leak testing, pressure vessels, aircraft, marine, construction, maintenance, petroleum pipelines, power plants and general metalwork.

Part Number:

01-5970-48 - Spotcheck® SK-416: Each kit contains:

- 1 Can SKL-SP2 Penetrant
- 1 Can SKD-S2 Developer
- 2 Cans SKC-S Remover
- Paint Marker
- SCRUBS® Hand Towels
- Plastic Carrying Case

01-5920-48 - Spotcheck® SK-816: Each kit contains:

- 2 Cans SKL-SP2 Penetrant
- 2 Can SKD-S2 Developer
- 4 Cans SKC-S Remover
- Paint Marker
- SCRUBS® Hand Towels
- Plastic Carrying Case



01-5970-48



01-5920-48

SPECIFICATIONS

ZYGLO® PENETRANTS

SPECIFICATIONS	Water Washable					Post Emulsifiable		
	ZL-15B	ZL-19	ZL-60D	ZL-67	ZL-56	ZL-2C	ZL-27A	ZL-37
NAVSEA T9074-AS-GIB-010/271	X	X	X	X	X	X	X	X
MIL-STD-2132	X	X	X	X	X	X	X	X
AECL	X	X	X	X	X	X	X	X
AMS-2644	X	X	X	X	X	X	X	X
AMS-2647			X	X	X	X	X	X
ASME B & PV Code, Sec. V	X	X	X	X	X	X	X	X
ASTM E165	X	X	X	X	X	X	X	X
ASTM E1417	X	X	X	X	X	X	X	X
Boeing BAC 5423 PSD 6-46 or 8-4	X	X	X	X	X	X	X	X
Honeywell EMS 52309	X	X	X	X	X	X	X	X
General Electric P3TF2			X	X	X	X	X	X
Boeing PS 21202	X	X	X	X	X	X	X	X
Pratt & Whitney FPM		X	X	X		X	X	X

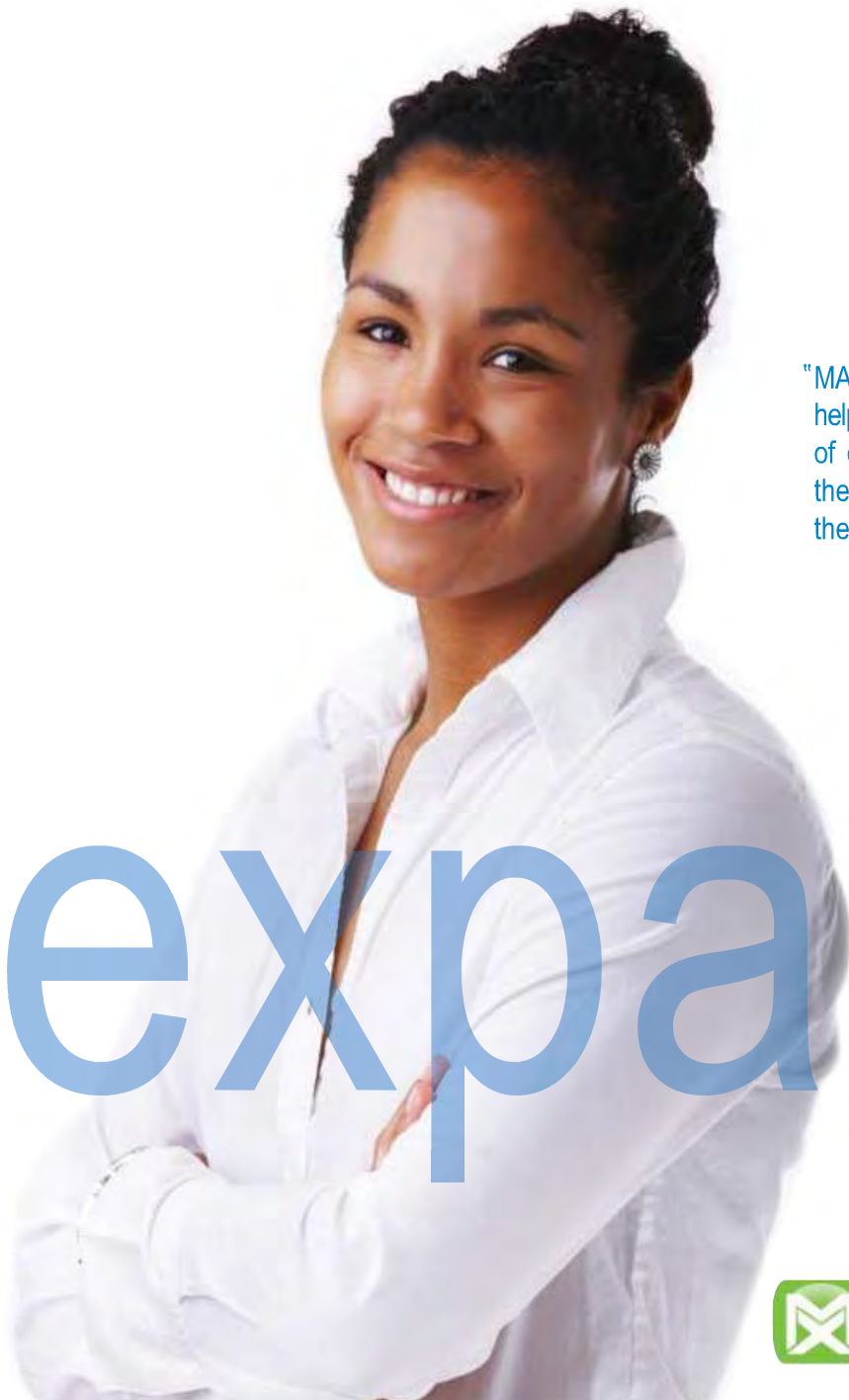
ZYGLO® EMULSIFIERS, REMOVERS and DEVELOPERS

SPECIFICATIONS	Emulsifiers & Removers			Developers			
	ZE-4B	ZR-10B	SKC-S	ZP-4B	ZP-14A	ZP-5B	ZP-9F
NAVSEA T9074-AS-GIB-010/271	X	X	X	X	X	X	X
MIL-STD-2132	X	X	X	X	X	X	X
AECL	X	X	X	X	X	X	X
AMS-2644	X	X	X	X	X	X	X
AMS-2647	X	X	X	X	X	X	X
ASME B & PV Code, Sec. V	X	X	X	X	X	X	X
ASTM E165	X	X	X	X	X	X	X
ASTM E1417	X	X	X	X	X	X	X
Boeing BAC 5423 PSD 6-46 or 8-4	X	X	X	X	X	X	X
Honeywell EMS 52309	X	X	X	X	X	X	X
General Electric P3TF2	X	X	X	X	X	X	X
Boeing PS 21202	X	X	X	X	X	X	X
Pratt & Whitney FPM		X		X			X



SPOTCHECK® PENETRANTS, CLEANERS and DEVELOPERS

SPECIFICATIONS	Penetrants			Cleaners	Developers	
	SKL-SP2	SKL-WP2	SKL-4C	SKC-S	SKD-S2	ZP-5B
NAVSEA T9074-AS-GIB-010/271	X	X		X	X	X
NAVSEA 250-1500-1	X			X	X	
MIL-STD-2132	X	X		X	X	X
AECL	X	X		X	X	X
AMS-2644	X	X		X	X	X
ASME B & PV Code, Sec. V	X	X	X	X	X	X
ASTM E165	X	X	X	X	X	X
ASTM E1417	X	X		X	X	X
Boeing BAC 5423 PSD 6-46 or 8-4	X	X		X	X	X
Boeing PS 21202	X			X	X	X



"MAGNAFLUX® penetrant testing accessories helped to increase the speed and effectiveness of our NDT process and literally paid for themselves in time and labor savings within the first year."

expand



Magnaflux® Penetrant Testing Accessories have been designed to simplify and enhance the penetrant testing process and to make sure that the highest process control standards are maintained throughout the entire NDT test sequence.

Expanding Capabilities

TIMERS & MONITORING DEVICES

Hydrometer

A hydrometer is a lab or field device used to measure the specific gravity of a liquid solution and, therefore, its strength. When used for water based developers such as ZP-14A Water Soluble Developer and ZP-5B Water Suspendible Developer, it will give the specific concentration range for optimum performance.

If the hydrometer reading is high (based upon the supplied concentration graph), water is generally added. If the reading is low, developer is added to the bath.

Part Number:

5857 Hydrometer

Specifications Compliance: ASTM E1417-11

Refractometer

A refractometer is an easy to use laboratory or field device used to measure the concentration of the Hydrophilic Remover (ZR-10B) in water and is required to meet Pratt and Whitney and GE concentration specifications for hydrophilic removers.

A chart for converting refractive index to percent concentration of ZR-10B can be found and is available for downloading on the Magnaflux® website.

Part Number:

513829-01 Refractometer

Specifications Compliance: Pratt & Whitney and GE specifications, ASTM E1417-11.

Multi-Station Process Control Digital Timer

Battery operated multi-station digital timer shows MS/HM and station number with corresponding color LEDs. Timer displays up to 4 separate time cycles running at one time.

- Set audible and visual alarms for up to four (4) different dwell times: penetrant, rinse, emulsification and developer
- Features large easy to read LCD screen
- Count-up and count-down functions
- Wall mountable

Part Number:

522099 Multi-Station Process Control Digital Timer



5857



513829



522099

PENETRANT TESTING ACCESSORIES

Manufacturers and quality experts count on Magnaflux® penetrants to maintain their customer's rigid quality standards and to make sure that their parts, components and processes meet major industry certification requirements. The Accessories Group manufactures and maintains a broad inventory of products and support equipment designed to expand and enhance the penetrant inspection process for NDT professionals. From test panels and rinse sprayers to refractometers, Magnaflux® accessories help keep penetrant process control operations performing at peak productivity and quality levels.

HAND SPRAYERS

Dry Developer Spray Gun

Manual spray gun that delivers a light, even dry developer coating.

- Uses shop compressed air (dry)
- Features mix, jet and spread controls
- 1 quart capacity

Part Number:

521339 Dry Developer Spray Gun



521339

Hydro-Wash Spray Gun

For pre and post rinsing of parts using either the water-wash or post-emulsifiable processes.

- Air injection boosts velocity to permit faster rinsing of hollow or rough-surface parts
- Advantageous for areas with low or fluctuating water pressure

Part Number:

518992 Hydro-Wash Spray Gun



518992

Portable Pressure Sprayer

Lightweight pressure sprayer for spot application of penetrants, developers, and cleaners.

- 1 quart capacity
- Easy disassembly for cleaning
- Pressurize with compressed air to 80 - 200 psi

Part Number:

625774 Portable Pressure Sprayer



625774

Water Spray Gun

For pre and post rinsing of parts using either the water-wash or post-emulsifiable processes.

- Provides optimal coarse spray to help prevent part over-washing

Part Number:

520090 Water Spray Gun



520090

CRACK COMPARATORS

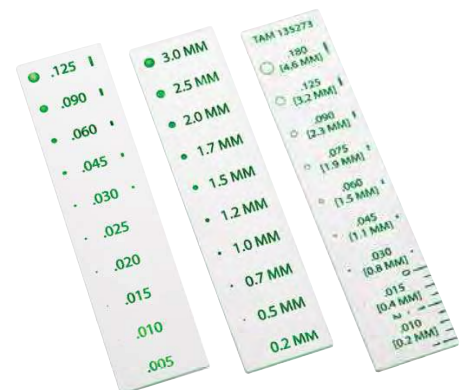
Inch and Metric Crack Comparators

Magnaflux® crack comparators are used to measure the actual size of indications identified during the liquid penetrant inspection process.

Part Number: 514048 - General Purpose Comparator. Measures indications in increments between .005" and 0.125"

Part Number: 514049 - General Purpose Metric Comparator. Measures indications in increments between 0.2mm and 3.0mm

Part Number: 514050 - Pratt & Whitney Crack Comparator. Measures indications in increments between 0.010" and 0.180" and meets Pratt & Whitney requirements (P&W Reference - TAM 135273)



514048

514049

514050



TEST BLOCKS

Aluminum Test Block

The Aluminum Test Block is an aluminum test piece measuring 3" x 2" x 3/8" with a 1/8" wide groove that splits the face in half. The test block is used to check the strength of "in-use" penetrants. This is done by processing one half of the block with "used" penetrant, and the other half with "fresh" penetrant.

Part Number:

14755 Aluminum Test Block

Specifications Compliance: Complies with ASTM E 165, E1417-11, ASME Boiler and Pressure Vessel Code.



14755

Stainless Steel Test Block

The stainless steel test block offers a simple and convenient comparator for monitoring the washability of water-wash or post-emulsified penetrants.

The "grit blasted" finish provides a rough surface which will retain fluorescent background when the in-use penetrant has decreased when compared to fresh (unused) penetrant. The test block should be thoroughly cleaned with SKC-S Cleaner/Remover, as well as periodically refinished grit blast.

Part Number:

154400 Stainless Steel Test Block

Specifications Compliance: Complies with ASTM E 165, E1417-11.



154400

TEST PANELS

NiCr Penetrant Test Panels

Magnaflux® NiCr test panels are ideal penetrant sensitivity comparators. They come in pairs, with panel set crack depths available in 10, 20, 30 and 50 microns. NiCr test panels allow "in use" Zyglo® penetrants to be compared against "new, unused" product to determine if the penetrant is performing properly.

Dimensions: Length 100mm ± 2mm X Width 35mm ± 2mm X Thickness 2mm ± 0.2mm

Part Number:

506251 1 pair of 10 micron panels 506253 1 pair of 30 micron panels
506252 1 pair of 20 micron panels 506254 1 pair of 50 micron panels

Specifications Compliance: Complies with ASTM E1417-11.



506251

TAM Panel / Z5 Test Panel

The Magnaflux® TAM Panel (Pratt and Whitney TAM #146040) monitors both sensitivity and washability of Zyglo® liquid penetrants. The test panel is meant to detect "sudden" penetrant system changes and to ascertain that all parts of the penetrant processing system are functioning in the proper manner.

Part Number:

198055 TAM Panel / Z5 Test Panel

Specifications Compliance: Meets Pratt and Whitney TAM #146040 specifications, ASTM E1417-11.



198055

KDS Test Panel

The Magnaflux® KDS Panel is a Known Defect Standard used for daily system performance analysis. The test panel is used to monitor a penetrant system for sudden changes and verify performance of in-use materials.

Part Number:

625557 KDS Panel

Specifications Compliance: ASTM E1417-11, SAE/AMS 2647.



625557

MISCELLANEOUS ACCESSORIES

TAM Panel Ultrasonic Cleaning Unit

Compact, table-top, ultrasonic cleaning unit with integrated heater and timer provides precision cleaning of TAM panels. Unit available in 115 or 230 volt versions.

Kit Includes:

- Table-top (toaster size) ultrasonic cleaning unit
- 1 gallon of MagnaVu® alkaline cleaner concentrate

Part Number:

01-7500-00 115V Cleaning Unit

01-7501-00 230V Cleaning Unit



01-7500-00

Purified Wiping Cloths

Magnaflux® Purified Penetrant Wiping Cloths are ideally suited for penetrant inspection work in the nuclear industry or wherever lint free, low-contamination wiping cloths are required or mandated. The unique crimped finish of the “Rymple Cloth” provides more surface area for collecting dirt particles, and better absorbency for collecting fluids. Each bulk dispensing roll is made from 100 square yards of cloth and yields 100 cloths per roll.

- Super absorbent
- Lint-free
- Soft texture will not scratch parts
- Cloths come with manufacturer certification
- Chemically pure, does not contain binders or silicone

Part Number:

512302 Case of 12 rolls and dispensing rack



512302

Wire Basket

Sturdy 12" diameter 3/4" wire mesh basket designed to enable processing of numerous small parts at one time.

- Epoxy coated mesh protects parts from scratching

Part Number:

1962 Wire Basket



1962



E 1417-11 REQUIRED TESTS and FREQUENCY

TESTS	FREQUENCY	PARAGRAPH
Penetrant Contamination ¹	Daily	7.8.2.1
Penetrant Brightness	Quarterly	7.8.2.2
Water Content: Water Based Penetrant (Method A)	Weekly	7.8.2.3
Water Content: Non-Water Based Penetrant (Method A)	Monthly	7.8.2.4
Lipophilic Emulsifier Water Content ²	Monthly	7.8.2.5
Hydrophilic Emulsifier Concentration ²	Weekly	7.8.2.6
Dry Developer Condition ²	Daily	7.8.2.7
Aqueous Developer Contamination: Soluble and Suspendible	Daily	7.8.2.8
Aqueous Developer Concentration: Soluble and Suspendible	Weekly	7.8.2.9
Penetrant System Performance ³	Daily	7.8.3
Water-Washable Penetrant Removability	As Required Per 7.8.3	7.8.3.2
Emulsifier Removability	As Required Per 7.8.3	7.8.3.3
Comparative Penetrant Sensitivity	As Required Per 7.8.3	7.8.3.4
Black Light Intensity ²	Daily	7.8.4.1
Black Light Integrity	Weekly	7.8.4.1
Special UV Lighting	Daily	7.8.4.2
Battery Powered UV-A Lights	Prior to Use	7.8.4.2.1
Visible Light Intensity	Weekly	7.8.4.3
Light Meter Calibration ²	Semi-Annually	7.8.4.4
Inspection Area Cleanliness ¹	Daily	7.8.4.5
Inspection Area Ambient Light Intensity	Quarterly	7.8.4.5
Water Wash Pressure Check ¹	Start of Each Shift	7.8.4.6
Water Pressure Gauge Calibration ²	Semi-Annually	7.8.4.6
Water Wash Temperature Check ¹	Start of Each Shift	7.8.4.6
Water Temperature Gauge Calibration ²	Semi-Annually	7.8.4.6
Drying Oven Calibration ²	Quarterly	7.8.4.7
Air Pressure Gauge Check	Start of Each Shift	7.8.4.9
Air Pressure Gauge Calibration	Semi-Annually	7.8.4.9

¹ Need not be recorded.

² The maximum time between verifications or checks may be extended when substantiated by technical data and approved by the Cognizant Engineering Organization.

³ Not required for Method C Examinations.

PENETRANT INSPECTION EQUIPMENT



LPI Equipment

"MAGNAFLUX® penetrant testing equipment has significantly advanced the productivity of our NDT operations. We couldn't be more satisfied."

improve



Magnaflux® Penetrant Inspection Equipment is designed to enhance the quality inspection of critical parts and is widely used within the automotive, aerospace and energy markets to increase NDT productivity.

Boosting Productivity

LIQUID PENETRANT INSPECTION EQUIPMENT

Magnaflux Liquid Penetrant Inspection (LPI) Systems are designed for testing everything from small, high volume automotive parts and tolerance critical surgical implants, to large turbine blades. Offered in a variety of configurations and supported with materials and accessories to meet the most demanding applications, they are among the most flexible and accurate NDT equipment available today.

Our ZA-1227 Series LPI system offers sequenced processing capabilities and versatility in the inspection of high volume, extremely small parts and low to moderate volume, small to mid-size parts. With all stations welded into a single uni-frame body, its compact design helps to minimize floor space for easy production line integration. The ZA-1633 Series system comes with a larger penetrant tank to accommodate a greater volume and variety of parts, drain racks for increased productivity, and a standalone inspection booth.

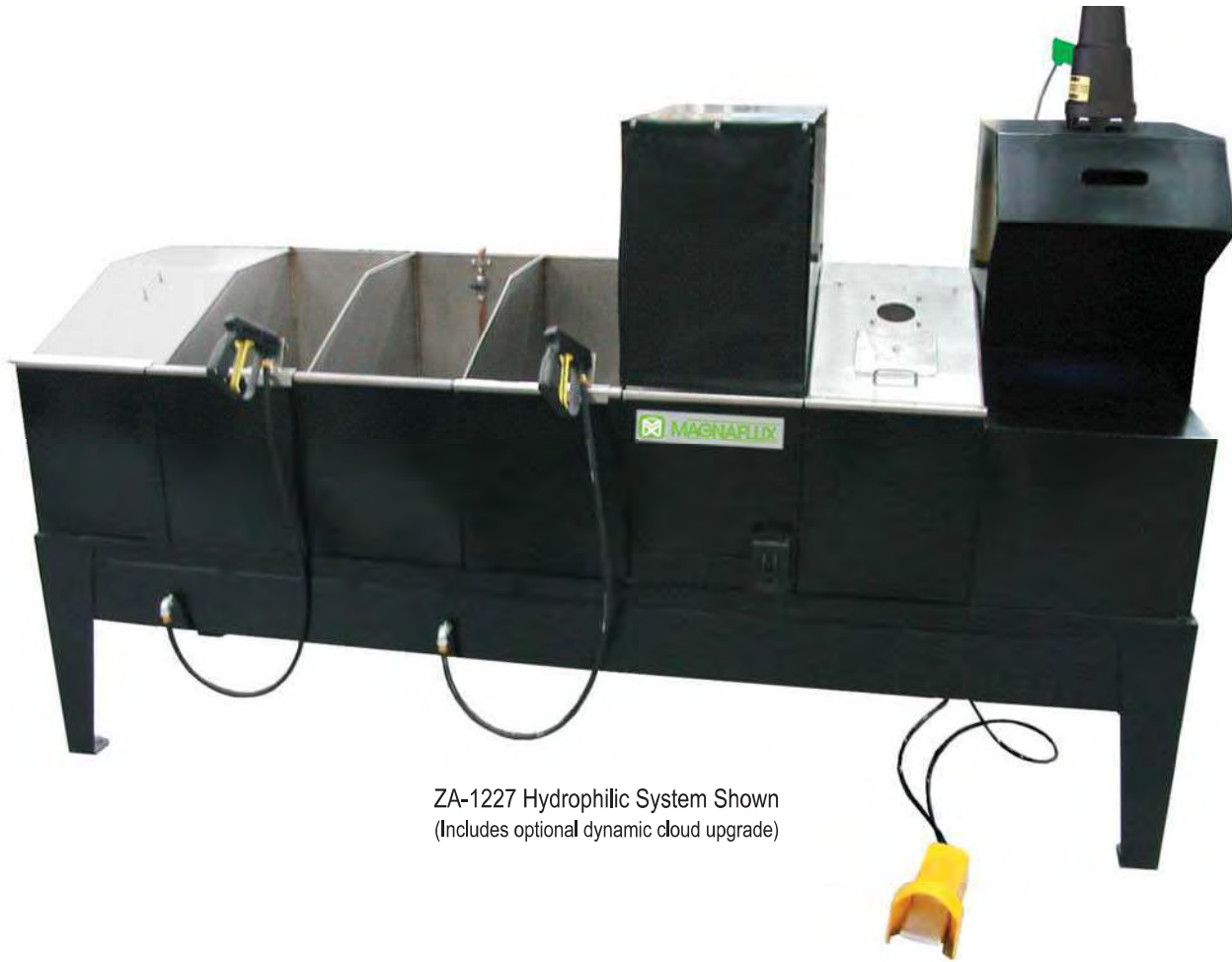
Both series offer three models designed to accommodate different inspection methods; Water Wash, Post Emulsified Lipophilic and Post Emulsified Hydrophilic. The Water Wash method is the simplest unit as water can be used directly to wash excess penetrant from parts without additional steps. The Lipophilic method can locate extremely shallow flaws but requires an extra processing step, applying an emulsifier to make the penetrant washable. The Hydrophilic method delivers the highest inspection sensitivity but also requires the application of an emulsifier, and an additional processing station for pre-rinsing parts.

Should you have a special need not met by any of our standard units detailed in the following pages, our engineering group will happily design a custom LPI system to meet your exact requirements and application. Simply contact a Magnaflux Customer Service Representative at (847) 657-5300 to discuss your system needs.

PENETRANT INSPECTION EQUIPMENT

Magnaflux® Liquid Penetrant Inspection (LPI) Systems are engineered for critical part testing in industries with high inspection tolerances that require easy-to-operate equipment built tough enough to stand up to years of use. Offering outstanding design flexibility and proven performance advantages over less technologically advanced systems, Magnaflux® LPI equipment remains the leading choice among global automotive, aerospace and energy parts manufacturers who trust in their outstanding repeatability to uphold their rigid quality standards.

ZA-1227 SERIES LIQUID PENETRANT INSPECTION EQUIPMENT



ZA-1227 Hydrophilic System Shown
(Includes optional dynamic cloud upgrade)

Zygl[®] ZA-1227 Method A, Water Wash Fluorescent Penetrant Inspection System

The Zygl[®] ZA-1227 Water Wash Penetrant Inspection System is a compact, standalone 5-station system designed for batch and low volume fluorescent inspection of small to medium size parts.

Dimensions: 56"L x 28"W x 36"H (142.2cm x 71.1cm x 91.4cm)

Core Features:

- Compact size
- 304 stainless steel tanks (16 gauge)
- Durable welded steel frame
- Adaptable to multiple applications
- 3 year warranty
- Global authorized service centers

General Specifications:

- Elec. Requirements - 115V, 60Hz, single phase
- Tank Size - 12.88"L x 27.63"W x 16"H (32.7cm x 70.2cm x 40.6 cm)
- Tank Capacity - 10 gallons (37.9L)
- Dryer - Thermostatically controlled
- Black Light - Zygl[®] ZB-100F handheld, 100 Watt fan-cooled
- Stations:
 - 1) Penetrant
 - 2) Rinse
 - 3) Dryer
 - 4) Developer
 - 5) Inspection



Zyglo® ZA-1227 Method B, Post Emulsified Lipophilic Fluorescent Penetrant Inspection System

The Zyglo® ZA-1227 Post Emulsified Lipophilic Penetrant Inspection System is a compact, standalone 6-station system designed for batch and low volume fluorescent inspection of small to medium size parts.

Dimensions: 70"L x 28"W x 36"H (177.8cm x 71.1cm x 91.4cm)

Core Features:

- Compact size
- 304 stainless steel tanks (16 gauge)
- Durable welded steel frame
- Adaptable to multiple applications
- 3 year warranty
- Global authorized service centers

General Specifications:

- Elec. Requirements - 115V, 60Hz, single phase
- Tank Size - 12.88"L x 27.63"W x 16"H (32.7cm x 70.2cm x 40.6 cm)
- Tank Capacity - 10 gallons (37.9L)
- Dryer - Thermostatically controlled
- Black Light - Zyglo® ZB-100F handheld, 100 Watt fan-cooled
- Stations:
 - 1) Penetrant
 - 2) Emulsifier
 - 3) Rinse
 - 4) Dryer
 - 5) Developer
 - 6) Inspection

Zyglo® ZA-1227 Method D, Post Emulsified Hydrophilic Fluorescent Penetrant Inspection System

The Zyglo® ZA-1227 Post Emulsified Hydrophilic Penetrant Inspection System is a compact, standalone 7-station system designed for batch and low volume fluorescent inspection of small to medium size parts.

Dimensions: 83"L x 28"W x 36"H (210.8cm x 71.1cm x 91.4cm)

Core Features:

- Compact size
- 304 stainless steel tanks (16 gauge)
- Durable welded steel frame
- Adaptable to multiple applications
- 3 year warranty
- Global authorized service centers

General Specifications:

- Elec. Requirements - 115V, 60Hz, single phase
- Tank Size - 12.88"L x 27.63"W x 16"H (32.7cm x 70.2cm x 40.6 cm)
- Tank Capacity - 10 gallons (37.9L)
- Dryer - Thermostatically controlled
- Black Light - Zyglo® ZB-100F handheld, 100 Watt fan-cooled
- Stations:
 - 1) Penetrant
 - 2) Pre-Rinse
 - 3) Remover
 - 4) Final Rinse
 - 5) Dryer
 - 6) Developer
 - 7) Inspection

ZA-1633 SERIES LIQUID PENETRANT INSPECTION EQUIPMENT



Zygro® ZA-1633 Method A, Water Wash Fluorescent Penetrant Inspection System

The Zygro® ZA-1633 Water Wash Penetrant Inspection System is a standalone 6-station system designed for batch and low volume fluorescent inspection of small to medium size parts. The system comes with a standalone inspection booth with black light, white light, ventilating fan, and digitally calibrated dryer control.

Dimensions: 132"L x 34"W x 36"H (335.3 cm X 86.4 cm X 91.4 cm)

Core Features:

- Stand alone inspection booth
- 304 stainless steel tanks (16 gauge)
- Adaptable to multiple applications
- Durable welded steel frame
- 3 year warranty
- Global authorized service centers

General Specifications:

- Elec. Requirements - 230V or 460V, 60Hz, single phase
- Tank Size - 15.75"L x 33"W x 14.75"H (40 cm x 83.8 cm x 37.5 cm)
- Tank Capacity - 27 gallons (102.2L)
- Dryer - Digitally calibrated temperature control
- Black Light - Zygro® ZB-100F handheld, 100 Watt fan-cooled
- Stations:
 - 1) Penetrant
 - 2) Drain
 - 3) Rinse
 - 4) Dryer
 - 5) Developer
 - 6) Inspection



Zygro® ZA-1633 Method B, Post Emulsified Lipophilic Fluorescent Penetrant Inspection System

The Zygro® ZA-1633 Post Emulsified Lipophilic Penetrant Inspection System is a standalone 8-station system designed for batch and low volume fluorescent inspection of small to medium size parts. The system comes with a standalone inspection booth with black light, white light, ventilating fan, and digitally calibrated dryer control.

Dimensions: 165"L x 34"W x 36"H (419.1 cm X 86.4 cm X 91.4 cm)

Core Features:

- Stand alone inspection booth
- 304 stainless steel tanks (16 gauge)
- Adaptable to multiple applications
- Durable welded steel frame
- 3 year warranty
- Global authorized service centers

General Specifications:

- Elec. Requirements - 230V, 60Hz, single phase
- Tank Size - 15.75"L x 33"W x 14.75"H (40 cm x 83.8 cm x 37.5 cm)
- Tank Capacity - 27 gallons (102.2L)
- Dryer - Digitally calibrated temperature control
- Black Light - Zygro® ZB-100F handheld, 100 Watt fan-cooled
- Stations:
 - 1) Penetrant
 - 2) Drain #1
 - 3) Emulsifier
 - 4) Rinse
 - 5) Drain #2
 - 6) Dryer
 - 7) Developer
 - 8) Inspection

Zygro® ZA-1633 Method D, Post Emulsified Hydrophilic Fluorescent Penetrant Inspection System

The Zygro® ZA-1633 Post Emulsified Hydrophilic Penetrant Inspection System is a standalone 9-station system designed for batch and low volume fluorescent inspection of small to medium size parts. The system comes with a standalone inspection booth with black light, white light, ventilating fan, and digitally calibrated dryer control.

Dimensions: 182"L x 34"W x 36"H (462.3 cm X 86.4 cm X 91.4 cm)

Core Features:

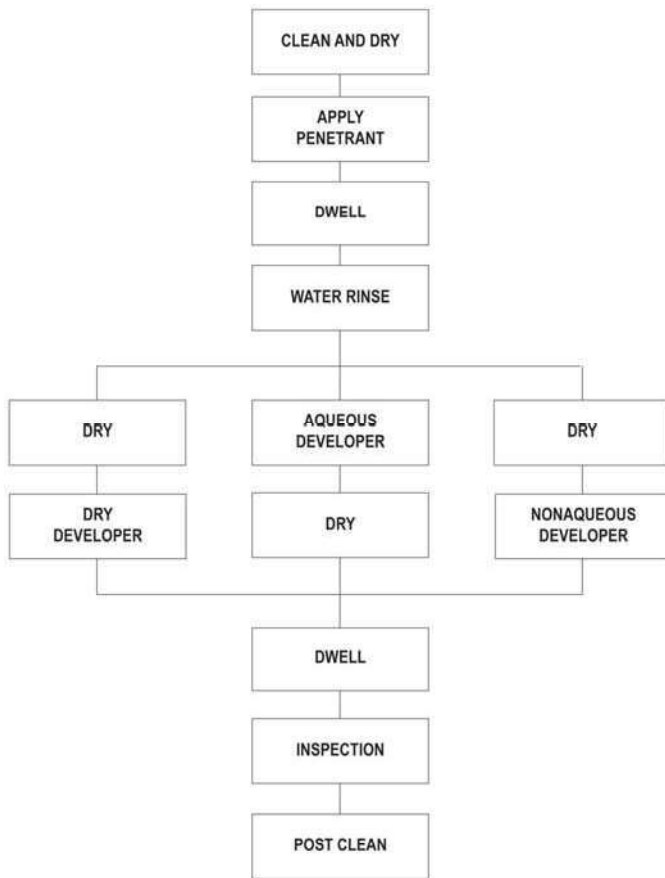
- Stand alone inspection booth
- 304 stainless steel tanks (16 gauge)
- Adaptable to multiple applications
- Durable welded steel frame
- 3 year warranty
- Global authorized service centers

General Specifications:

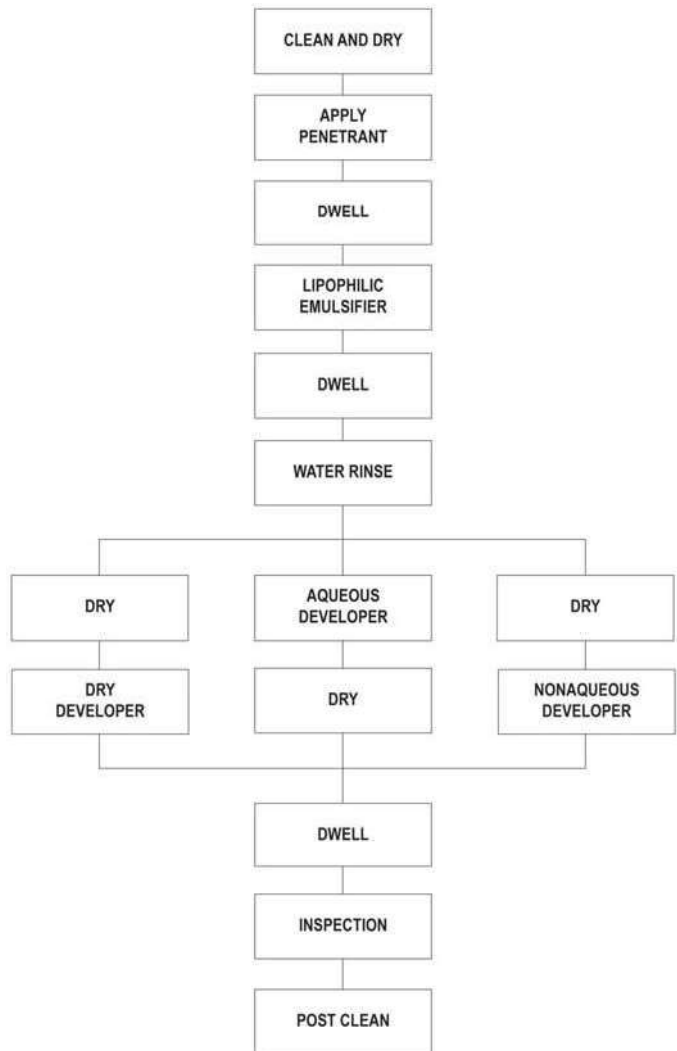
- Elec. Requirements - 230V or 460V, 60Hz, single phase
- Tank Size - 15.75"L x 33"W x 14.75"H (40 cm x 83.8 cm x 37.5 cm)
- Tank Capacity - 27 gallons (102.2L)
- Dryer - Digitally calibrated temperature control
- Black Light - Zygro® ZB-100F handheld, 100 Watt fan-cooled
- Stations:
 - 1) Penetrant
 - 2) Drain #1
 - 3) Pre-Rinse
 - 4) Drain #2
 - 5) Remover
 - 6) Final Rinse
 - 7) Dryer
 - 8) Developer
 - 9) Inspection

PROCESS FLOW FOR PENETRANT INSPECTION METHODS

METHOD A, WATER-WASHABLE



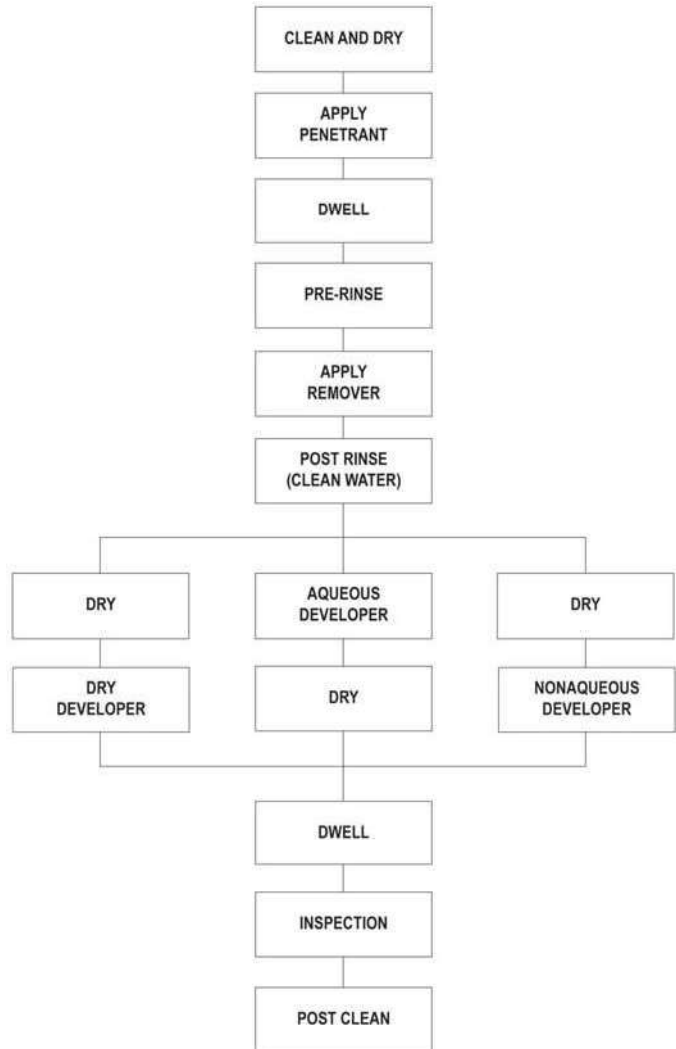
METHOD B, LIPOPHILIC



METHOD C, SOLVENT REMOVABLE



METHOD D, HYDROPHILIC





"MAGNAFLUX Daraclean® brand cleaners and corrosion inhibiting additives are multi-metal safe and packed with soil rejecting properties that promote self-cleaning and prolong bath life."

effective



Magnaflux Daraclean® brand aerospace approved cleaners and corrosion inhibiting additives have been formulated to deliver superior performance effectiveness across a broad range of soils and surfaces.

Superior Formulations

NEUTRAL CLEANERS

Daraclean® 121 Industrial Cleaner

Daraclean® 121 Industrial Cleaner is a mild, neutral cleaning solution formulated with a blend of surfactants and corrosion inhibitors. It is effective on most surfaces, and all components are FDA approved for indirect contact with food.

Applications: Designed to be used by hand and with immersion and ultrasonic applications, Daraclean® 121 is an excellent cleaner for use on a broad spectrum of soils. It has been proven excellent at removing food grade lubricants, machining fluids, lube oils, motor oils, and buffing compounds. Using mild, neutral surfactant chemistry, oils and solids are broken down and pulled free from part surfaces. Foaming action allows the cleaner to penetrate into crevices and holes, rinsing freely with no remaining residue.

Part Number & Container Size:

01-6140-45 55 Gal. Drum



Daraclean® 212 Aerospace Cleaner

Daraclean® 212 Aerospace Cleaner is an aerospace approved foaming, all-purpose neutral cleaning solution. Formulated with a blend of surfactants, emulsifiers, and corrosion inhibitors, it is an excellent cleaner for use on a broad spectrum of soils.

Applications: Designed for ultrasonic applications, Daraclean® 212 is safe for use with most metals and is non-aggressive towards aluminum and titanium alloys. It possesses excellent soil-rejecting qualities, suspending soils in the cleaner for a short period of time after lifting from a part's surface. Over time, solids will settle out, and oil and grease droplets will coalesce and float on the surface of the solution. Removal of soils can easily be accomplished using filters or skimmers as necessary. This action extends the useful life of Daraclean® 212 far beyond that of emulsion-type cleaning solutions.

Specification Compliance: Daraclean® 212 has been tested and certified to meet and exceed most Aerospace industry specifications for aqueous and alkaline cleaners. OEM certifications include Boeing and Douglas. Independent laboratory tests confirm that Daraclean® 212 complies with AMS 1526 (except dichromated magnesium), ARP 1755, and ASTM F-331, F-483, F-484, F-485, F-502, F-519, F-945, F-1110, and F-1111.

Part Number & Container Size:

01-6030-40 5 Gal. Pail

01-6030-45 55 Gal. Drum



AQUEOUS CLEANERS & ADDITIVES

Daraclean® aerospace cleaners make up one of the industry's broadest and most trusted lines of aqueous cleaners with formulas designed to meet or exceed almost every specification and need. Multi-metal safe and packed with soil-rejection technologies that promote self-cleaning and extend bath life, Daraclean® cleaners can improve the effectiveness of your NDT application process and help keep labor and material costs in check.

Daraclean® 235 Aerospace Cleaner

Daraclean® 235 Aerospace Cleaner is an aerospace approved low foaming, all-purpose neutral cleaning solution. Formulated with a blend of surfactants, emulsifiers and corrosion inhibitors, it is an excellent cleaner for use on a broad spectrum of soils.

Applications: Designed for immersion, ultrasonic and light spray applications, Daraclean® 235 is safe for use with most metals and is non-aggressive towards aluminum, brass, copper, titanium and zinc alloys. It possesses excellent soil-rejecting qualities, suspending soils in the cleaner for a short period of time after lifting from a part's surface. Over time, solids will settle out, and oil and grease droplets will coalesce and float on the surface of the solution. Removal of soils can easily be accomplished using filters or skimmers as necessary. This action extends the useful life of Daraclean® 235 far beyond that of emulsion-type cleaning solutions.

Specification Compliance: Daraclean® 235 has been tested and certified to meet and exceed Aerospace industry specifications for aqueous and alkaline cleaners. OEM certifications include Boeing and Douglas. Independent laboratory tests confirm that Daraclean® 235 complies with AMS 1526 (except dichromated magnesium), ARP 1755, and ASTM F-331, F-483, F-484, F-485, F-502, F-519, F-945, F-1110, and F-1111.

Part Number & Container Size:

01-6050-40 5 Gal. Pail
01-6050-45 55 Gal. Drum



Daraclean® 236 Aerospace Cleaner

Daraclean® 236 Aerospace Cleaner is an aerospace approved low foaming, all-purpose neutral cleaning solution. Formulated with a blend of surfactants, emulsifiers, and corrosion inhibitors, it is an excellent cleaner for use on a broad spectrum of soils.

Applications: Designed for immersion, ultrasonic and spray applications, Daraclean® 236 is safe for use with most metals and is non-aggressive towards aluminum, brass and copper alloys. It possesses excellent soil-rejecting qualities, suspending soils in the cleaner for a short period of time after lifting from a part's surface. Over time, solids will settle out, and oil and grease droplets will coalesce and float on the surface of the solution. Removal of soils can easily be accomplished using filters or skimmers as necessary. This action extends the useful life of Daraclean® 236 far beyond that of emulsion-type cleaning solutions.

Specification Compliance: Daraclean® 236 has been tested and certified to meet and exceed Aerospace industry specifications for aqueous and alkaline cleaners. OEM certifications include Boeing and Douglas. Independent laboratory tests confirm that Daraclean® 236 complies with AMS 1526 (except dichromated magnesium), ARP 1755, and ASTM F-331, F-483, F-484, F-485, F-502, F-519, F-945, F-1110, and F-1111.

Part Number & Container Size:

01-6040-40 5 Gal. Pail
01-6040-45 55 Gal. Drum





ALKALINE CLEANERS

Daraclean® 232 Aerospace Cleaner

Daraclean® 232 Aerospace Cleaner is an aerospace approved moderately foaming, all-purpose alkaline cleaning solution. Formulated with a blend of surfactants and corrosion inhibitors, it is an excellent cleaner for use on a broad spectrum of soils.

Applications: Designed for immersion, ultrasonic and light spray applications, Daraclean® 232 is safe for use with most metals and is non-aggressive towards aluminum, magnesium and titanium alloys. It possesses excellent soil-rejecting qualities, suspending soils in the cleaner for a short period of time after lifting from a part's surface. Over time, solids will settle out, and oil and grease droplets will coalesce and float on the surface of the solution. Removal of soils can easily be accomplished using filters or skimmers as necessary. This action extends the useful life of Daraclean® 232 far beyond that of emulsion-type cleaning solutions.

Specification Compliance: Daraclean® 232 has been tested and certified to meet and exceed Aerospace industry specifications for aqueous and alkaline cleaners. OEM certification includes Pratt & Whitney requirements. Independent laboratory tests confirmed that Daraclean® 232 complies with ARP 1755 and ASTM F-945.

Part Number & Container Size:

01-6070-45 55 Gal. Drum



Daraclean® 257 Aerospace Cleaner

Daraclean® 257 Aerospace Cleaner is an aerospace approved low foaming, heavy duty alkaline cleaning solution. Formulated with a blend of surfactants, corrosion inhibitors and phosphates, it is an excellent cleaner for use on a broad spectrum of tough soils.

Applications: Designed for immersion, ultrasonic and spray applications, Daraclean® 257 is safe for use with hard metals and is non-aggressive towards aluminum, magnesium and titanium alloys. It possesses excellent soil-rejecting qualities, suspending soils in the cleaner for a short period of time after lifting from a part's surface. Over time, solids will settle out, and oil and grease droplets will coalesce and float on the surface of the solution. Removal of soils can easily be accomplished using filters or skimmers as necessary. This action extends the useful life of Daraclean® 257 far beyond that of emulsion-type cleaning solutions.

Specification Compliance: Daraclean® 257 has been tested and certified to meet and exceed most Aerospace industry specifications for aqueous and alkaline cleaners. OEM certifications include Boeing, Douglas, GE, Canadair, and Pratt & Whitney. Independent laboratory tests confirm that Daraclean® 257 complies with AMS 1526, ARP 1755, and ASTM F-483, F-484, F-485, F-502, F-519, F-945, F-1110, and F-1111. Daraclean® 257 is also SCAQMD Clean Air Certified.

Part Number & Container Size:

01-6090-40 5 Gal. Pail

01-6090-45 55 Gal. Drum



Daraclean® 282 Aerospace Cleaner

Daraclean® 282 is an aerospace approved low foaming, all-purpose alkaline cleaning solution. Formulated with a blend of surfactants, emulsifiers and corrosion inhibitors, it is an excellent cleaner for use on a broad spectrum of soils.

Applications: Designed for immersion, ultrasonic and spray applications, Daraclean® 282 is safe for use with hard metals and is non-aggressive towards aluminum, magnesium and titanium alloys. It possesses excellent soil-rejecting qualities, suspending soils in the cleaner for a short period of time after lifting from a part's surface. Over time, solids will settle out, and oil and grease droplets will coalesce and float on the surface of the solution. Removal of soils can easily be accomplished using filters or skimmers as necessary. This action extends the useful life of Daraclean® 282 far beyond that of emulsion-type cleaning solutions.

Specification Compliance: Daraclean® 282 has been tested and certified to meet and exceed most Aerospace industry specifications for aqueous and alkaline cleaners. OEM certifications include Boeing, Douglas, GE, Honeywell, Lockheed, Pratt & Whitney, Raytheon, Rolls Royce and Sunstrand. Independent laboratory tests confirm that Daraclean® 282 complies with AMS 1526, AMS 1537, ARP 1755, and ASTM F-483, F-484, F-485, F-502, F-519, F-945, F-1110, and F-1111.

Part Number & Container Size:

01-6000-40 5 Gal. Pail
01-6000-45 55 Gal. Drum



Daraclean® 282GF Aerospace Cleaner

Daraclean® 282GF (Glycol-Free) is an aerospace approved low foaming, all-purpose alkaline cleaning solution. Formulated with a blend of surfactants and corrosion inhibitors, it is an excellent cleaner for use on a broad spectrum of soils.

Applications: Designed for immersion, ultrasonic and spray applications, Daraclean® 282GF is safe for use with most metals and is non-aggressive towards aluminum, magnesium and titanium alloys. It possesses excellent soil-rejecting qualities, suspending soils in the cleaner for a short period of time after lifting from a part's surface. Over time, solids will settle out, and oil and grease droplets will coalesce and float on the surface of the solution. Removal of soils can easily be accomplished using filters or skimmers as necessary. This action extends the useful life of Daraclean® 282GF far beyond that of emulsion-type cleaning solutions.

Specification Compliance: Daraclean® 282GF has been tested and certified to meet and exceed most Aerospace industry specifications for aqueous and alkaline cleaners. OEM certifications include Boeing, Douglas, GE, Pratt & Whitney, and Rolls Royce. Independent laboratory tests confirm that Daraclean® 282GF complies with AMS 1526, ARP 1755, and ASTM F-483, F-484, F-485, F-502, F-519, F-945, F-1110 and F-1111. Daraclean® 282GF is SCAQMD Clean Air Certified and is approved to MIL-C-29602.

Part Number & Container Size:

01-6010-40 5 Gal. Pail
01-6010-45 55 Gal. Drum





HEAVY DUTY CLEANERS

Daraclean® 200 Industrial Cleaner

Daraclean® 200 is a low foaming, all-purpose alkaline cleaning solution. Formulated with a blend of surfactants, emulsifiers, and corrosion inhibitors, it is an excellent cleaner for use on a broad spectrum of soils.

Applications: Designed for immersion, ultrasonic and spray applications, Daraclean® 200 is safe for use with most metals and is non-aggressive towards brass, copper, and titanium alloys. It has been proven effective at removing machine oils, lube oils, cutting fluids, buffing compounds, and even tough, carbonized soils. Using aggressive alkaline chemistry, heavy petroleum-based oils and carbonized soils are broken down and pulled free from part surfaces.

Specification Compliance: Daraclean® 200 is easy to use and maintain and is Clean Air Certified to SCAQMD requirements.

Part Number & Container Size:

- 01-6020-40 5 Gal. Pail
- 01-6020-45 55 Gal. Drum



Daraclean® 238 Aerospace Cleaner

Daraclean® 238 is an aerospace approved foaming, heavy duty alkaline cleaning solution. Formulated with a blend of surfactants, corrosion inhibitors, and phosphates, it is an excellent cleaner for use on a broad spectrum of tough soils.

Applications: Designed for immersion and ultrasonic applications, Daraclean® 238 is safe for use with hard metals and is non-aggressive towards aluminum, magnesium, and titanium alloys. It possesses excellent soil-rejecting qualities, suspending soils in the cleaner for a short period of time after lifting from a part's surface. Over time, solids will settle out, and oil and grease droplets will coalesce and float on the surface of the solution. Removal of soils can easily be accomplished using filters or skimmers as necessary. This action extends the useful life of Daraclean® 238 far beyond that of emulsion-type cleaning solutions.

Specification Compliance: Daraclean® 238 has been tested and certified to meet and exceed Aerospace industry specifications for aqueous and alkaline cleaners. OEM certifications include Boeing, Douglas, Lockheed, and Pratt & Whitney. Independent laboratory tests confirm that Daraclean® 238 complies with AMS 1526, ARP 1755, and ASTM F-483, F-484, F-485, F-502, F-519, F-945, F-1110, and F-1111. Daraclean® 238 is also SCAQMD Clean Air Certified.

Part Number & Container Size:

- 01-6080-45 55 Gal. Drum



Daraclean® 259 Optic Cleaner

Daraclean® 259 Optic Cleaner is a low foaming, all-purpose alkaline cleaning solution formulated with a blend of surfactants, corrosion inhibitors, and phosphates. It is an excellent cleaner for use on a broad spectrum of soils and is safe to use with glass, ceramics, plastics, and metal.

Applications: Designed for immersion, spray, and ultrasonic applications, Daraclean® 259 has been proven effective at removing machine oils, lube oils, cutting fluids, buffing compounds, and even tough, carbonized soils. Using aggressive alkaline chemistry, heavy petroleum-based oils and carbonized soils are broken down and pulled free from part surfaces.

Part Number & Container Size:

01-6160-45 55 Gal. Drum



Daraclean® 283 Aerospace Cleaner

Daraclean® 283 is an aerospace approved low foaming, heavy duty alkaline cleaning solution. Formulated with a blend of surfactants, emulsifiers and corrosion inhibitors, it is an excellent cleaner for use on a broad spectrum of soils.

Applications: Designed for immersion, ultrasonic and spray applications, Daraclean® 283 is safe for use with most metals and is non-aggressive towards titanium alloys. It possesses excellent soil-rejecting qualities, suspending soils in the cleaner for a short period of time after lifting from a part's surface. Over time, solids will settle out, and oil and grease droplets will coalesce and float on the surface of the solution. Removal of soils can easily be accomplished using filters or skimmers as necessary. This action extends the useful life of Daraclean® 283 far beyond that of emulsion-type cleaning solutions.

Specification Compliance: Daraclean® 283 has been tested and certified to meet and exceed Aerospace industry specifications for aqueous and alkaline cleaners. OEM Certifications include Boeing, Canadair, and Pratt & Whitney. Independent laboratory tests confirm that Daraclean® 283 complies with AMS 1526†, ARP 1755, and ASTM F-483, F-484, F-485†, F-502, F-519, F-945, F-1110†, and F-1111.

†Except dichromated magnesium, anodized aluminum, and zinc.

Part Number & Container Size:

01-6060-40 5 Gal. Pail

01-6060-45 55 Gal. Drum



HEAVY DUTY POWDER CLEANERS

Daraclean® LC5 Industrial Cleaner

Daraclean® LC5 Industrial Cleaner is a heavy duty powder detergent for use with most metals and hard surfaces. It has proven highly effective at removing dirt, grease, grime, oil, waxes, and buffing compounds. Using powerful chemical action, oils and solids are broken down and pulled free from part surfaces while inhibitors prevent surface pitting and corrosion.

Part Number & Container Size:

01-6400-87 45lb. Pail





MAGNAVU® CLEANERS

MagnaVu® Dip & Spray Cleaners

MagnaVu® formula cleaners are comprised of alkaline builders, surfactants, a corrosion inhibitor, pH adjuster and coupler, and come in both dip and spray formulas to meet all application needs. MagnaVu® cleaners have been tested in pre-cleaning and post-cleaning phases of NDT and determined to have no effect on processing if the part is thoroughly rinsed after cleaning.

Part Number & Container Size:

- 01-5731-40 MagnaVu® Dip Cleaner - 5 Gal. Pail
- 01-5731-45 MagnaVu® Dip Cleaner - 55 Gal. Drum
- 01-5733-45 MagnaVu® Spray Cleaner - 55 Gal. Drum



ADDITIVES

Daraclean® 615 Inhibitor

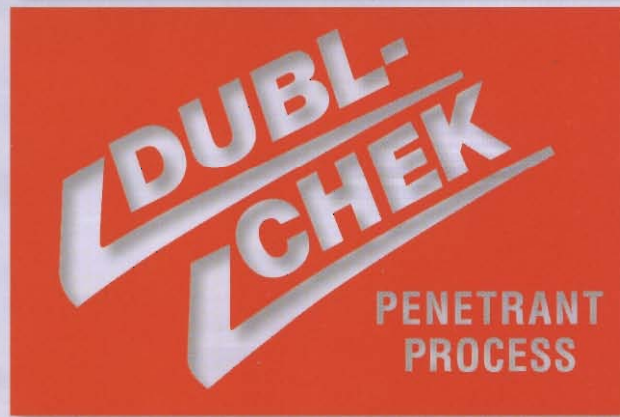
Daraclean® 615 is a non-foaming additive that prevents rust and corrosion. Formulated with a blend of inhibitors and emulsifiers, it is hard water tolerant, free-rinsing, and will not leave mineral films on part surfaces. Daraclean® 615 provides excellent broad-spectrum corrosion resistance to critical part surfaces, without depositing any mineral scale or insoluble films. It forms a monomolecular layer over clean metal surfaces, providing a barrier between the metal and environmental oxidizers and humidity. The monomolecular film rinses away cleanly with solvent, coating prep, or aqueous cleaning.

Applications: Daraclean® 615 is designed to be used with immersion and spray rinses and is safe for use with most metals, and non-aggressive towards aluminum, brass, copper, and titanium alloys.

Part Number & Container Size:





- 01-6120-40 5 Gal. Pail
- 01-6120-45 55 Gal. Drum

SHERWIN



I N C O R P O R A T E D

MATERIALS GUIDE

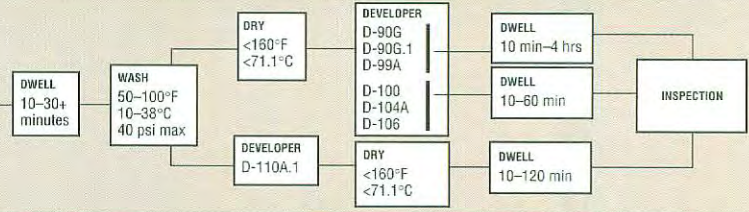
	PRODUCTS	CLASSIFICATION TO AMS-2644	BIODEGRADABLE	DESCRIPTION	TYPICAL APPLICATION	SPECIAL FEATURES
	FLUORESCENT PENETRANT Water-washable (Method A & C)					
	TRI-A	N/A		surfactant-based	ceramic, plastic, and porous parts	crack detection without staining or use of developer
	HM-1	Level 1/2		low sensitivity	non-ferrous metal casting	excellent washability, low penetrant consumption due to low viscosity, excellent electrostatic spray capability flash point over 200 degrees F
	HM-2D	Level 1		low sensitivity		
	HM-220	Level 1	X	low sensitivity		
	HM-3A	Level 2		medium sensitivity	welds, castings forging and extrusions of automotive and aerospace, ferrous and non-ferrous, air frame and turbine engine components	
	HM-406	Level 2		medium sensitivity		
	HM-412	Level 2		high level 2 sensitivity		
	HM-440	Level 2	X	medium sensitivity		
	HM-602	Level 2	X	medium sensitivity		
	HM-430	Level 3		high sensitivity	turbine engine components including turbine blades and critical welds, castings, forging and extrusions	resists over-washing, low background and excellent electrostatic spray capability flash point over 200 degrees F
	HM-604	Level 3	X	high sensitivity		
	HM-607	Level 3	X	high sensitivity		
	HM-704	Level 4	X	ultra-high sensitivity		
HM-707	Level 4	X	ultra-high sensitivity			
FLUORESCENT PENETRANT Post-Emulsifiable (Method B, C & D)						
RC-29	Level 1		low sensitivity	welds, castings, forging in automotive, airframe and turbine engine	low penetrant consumption due to low viscosity, excellent electrostatic spray capability, superior heat resistance, fully approved and proven over two decades flash point over 200 degrees F	
FP-22B	Level 2		medium sensitivity			
RC-50	Level 2		medium sensitivity			
RC-65	Level 3		high sensitivity	critical turbine engine components, e.g. turbine blades, turbine engine rotating parts, discs, fan-blades		
RC-77	Level 4		ultra-high sensitivity			
RC-88	Level 4		ultra-high sensitivity			
FLUORESCENT PENETRANT Water-based (Method A & C)						
I-319 Water-based	N/A	X		liquid oxygen applications	water-base, LOX compatible	
WB-100 Water-based	Level 1	X	low sensitivity	castings, forging in automotive airframe and turbine engine	first approved water-based fluorescent penetrants biodegradable, resists over-washing, non-flammable	
WB-200 Water-based	Level 2	X	medium sensitivity			
	EMULSIFIERS					
	ER-83A	Method D	X	hydrophilic	use with P.E. penetrants and DP-40	qualified to 30% max. concentration – high tolerance to contamination
	ER-85	Method B		lipophilic	use with P.E. penetrants and DP-40	slow diffusion with lower risk of over-emulsification
	DEVELOPERS					
	D-90G	form a		dry powder	dust chamber – hand application, or powder bulb	stabilizes and enhances brilliance to indications
	D-90G.1					
	D-90H					
	D-100	form d & e		nonaqueous alcohol	aerosol, sprayer	refined white particles give thin, more uniform layer refined white particles, dries fast into uniform layer nonhazardous, economical developer for testing large number of parts
	D-104A	form d & e		nonaqueous acetone/alcohol	aerosol, sprayer	
	D-106	form d & e		nonaqueous acetone	aerosol, sprayer	
D-110A.1	form c		water-suspendible	dip tank		
D-113G.1	form b		water-soluble	dip tank		
CLEANERS / REMOVERS						
DR-60	Class 2		hydrocarbon based	use with all visible or fluorescent	excellent solvent action- pre-cleaner and remover more volatile than DR-60, excellent pre-cleaner	
DR-62	Class 2		hydrocarbon based			
LA-1 Cleaner	N/A		hot tank - alkaline	dilution, spray or immersion	non-corrosive, non-toxic, sodium-free	
	VISIBLE DYE PENETRANT					
	DP-40	Method B & C & D Method A & C		P.E. type water washable	welding, castings, forging and extrusions of both ferrous and non-ferrous components and some plastics and ceramics	sharp indications through high color content resist over-washing, high color content flash point over 200 degrees
	DP-50					
	DP-51	Method A & C		water washable		
	DP-52	N/A		water washable		
	DP-54	Method A & C	X	easily water washable	rough castings	easy wash-off for use on heavily textured parts
	BY-LUX	N/A		visible and fluorescent	second look with black light	no second application when closer look needed
HIGH TEMPERATURE SYSTEM						
K-017 Penetrant	Method A & C	X	high temp. visible dye	welding, castings, forging at high temperature	inspection on hot surfaces, no need to cool down parts reducing processing time and inspection costs dwell up to 350 degrees	
K-019 Remover	Class 2		high temp. remover			
D-350 Developer	form d & e		high temp. developer			

SHERWIN GUIDE TO PENETRANT PROCESSES

TYPE I - FLUORESCENT PENETRANTS

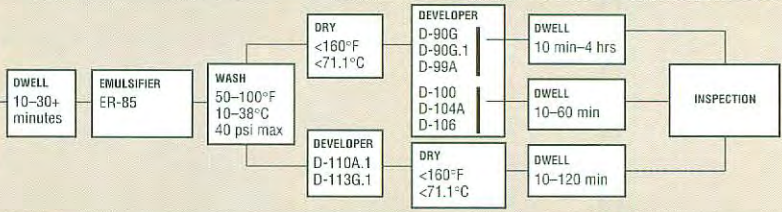
Method A – Water Washable

APPLICATION	PENETRANTS	
Dipping, spraying, flowing or brushing	HM-1	HM-430
	HM-2D	HM-604
	HM-220	HM-607
	HM-3A	HM-704
	HM-406	HM-707
	HM-412	WB-100
	HM-440	WB-200
	HM-602	



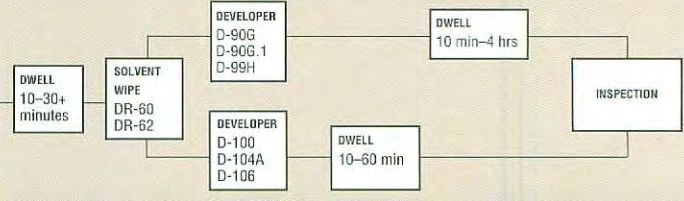
Method B – Post-Emulsifiable, Lipophilic

APPLICATION	PENETRANTS	
Dipping, spraying, flowing or brushing	RC-29	
	FP-22B	
	RC-50	
	RC-65	
	RC-77	
	RC-88	



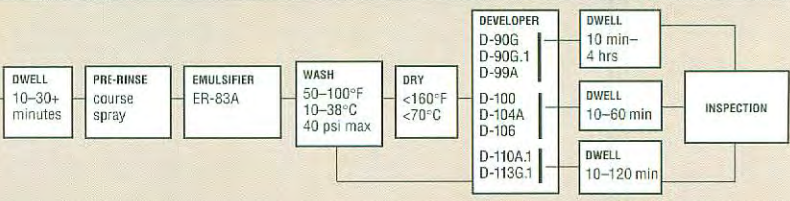
Method C – Solvent Removal

APPLICATION	PENETRANTS		
Dipping, spraying, flowing or brushing	HM-1	HM-602	WB-200
	HM-2D	HM-430	RC-29
	HM-220	HM-604	FP-22B
	HM-3A	HM-607	RC-50
	HM-406	HM-704	RC-65
	HM-412	HM-707	RC-77
	HM-440	WB-100	RC-88



Method D – Post-Emulsifiable, Hydrophilic

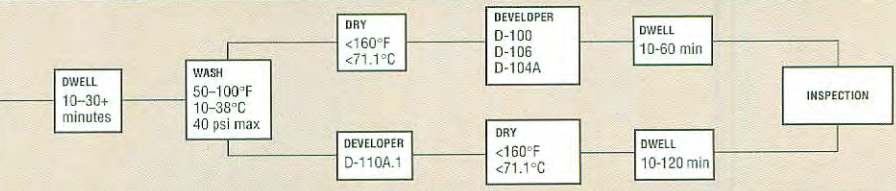
APPLICATION	PENETRANTS	
Dipping, spraying, flowing or brushing	RC-29	
	FP-22B	
	RC-50	
	RC-65	
	RC-77	
	RC-88	



TYPE II - VISIBLE PENETRANTS

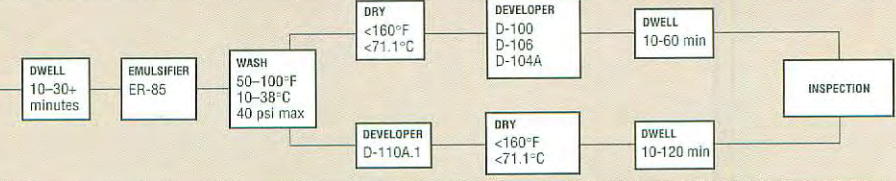
Method A – Water Washable

PENETRANTS
DP-51
DP-50
DP-52
DP-54
BY-LUX



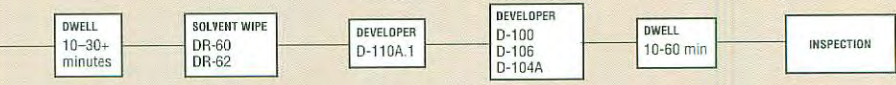
Method B – Post-Emulsifiable, Lipophilic

PENETRANTS
DP-40



Method C – Solvent Removal

PENETRANTS
DP-40
DP-51
DP-50
DP-52
DP-54
BY-LUX



SHERWIN penetrant materials are listed in the Qualified Product List (QPL) of MIL-I-25135E and AMS-2644-1

NOTE: Some specialty products do not meet requirements and are only used for special inspections.

Rolls-Royce
Pratt & Whitney
General Electric
Snecma DMC
Aerospatiale
Turbomeca
FIAT Aviazione
Augusta
MTU
Garrett EMS
Allison
Douglas DMS
Airbus Industry
Boeing BAC 5423
Sikorsky Aircraft
Lockheed
General Dynamics
Northrop
ASME Code Sec V
RDT-F3-6T
AMS/SAE 2647
AMS-3155
AMS-3156
AMS-3157
Embraer
Bombardier



Penetrant Classification System

Penetrants:	Type I	Fluorescent
	Type II	Visible (Red)
Removal Method:	Method A	Water Removable
	Method B	Lipophilic Emulsifier (oil base)
	Method C	Solvent Wipe
	Method D	Hydrophilic Emulsifier (water base)
Removers:	Class (1)	Halogenated (nonflammable)
	Class (2)	Nonhalogenated (flammable)
Developers:	Form a	Dry powder
	Form b	Water Soluble
	Form c	Water Suspensible
	Form d	Nonaqueous
	Form e	Nonaqueous
Fluorescent Sensitivity:	Level 1/2	Ultra Low
	Level 1	Low
	Level 2	Medium
	Level 3	High
	Level 4	Ultra High

Frequency of In-Use Penetrant Tests ASTM E-1417

Each Shift

Water Wash Pressure and Temperature

Daily

Penetrant Contamination
 Dry Developer Condition
 Developer Contamination (form b & c)
 System Performance
 Black Light: Intensity, Reflectors & Filters
 Examination Area Cleanliness

Weekly

Emulsifier (hydrophilic) Concentration
 Penetrant Sensitivity*
 Water Content (water based)
 Aqueous Developer Concentration (b & c)
 Visible & Black Light Integrity

Note: Table as it appears is not a complete summary of the required in-use material tests.

Monthly

Penetrant Water Content (method a only)
 Penetrant Removability* (method a only)
 Emulsifier Water Content (lipophilic only)
 Emulsifier Removability*

Quarterly

Penetrant Brightness*
 Calibrate Drying Oven

Semi-Annually

Calibrate Light Meter
 Water Pressure Gage Calibration
 Water Temperature Gage Calibration

* These tests may be combined and performed during the "system performance" test in accordance with 7.8.4.

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SHERWIN INCORPORATED

Sherwin Incorporated provides a full line of products and related services, including:

Penetrant Products

Visible & Fluorescent
Cleaners & Removers
Emulsifiers
Developers

Specialized Penetrants

Magnetic Particle Products

Test Panels

PSM-5
KDS Twin Panels
Panel Recalibration

Laboratory Services

In-Use Testing
Custom Products

Penetrant Inspection Accessories



Represented by:



DETEK

6805 Coolridge Drive
Temple Hills, MD 20748-6940
301-449-7300 FAX 301-449-7011
www.detek.com email: sales@detek.com

VISIBLE DYE PENETRANT MATERIALS



PRODUCT SUMMARY

VISIBLE PENETRANTS

Sherwin Incorporated produces two standard, visible dye penetrants; one nonwater-washable, and the other water-washable or water-removable.

DP-40 Dye Penetrant (nonwater-washable): Approved Type II, Method B post-emulsifiable and Method C solvent wipe-off penetrant MIL-I-25135 and AMS-2644. (Also, approved Group I and II under MIL-I-25135-C.) Intense red color for maximum color contrast. Meets all applicable codes and standards; ASTM E-1417, ASME, NAVSHIPS, MIL-STD-6866, etc.

DP-51 Dye Penetrant (water-washable): Approved Type II, Method A water-washable or water wipe-off and Method C solvent wipe-off penetrant under MIL-I-25135 and AMS-2644. A water-removable visible dye penetrant with sensitivity equivalent or superior to most nonwater-washable Type II penetrants. Meets all applicable codes and standards; ASTM E-1417, ASME, NAVSHIPS, MIL-STD-6866, ASTM E-1417, etc.

KO-17 HI-TEMP® Penetrant: Visible dye penetrant, approved under MIL-I-25135 and AMS-2644. Finds flaws on surfaces at elevated temperatures, up to 350°F. Saves time; for weldment inspection before complete cooling (maintain pre-heat temperature); in-service inspection of chemical processing equipment, etc. Used with Hi-Temp KO-19 Remover and either D-100 or Hi-Temp D-350 Developer. ASME Code qualification procedure compliance.

(Under certain circumstances, two other Sherwin Incorporated visible dye penetrants, **DP-50** and **By-Lux** may be appropriate. **DP-50** is similar to **DP-51**, but less bright; and may be appropriate for dip tank procedures. **By-Lux** may be useful in operations that combine visible and black light procedures. See "Product Summary — Specialty Penetrant Materials" for a description of these and other specialty products.)

REMOVER/CLEANERS

Three standard "Remover/Cleaners" are provided. All are volatile solvents. Two are nonchlorinated solvents and flammable. A third "Remover/Cleaner" is specially formulated for use on hot surfaces.

DR-60 Cleaner/Remover: Clear solvent. Method C, Class (2) Remover (nonchlorinated) MIL-I-25135/AMS-2644. Flash point about 110°F. Used both for cleaning prior to penetrant application and for penetrant removal by wipe-off method. Evaporates clean without residue. Meets applicable codes and specifications.

DR-62 Cleaner/Remover: Clear solvent. Method C, Class (2) Remover (nonchlorinated) MIL-I-25135 and AMS-2644. Use both to clean prior to penetrant application and to remove penetrant by wipe-off method. Evaporates more rapidly than DR-60. Leaves no residue. Meets applicable codes and specifications.

KO-19 FOAM Remover: Used for removal of both Type I and II penetrants when shallow, wide cracks are suspected. Foam — similar to shaving lather — is emitted from the KO-19 spray can directly on the penetrant treated surface. Foam lifts penetrant from the surface, but not from the cracks. Dry toweling is used to wipe surface clean.

EMULSIFIERS

Two emulsifiers are offered. **ER-85**, a "lipophilic" type, is oil-based and used full strength, and **ER-83A**, a "hydrophilic" type, is detergent-based and used highly diluted with water.

ER-85 Emulsifier (Lipophilic): For use with nonwater-washable visible dye (and fluorescent) penetrants (Method B, MIL-I-25135/AMS-2644). Applied full strength as an over-layer to penetrant following penetrant dwell. Makes possible the removal of nonwater-washable penetrant with water spray.

ER-83A Emulsifier (Hydrophilic): Hydrophilic emulsifier (Method D) is also offered for use with nonwater-washable penetrants including **DP-40**. Process includes a plain water pre-wash before **ER-83A** application. Process provides greater reliability where shallow flaws are suspected.

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DEVELOPERS

Sherwin Incorporated offers three nonaqueous (volatile solvent carrier) developers. **D-100**, is more sensitive, uses alcohol as the carrier, and is flammable. **D-106** is a nonchlorinated solvent based developer that dries more quickly than **D-100**. **D-350** is designed to be used at high temperatures.

D-100 Developer (nonaqueous): Approved MIL-I-25135/AMS-2644 for both Type I and II penetrants. (Also, approved Groups I through VII.) Adsorbent white particles suspended in volatile solvent (alcohol). Maximum sensitivity. Lays on surface in thinner, more uniform coat. Flash point about 60°F. Apply by spraying. Meets all applicable codes and standards.

D-106 Developer (nonaqueous): Approved MIL-I-25135-E/AMS-2644 for Type I and Type II penetrants. Adsorbent white particles suspended in volatile solvent. Lays on surface in thinner, more uniform coat. Apply by spraying. Meets all applicable codes and standards.

D-350 HI-TEMP® Developer: Nonaqueous. Hi-Temp D350 is used with Hi-Temp KO-17 Penetrant and Hi-Temp KO-19 Remover. White adsorbent particles suspended in nonchlorinated, volatile solvent (alcohol). Available only in spray cans. Performs on elevated temperature surfaces; 200°F to 350°F. Approved Group I and III under MIL-I-25135-C.

PRECAUTIONARY INFORMATION

Materials described on this Product Summary should be used in accordance with instructions. Use with adequate ventilation and away from sparks, fire and open flame. Avoid contact with skin. Avoid breathing vapors or spray mist. Do not get in eyes. Do not take internally.

The products listed are for industrial use by qualified personnel only. Like all nondestructive testing methods, the penetrant process has limitations and no penetrant manufacturer claims that the use of these materials will show all dangerous cracks or defects under all conditions.

LIMITED WARRANTY

Buyer agrees that if any of these products are defective, manufacturer's and seller's only obligation shall be to replace the product or refund its purchase price.

FLUORESCENT PENETRANT MATERIALS

MIL-I-25135 - TYPE 1



PRODUCT SUMMARY

Fluorescent penetrants show surface cracks and porosity as glowing lines or dots in a darkened area under "black" (ultra-violet) light. A developing agent is not always necessary but is generally required to amplify the glowing lines or dots.

Fluorescent penetrants come in two basic formulas: "water-washable" and "nonwater-washable." Water-washable penetrants have an integral emulsifying agent and can be removed from the surface by washing with plain water. Nonwater-washable penetrants are not water-miscible and, while a plain water pressure wash will mechanically remove most of the penetrant, a separate emulsifying step is needed for a clean surface.

Water-washable fluorescent penetrants are classified under MIL-I-25135 as Type 1, Method A, while nonwater-washables are classified as Type 1, Method B and/or Method D, depending upon whether a lipophilic (oil base) or hydrophilic (water base) emulsifier is designated. Both water-washable and nonwater-washable penetrants can be classified as Method C, as this solvent wipe-off method is effective with both.

Fluorescent penetrants are also classified according to their "sensitivity," or their ability to detect the smallest flaws, with Level 1/2 being the least sensitive and Level 4 being the highest. The prescribed sensitivity level depends on manufacturing specifications.

WATER-WASHABLE PENETRANTS - METHOD A and C

SENSITIVITY LEVEL 1/2

HM-1 Fluorescent Penetrant — (approved Group V, MIL-I-25135-D & E) For relatively noncritical work. Flash point over 200°F, OSHA Class IIIB. Low sulfur and low halogen. Low cost.

SENSITIVITY LEVEL 1

HM-2D Fluorescent Penetrant — (approved Group V, MIL-I-25135-D & E) Flash point over 200°F, OSHA Class IIIB. Low sulfur and low halogen. Recommended for magnesium and aluminum castings with difficult surfaces.

HM-220 Fluorescent Penetrant — (approved Group V, MIL-I-25135-C, D & E) Flash Point over 200°F, OSHA Class IIIB. Low sulfur and low halogen. Very free rinsing for extremely difficult surfaces. Does **not** contain petroleum distillates and **more** likely to be accepted by sewage treatment facilities.

SENSITIVITY LEVEL 2

HM-3A Fluorescent Penetrant — (approved Group V, MIL-I-25135-C, D & E) Flash point over 200°F, OSHA Class IIIB. Low sulfur and low halogen. Versatile, general purpose material; used extensively on aluminum and magnesium castings. Competitively priced.

HM-406 Fluorescent Penetrant — (approved Group VI, MIL-I-25135-C, D & E) Flash point over 200°F, OSHA Class IIIB. Low sulfur and low halogen. Well recognized penetrant, approved and used by prime aerospace contractors on magnesium, aluminum and titanium castings and extrusions. More sensitive than HM-3A.

HM-412 Fluorescent Penetrant — (approved Group V, MIL-I-25135-D & E) Flash point over 200°F, OSHA Class IIIB. Low sulfur and low halogen. General purpose penetrant, used on aluminum, magnesium, and titanium castings and extrusions. More sensitive than HM-406.

HM-440 Fluorescent Penetrant — (approved Group VI, MIL-I-25135-C, D & E) Flash point over 200°F, OSHA Class IIIB. Low sulfur and low halogen. Free rinsing. Does **not** contain petroleum distillates and **more** likely to be accepted by sewage treatment facilities.

SENSITIVITY LEVEL 3

HM-420C Fluorescent Penetrant — (approved Group V, MIL-I-25135-D & E) Flash point over 200°F, OSHA Class IIIB. Low sulfur and low halogen. Low viscosity, Level 3 penetrant designed for machined, smooth surfaces.

HM-430 Fluorescent Penetrant — (approved Group V, MIL-I-25135-D & E) Flash point over 200°F, OSHA Class IIIB. Low sulfur and low halogen. High sensitivity penetrant, formulated for rough surfaces; the four wheel drive penetrant for rough terrain.

HM-604 Fluorescent Penetrant — (approved Group VI, MIL-I-25135-C, D & E) Flash point over 200°F, OSHA Class IIIB. Low sulfur and low halogen. Where water-washable Level 3 penetrant is designated, **HM-604** is favored, as it does not leave an interfering fluorescent background. Competitively priced! Does **not** contain petroleum distillates and **more** likely to be accepted by sewage treatment facilities.

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SENSITIVITY LEVEL 3

HM-430 Fluorescent Penetrant — Flash point over 200°F, OSHA Class IIIB. Low sulfur and low halogen. High sensitivity penetrant, formulated for rough surfaces; the four wheel drive penetrant for rough terrain.

HM-604 Fluorescent Penetrant — (Group VI) Flash point over 200°F, OSHA Class IIIB. Low sulfur and low halogen. Where water-washable Level 3 penetrant is designated, **HM-604** is favored, as it does not leave an interfering fluorescent background. Competitively priced! Does **not** contain petroleum distillates and is more likely to be accepted by sewage treatment facilities. Resists over-washing.

HM-607 Fluorescent Penetrant — (Group VI) Flash point over 200°F, OSHA Class IIIB. Low sulfur and low halogen. Similar to HM-604 in formulation but more sensitive, not quite as free rinsing, and somewhat more expensive. Does **not** contain petroleum distillates and is more likely to be accepted by sewage treatment facilities. Resists over washing.

SENSITIVITY LEVEL 4

HM-704 Fluorescent Penetrant — Flash Point 200°F, OSHA Class IIIB. Low sulfur and low halogen. Ultra-high sensitivity penetrant used on very smooth surfaces. Does **not** contain petroleum distillates and is more likely to be accepted by sewage treatment facilities.

NONWATER-WASHABLE PENETRANTS - METHODS B, & D, and C

The following nonwater-washable penetrants, RC-29, RC-50, RC-65 and RC-77, are approved as Method B with ER-85 Emulsifier, Method D with ER-83A Emulsifier, or as Method C with any approved "cleaner/ remover."

SENSITIVITY LEVEL 1

RC-29 Fluorescent Penetrant — (Group V) Flash point over 200°F, OSHA Class IIIB. Low sulfur and low halogen. Competitively priced.

SENSITIVITY LEVEL 2

RC-50 Fluorescent Penetrant — (Group V) Flash point over 200°F, OSHA Class IIIB. Low sulfur and low halogen. Approved by major turbine engine manufacturers in addition to DoD.

SENSITIVITY LEVEL 3

RC-65 Fluorescent Penetrant — (Group VI, VIA, & VII) Flash point over 200°F, OSHA Class IIIB. Low sulfur and low halogen. Approved by major turbine engine manufacturers in addition to DoD.

SENSITIVITY LEVEL 4

RC-77 Fluorescent Penetrant — (Group VI, VIB, & VII) Flash point over 200°F, OSHA Class IIIB. Low sulfur and low halogen. Approved by major turbine engine manufacturers in addition to DoD.

RC-88 Fluorescent Penetrant — Flash point over 200°F, OSHA Class IIIB. Low sulfur and low halogen. Ultra-high sensitivity penetrant formulated for critical inspections; increases the visibility of microscopic flaw indications.

EMULSIFIERS FOR FLUORESCENT PENETRANTS - METHODS B & D

Two emulsifiers are offered. One, a lipophilic type, or Method B, is oil based and used full strength. The other, a hydrophilic type, or Method D, is detergent based and used highly diluted with water.

ER-85 Emulsifier (lipophilic): Method B Flash point over 200°F, OSHA Class IIIB. Low sulfur and low halogen. For use with all of the above listed nonwater-washable, fluorescent penetrants. Used in the post-emulsification process. Relatively viscous. Minimizes over-emulsification risk by slow diffusion properties.

ER-83A Emulsifier (hydrophilic): Method D Flash point over 200°F, OSHA Class IIIB. Low sulfur and low halogen. For use with all of the above listed nonwater-washable, fluorescent penetrants. Used in the pre-wash hydrophilic emulsifier process. **ER-83A** is "non-aggressive" with minimum solvent action. It provides greater reliability. A majority of major turbine engine manufacturers have selected **ER-83A** together with RC-77 Penetrant for use on their most critical rotating parts.

ER-83A is diluted with water before use. As shown on the Qualified Products List, **ER-83A** Emulsifier may be used at a solution strength as high as 30% in water by volume. Normally, it is used at a lower strength than the 30% maximum, and for immersion applications, a 20% solution strength is typical. In the spray mode, the solution strength varies from less than 1% to no higher than 5%. (See Product Bulletin **ER-83A** for details.)

Note: QPL-25135 and AMS-2644 specifications do not establish a minimum emulsifier solution concentration, only a maximum. The maximum for **ER-83A** is 30% when used with all of the nonwater-washable penetrants listed above. User established minimum concentrations vary according to surface conditions and pre-wash completeness. For example, smooth surfaces, which accommodate effective pre-washes, may only require a 5% solution.

CLEANER/REMOVERS FOR FLUORESCENT PENETRANTS - METHOD C

Two standard "Remover/Cleaners" are provided. They are nonchlorinated solvents and are flammable

DR-60 Cleaner/Remover: Clear solvent. Method C, Class 2 Remover (nonchlorinated). Flash point about 110°F. Used both for cleaning prior to penetrant application and for penetrant removal by wipe-off method. Evaporates clean without residue. Meets applicable codes and specifications.

DR-62 Cleaner/Remover: Clear solvent. Method C, Class 2 Remover (nonchlorinated). Used both for cleaning before penetrant application and for penetrant removal by wipe-off method. Evaporates more rapidly than DR-60. Leaves no residue. Meets applicable codes and specifications.

Special Note: In accordance with MIL-I-25135/AMS-2644 and MIL-STD-6866/ASTM E-1417, the Class 1 and Class 2 Removers are outside of the "family," or same brand, concept. Sherwin's Cleaner/Removers DR-60, and DR-62 may be used with any QPL-approved penetrants.

DEVELOPERS FOR FLUORESCENT PENETRANTS

Dry Powder

D-90G Developer: Approved "form a." Low sulfur and low halogen. Excellent surface cling.

NonAqueous Developers

Sherwin Incorporated offers two nonaqueous (volatile solvent carrier) developers. One, **D-100**, uses alcohol as the carrier, and is flammable, but gives higher sensitivity performance. The other, **D-106**, is a non-chlorinated solvent carrier formulation, and flammable. It dries more rapidly than the alcohol solvent carrier developer.

D-100 Developer: Approved for both Type I and Type II penetrants. Adsorbent white particles suspended in volatile solvent (alcohol). Maximum sensitivity performance. Lays on surface in thinner, more uniform coat. Flash point about 60°F. Apply by spraying. Meets all applicable codes and standards.

D-106 Developer: Approved for Type I and II penetrants. Adsorbent white particles suspended in volatile solvent. Lays on surface in thinner, more uniform coat. Apply by spraying. Meets all applicable codes and standards.

Water Soluble

D-113G.1 Developer (water soluble): Approved "form b." Low sulfur and low halogen. A powder which dissolves completely in water, typically one pound per gallon. After application and drying, it forms a uniform, thin white coat on the surface. Normally, only used with nonwater-washable penetrants.

Water Suspendable

D-110A.1 Developer—approved "form c" developer. Low sulfur and low halogen. A powder typically mixed with water at one pound per gallon to form a suspension. After application and drying, **D-110A.1** leaves a uniform, thin, white coating on the surface. Exercise care in choosing the proper circulating equipment for keeping developer particles in suspension.

Special Note: In accordance with MIL-I-25135/AMS-2644, MIL-STD-6866, and ASTM E-1417, developers are outside of the "family," or same brand, concept. All Sherwin developers may be used with any QPL-approved penetrant systems.

FLUORESCENT PENETRANT MATERIALS

PRODUCT SUMMARY

PRECAUTIONARY INFORMATION

The materials described on this Product Summary should be used in accordance with instructions. Use with adequate ventilation and away from sparks, fire and open flame. Avoid contact with skin. Avoid breathing vapors or spray mist. Do not get in eyes. Do not take internally.

The products listed are for industrial use by qualified personnel only. Like all nondestructive testing methods, the penetrant process has limitations and no penetrant manufacturer claims that the use of these materials will show all dangerous cracks or defects under all conditions.

LIMITED WARRANTY

Buyer agrees that if the product proves to be defective, the manufacturer's and seller's only obligation shall be to replace the product or refund its purchase price.



HI-TEMP® PENETRANT INSPECTION SYSTEM

PRODUCT INFORMATION

Description: Sherwin Incorporated's Hi-temp® Penetrant System is designed to work at temperatures above which ordinary penetrants are ineffective. Three products comprise the system: K-019 Remover, K-017 Penetrant, and D-350 Developer.

Special Features: The Hi-temp® Penetrant System is effective at higher temperatures. Using the system can reduce inspection costs; waiting times are reduced.

Temperatures rise during welding processes. They also rise under normal operating conditions for certain kinds of equipment, such as pressure vessels, or simply, when inspection work is done in the sun. Often, before moving to a new piece, welders must wait for the current piece to cool before inspecting it. Similarly, some fabrication processes require as much as 24 hours between steps because parts must cool enough to allow inspection with ordinary penetrants. Waiting for parts to cool — generally to less than 140°F — increases processing time, and production costs.

Heat actually enhances the Hi-temp® Penetrant System's performance. Heat drives contaminants from flaws; and heat-expanded flaws trap more penetrant, giving stronger indications after developer is applied. Additionally, Hi-temp® K-017 Penetrant requires less dwell time than ordinary penetrants in order to locate equivalent sized flaws. Finally, Hi-temp® K-017 Penetrant is water washable, so removing excess penetrant does not require a "remover" under most conditions, and post-cleaning of spillage and over-spray is easy.

The Hi-temp® Penetrant System reduces processing time and production costs.

Container Sizes:
case of 12 spray cans
one-gallon cans
case of 4 one-gallon cans
five-gallon pails

Basic Instructions: (These instructions describe the basic process. They may be amended by the user to comply with applicable specifications and/or inspection criteria provided by the contracting agency.)

1. **Cleaning:** Cleaning may be unnecessary prior to applying Hi-temp® K-017 Penetrant because the penetrant itself is highly detergent and dissolves organic contaminants, especially on heated surfaces. In addition, at higher temperatures certain contaminants, such as oils, greases, and waxes, will liquify and be easily displaced, while other contaminants, such as water and solvents, will evaporate. Even so, it may be necessary to use Hi-temp® K-019 Remover before applying the penetrant.

a. **K-019 Application:** Spray or brush Hi-temp® K-019 Remover on the surface and allow to dwell for 1 to 4 minutes; use shorter times for higher temperatures and less contamination.

Wipe K-019 Remover from the surface with clean, dry cloth or paper towels. Then, wipe with water saturated towels. A final wipe with dry towels in order to speed drying may be required at lower temperatures.

Repeat the application/wiping procedure if necessary. Wire brushing may be required to remove scale or other deposits. Paint is generally removed with a torch.

b. **Drying:** The part must be dry before applying Hi-temp® K-017 Penetrant. Hotter parts dry more quickly than cooler parts.

2. **Apply Penetrant:** Spray or brush Hi-temp® K-017 Penetrant on a limited area. It is important that the area to which the penetrant is applied not be too large so processing can be completed within penetrant and developer dwell time restraints. The acceptable area size will vary with inspection temperatures, part geometry, and operator experience.

The penetrant must dwell on the part in order to penetrate surface flaws. At higher temperatures, penetration occurs more quickly. The following table suggests how K-017 dwell times vary with temperature. Allowances must be made for contamination levels and flaw sizes.

225° - 350°F	30 seconds to 1 minute
175° - 225°F	1 - 2 minutes
125° - 175°F	2 - 3 minutes
75° - 125°F	3 - 10 minutes
50° - 75°F	10 - 30 minutes

3. **Remove Excess Penetrant:** It is important that all excess penetrant be removed, otherwise the developer step may be adversely affected.

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- a. **Wipe Surface:** Remove as much **Hi-temp® K-017** Penetrant as possible using paper or soft, clean cloth towels to wipe the surface.
- b. **Apply Remover:** Use **Hi-temp® K-019** Remover to clean remaining penetrant from the surface. **K-019** may be directly sprayed in a thin coat and immediately wiped from the surface. If part surfaces are smooth, using **K-019** may be unnecessary. In either case, as a final step, the part should always be wiped with a water saturated towel or cloth to remove the last traces of penetrant. Immediately follow water wipe with a dry wipe.

Note: The surface must be completely free of both penetrant and remover, or **Hi-temp® D-350** Developer will not lay in an even coat. Generous water usage is suggested.

- c. **Drying:** Use paper or cloth toweling to dry the part's surface thoroughly. Special drying time before applying developer to heated parts should not be required.
4. **Apply Developer:** Two non-aqueous developers may be used with the **Hi-temp®** system: **D-100**, a conventional developer which is recommended for temperatures from 50° - 250°F, and **D-350** which is recommended for temperatures between 175°F and 350°F. When temperatures exceed 175°F, and the more they approach 250°F, the more **D-350** is preferred. (A separate information sheet is available for **D-100**.)

The developer should be sprayed on the part surface from a distance of 6-8 inches immediately after the excess penetrant has been removed and the part has dried. Apply a thin even coat over the entire surface to which **K0-17** Penetrant was originally applied; two or three thin coats are preferred to a single, heavy coat. If penetrant removal is incomplete, the developer will not go evenly on the part.

5. **Observe Indications:** Observe the surface for defect indication formation while the developer is applied.

At high temperatures, flaw indications appear almost instantly. Color depth is greatest within a few seconds after applying developer. Therefore, final surface examination should begin within a minute or two after developer application.

At high temperature, developed indications have a tendency to spread and lose their definition more rapidly. Moreover, some color fading with extended development times must be anticipated. Surface examination should be completed as quickly as practical, and within ten or fifteen minutes.

Red lines usually indicate cracks or lack of fusion. Red dots in a line or curved pattern usually indicate a tight crack. And, scattered dots usually denote porosity.

General Information: Do not attempt to inspect large areas that cannot be processed quickly. Permitting the penetrant to dwell longer than maximum times produces color degradation and excess vapors. Also, penetrant indications lose their resolution and tend to fade when exposed to heat.

At high temperatures, **D-350** Developer may be removed by simple brushing. However, at lower temperatures, complete removal may require wiping with towels dampened with water or **K-019** Remover.

PRECAUTIONARY INFORMATION

All **Hi-temp®** Penetrant System products —**K-017**, **K-019**, **D-350**, and **D-100**— should be used with adequate ventilation and away from sparks and flame, especially when these products are applied to heated surfaces.

D-350 and **D-100** are flammable. Their vapors may cause drowsiness or unconsciousness. Victims should be removed to fresh air; commence CPR if necessary; seek medical attention. In the event of a **D-350** or **D-100** spill, eliminate all sources of ignition, stand-by with fire extinguisher, and contact authorities.

Be careful not to place spray cans containing **Hi-temp®** Penetrant System materials on heated surfaces; heated containers may explode. Never burn, puncture, or heat spray cans: store at less than 120°F; keep out of direct sun.

Wear protective clothing and equipment. Eye contact will cause severe pain and may result in injury. Flush eyes with water and seek immediate medical attention.

K-017 and **K-019** have strong detergent properties and may cause severe skin irritations. Promptly remove from skin by washing with water. Do not wear clothes contaminated with **Hi-temp®** Penetrant System products.

Read and follow safety instructions presented on container labels and on the manufacturer's Material Safety Data Sheets.

QUESTIONS AND ANSWERS ABOUT USING THE HI-TEMP® SYSTEM

Do Hi-temp® penetrants meet sulfur and halogen restrictions of specifications such as ASME Codes III and V, RDT F3-6T, and NAVSHIPS 250-1500?

Definitely. Analyses by a recognized laboratory yielded the following determinations, well below the 1.00% (10,000 ppm) and 0.50% (5,000 ppm) limits:

Hi-temp® Material	Halogens (ASTM D808)	Sulfur (ASTM D129)
K-017Dye Penetrant	0.002% (20 ppm)	0.02% (200 ppm)
K-019Remover	0.002% (20 ppm)	0.01% (100 ppm)
D-100 Developer	0.002% (20 ppm)	0.01% (100 ppm)
D-350 Developer	0.005% (50 ppm)	0.01% (100 ppm)

Complete certification available upon request.

Does the Hi-temp® Dye Penetrant process conform to Article 6, paragraph T-660, "Qualification of Procedures for Nonstandard Temperatures" of ASME Code Section V, as well as comparable paragraphs in Section III and RDT F3-6T?

Yes. An independent laboratory confirmed that K-017Visible Penetrant at elevated temperatures performs as well as conventional visible dye penetrants perform at ambient temperature. After tests, the laboratory concluded that the sensitivity yield of K-017Dye Penetrant with K-019Remover and D-100 Developer on surfaces maintained at 250°F was equivalent to the Mil-I-25135 Group I "Standard" on ambient (about 80°F) surfaces. (Aluminum block comparators, cut into two sections, were used in these tests.)

Similar tests with equally good results have been performed on surfaces of 350°F using Hi-temp® K-017Dye Penetrant and K-019Remover, but substituting D-350 Developer for D-100.

What are the provisions for using the Hi-temp® Penetrant System on NAVSHIPS contracts?

The system is now used in the NAVSHIPS program. Contractors can arrange to use the Hi-temp® process by demonstrating the system's efficacy under a particular contract. The U.S. Military has shown substantial interest in processes which improve performance and lower costs.

In a multi-pass weldment situation, what is the effect of residues from Hi-temp® products on the subsequent weld layer?

In one NAVSHIPS approval program, tests were made where heavy residues of all material were purposely left between weld layers. Subsequent microsectioning and examination revealed no harmful effect.

What are the personal hazards when using the Hi-temp® System?

Wear suitable gloves for protection against contact with heated surfaces during wipe-off step.

At higher temperatures, some irritating vapors will be produced. Where practical, a fan should direct the vapors away from the technician, and, to minimize any adverse effects, small part segments should be inspected at a time. Considering the small area inspected and the brief penetrant dwell before wipe-off—30 to 60 seconds—vapor quantities will be minimal.

In addition, K-017 and K-019 have strong detergent properties and should immediately be flushed from skin and eyes with fresh water.

What about the fire hazard?

Again, very small areas and quantities of material are involved. For example, less than one half ounce of Hi-temp® K-017 Penetrant is required to paint 20 linear feet of 1.5 inch wide weldment. Such small quantities should not alarm safety engineers. Also, Hi-temp® K-017 Penetrant and Hi-temp® K-019 Remover have flash points in the 400°F range. Both developers, D-100 and D-350, are invariably applied from pressurized spray cans, so, even though they are alcohol based, quantities of exposed flammable material in the area are negligible.

The greatest personnel risk would be from leaving a pressurized can on a heated surface.

Why are there two developers, D-100 and D-350? What is the difference between the two?

D-100 Developer, Sherwin Incorporated's standard, normal temperature developer, is effective with the Hi-temp® process on surfaces as hot as 250°F. However, above 250°F, the developer's white particles tend to flake from the surface, so the effective limit of D-100 Developer is 250°F.

SPECIALTY PENETRANT MATERIALS



PRODUCT SUMMARY

The products listed on this summary have been specially formulated by Sherwin Incorporated to meet non-routine penetrant application requirements; i.e., when our more general purpose products may be inappropriate. Descriptions of Sherwin Incorporated's more general purpose products are described in other product summaries.

VISIBLE DYE PENETRANTS

DP-50 Dye Penetrant (Water-Washable): Widely accepted for use without developer to find cracks on surfaces of light colored technical ceramics. Has unusual affinity for ceramic surfaces. Also used extensively on metal surfaces, including weldments. Removable by water-spray, water wipe-off and by solvent wipe-off. Not as sensitive as DP-51—a non-specialty—visible dye penetrant for metal surface inspection. Approved Group III under MIL-I-25135-C. Flash point approximately 160°F.

DP-54 DYE PENETRANT (Water-Washable): Approved Type II, Method A and C, MIL-I-25135-E. "Biodegradable." Contains no petroleum distillates and is more likely to be accepted by sewage treatment facilities. Flash point over 200°F, OSHA Class IIIB. Low sulfur and low halogen. Removable by water spray; water wipe-off; or solvent wipe-off. Free rinsing.

DUAL RESPONSE PENETRANT

BY-LUX™ PENETRANT #1: Approved Group III, MIL-I-25135-C. Remove with water. Flaw marks show red on white D-100 Developer background under normal, or "white light," and glow orange under "black light." Provides two levels of sensitivity. Flash point over 200°F. Also may be used with the hydrostatic leak test. (See "Hydrostatic Leak Detection" below.)

WATER-BASE FLUORESCENT PENETRANT

I-319 FLUORESCENT PENETRANT: Water-washable, water-base penetrant. Uses distilled water; no petroleum solvents or distillates. Considered insensitive to liquid oxygen in its diluted state, so-called "LOX-Compatibility." Has good acceptance for use on plastics. Meets most sanitation districts effluent disposal requirements. Not recommended for finding shallow, or wide cracks. Approved Group VI, MIL-I-25135-C.

HIGH TEMPERATURE PENETRANT MATERIALS

KO-17 HI-TEMP® PENETRANT: Visible dye penetrant, approved Groups I and III, MIL-I-25135-C, D & E. Finds flaws on surfaces at elevated temperatures, up to 350°F. Saves time; for weldment inspection before complete cooling (maintain pre-heat temperature); in-service inspection of chemical processing equipment, etc. Used with Hi-Temp KO-19 Remover and either D-100 or Hi-Temp D-350 Developer. ASME Code qualification procedure compliance.

KO-19 HI-TEMP® REMOVER: For use with Hi-Temp KO-17 Penetrant. Approved Group I remover, MIL-I-25135-C, D & E. Use as a wipe-off remover.

D-350 HI-TEMP® DEVELOPER: Nonaqueous. Hi-Temp D350 is used with Hi-Temp KO-17 Penetrant and Hi-Temp KO-19 Remover. White adsorbent particles suspended in nonchlorinated, volatile solvent (alcohol). Available only in spray cans. Performs on elevated temperature surfaces; 200°F to 350°F. Approved Group I and III under MIL-I-25135-C.

FOAM REMOVER

KO-19 FOAM REMOVER: Used for removal of both Type I and II penetrants when shallow, wide cracks are suspected. Foam — similar to shaving lather — is emitted from the KO-19 spray can directly on the penetrant treated surface. Foam lifts penetrant from the surface, but not from the cracks. Dry toweling is used to wipe surface clean.

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FOAM REMOVER

KO-19 FOAM REMOVER: Used for removal of both Type I and II penetrants when shallow, wide cracks are suspected. Foam — similar to shaving lather — is emitted from the KO-19 spray can directly on the penetrant treated surface. Foam lifts penetrant from the surface, but not from the cracks. Dry toweling is used to wipe surface clean.

HYDROSTATIC LEAK DETECTION

A-416 FLUORESCENT ADDITIVE: Additive for hydrostatic leak testing; provides fluorescent color to the water. When wet, water fluoresces blue; after drying, water fluoresces yellow. A-416 also lowers surface tension and increases water's penetration capability. (A-416 does not contain corrosion inhibiting agents.) Requires "black light" and semi-darkened conditions.

BY-LUX™ PENETRANT #1: By-Lux™ Penetrant is essentially a colorless liquid that turns bright red in contact with water. In hydrostatic leak testing, By-Lux™ enhances leak visibility. By-Lux™ is applied to the seams of the vessel after it is charged with water. By-Lux™ turns bright red where there are even only traces of water seepage.

HOT TANK CLEANER

LA-1 CLEAR CLEANER®: An aqueous cleaner. Use it to replace solvent-based pre-cleaners in the penetrant process and for general cleaning where solvent cleaners might otherwise be used.

PRECAUTIONARY INFORMATION

Materials described on this Product Summary should be used in accordance with instructions. Use with adequate ventilation and away from sparks, fire and open flame. Avoid contact with skin. Avoid breathing vapors or spray mist. Do not get in eyes. Do not take internally.

The products listed are for industrial use by qualified personnel only. Like all nondestructive testing methods, the penetrant process has limitations and no penetrant manufacturer claims that the use of these materials will show all dangerous cracks or defects under all conditions.

LIMITED WARRANTY

Buyer agrees that if the product proves to be defective, manufacturer's and seller's only obligation shall be to replace or refund the purchase price of such product.

With the 350°F preheat temperature required for most multi-pass welds, there is a critical need for a process effective at this higher temperature. D-350 Developer fills this need. With D-350 Developer, the **Hi-temp®** System performs at temperatures slightly in excess of 350°F; D-350 adheres to the surface at this higher temperature.

When should D-100 be used and when should D-350 be used?

The recommendation is to use D-100 Developer from normal temperatures to 250°F, and D-350 from 175°F to 350°F.

There is an overlap between the two developers. Which should be used at, say, 200°F?

If D-100 is already being used with Sherwin Incorporated's normal temperature process, continue using D-100. Otherwise, D-350 is preferred.

Can D-350 Developer be used at temperatures lower than 175°F, say as low as 70°F?

D-350 is not recommended for use at temperatures lower than 175°F. At lower temperatures, D-350 dries more slowly. Also, the particles are more adhering at lower temperatures and require greater effort to remove upon completion of the inspection process. Removing D-350 requires wiping with water dampened toweling.

Is the Hi-temp® System effective at normal temperatures?

Yes. **Hi-temp®** K-017Dye penetrant with K-019 Remover and D-100 Developer do an excellent job of finding cracks at normal and even low temperatures. K-017 does a better job of showing the shallow flaw than conventional penetrants, but the penetrant is not as fluid at lower temperatures. Thus, penetration time should be longer. Also, in a manual wipe (Group I) method, at lower temperatures, the penetrant removal step is too laborious for routine use.

Can chemical processing plants or refineries gain from using the Hi-temp® System?

Absolutely. Such facilities circulate hot fluids. Leaks occur in equipment which produces revenue of hundreds of dollars per hour, or more. Allowing the equipment to cool to 125°F in order to pinpoint and repair leaks as is required by conventional penetrants may take hours. Finding a leak and verifying the repair without cooling saves valuable production time.

Why is the Hi-temp® penetrant dwell time so short —30 to 60 seconds— when conventional penetrants require 10 minutes?

At elevated temperatures, such as 250°F, molecular movement greatly speeds penetration.

If K-017 Penetrant dwelled on a 250°F surface for 10 minutes, what would happen? Would the penetrant volatilize? Would the color be destroyed?

There was no discernible difference between sections of an aluminum comparative test block maintained at 250°F when K-017 dwelled on one section for a full 11 minutes, and on the other section for only 60 seconds. K-017 on both sections was equally fluid and easily removed. Color depth was identical. Sensitivity was the same. The longer dwell time seems to have little effect, either harmful or beneficial. However, 15 minutes is the suggested maximum penetrant dwell time at higher temperatures.

How are developed flaw indications affected by high temperatures?

At high temperatures, flaw indications develop almost instantly. The initial deep red color of an indication is greatest within a few seconds after developer is applied. After a few minutes, the indication tends toward an orange-red shade. However, even after 30 minutes with surfaces maintained at 250°F, flaw marks are still pronounced and well defined with good color contrast.

Do Hi-temp® materials come in spray cans as well as gallons and pails?

Yes. **Hi-temp®** K-017 Penetrant, K-019 Remover, and both D-100 and D-350 Developers are packaged in gallons, pails, and spray cans.

NONDESTRUCTIVE TESTING

LIQUID PENETRANT INSPECTION RANGE

All ARDROX® products meet AMS 2644 requirements.

PENETRANTS

Type	Classification	Sensitivity	Product	Remover/Emulsifier	Developer
Type 1, Fluorescent	Water Washable	Level 1	Ardrox 970P22	- Method A: Water - Method C: Ardrox 9PR50, Ardrox PR1	All developers except Ardrox 9D75
		Level 1+	Ardrox P131E*		
		Level 2	Ardrox P133D		
		Level 2+	Ardrox 970P24		
		Level 2+	Ardrox P134E*		
		Level 3	Ardrox 970P25E†		
		Level 3+	Ardrox P6F4*		
	Level 4	Ardrox P136E*			
	Post Emulsifiable	Level 2	Ardrox 985P12	- Method B: Ardrox 9PR3	All developers
		Level 3	Ardrox 985P13	- Method C: Ardrox 9PR50, Ardrox PR1	
Level 4		Ardrox 985P14†	- Method D: Ardrox 9PR12 (10% concentration)		
Level 3+		Ardrox P7F3*	- Method C: Ardrox 9PR50, Ardrox PR1 - Method D: Ardrox E1 (10% concentration)		
Type 2 Visible	Water Washable	NA	Ardrox P6R† Ardrox 906†	- Method A: Water - Method C: Ardrox 9PR50, Ardrox PR1	Ardrox 9D1B Ardrox NQ1
	Post Emulsifiable	NA	Ardrox 996†	- Method C: Ardrox 9PR50, Ardrox PR1	

EMULSIFIERS & REMOVERS

Removal Method	Product
Method B: Post Emulsifiable, lipophilic	Ardrox 9PR3
Method C: Solvent removable	Ardrox 9PR50† Ardrox PR1†
Method D: Post Emulsifiable, hydrophilic	Ardrox 9PR12 Ardrox E1

DEVELOPERS

Form	Product
Form a: Dry powder	Ardrox 9D4A
Form b: Water soluble	Ardrox 9D75
Form c: Water suspendible	Ardrox 9D76
Form d: Nonaqueous (solvent based)	Ardrox 9D1B†
Form e: Nonaqueous (solvent based)	Ardrox NQ1†

*Volatile Organic Compound free (VOC-free) and Ozone Layer Depleting Substance free (OLDS-free) products. †Available in aerosols.

MAGNETIC PARTICLE INSPECTION RANGE

All ARDROX® products meet AMS and Military standards.

Inspection Description	Product	Form	Bath Vehicle / Solvent Carrier
Fluorescent	Ardrox 8800	Powder	Ardrox Base Oil HF or Water & Ardrox 8771
	Ardrox 8800A	Aerosol	Ardrox Base Oil HF
	Ardrox 8800B	Premixed Bath	Ardrox Base Oil HF
	Ardrox 8810	Powder	Water
	Ardrox 8810L	Liquid Concentrate	Water
Water Conditioner	Ardrox 8771	Liquid	Water
Visible Black	Ardrox 800/3	Aerosol	Ardrox Base Oil HF
White Background	Ardrox 8901W	Aerosol	NA
Petroleum Bath Vehicle	Ardrox Base Oil HF	Liquid	NA

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NONDESTRUCTIVE TESTING EQUIPMENT

Penetrant Inspection Systems

- Modular design provides the ultimate in customization.
- Stations are engineered for compatible shapes and sizes.

OPTIONAL FEATURES

- Lowerators for handling heavy pieces or containers of small parts
- Pumps and fittings
- Folding stainless steel covers on tanks
- Split roofs on rinse, dryer and inspection stations
- Semi-automated or automated system operation
- Electrostatic spray modules
- Effluent treatment systems
- Galvanized rollers with corrosion resistant bearings
- Pneumatic doors



The modular character of the Gould-Bass line of manual penetrant systems makes it possible to provide a fully customized system for each installation. The stations are constructed to mutually compatible sizes and couplings, and are made of compatible materials. As a result, they can simply be selected and mated together as systems.

The first step is to determine the proper approach to the penetrant inspection task. Each application will depend on the kind of part to be tested, together with its characteristic defects. The types and quantities of stations can then be selected.

Station size is determined by piece part, size, weight, shape, and other characteristics. Arrangement of the stations will depend on the space availability and configuration of the production line. For some applications, optional features or customized construction may be required.

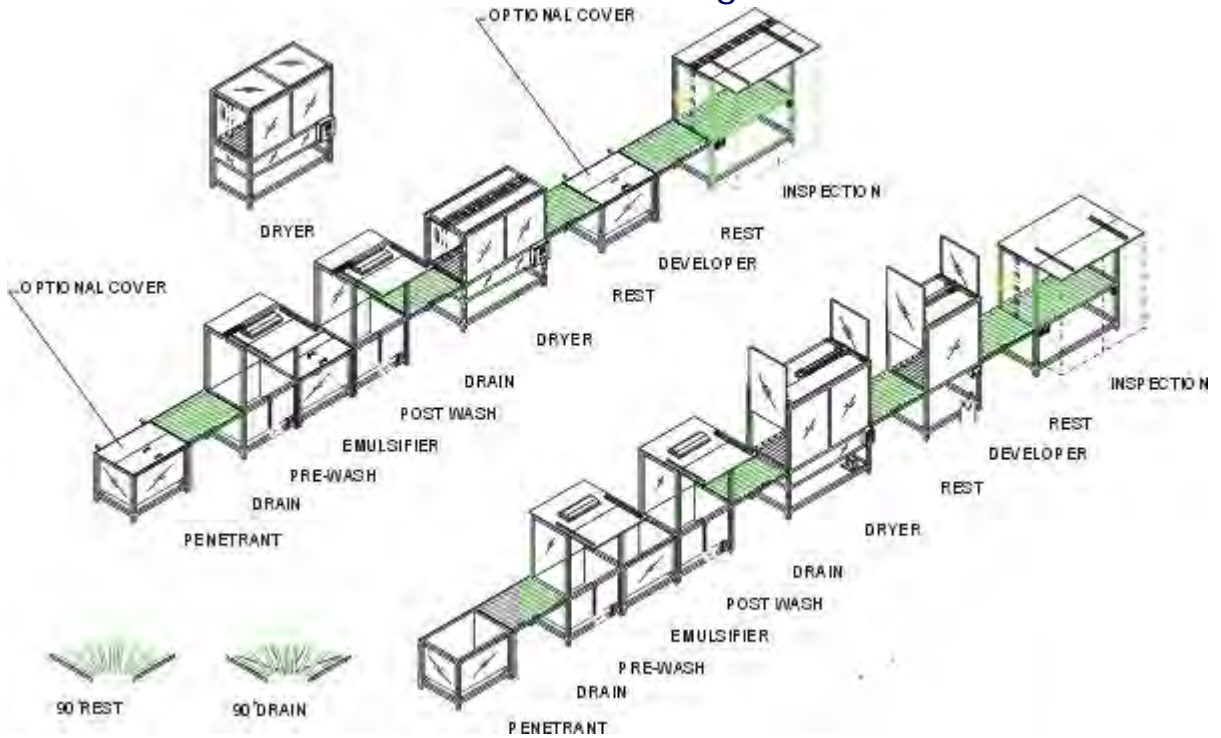
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301-449-7300 ■ 800-638-0554 ■ FAX 301-449-7011
EMAIL: sales@detek.com



NONDESTRUCTIVE TESTING EQUIPMENT



Isometric Design



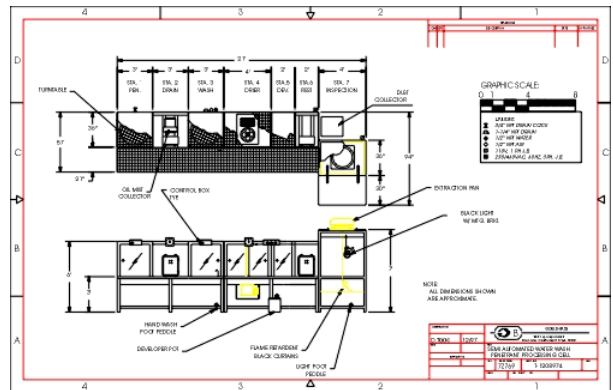
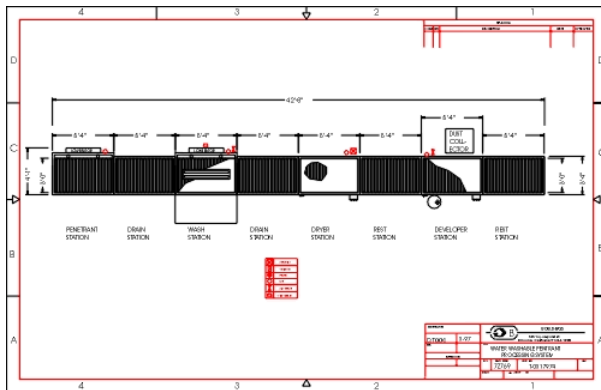
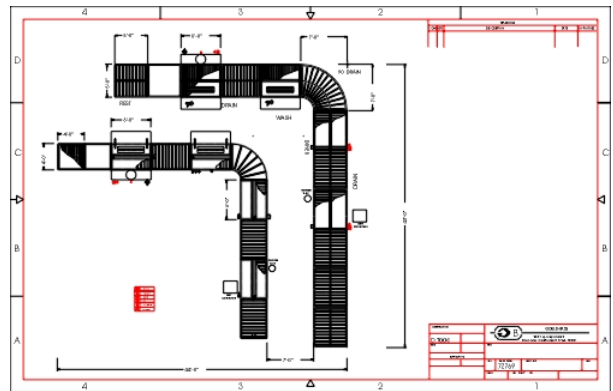
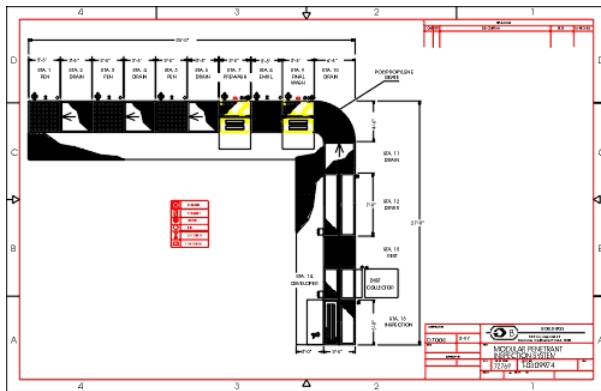
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NONDESTRUCTIVE TESTING EQUIPMENT

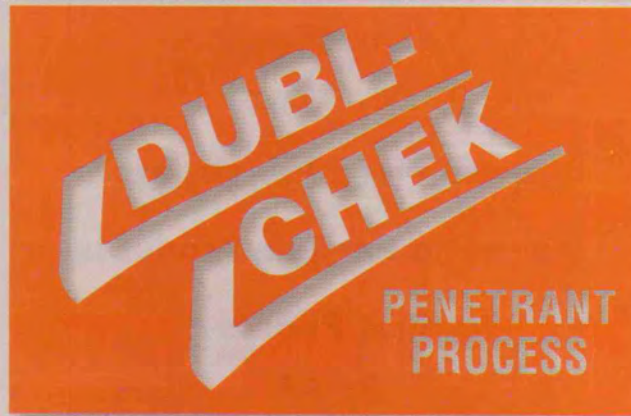
Sample Layouts



If you are considering a liquid penetrant inspection system, a Gould-Bass applications engineer will work with you to determine the proper system to meet your requirements. With your design approval, we can fabricate the system, prove it out, and instruct your personnel in its proper use.

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SHERWIN



I N C O R P O R A T E D

PENETRANT ACCESSORIES



Sherwin, Incorporated provides a full line of products and related services, including:

Penetrant Products

Visible & Fluorescent
Cleaners & Removers
Emulsifiers
Developers

Specialized Penetrants

Magnetic Particle Products

Test Panels

PSM-5
Twin KDS Panels
Panel Recalibration

Laboratory Services

In-Use Testing
Annual Contract Available
UV-A/Visible Meter Calibration

Penetrant Progress Newsletter

PENETRANT ACCESSORIES

WG-1 WASH GUN complete (shown)

A sturdy spray wash gun meeting MIL-I-6866 and ASTM E-1417 requirements. The wash gun is available with or without the full jet nozzle that emits coarse spray without air pressure.

Also: **WG-O** Wash Gun only
WG-N Nozzle only (shown)
WG-R Washer Repair Kit



2C715 WATER TEMPERATURE GAUGE*

Thermometer, dial size 3 inches, temperature range 0 to 250 degrees fahrenheit, stem length 2.5 inches, 1 percentage dual scale accuracy.



CPB94 PRESSURE SPRAYER

Portable, lightweight pressure sprayer for spot application of penetrants, developers, and cleaners. Interchangeable nozzles for mist or pin spray. One quart capacity. Uses shop compressed air. Chrome-plated brass. Measures 9"H x 4"Dia.



10431VP HAND HELD REFRACTOMETER*

Has a built-in temperature compensator to insure accurate readings. Meets MIL-STD-6866 and ASTM E-1417 requirements for weekly testing of hydrophilic emulsifier bath concentration and control of water base penetrants.

Calibration available at Kentucky facility.



244C DEMA INJECTOR

For spraying hydrophilic emulsifier. The emulsifier is drawn into the water stream by the Dema valve, emitting an emulsifier/water spray. The Dema Injector allows the penetrant user to process parts with the hydrophilic method without adding large dip tanks.



N-50 REFRACTOMETER*

Measures hydrophilic emulsifier concentrations. Hand held and equipped with a rubber grip and adjustable eyepiece. Meets MIL-STD-6866 and ASTM E-1417 requirements for weekly testing of hydrophilic emulsifier concentration.

Calibration available at Kentucky facility.



2A645 WATER PRESSURE REGULATOR*

Valve Water Pressure Regulator, brass body, 1/2 FNPT inlet and outlet, 1/4 FNPT in gauge port, adjustable from 3 to 50 PSI, maximum 300 PSI, maximum temperature 140 degrees fahrenheit.



11-555G HYDROMETER*

Monitors aqueous developer concentration and, with the help of a graph, facilitates developer concentration adjustments. Meets the requirements of MIL-STD-6866 and ASTM E-1417 requirements for weekly concentration monitoring.

Sp. Gravity Range 1.00 – 1.07



5WZ19 WATER PRESSURE GAUGE*

For use with water regulators. Standard Pressure Gauge, range 100 PSI, dial size 2 inches, pipe size NPT 1/4 inch, smallest graduation 2 PSI, lower mount.



300 DARKROOM TIMER

Plastic boot over the power switch prevents corrosion from chemicals or water. Easy-to-read numerals on a large 6 1/2 inch diameter face. Numerals, dial and hands are luminous. Setting knob for fast fingertip control. Precision accuracy assured by electric synchronous motor. Buzzer automatically signals end of period. One second to sixty minutes.



2A606 WATER TEMPERATURE GAUGE*

Thermometer, dial size 3 inches, temperature range 0 to 250 degrees fahrenheit, stem length 2.5 inches, back connection.



314F SURFACE TEMPERATURE THERMOMETER*

A dual magnet surface temperature thermometer, designed to measure temperatures of many different surfaces. The bimetallic sensor is a specially processed alloy, pre-conditioned and pre-tested for permanent calibration and maximum stability. The thermometer reaches sensing equilibrium within three minutes, and is accurate within 2%.



* Calibration certificate not provided.

PENETRANT ACCESSORIES (CONTINUED)



APRON

Helps protect clothing.
One size fits all.



NORTH VITON GLOVES

Provides excellent protection from a broad range of chemicals, Penetrants and Mag Particle solutions.
Measures 11 inches long.



SCG 100 CAN GUN

Sherwin Incorporated's Spray Can Gun is an essential accessory for penetrant spray can users. The Can Gun precisely controls the flow of penetrants and developer; improves performance; reduces waste and sloppiness; and speeds production. The Can Gun fits any standard spray can and is reusable.



8998 DISPENSER JAR

Flip up cap and press the 1 1/2 inch diagonal dish—pump fills the dish with enough fluid.
4 oz., 2 1/8 inch diameter, 4 3/16 inch overall height, amber color.



RECTANGULAR STAINLESS STEEL BASKET

304 stainless steel, 4 x 4 mesh

Sizes:

181206 - 18"L x 12"W x 6"H, 3" handles
181806 - 18"L x 18"W x 6"H, 3" handles
181812 - 18"L x 18"W x 12"H, 3" handles
201206 - 20"L x 12"W x 6"H, 3" handles
242412 - 24"L x 24"W x 12"H, 3" handles



ROUND STAINLESS STEEL BASKET

304 stainless steel, 4 x 4 mesh

Sizes:

1010 - 10"W x 10"H, 3" handles
1212 - 12"W x 12"H, 3" handles
1512 - 15"W x 12"H, 3" handles



EXPANDED STAINLESS STEEL BASKET

18 ga. metal basket, 303 stainless steel, 1/2 inch mesh openings.

Sizes:

161004 - 16"L x 10"W x 4 1/2"H
211306 - 21"L x 13 1/4"W x 6"H
241306 - 24"L x 13 1/4"W x 6"H



300D RINSE WATER MANAGEMENT SYSTEM

State-of-the-art ozone injection technology which is designed to breakdown the hydrocarbons and greases of your penetrant waste water to levels low enough to allow you to go directly to drain. Converts the petroleum hydrocarbons to H₂O and CO₂ and destroys the fluorescent dye in the penetrant wastewater. **No** oil-filled filters to replace and **no** hazardous waste to dispose of. Quiet and odorless.

BLACK LIGHTS & ACCESSORIES



SB-100P SPECTROLITE HAND-HELD BLACK LIGHT

Super-high ultraviolet lamp with transformer base. 100-watt. Stay-cool handle. Eight-foot cord. Produces 4,800 μ W/cm² at 15 inches.
Replacement Bulb #100S



BIB-150P SPECTROLITE BLACK LIGHT

Super-high ultraviolet lamp. 150-watt Built-In-Ballast™ bulb eliminates the need for a heavy, external transformer. Lightweight design. Concentrated spot bulb. Eight-foot power cord. Produces 6,000 μ W/cm² at 15 inches.
Replacement Bulb #BLE-150CS

BLACK LIGHTS & ACCESSORIES (CONTINUED)

FC-100 SPECTROLINE BLACK LIGHT

Built-in fan reduces running temperatures and allows faster and easier restarting of lamp. Transformer based, 100-watts. Eight-foot cord. Produces 5,000 $\mu\text{W}/\text{cm}^2$ at 15 inches.

Replacement bulb #100S



Maxima 3500 SPECTROLINE ULTRA-HIGH INTENSITY BLACK LIGHT

Micro discharge light (MDL) technology produces a steady-state UV-A intensity of 60,000 $\mu\text{W}/\text{cm}^2$ at 15 inches—up to 10 times the output of conventional HID inspection lamps. Exposes even the smallest defects, resulting in a more accurate inspection.

Total weight 6.1 lbs. Instant-on eliminates waiting. Replacement bulb #BLE-35RA



REPLACEMENT ULTRAVIOLET BULBS & FILTERS

100S REPLACEMENT 100-WATT BULB AD-MEDIUM BASE (Larger Base)

Replacement spot bulb for use on Spectroline SB-100P and FC100.

Also used on UVP Inc., B-100A & all B-100 lamps.



2F958 REPLACEMENT UV FILTER LENS

For use on Spectroline SP100-P, BIB-150P, FC-100 and ML-3500.

Also, Magnaflux ZB 100, ZB100F and UVP, all models.



100S/M REPLACEMENT BULB MEDIUM BASE (Standard Lamp Base)

Also used on:

Gould-Bass (Ardrox) 1025 & 1040M

Magnaflux ZB-100, ZB23, ZB24, ZB26 & ZB27.

BLE-150CS REPLACEMENT BULB (Self-Ballasted)

For use on:

Spectroline BIB-150

Gould-Bass (Ardrox) #1010



SPECTROLINE BLACK LIGHT BENCH LAMPS

X-15A FLUORESCENT LAMP

Single 15-watt lamp 4.5 x 18.75 x 3.5 inches that produces 1250 $\mu\text{W}/\text{cm}^2$ at 12 inches.



BLE-1800B Replacement Tube

XX-15A FLUORESCENT LAMP

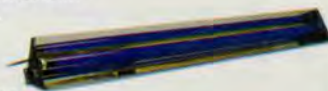
Two 15-watt BLB tubes 4.5 x 18.75 x 3.5 inches that produce 1600 $\mu\text{W}/\text{cm}^2$ at 12 inches.



BLE-1800B Replacement Tube

X-40 FLUORESCENT LAMP

Single 40-watt lamp 6 x 49 x 4 inches that produces 1500 $\mu\text{W}/\text{cm}^2$ at 12 inches.



BLE-7900B Replacement Tube

40-watt four-foot tube (long wave)

XX-40 FLUORESCENT LAMP

Two 40-watt BLB tubes 6 x 49 x 4 inches that produce 1,570 $\mu\text{W}/\text{cm}^2$ at 12 inches.



BLE-7900B Replacement Tube

40-watt four-foot tube (long wave)

BLACK LIGHT METERS



DSE-2000A VISIBLE AND UV DIGITAL METER

Designed to measure long wave ultra violet radiation (black light) in the range of 320 to 380nm, with an accuracy of $\pm 5\%$. Visible Light 380-760 nm $\pm 5\%$.

Recalibration available at Kentucky facility.



DM-365XA ULTRA VIOLET RADIOMETER

Provides unmatched overall accuracy of better than $\pm 5\%$, traceable to NIST. Complies with both MIL and ASTM standards. Easy to read LED display. Water/liquid-resistant.

Recalibration available at Kentucky facility.



J-221 BLACK LIGHT METER

An inexpensive meter designed to measure overall black light intensity between 300nm and 400nm with a peak sensitivity at 365nm. The J-221 is supplied with a sensor cell, a four-foot extension cord for the sensor cell, reduction screen, contrast filter, certification report, and instructions.

Filter Contrast Shield

Recalibration available at Kentucky facility.

EYE PROTECTION



UVS-30 SPECTROLINE SPECTACLES

Protects eyes from exposure to sporadic, low-intensity ultraviolet sources. The well-proportioned frames fit easily over regular prescription glasses.



UVF-80 SPECTROLINE FACE SHIELD

Provides eye protection from exposure to extended or high-intensity ultraviolet sources. Meets both ANSI Specification Z87.1 for safety eye wear and OSHA Standard 1910.133 for eye and face protection.

Adjusts to fit all head sizes.



UVG-50 SPECTROLINE GOGGLES

Protects eyes from exposure to extended or high-intensity ultraviolet sources. Meets both ANSI Specification Z87.1 for safety eye wear and OSHA Standard 1910.133 for eye protection. Adjustable, well proportioned frames fit easily over regular prescription glasses.

PENETRANT TEST PIECES



SHERWIN PSM-5 PENETRANT SYSTEM MONITOR PANEL

A stainless steel panel, 0.090 inch thick, and measuring 4 x 6 inches. A chrome-plated strip runs the length of one side of the panel. Five crack centers are evenly spaced in the chrome plating in order of magnitude; the largest is easily visible with low-sensitivity penetrants, while the smallest is difficult to observe even with high-sensitivity materials.

Adjacent to the chrome-plated section is a grit-blasted area of "medium roughness" to judge penetrant wash characteristics.

The **PSM-5 Panel** comes in two versions. One version **TAM #146040-1** has a polished-chrome strip and a grit-blasted side used for background analysis. The other version **TAM #146040-2** has the polished-chrome strip lightly grit blasted in order to dull the surface. Both versions are manufactured to the Pratt & Whitney TAM #146040 specification.

PENETRANT TEST PIECES (CONTINUED)

SHERWIN TWIN KDS PANELS

A pair of nearly identical panels measuring 2 x 6 inches and 0.090 inch thick with matching crack patterns. Being rugged, Sherwin Twin KDS Panels may be used to satisfy MIL-STD-6866 and ASTM E-1417 requirements for daily system checks. And, having matching cracks of known sizes, the panels may be used to compare penetrant performance.



WTP-1 SHERWIN WASH TEST PANEL

A stainless steel panel measuring 4 x 6 inches and 0.090 inch thick with two parallel, "medium rough" strips, each 6 x 1 1/2 inches separated by a smooth 1 inch strip. The wash panel is used to meet monthly removability testing required by MIL-STD-6866 and ASTM E-1417.



WTP-2 SHERWIN WASH TEST PANEL

The 1.5 x 2 inch panel is made from 16 gauge 301 or 302 stainless steel by grit blasting with 80 mesh aluminum oxide grit and 60 psi of air pressure. The roughened surface that is produced is free of scratches and blemishes. This panel is used to run removability tests, in a laboratory setting.



Twin NiCr SENSITIVITY PANELS

A set of two panels, each measuring 3.875 x 1.875 inches (100 x 35mm), sheared from the same stock with matching crack patterns. Makes simultaneous comparison of two penetrant batches practical. Specify crack sizes of 10µm, 20µm, 30µm, and 50µm.



KC-KIT KLEEN CHEK Q-PON TESTING KIT

Cleaning system monitor helps assure that parts are thoroughly clean and ready to receive penetrant. Nickel-plated coupons with induced cracks to which is applied a soil having a fluorescent tracer. Kit contains four Q-pons and three bottles of soil.



KLEEN CHEK Q-PONS

Replacement coupons for Kleen Chek Testing Kit. Nickel-plated coupons with induced cracks to which is applied a soil having a fluorescent tracer. Each coupon measures 1 x 3 inches.

- KC-3 3 Q-pons
- KC-6 6 Q-pons
- KC-12 12 Q-pons



CAB CRACKED ALUMINUM BLOCK (or "Penetrant Comparator")

Pressure Code, Section V & III, MIL-I-25135 and AMS-2644. The cracked aluminum block is made from SB-211 Type 2024 aluminum, rolled 3/8 inch thick with dimensions of 2 x 3 inches. A notch separates the block's two sides to facilitate side-by-side comparisons.



FC-1 FLUORESCENT COMPARATOR

A plastic ruler with linear and circular fluorescent marks in inches for flaw dimension comparison under UV light. The tool measures graded flaw markings from .005 to .125 inches.

General purpose model.



ADP-1 PANEL FOR AQUEOUS DEVELOPER

Aqueous developer check panel made from aluminum.

Measures 3 x 10 inches.

ASTM E-1417 (Sec. 7.8.2.5).



FC-3 FLUORESCENT COMPARATOR (TAM #135273)

A plastic ruler with linear and circular fluorescent marks in inches and millimeters for flaw dimension comparison under UV light. The tool measures graded flaw markings from .010 to .180 inches (.2 to 4.6mm).

Pratt-Whitney model.

FC-13 FLAW DIMENSION TOOL (TAM #190466A)

Plastic swing-away keys, tapered and angled for tight radius comparisons. Linear and circular fluorescent marks in inches for flaw dimension comparison under UV light. The tool measures graded flaw markings from .010 to .180 inches.

Pratt-Whitney model.

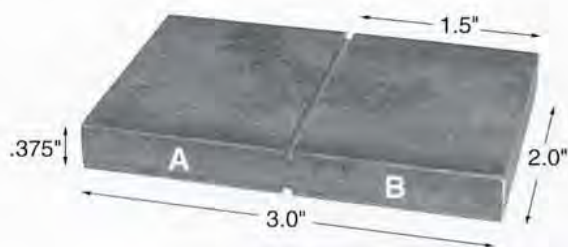


FC-4 FLUORESCENT COMPARATOR (G.E.)

A plastic ruler with linear and circular fluorescent marks in inches for flaw dimension comparison under UV light. The tool measures graded flaw markings from .005 to .125 inches.

General Electric model.

PENETRANT TEST PIECES



Cracked Aluminum Block (Penetrant Comparator):

Meets ASME boiler Pressure Code, Section V & III, MIL-1-25135 and AMS-2644. The cracked aluminum block is made from SB-211 Type 2024 aluminum, rolled 3/8" thick with dimensions of 2 x 3 inches. A notch separates the block's two sides to facilitate side by side comparisons.

Sherwin PSM-5 Penetrant System Monitor Panel:

A stainless steel panel, 0.090" thick and measuring 4 x 6 inches. A chrome plated strip runs the length of one side of the panel. Five crack centers are evenly spaced in the chrome plating in order of magnitude; the largest is readily visible with low sensitivity penetrants, while the smallest is difficult to observe even with high sensitivity materials. Adjacent to the chrome plated section is a grit blasted area of "medium roughness" to judge penetrant wash characteristics.

The **PSM-5 Panel** comes in two versions. Both versions are manufactured to Pratt-Whitney P/N TAM 146040 specifications. One has a chrome strip which has been lightly grit blasted in order to dull the surface. The chrome plated strip of the second version is not grit blasted. Sherwin Incorporated is an authorized manufacturer of TAM 146040 panels.

PSM-5 Panel processing meets MIL-STD-6866 and ASTM E-1417 requirements for daily system check.

Sherwin WTP-1 Wash Test Panel:

A stainless steel panel measuring 4 x 6 inches and 0.090" thick with two parallel, "medium rough" strips, each 6 x 1.5 inches separated by a smooth 1 inch strip. The wash panel is used to evaluate removability testing required by MIL-STD-6866 and ASTM E-1417.



PSM-5 Panel
(Polished)

PSM-5 Panel
(Grit)





Sherwin Twin KDS Panels:

A pair of nearly identical panels with matching crack patterns. Being rugged, **Sherwin Twin KDS Panels** may be used to satisfy MIL-STD-6866 and ASTM E-1417 requirements for daily system checks. And, having matching cracks of known sizes, the panels may be used to compare penetrant performance.



Twin NiCr Sensitivity Panels:

A set of two panels, each measuring 3.875 x 1.875 inches (100 x 35mm), sheared from the same stock with matching crack patterns. Makes simultaneous comparison of two penetrant batches practical. Available in sets having crack depths of 10µm, 20µm, 30µm, and 50µm.



Sherwin WTP-2 Wash Test Panel:

The 1.5 x 2 inch panel is made from 16 guage 301 or 302 stainless steel by grit blasting with 80 mesh aluminum oxide grit and 60 psi of air pressure. The roughened surface that is produced is free of scratches and blemishes. This panel is used to run removability tests.

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SHERWIN TWIN KDS PANELS™

Twin Known Defect Standards*

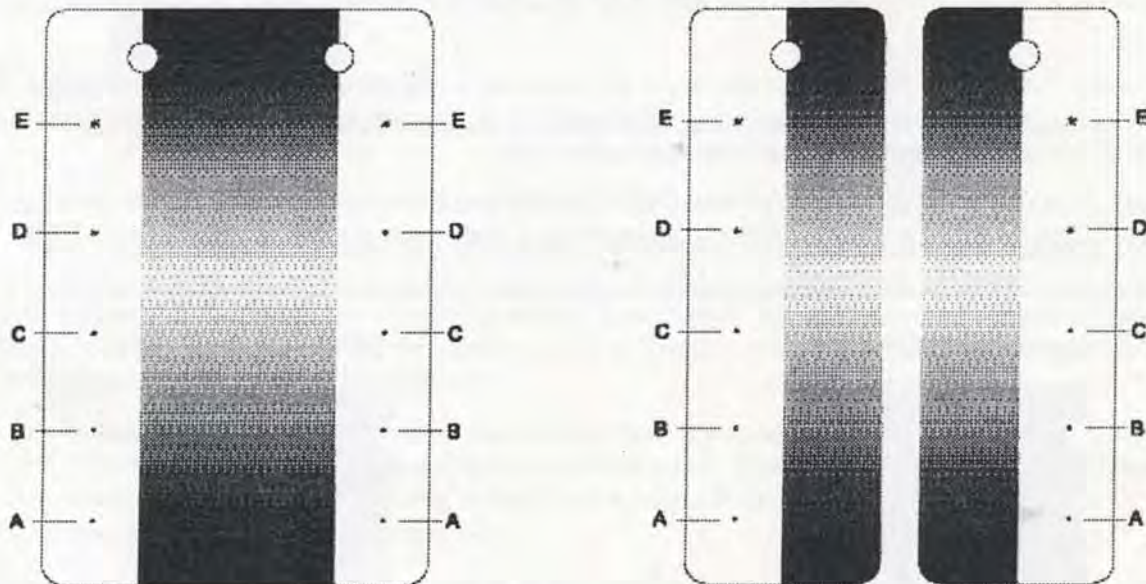
- Penetrant System Monitoring
- Sensitivity Comparison
- System Performance Evaluation



SHERWIN TWIN KDS PANELS are a major improvement over other panels used to monitor fluorescent penetrant system performance and to compare penetrant sensitivity; e.g., TAM and NiCr panels.

Using a new manufacturing process, it is possible to control crack size and depth, while producing panels that are sufficiently rugged to withstand being routinely sent down the penetrant inspection line.

TWIN KDS PANEL MANUFACTURING PROCESS



Plating, grit blasting and cracks induced when the panel is in one piece.

After shearing into two sections, the panel is converted into twins, a matching set.

So precise is the process that Sherwin Twin KDS Panels can be manufactured in pairs of nearly identical twins, permitting the side-by-side comparison of in-use penetrant with unused penetrant, as required by ASTM E-1417.

Users of the fluorescent penetrant inspection (FPI) method of detecting cracks on critical surfaces will find that Sherwin Twin KDS Panels do a far better job of system monitoring. Sherwin Twin KDS Panels are discriminating: they are better at detecting diminished sensitivity and brightness. They are rugged and easy to clean.

Sherwin Twin KDS Panels are the preferred sensitivity and performance comparison tool.

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South Gate, CA 90280

Sherwin Twin KDS Panels Comply With ASTM E-1417

ASTM E-1417 requires a daily penetrant system check using a known defect standard. The purpose of the daily check is to assure that the penetrant system is functioning properly: that there has been no system breakdown, e.g., over-heated oven, inadequate developer application, elevated rinse water temperature, penetrant degradation, etc. After processing the known defect standard through the penetrant system, results must be compared to a similar known defect standard, processed with unused penetrant, or to a photograph.

Sherwin Twin KDS Panels meet the ASTM E-1417 comparison requirement in real time: side-by-side comparison of in-use and new penetrant material, using matching twin panels, not photographs which inaccurately portray fluorescent colors.

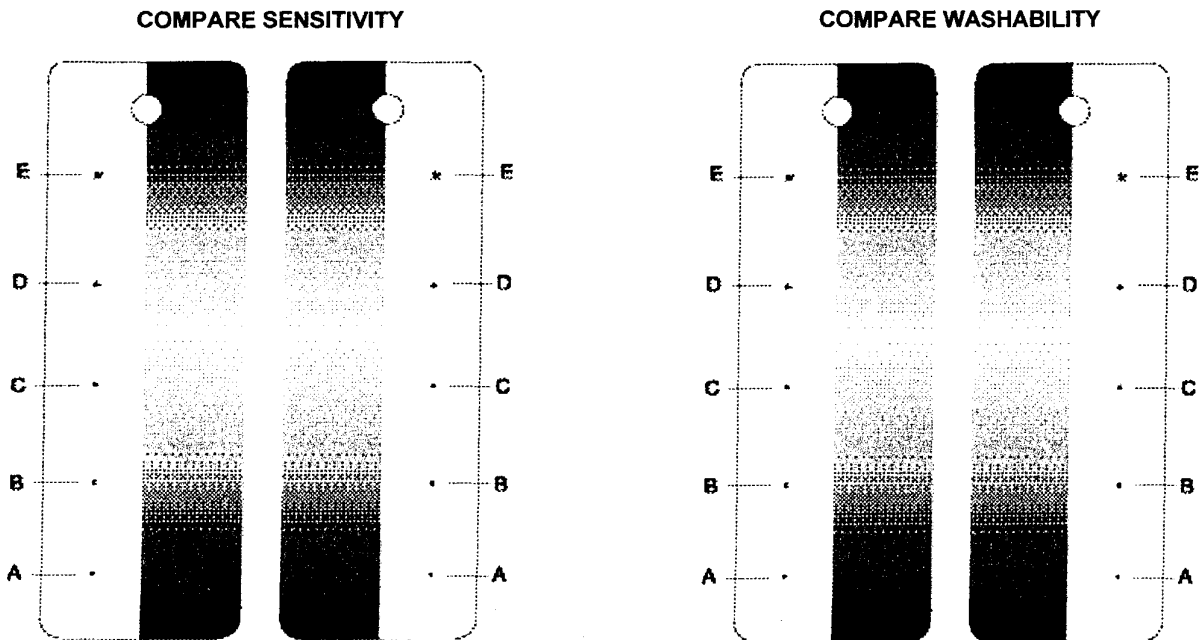
No other panel—not the TAM or the NiCr panel—can meet the requirements of being both a true penetrant comparison tool and system monitor, and of being sufficiently rugged to be sent down the penetrant line.

Sherwin Twin KDS Panels Are Multi-Purpose Comparators

As the Sherwin Twin KDS Panels are “twins,” they may be used to judge relative penetrant sensitivity and relative system performance. They also may be used to compare penetrant removability and washability.

Sherwin Twin KDS Panels can be used to maximize a penetrant system's performance by examining the effects of varying processing parameters; e.g., dwell times, rinse or removal times and pressures, emulsifier strengths, developer application, etc.

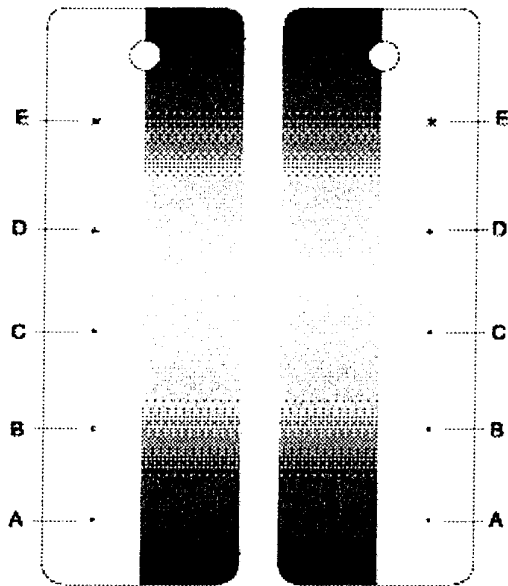
And, of course, as single panels or twins, their primary function is to monitor penetrant systems in order to comply with the ASTM E-1417 requirement for a daily system performance check.



Twin KDS Panels, with the cracked sections side by side, facilitate quick and accurate determination of relative defect visibility.

Twin KDS Panels, with the grit-blasted sections side by side, make fluorescent background comparison simple.

TWIN KDS-TAM MODEL



Twin KDS Panels come in a TAM model for use with Method A water-washable penetrants and for use with nonwater-washable Method B, C & D penetrants.

Crack Size Reference Scale

Crack No.	Inches	MM
A	.015 - .031	0.38 - 0.79
B	.046 - .062	1.17 - 1.59
C	.075 - .093	1.91 - 2.36
D	.125 - .171	3.18 - 4.34
E	.180 - .250	4.57 - 6.35

Description

The Sherwin Twin KDS Panels are two panels, each measuring two by six inches and having five sunburst style cracks induced in a brittle metal plating, which itself has a depth of approximately 0.001 inches (26µm). The cracks run along one side of each panel, top to bottom, in varying diameters. Adjacent to the cracked portion is an unplated strip of medium rough, grit blasted stainless steel for removability evaluation. (See illustrations.)

The panels are produced as twins by accomplishing all of the processing steps—plating, cracking, and grit blasting—while the metal is a single, 4 x 6 inch piece. After processing, the metal is sheared into two separate, twin 2 x 6 inch panels, which share a common serial number and are labeled “A” and “B”. The two panels are nearly identical twins.

The Sherwin Twin KDS Panel comes in a TAM model. The TAM Model is for Method A, water washable penetrants, and for Methods B, C and D, post-emulsifiable penetrants. (See illustration above.) In addition, the manufacturing process is so controlled that Sherwin Twin KDS Panels can be custom manufactured.

Proprietary Manufacturing

Proprietary manufacturing methods insure that the “A” and “B” panels are nearly identical. Our method controls the crack-inducing force, insuring that crack sizes on one panel closely match the crack sizes on the other panel. In addition, the plating bath is specially formulated to insure that the plating holds fast to the substrate without cavities that would retain penetrant or would lead to unpredictable varying crack sizes.

The plating's brittleness is also controlled so that crack size resulting from applied force is predictable.

Sherwin Twin KDS Panels Excel Over TAM Panels

- **Sherwin Twin KDS Panels** have special advantages over other system monitoring test pieces, such as TAM (PSM-5) Panels.
- They do a better job of detecting system malfunctions, e.g., over-emulsification, over-washing, excessive temperatures. They are more sensitive to processing errors.
- Being nearly identical twins and having defects of known size and depth, **Sherwin Twin KDS Panels** can legitimately be used as relative sensitivity and performance comparators.
- Their plated surfaces are typically metallic and without glare. They are not shiny or reflective, giving less distortion.
- They are easily cleaned. A thirty minute soak in a volatile solvent, such as isopropyl alcohol, is all that is required; there is no overnight soaking or residual penetrant to interfere with accurate reading. Testing reliability and speed are improved.

Sherwin Twin KDS Panels Excel Over NiCr Panels

- **Sherwin Twin KDS Panels** are better for testing real life penetrant removal techniques. Their flaws are not open-ended troughs which readily flush free of penetrant and require restricted removal techniques.
- **Sherwin Twin KDS Panels'** base metal is corrosion resistant stainless steel, not brass.
- **Sherwin Twin KDS Panels** are rugged and designed to be sent down penetrant lines, whereas NiCr panels are fragile laboratory tools.
- **Sherwin Twin KDS Panels** have a roughened section to gauge fluorescent background; NiCr panels do not.

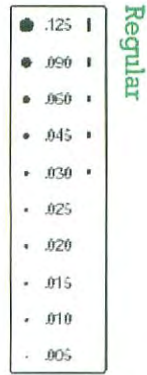
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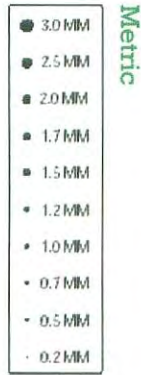
MX Industrial Distributors

35 Steamwhistle Dr. – Ivyland, PA 18974
 Phone: 215-322-8909 – Fax: 215-322-8287

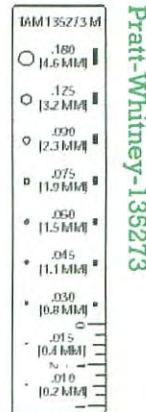
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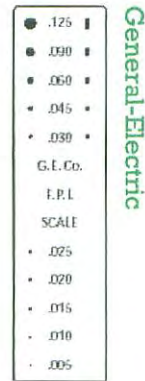
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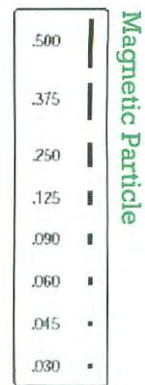
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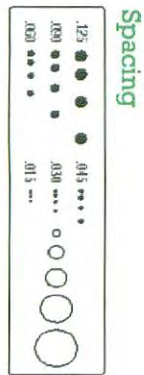
MX-3



MX-4



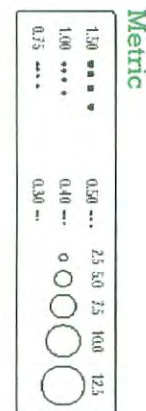
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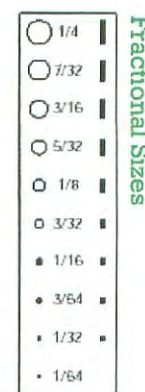
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MX-7



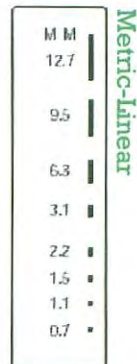
MX-8



MX-9



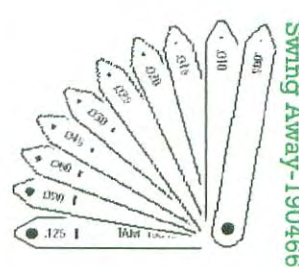
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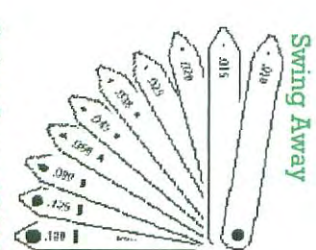
MX-11



MX-12



MX-13



MX-14

*.005 size was removed
 .180 size was added

*Available in the following colors: white, fluorescent green, black and orange.

www.mxindustrial.com – mxind@voicenet.com

Revised 4/25/06



Model "A" and "M" sprayers are our 2 most industrial lines of sprayers. They feature metal construction, brass nozzles, and corrosion resistant working parts. Model "A" Sprayers have a 32 oz. liquid capacity and the Model "M" sprayers have a 24 oz. liquid capacity. Model "A" sprayers feature a steel canister and come with either a powder coated or chrome plated exterior. Model "M" sprayers have an industrial anodized finish on both the interior and exterior. Model "A" sprayers work with oil and solvent based materials and Model "M" sprayers can also be used with water based materials. Partial and complete repair kits are available and all of the nozzles and extensions fit both "A" and "M" sprayers.

ONE QUART CAPACITY STEEL SPRAYER (Model A)



NOT RECOMMENDED FOR PAINT



POWDER COATED FINISH

- A1000 Comes With Multi Purpose Nozzle. Nozzle Is Set For Regular Mist. For Pin Stream Remove #303 Spiral.
- A1002 Nozzle #602, Adjustable From Extra Fine Mist To Pin Stream. Black only.
- A6100 Features Relief Valve. Comes With Multi Purpose Nozzle. Nozzle Is Set For Regular Mist. For Pin Stream Remove #303 Spiral.
- A6102 Features Relief Valve. Nozzle #602, Adjustable From Extra Fine Mist To Pin Stream.

NICKEL-PLATED FINISH

- A1100 Comes With Multi Purpose Nozzle. Nozzle Is Set For Regular Mist. For Pin Stream Remove #303 Spiral.
- A1102 Nozzle #602, Adjustable From Extra Fine Mist To Pin Stream.

24 oz. CAPACITY ANODIZED ALUMINIUM SPRAYER (Model M)



INDUSTRIAL ANODIZED FINISH

- M2400 Nozzle #602, Adjustable From Extra Fine Mist To Pin Stream.

Sure Shot Model "M" sprayers offer the same chemical resistant working parts as the Model "A" sprayers. They come standard with an adjustable nozzle and feature a chemical resistant anodized finish. Model "M" sprayers will work with water, solvent and oil based materials. Model "M" sprayers use the same nozzles and extensions as the Model "A" sprayers. Your choice of either Silver or Black Anodized finish. All Sure Shot® sprayers have a maximum pressure of 200 P.S.I.



**NICKEL PLATED BRASS
NOZZLES OFFER EXCELLENT
CHEMICAL RESISTANCE.**

Milwaukee Sprayer has many different stock nozzles and extensions available for Model A sprayers. Below is a list with some brief descriptions. If you can't find exactly what you want, or if you need something different, contact us using the information on the back. Because we manufacture our parts and accessories, as well as our sprayers, we can modify or customize many items to meet your needs.

NOZZLE / EXTENSION SELECTION
(Available for Model A Units Only)



301

Solid pin stream pattern. For applications where "splash" coverage is preferred or deeper penetration is required (such as penetrating oil, lubrication oil, insecticide, etc.) Ideal for distant or inaccessible areas. Effective range up to 20 feet.



302-B

Solid cone pattern, heavy density. For use where heavier coverage is preferred such as whitewall tire cleaner and machinery cleaner.



302

Standard solid cone pattern, medium density.



302-C

Solid cone pattern, extra fine density. For use where light coverage with a fine mist is preferred such as marking dyes and ink.



305

Solid cone pattern, fine density. For use with lighter liquids and applications that require extra uniformity such as mold release agents and dry-cleaning fluids.



501

Flat, fan-shaped pattern, medium to heavy density. For applications that require a uniform film over a large area such as insecticides, bakers trough grease, etc. Handles heavier viscosity liquids more effectively.



602

Adjustable spray nozzle permits finger-tip regulation of spray from extra fine mist to pin stream. Should not be used with materials harmful to plastics.



707

Extra fine full pattern. Will spray some heavier type liquids.

FILLER CAP



156

"T" handle allows for easy removal and tightening by hand.

NOZZLE EXTENSIONS - 320/345/337

344 Hypodermic tubing 3" long

320 Rigid 3-inch with built-in solid cone medium density spray head.

345 Rigid 3 inch with pin stream spray

337 Pin stream plastic tube, 12"

NOZZLE EXTENSIONS FOR - 301/302/302C/302B/501

325 Rigid 6-inch

335 Bendable brass tube, 12"

330 Flexible Teflon® tube, 12"

NOZZLE EXTENSIONS FOR - 305/550/567/602/707

338 Rigid 6-inch

339 Bendable brass tube, 12"

331 Flexible Teflon® tube, 12"

Individual parts, kits and accessories are available for all Sure Shot® sprayers. Contact us for more information. Toll Free 800.558.7035

SECU-CHEK

UV-LED-Handlamp H-224

RRES 90061 Qualified | Extreme Large Irradiated Area

Revolutionary UV Features:


 Electronic UV-LED Monitoring to use LED-Sources as Discharging Bulb-based UV-Sources without Additional Checks and Records

  Adaption Time Signalization (1, 3 or 5 minutes pre-adjustable)

 Battery Monitoring with Pre-Warning and Security Switch-Off Before Output Drops

 Temperature Monitoring With Pre-Warning and Overheat Protection

  Temperature Regulated and Electronic Monitored Cooling System

 ECO-Mode for Maximum Life-Time and Power-Saving

  Auto Switch-Off When Not Used, Instant ON when Resuming Work, (Can be Deactivated and Pre-Adjusted)

 Qualified and Approved According to Rolls-Royce Engineering Specification RRES 90061

   Guaranteed Requalification Possibility for Upcoming ASTM and ISO Standards (at Least Until 2017)

   Conform to All Actual Major Standards(August 2015)

Revolutionary Whitelight Option:

 Stepless Soft White Light Dimming and Crossfade Features for Maximum Interpretation Capability Instead of Showing Different Picture AND Flash Blinding the Eyes

  UV/VIS Toggling and White Light Shiftable in Addition to UV

   Finely In-Use Adjustable White Light Output With Fallback And Configuration Options



Configuration Option:


 Focussed Spot With Hard Radiation Drop at the Edges

 Flood Lamp With Soft Radiation Drop Extremely Uniform Beam Pattern and Short Minimum Working Distance


 High Quality White Light Options

 All Worldwide Mains Plugs and Voltage Versions Available

Detailed Specification:

 Real Peak 365 ± 5 nm, also at maximum qualified ambient temperature

  Acoustic and Visual Indicators

  Qualified and Approved for Ambient Temperatures from 5° to 50°C (40° - 122° F)

  Exceptional Life-Time

 Robust Design for Reliable Operation Even Under Rough Industrial Conditions

  Engineered and Made in Germany by NDT-experts

 Integrated UV-Pass Filter

 Optional Mains Operation or Rechargeable Battery

 Qualification Report and Certificate of Compliance Stating All Relevant Lamp Individual Results

Lamp Type

	UVE-H224		UVE-H224W	
Beam Pattern	FL	FO	FL	FO
FL: Flood with soft radiation drop at the edges - FO: Focussed spot				

Specification UV-A Radiation

Number of UV-LEDs	8 Highpower UV-LEDs			
Peak-Wavelength	365 ± 5 nm (within the approved ambient temperature range)			
Approved ambient temperature	5 - 50° C (40 - 122° F)			
Full Width Half Maximum (FWHM) UV-Spectrum	maximal ± 10 nm of the peak-wavelength			
Integrated, automatic adaption time signalization	pre-selectable: 1, 3 or 5 minutes after switch-on of UV			
Advanced Electronic UV-LED Monitoring for maximum process reliability and usage of LED lamps without additional checks and records	✓			
Automated shutdown when lamp is not in use (ECO-Mode)	after 3 minutes, immediate reconnection by movement, deactivatable			
Connection possibility for external foot paddels	✓			
Battery monitoring and security switch-off	integrated, with early-warning			
Electronic fan monitoring	✓			
Temperature-sensitive fan control	✓			
Standard conformance, approvals and qualifications (Λ= ready for upcoming standards)*	ASTM E1444, ASTM E1417, ASTM E2297, ASTM E0709, ASTM E165, ASME, EN ISO 3059, EN ISO 3452, EN ISO 9934, NADCAP^, Pratt & Whitney^			
Rolls-Royce RRES 90061 conform	✓	-	✓	-
UV-A intensity (μW/cm²) in 15 in. (38 cm) distance	> 2,600	> 9,000	> 2,600	> 9,000
Irradiated area in 15 in. (38 cm) distance (> 1,000 μW/cm²)	ø 36 - 38 cm	ø 19 - 22 cm	ø 36 - 38 cm	ø 19 - 22 cm
Irradiated area in 15 in. (38 cm) distance (> 100 μW/cm²)	ø 50 - 58 cm	ø 13 - 28 cm	ø 50 - 58 cm	ø 13 - 28 cm
Minimum working distance	7 cm	25 cm	7 cm	25 cm
Typical Lifetime T70 / T50	> 15.000 h / > 18.000 h			
Stability of UV-intensity	> 85 %			
Amount of visible light	< 0,5 fc (< 5 Lux), not visible			
Risk Class acc. DGZfP EM6	2 (up to 9.000 μW/cm²); 3 (more than 9.000 μW/cm²)			

Specification high quality, integrated whitelight functions for daylight inspection (W versions)

Illuminance in 15 in. (38 cm) distance	-	> 115 fc (> 1.250 lx)
Pre-adjustable white light output	-	0.5 - 100 %, fine adjustable
In-use illuminance adjustment	-	0.5 - 100 %, fine adjustable
UV / VIS toggling	-	✓
Shiftable white light (UV + VIS)	-	✓
Automated stepless white light dimming in addition to UV	-	2 dimming speeds or white light switching selectable
Automated stepless crossfading (UV / VIS)	-	
Color temperature TCP (Light color)	5.300 K - 6.000 K (similar to daylight)	
Color Rendering Index (CRI)	-	Ra > 80

Technical Specification

Power Supply	100 - 230V AC/DC-power supply and optional battery
Status Indicators	1 separate multicolor LED for UV and VIS*, acoustic signal
Power Consumption (only UV / with VIS)	35 W / 60 W
Operating Voltage lamp unit	< 50 V DC (SELV)
Electric Protection Class	III (Safety extra-low voltage, SELV)
Weight*: (Lamp unit / complete with power supply)	1.65 lbs / 2.85 lbs

Accessories



Foot-Paddle for Handsfree Operation of the Whitelight Options



Extra Robust Power Supply in Metal Casing, Made in Germany



High Power Rechargeable Li-Ion Battery Pack



UV-Pass Filter



Advanced Power Supply



Various Mounting Equipment and Stands



UV Protection Glasses



Robust Carrying Case

SECU-CHEK

H1 UV LED HANDLAMPS

advanced and professional tools for enhanced fluorescent inspection

GROUNDBREAKING INNOVATION

uncompromising better than bulb-based UV lamps

The Perfect UV-A LED Blacklight for Every Specific Application

REVOLUTIONARY INTERPRETATION



Automatic Stepless
White Light Dimming and
Crossfade Features

*Uninterrupted, relaxed and enhanced observation
of indications by viewing films of transition between
the 3 possible illuminations:*

*UV only / UV and VIS together / VIS only
NO Flash Blinded Eyes, NO Loss of Sharpness,
NO Unneeded Stress for the Eyes*

ORIENTATION AND CLEAR VISION



REAL Floodlamps with Soft Radiation Drop and
NO Inhomogeneity Within the Beam
Even When Moving the Lamp

*UV LED lamps WITHOUT any compromises, always
BETTER than using bulb-based UV sources.*

Clear and sharp display, even of tiny indications.

*WITHOUT loss of inspection performance by using the full detection
capability of the human eye for fast, secure, easy and tireless inspection
NO hotspots even in very short distances*

INVESTMENT SECURITY



Guaranteed Requalification
Possibility for Upcoming Standards (until 2017)
Conform to All Actual Major Standards

*Using UV LED Technology by NOW without worries and
NO waste of money! Paper requalification and necessary
technical upgrades free of charge for upcoming
ASTM, ISO and NADCAP requirements (at least until 2017)*

MAXIMUM PROCESS SECURITY



MORE Secure Inspection due to
Electronic System Monitoring and
Adaption Time Signalization

*Easier, better and more reliable inspection by
additional integrated process support and security features*

HIGH QUALITY



For NDT Professionals
Engineered and
Made in Germany

*Completely designed, manufactured,
assembled and qualified in Germany*



Further Highlights of UVE Series



Electronic UV-LED Monitoring to Use UV LED Sources At Least As Secure As Bulb-based UV Sources



Optional Stepless Soft White Light Dimming and Crossfade Features for Maximum Interpretation Capability



Programmable Adaption Time Signalization (1, 3 or 5 minutes)



High-End White Light in Daylight Quality (5,700 K | CRI > 90)



Individually Configurable by the User



ECO-Mode for Maximum Life-Time and Power-Saving



Exceptional Life-Time



Battery Monitoring with Pre-Warning and Security Switch-Off Before Output drops

Additional Highlights of UVN Series



Adaption Time Signalization



Guaranteed Requalification Possibility for Upcoming Aerospace, ASTM and ISO Standards (at Least Until 2017, for Selected Models)



In-Use Adjustable White Light. Shiftable in Addition to UV / VIS Toggling



Enhanced Ambient Temperature Range 40 - 122°F (5 to 50°C)



Qualified and Approved According to Aerospace Standards



Temperature Monitoring and Overheat Protection With Pre-Warning



Qualification Report and Certificate of Compliance Stating All Relevant Lamp Individual Results



Integrated UV Pass Filter

Highlights of All Series



Real Peak 365 ± 5 nm Always During Operation Within the Qualified Temperature Range



Conform to All Actual Major Standards (November 2015)



Optional UV / White Light Toggling



High Stability of Intensity and Wavelength



Wearless Touch Switches (Work Also When Wearing Gloves)



Exchangeable Rubber Bumper With Integrated Protective Sheave



Monitored Fan Cooling



Integrated Holder for Standard Mount and Fixation Possibility



Battery Monitoring with Security Switch-Off Before Output Drops



Robust Design For Reliable Operation Even Under Rough Industrial Conditions



Acoustic and Visual Indicators



Designed for NDT Applications by NDT-Experts for NDT-Professionals



Mains Supply by AC/DC Transformer and Mobile Battery Supply by Rechargeable NiMH or Lilon Battery Packs



Safety Extra Low Voltage (SELV) at Hand Set



Easy and Tireless Long-Term Usage Based on Groundbreaking Ergonomic and Lightweight Design



Engineered, Manufactured, Assembled and Qualified in Germany

Select the perfect UV LED lamp for your needs from 48 different models and many options:

3 Series

- UVS** Basic Series for Standard Applications
- UVN** Advanced Series for Applications with Enhanced Requirements
- UVE** Professional Series with Advanced Monitoring Features for Maximum Process Security

Optional White Light Features

- UV** Automatic Stepless White Light Dimmung and Crossfade Features
- UV** **UV** UV / White Light Toggling and White Light Shiftable in Addition to UV
- IN USE** In-Use Adjustable White Light Output, With Fallback Option

Beam Style

- Focused Spot** With Hard Radiation Drop at the Edges
- Flood Lamp** With Soft Radiation Drop at the Edges and Extreme Homogeneity of the Beam

Number of UV LED Elements

- 3 to 6 UV-LEDs to Select Various Intensities (1,700 to 12,500 $\mu\text{W}/\text{cm}^2$) and Irradiation Area Sizes























Power Supply

- All Worldwide Mains Plugs and Voltages** Versions Available
- AC/DC** External Standard Transformer with Permanently Fixed Cables Made in Europe
- Li-Ion** Extra Lightweight, High Power Rechargeable Li-Ion Battery Pack
- Extra Robust Metal Cased Transformer** Made in Germany
- Aluminium Cased Transformer** for Expanded Connections Made in Germany
- NiMH** Rechargeable NiMH Battery Pack

Accessories

- Foot-Paddle** for Handsfree Operation of the White Light Options
- Robust Carrying Case**
- MOUNT + HOLD** Various Mounting Equipments
- UV** UV Pass Filter
- UV** UV Protection Glasses
- Retractable** Qualified Retractable Coiled and Straight Extension Cords

Detailed UV Specification:

-  Real Peak 365 ± 5 nm
Always During Operation
Within the Qualified Temperature Range
-  Battery Monitoring With
Security Switch-Off
Before Output Drops
-  Robust Design for Reliable
Operation Even Under
Rough Industrial Conditions
-   Conform to Actual Major Standards
(November 2015)
-  
-  
-  
-  Groundbreaking Ergonomic and
Lightweight Design for
Easy and Tireless Long-Term Usage
-  Monitored
Fan Cooling
-  Temperature Monitoring
and Overheat Protection
-   10,000 Hours Typical Operation Time with
At Least 70% of the Output at Delivery
Under Real Conditions
-   Qualified and Approved for Ambient Temperature from
5° to 40° C (40° - 105° F)
-  Mains Supply by AC/DC Transformer and
Mobile Battery Supply by
Rechargeable NiMH or Lilon Battery Packs
-   Acoustic and
Visual Indicators
-  Standard Qualification Report and
Certificate

High Quality White Light Option:

-  UV / White Light Toggling
-  Multi-Level Pre-Adjustable
White Light Output
-   High Quality Cool White Light
(5,000 K | CRI > 80)
Large Illumination Area

















We reserve the right of error, improvement and technical modification without notice.








1H1016v

Advanced UV Features:








-  **Qualified and Approved According to Rolls-Royce RRES 90061**
-  **Adaption Time Signalization 1 Minute**
-  **Ideal for NDT**
-  **Qualified and Approved for Ambient Temperatures from 5° to 50° C (40° - 122° F)**
-  **Temperature Monitoring and Overheat Protection With Pre-Warning**
-  **Guaranteed Requalification Possibility for Upcoming Aerospace, ASTM and ISO Standards (at Least Until 2017, for Selected Models)**
-  **ASME CODE**
-  **NADCAP**
-  **ASTM E2297**
-  **ASTM E3022**
- Conform to All Actual Major Standards (November 2015)**
-  **Integrated UV-Pass Filter**
-  **T₇₀ 12,5K**
-  **T₅₀ 15K**
- Superior Life-Time**
-  **Detailed Qualification Report and Certificate of Compliance Stating All Lamp Individual Results**

Advanced White Light Option:

-  **White Light Shiftable in Addition to UV**
-  **In-Use Adjustable White Light Output**
-  **5.000 KELVIN**
-  **CRI >80**
- High Quality Cool White Light (5,000 K | CRI > 80) Large Illumination Area**
-  **UV / White Light Toggling**
























Basic Specification:

-  **Real Peak 365 ± 5 nm Always During Operation within the Qualified Temperature Range**
-  **Robust Design for Reliable Operation even under Rough Industrial Conditions**
-  **Mains Supply by AC/DC Transformer and Mobile Battery Supply by Rechargeable NiMH or Lilon Battery Packs**
-  **Battery Monitoring with Security Switch-Off Before Output Drops**
-  **Groundbreaking Ergonomic and Lightweight Design for Easy and Tireless Long-Term Usage**
-  **Monitored Fan Cooling**
-  **Acoustic and Visual Indicators**




We reserve the right of error, improvement and technical modification without notice.



Revolutionary UV Features:










-  **Electronic UV-LED Monitoring to Use UV LED Sources At Least As Secure As Bulb-based UV Sources**
-   **Programmable Adaption Time Signalization (1, 3 or 5 minutes)**
-  **Qualified and Approved According to Rolls-Royce RRES 90061**
-  **Individually Configurable by the User**
-   **Guaranteed Requalification Possibility for Upcoming Aerospace, ASTM and ISO Standards (at Least Until 2017, for Selected Models)**
-   **Conform to All Actual Major Standards (November 2015)**
-   **Conform to All Actual Major Standards (November 2015)**
-    **ECO-Mode for Maximum Life-Time and Power-Saving, Auto Switch-OFF and Switch-ON**
-    **Acoustic, Visual and Tactile (Vibrating) Indicators**
-   **Exceptional Life-Time of more than 18.000 hours Time of Usage Under Real Conditions**
-  **Retractable Coiled Power Cord**
-  **Detailed Qualification Report and Certificate of Compliance Stating All Lamp Individual Results**

Revolutionary White Light Option:

-  **Stepless Soft White Light Dimming and Crossfade Features for Maximum Interpretation Capability Instead of Showing Different Pictures and Flash Blinding the Eyes**
-    **In-Use Adjustable White Light Output, With Fallback Option**
-  **White Light Functions Additionally Hands-free Operable by Foot Paddles**
-    **High-End White Light in Daylight Quality (5,700 K | CRI > 90) Extreme Uniform and Large Illumination**
-   **White Light Shiftable in Addition to UV / White Light Toggling**



Basic Specification:

-  **Real Peak 365 ± 5 nm Always During Operation Within the Qualified Temperature Range**
-  **Battery Monitoring with Pre-Warning and Security Switch-Off Before Output Drops**
-   **Qualified and Approved for Ambient Temperatures from 5° to 50° C (40° - 122° F)**
-  **Groundbreaking Ergonomic and Lightweight Design for Easy and Tireless Long-Term Usage**
-  **Temperature Monitoring and Overheat Protection With Pre-Warning**
-  **Integrated UV-Pass Filter**
-  **Robust Design for Reliable Operation Even Under Rough Industrial Conditions**
-  **Mains Supply by AC/DC Transformer and Mobile Battery Supply by Rechargeable NiMH or Lilon Battery Packs**



For detailed product and qualification information, contact or visit us at www.secu-chek.com/uve-h1

UV-LED-Floodlamps UVED-S



- extra long-lasting, state-of-the-art LED-Technology
- Peak-Wavelength: 365 nm (± 5 nm)
- extra large irradiation area for optimal examination performance
- exceptional uniform distribution of the UV-radiation
- instant ON/OFF
- any irradiation area feasible
- low heat development
- tough industrial-grade for 24/7 and heavy duty use
- optional finely dimmable white light, shiftable in addition to UV or autonomous usable
- NO visible reflections, also on shining surfaces
- maximum contrast
- maximum stability of intensity and wavelength
- high-quality fan-cooling
- according to ISO/DIS 3059, ISO 9934, ISO 3452, ASTM- und ASME-standards
- engineered and manufactured in Germany

exceptional uniform distribution of the radiation

UV-intensity adjustable ex works

shiftable + dimmable white light up to 185 fc (2.000 lux)



further product information on the back side and
www.uv-led-lamp.com/uv-led-s

UVED-S stationary UV-LED-Floodlamps for industrial usage

Type:	Focus:**	UVED-S712W	UVED-S712	UVED-S710S	UVED-S710SW	UVED-S610	UVED-S608S	UVED-S508	UVED-S507S
Order Number:		800-UVED-S712W	800-UVED-S712	800-UVED-S710S	800-UVED-S710SW	800-UVED-S610	800-UVED-S608S	800-UVED-S508	800-UVED-S507S
Peak-Wavelength:		365 nm (± 5nm)							
FWHM (Full Width Half Maximum):		< 15 nm							
UV-A-Intensity in 38 cm (15 in.) Distance (high level):	FL	> 3,000 µW/cm ² (30 W/m ²)	> 2,200 µW/cm ² (22 W/m ²)	> 3,000 µW/cm ² (30 W/m ²)	> 2,000 µW/cm ² (20 W/m ²)	> 2,600 µW/cm ² (26 W/m ²)	> 2,000 µW/cm ² (20 W/m ²)	> 2,000 µW/cm ² (20 W/m ²)	> 2,000 µW/cm ² (20 W/m ²)
	F1	> 5,500 µW/cm ² (55 W/m ²)	> 4,000 µW/cm ² (40 W/m ²)	> 5,500 µW/cm ² (55 W/m ²)	> 4,000 µW/cm ² (40 W/m ²)	> 5,000 µW/cm ² (50 W/m ²)	> 4,000 µW/cm ² (40 W/m ²)	> 5,000 µW/cm ² (50 W/m ²)	> 4,000 µW/cm ² (40 W/m ²)
	F2	> 6,700 µW/cm ² (67 W/m ²)	not available	> 7,500 µW/cm ² (75 W/m ²)	not available	> 6,300 µW/cm ² (63 W/m ²)	not available	not available	not available
Minimum Working Distance:	FL	14 cm [5.5 in.]	15 cm [6 in.]	10 cm [4 in.]	15 cm [6 in.]	20 cm [8 in.]	25 cm [10 in.]	31 cm [12 in.]	25 cm [10 in.]
	F1	23 cm [9 in.]	25 cm [10 in.]	20 cm [8 in.]	25 cm [10 in.]	31 cm [12 in.]	34 cm [13 in.]	34 cm [13 in.]	25 cm [10 in.]
	F2	26 cm [10 in.]	not available	34 cm [13 in.]	not available	34 cm [13 in.]	not available	34 cm [13 in.]	not available
Irradiated Area in 38 cm (15 in.): > 1,000µW/cm ² (10 W/m ²)	FL	70 x 40 cm (28 x 16 in.)	65 x 35 cm (26 x 14 in.)	60 x 40 cm (24 x 16 in.)	55 x 35 cm (22 x 14 in.)	50 x 40 cm (20 x 16)	45 x 35 cm (18 x 14 in.)	45 x 35 cm (18 x 14 in.)	45 x 35 cm (18 x 14 in.)
	F1	65 x 35 cm (26 x 14 in.)	not available	55 x 35 cm (22 x 14 in.)	not available	45 x 35 cm (18 x 14 in.)	not available	45 x 35 cm (18 x 14 in.)	not available
	F2	65 x 35 cm (26 x 14 in.)	not available	55 x 35 cm (22 x 14 in.)	not available	45 x 35 cm (18 x 14 in.)	not available	45 x 35 cm (18 x 14 in.)	not available
Irradiated Area in 38 cm (15 in.) > 100µW/cm ² (1 W/m ²) (realized area):	FL	105 x 95 cm (41 x 37 in.)	90 x 80 cm (35 x 32 in.)	95 x 85 cm (37 x 33 in.)	90 x 80 cm (35 x 32 in.)	85 x 75 cm (33 x 30 in.)	70 x 60 cm (28 x 24 in.)	70 x 60 cm (28 x 24 in.)	70 x 60 cm (28 x 24 in.)
	F1	90 x 65 cm (35 x 26 in.)	70 x 50 cm (28 x 20 in.)	80 x 60 cm (32 x 24 in.)	70 x 55 cm (28 x 22 in.)	60 x 50 cm (24 x 20 in.)	50 x 40 cm (20 x 16 in.)	50 x 40 cm (20 x 16 in.)	50 x 40 cm (20 x 16 in.)
	F2	85 x 60 cm (33 x 24 in.)	not available	70 x 55 cm (28 x 22 in.)	not available	55 x 45 cm (22 x 18 in.)	not available	55 x 45 cm (22 x 18 in.)	not available
UV Intensity Levels:		1							
Stability of UV-Intensity		> 90%							
Number of UV-LEDs:		39	33	28	26	24			
Visible Output:		< 2 Lux	< 5 Lux	< 2 Lux	< 5 Lux	< 2 Lux	< 5 Lux	< 2 Lux	< 5 Lux
Visible Reflections:*		NO Reflections	minimal, substantial less than HID-UV-Sources	NO Reflections	minimal, substantial less than HID-UV-Sources	NO Reflections	minimal, substantial less than HID-UV-Sources	NO Reflections	minimal, substantial less than HID-UV-Sources
Typical Life Time T70		> 10,000 h	> 8,000 h	> 10,000 h	> 8,000 h	> 10,000 h	> 8,000 h	> 10,000 h	> 8,000 h
Typical Life Time T50		> 15,000 h	> 12,000 h	> 15,000 h	> 12,000 h	> 15,000 h	> 12,000 h	> 15,000 h	> 12,000 h
Risk Class according to DGZfP EM-6:		2							
Allowed Ambient Conditions:		Temperature: 0 - 55 °C (35 - 135 °F), Humidity: 20 - 80 % (non-condensing)							
Shiftable and Autonomous Usable White Light:		finely dimmable	not available	finely dimmable	not available	not available	not available	not available	not available
Dimmable White Light		stepless 20 - 800 Lux via control dial	not available	stepless 20 - 800 Lux via push button	not available	not available	not available	not available	not available

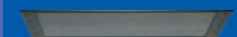


robust, multipurpose fixture for easy and stable mounting
800-UVED-S-Z-UH500
800-UVED-S-Z-UH6007



protection-pane attachment set
800-UVED-S-Z-SSBS

UV-permeable protection-pane
3 different sizes
800-UVED-S500-XSS3
800-UVED-S600-XSS3
800-UVED-S700-XSS3



high-quality white-light filter for zero VIS-emission and NO reflections
800-UVED-SFG-XXX-YY



foot-operated dimmer for all UVED-lamp types to dimm UV or VIS (customizable)
800-UVED-SW-FR



customizable ON/OFF-foot-switch for UV and/or VIS
800-UVED-SW-FS-UVWL

We reserve the right of error, improvement and technical modification without notice.

* when using ISO/DIS 3059 conform, clear UV-Protection-Glasses (Article 800-UV-SB-NR)

** FL: Floodlamp F1: softly focussed F2: focussed



RIL-CHEMIE Marc Breit
An der Faehre 7a - 9
66271 Kleinblittersdorf

+49 6805-942574-0
www.uv-led-lamp.com
info@uv-led-lamp.com

further information and accessories:
www.uv-led-lamp.com/uv-ed-s



Version: 10/2012


SPECTROLINE®

Inspection Products for Nondestructive Testing

Solutions for the NDT Technician



ISO 9001:2008
CERTIFIED COMPANY

NDT: AN OVERVIEW

Nondestructive testing (NDT) is a procedure used to examine and/or inspect materials and components to locate surface and subsurface defects in a way that allows such materials to be examined without changing or destroying their original design or structure.

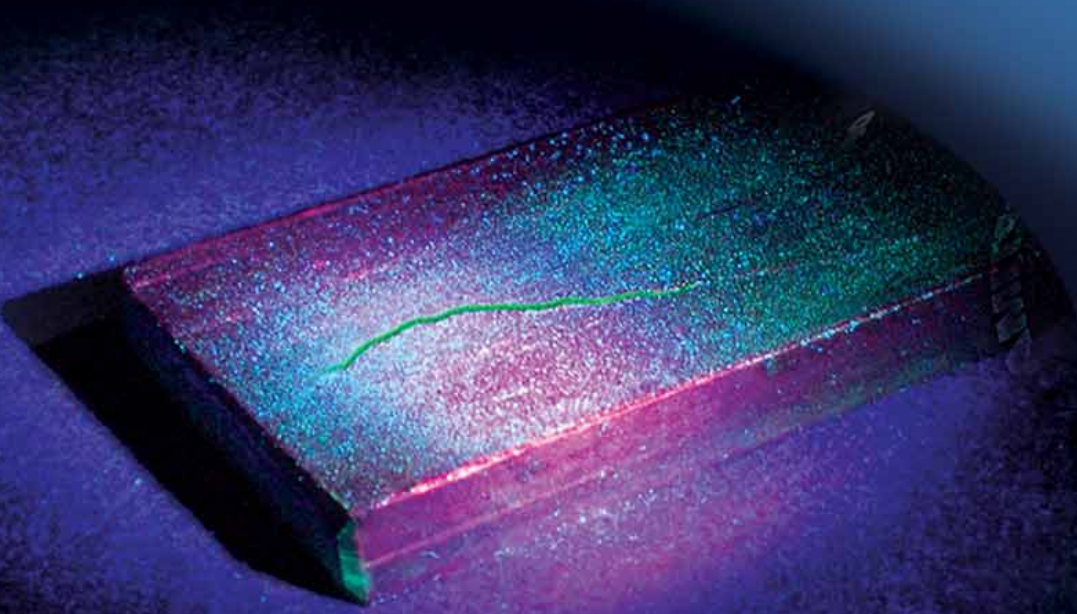
NDT plays a crucial role in everyday life. It is necessary to ensure structural integrity, safety and reliability in aircraft, motor vehicles, pipelines, seafaring vessels, bridges, trains, tunnels, power stations, refineries and oil platforms. All are inspected using some method of nondestructive testing.

Nondestructive testing is also a quality assurance production and management tool which can provide impressive results when used correctly. It requires an understanding of the various methods available, their capabilities and limitations, knowledge of the relevant standards and specifications for performing the tests.

Materials, products and equipment that fail to achieve their design requirements or projected life due to undetected defects may require expensive repair or early replacement. Such defects may also be the cause of unsafe conditions or catastrophic failure, as well as the loss of revenue due to unplanned shutdowns.

Nondestructive testing can be applied to each stage of an item's development, manufacture or construction. The item's materials and assembly can be examined using NDT and either accepted, rejected or repaired. NDT techniques can then be used to monitor the integrity of the item or structure throughout its service life.

The most commonly used NDT methods are visual inspection, liquid penetrant inspection, magnetic particle inspection, Eddy current inspection, acoustic emission, ultrasonic inspection and radiography.





Surface metal defect revealed using the TRITAN™ 365 UV-A inspection lamp and Zyglo® liquid penetrant

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Spectronics Corporation manufactures a wide array of medium and high-intensity inspection lamps and products that are used to detect and identify surface and subsurface flaws in the performance of nondestructive testing utilizing the visual inspection, liquid penetrant and magnetic particle methods. For more information see www.spectroline.com.

OLX-365 Series

OPTI-LUX™ 365 UV-A LED Inspection Flashlights

Affordable, Super-Compact and Designed Specifically for NDT!

Feature a powerful UV-A (365 nm) LED light source coupled with a rugged anodized lamp body. Lightweight and compact, they reduce user fatigue while providing an extremely uniform beam profile that surpasses those of more expensive lamps.

Available in four models to suit your specific NDT needs: high-intensity or standard-intensity versions, each with or without an internal black light filter.



- Choice of nominal steady-state UV-A intensity of 10,000 $\mu\text{W}/\text{cm}^2$ or maximum of 4,500 $\mu\text{W}/\text{cm}^2$ at 15 inches (38 cm)
- Coverage area up to 2.5 inch (6.3 cm) diameter at 15 inches (38 cm), with minimum UV-A intensity of 2,000 $\mu\text{W}/\text{cm}^2$
- Anodized aluminum lamp body minimizes corrosion and stands up to years of heavy use
- Instant-on operation; lamp reaches full intensity immediately!
- Convenient on/off switch for easy, one-handed operation
- Powered by one rechargeable lithium-ion battery with an extra battery included with the lamp. Each provides 4 hours of continuous inspection between charges.
- Meets ASTM UV-A intensity and wavelength specifications for LPT and MPT
- Both high- and standard-intensity versions are available with internal black light filter. Externally mounted black light filter with rubber bumper can be purchased as an accessory.
- **Certificate of compliance** for both wavelength and output measurements supplied with every lamp





OPTI-LUX™ 365 flashlight with **BF-365LX** external black light filter accessory

Model	Nominal steady-state UV-A (365 nm) intensity at 15 inches (38 cm) ①	Visible light measurement	Diameter of UV-A coverage area at 15 inches (38 cm)
OLX-365 High intensity, with clear filter	10,000 $\mu\text{W}/\text{cm}^2$	0.8 foot-candles (8.6 lux)	2 inch (5.0 cm)
OLX-365B High intensity, with internal black light filter	10,000 $\mu\text{W}/\text{cm}^2$	0.4 foot-candles (4.3 lux)	2 inch (5.0 cm)
OLX-365FL Standard intensity, with clear filter	4,500 $\mu\text{W}/\text{cm}^2$ maximum ②	0.3 foot-candles (3.2 lux)	2.5 inch (6.3 cm)
OLX-365BFL Standard intensity, with internal black light filter	4,500 $\mu\text{W}/\text{cm}^2$ maximum ②	0.2 foot-candles (2.1 lux)	2.5 inch (6.3 cm)

- Light Source:** UV-A LED
- Lamp Style:** Cordless flashlight
- Lamp Head Diameter:** 1.25 in (3.2 cm)
- Length:** 5.9 in (15 cm)
- Weight (w/Battery):** 4.6 oz (130 g)
- Power Requirement:** One 3.7V 2200mA/Hr lithium-ion battery (rechargeable)
- Run Time:** 4 hours (continuous)
- Charge Time:** 4 hours (one or two batteries)
- Charging Cradle:** Two-battery capability with AC and DC cord sets

① All UV-A intensity readings taken with Spectrolite® AccuMAX™ Series meter, and are factory set to the values shown

② To address aerospace industry concerns



OPTI-LUX™ 365 Series flashlights come complete with lanyard, belt holster, two rechargeable batteries, smart charging cradle with AC and DC cord sets, UV-absorbing spectacles and a padded carrying case.

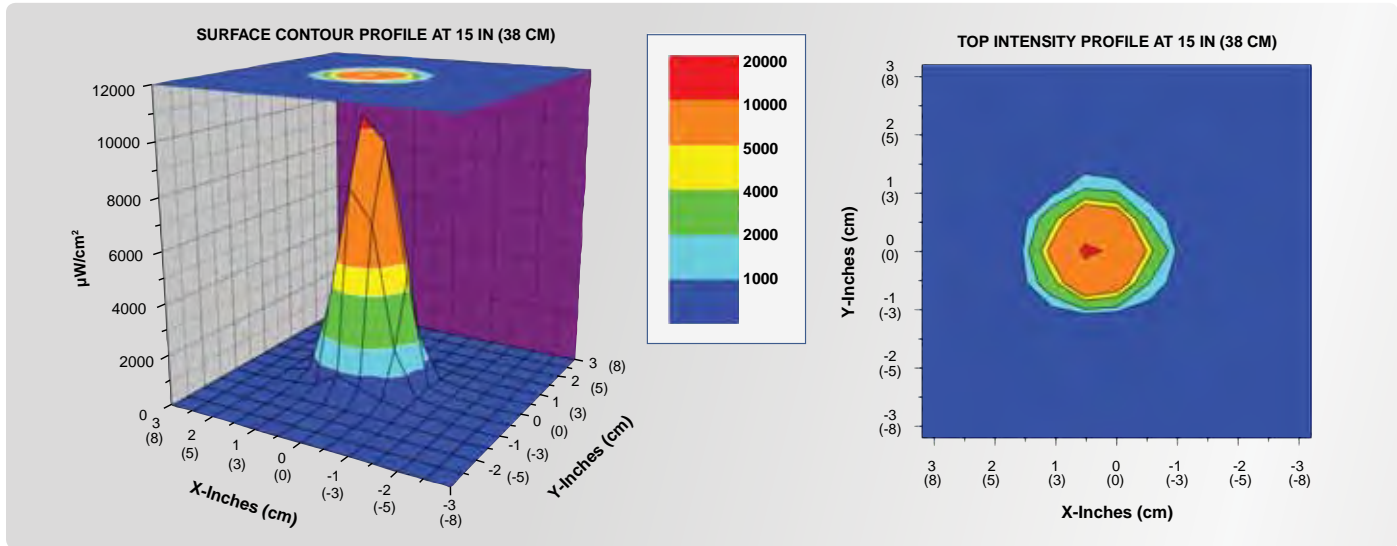
Replacement Parts & Accessories

- BF-365LX** External black light filter with rubber bumper
- 127423** Dome lens
- 127568** Lithium-ion battery (rechargeable)
- 127607** Internal black light filter
- 127785** Internal clear filter
- 128217** Battery charging cradle with AC cord
- 128225** DC cord set
- 127574** Belt holster
- UVS-30** UV-absorbing spectacles
- CC-365** Carrying case

HIGH-INTENSITY MODELS

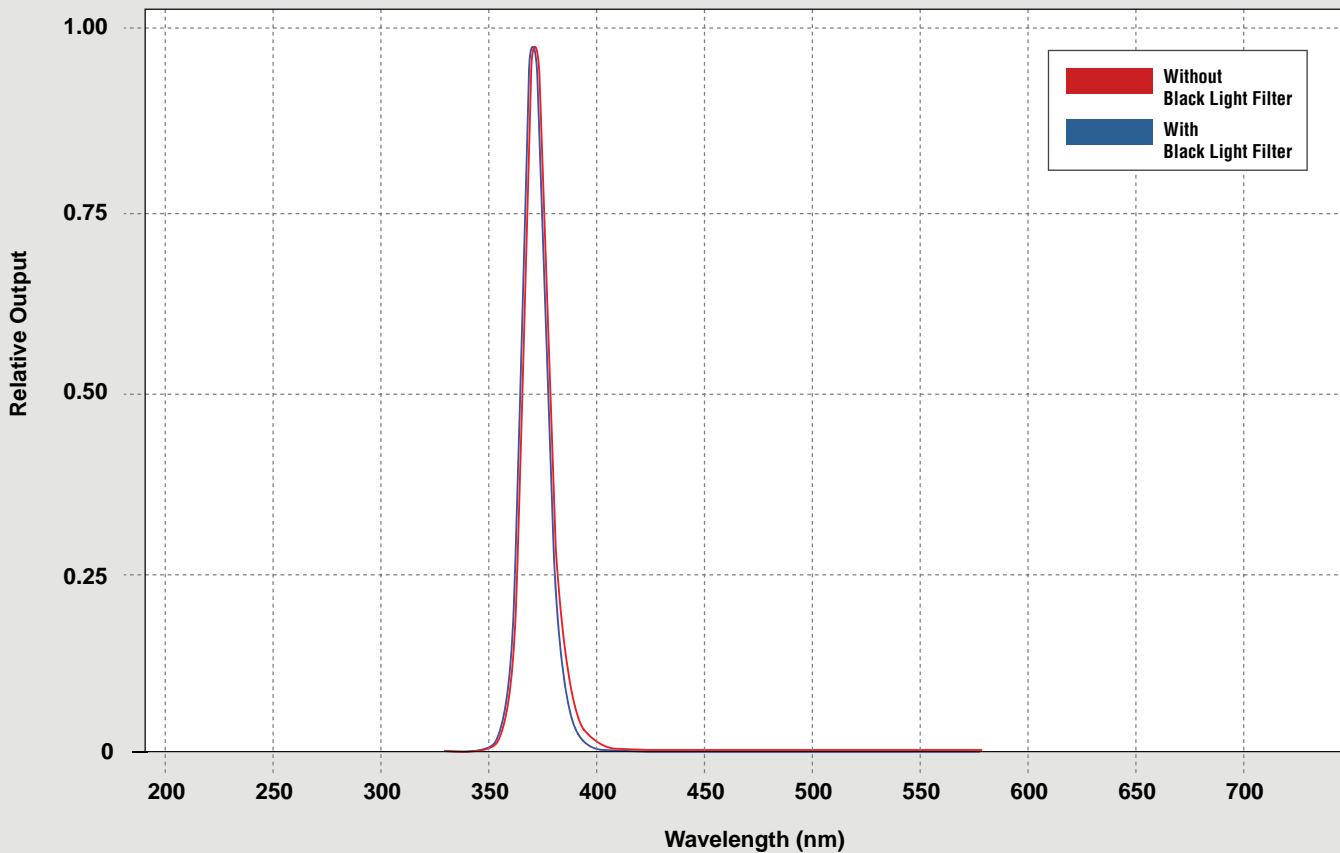
OPTI-LUX™ 365 Series flashlights are available in two *high-intensity* models that are designed for NDT inspection applications requiring high UV-A output. The **OLX-365** is equipped with a clear filter, while the **OLX-365B** comes with an internal black light filter that reduces the output of wavelengths longer than 400 nm. Both versions provide a nominal steady-state UV-A intensity of **10,000 $\mu\text{W}/\text{cm}^2$** at 15 inches (38 cm).

UV-A BEAM PROFILE



NORMALIZED UV IRRADIANCE

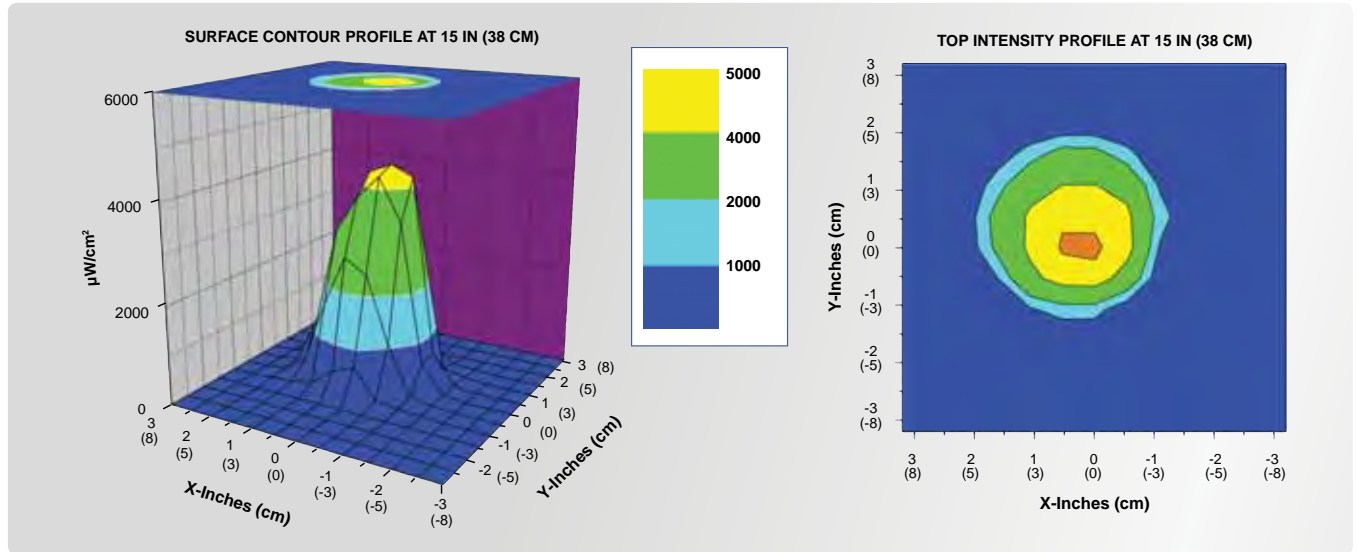
Typical wavelength output profile of OPTI-LUX™ 365 with and without black light filter, with peak at 365 nm.



STANDARD-INTENSITY MODELS

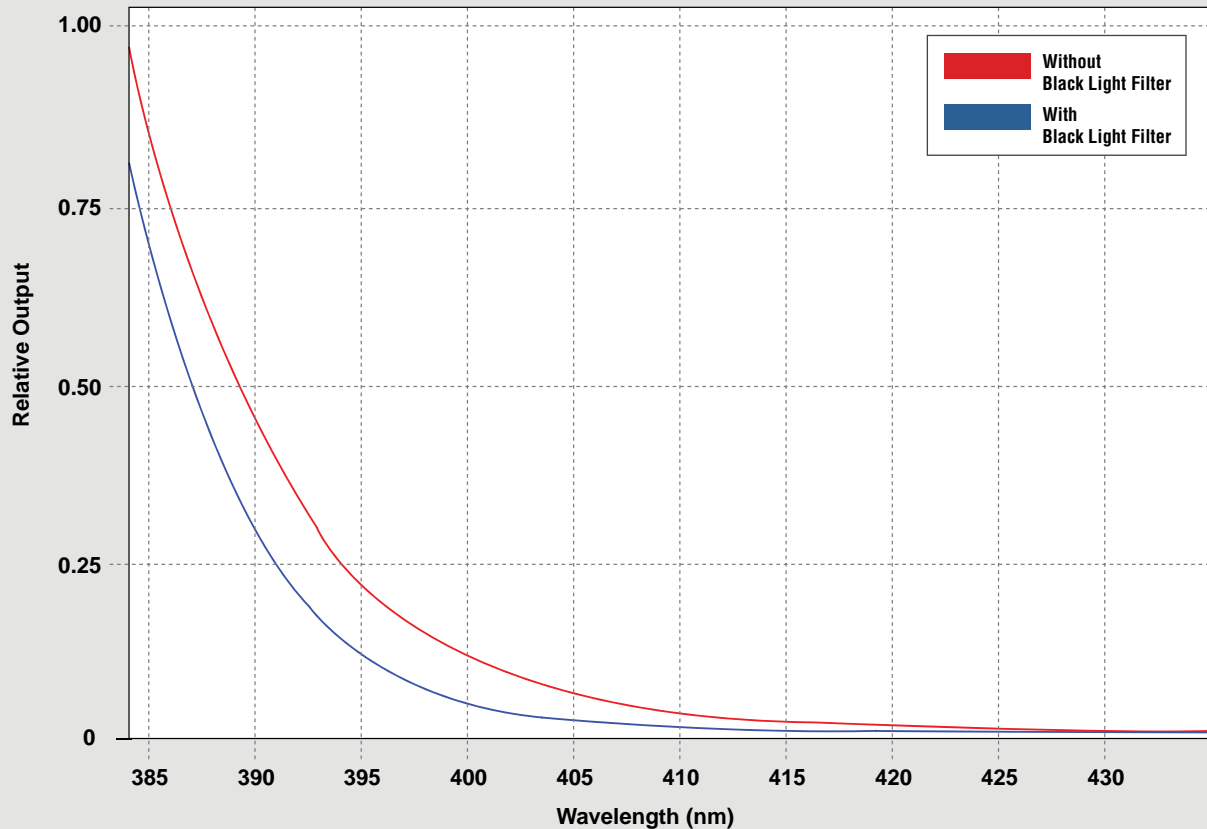
OPTI-LUX™ 365 flashlights are also available in two *standard-intensity* models that are designed for inspection applications requiring limited UV-A output. The **OLX-365FL** is equipped with a clear filter, while the **OLX-365BFL** comes with an internal black light filter that reduces the output of wavelengths longer than 400 nm. These lamps also offer a larger coverage area compared to high-intensity models. Both versions provide a nominal steady-state UV-A intensity of **4,500 $\mu\text{W}/\text{cm}^2$** maximum at 15 inches (38 cm), and comply with aerospace industry standards.

UV-A BEAM PROFILE



SELECT WAVELENGTHS WITH AND WITHOUT BLACK LIGHT FILTER

As the wavelength of the OPTI-LUX™ 365 moves into the visible light range, the black light filter significantly reduces the UV-A output of the lamp by as much as 50% at 400 nm.



OPX-365

OPTIMAX™ 365 UV-A LED Inspection Flashlight

(U.S. and foreign patents pending)

Powerful, rechargeable, high-intensity UV-A inspection flashlight featuring state-of-the-art, ultra-hi-flux LED technology!

- Nominal steady-state UV-A intensity of **18,000 $\mu\text{W}/\text{cm}^2$** at 15 inches (38 cm)
- Low visible light emission — less than 2 foot-candles (22 lux)
- Electronic Intensity Stabilizer assures consistent performance. Beam strength will not weaken between charges!
- Instant-on operation. Lamp reaches full intensity immediately!
- Rubber lamp protector prevents damage to LED head
- Ergonomic, portable and rugged. Anodized aluminum lamp body minimizes corrosion and stands up to years of heavy use.
- Powered by a rechargeable NiMH battery. Provides 90 minutes of continuous inspection between charges.

Also available: DF-365 diffusing filter (sold separately).



OPTIMAX™ 365 UV-A LED Inspection Flashlight comes complete with rubber lamp protector, smart AC and DC chargers, UV-absorbing spectacles, belt holster and padded carrying case.

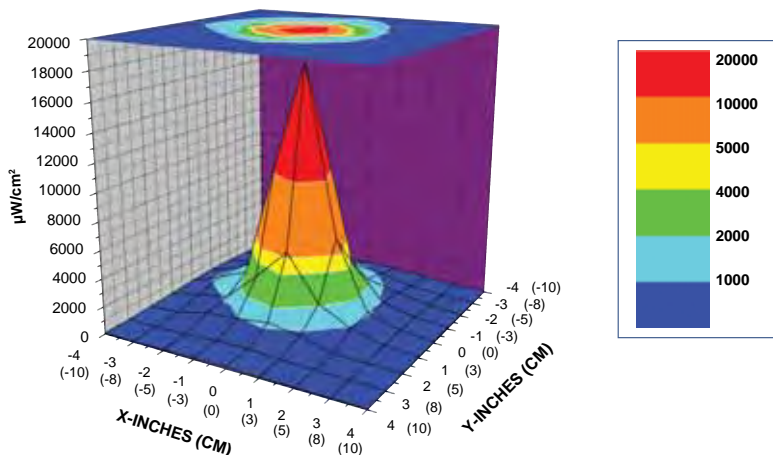
LAMP SPECIFICATIONS

Style	Cordless flashlight body with UV-A LED lamp head
Length	8.0 inch (20.3 cm)
Weight (with Battery)	11.8 oz (335 g)
Power Requirement	3.6V, 2 AH NiMH internal battery stick (rechargeable)
Run Time	90 minutes (continuous)
Charge Time	4 hours
Spectacles	UVS-30 UV-absorbing, clear

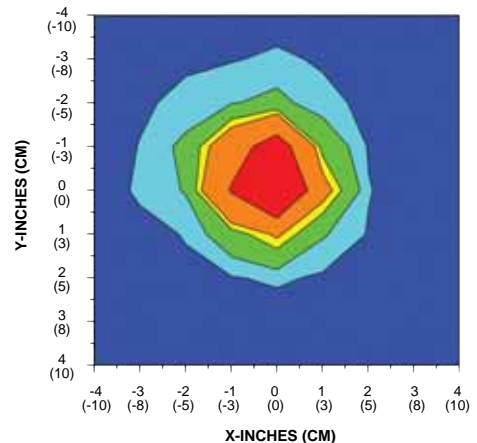


UV-A BEAM PROFILE

SURFACE CONTOUR PROFILE AT 15 IN (38 CM)



TOP INTENSITY PROFILE AT 15 IN (38 CM)



OPK-300N

OPTIMAX™ Multi-Lite™ NDT Inspection Kit

(U.S. patent no. 5,905,268; foreign patents pending)

A New Powerful, Versatile, Multi-LED, NDT Light Source!

Features three Qwik-Connect™ interchangeable LED lamp heads that connect to a rugged, black-anodized flashlight body. It provides single-wavelength illumination in UV-A and blue light, and is ideal for both pre-screening of fluorescent particles in ambient light conditions and full-fledged NDT inspections utilizing magnetic particles or fluorescent penetrants. A convenient white light LED provides general illumination of dark work areas.

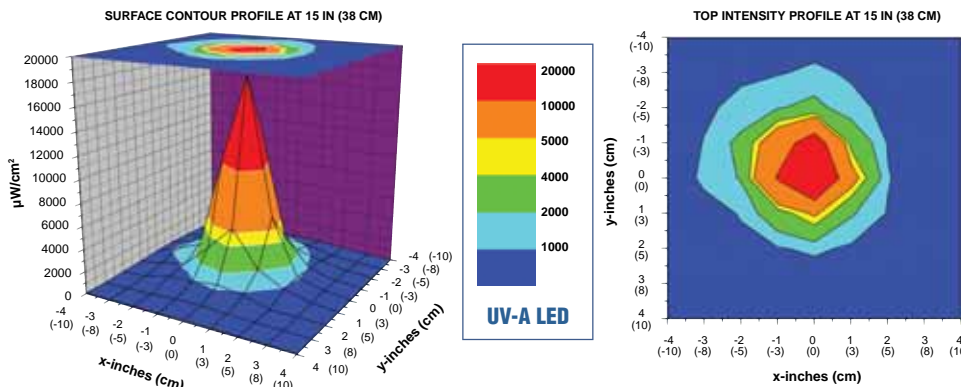
- Super-powerful LED optical output with ultra-high intensity 365 nm UV-A and 450 nm blue light performance
- Provides nominal steady-state intensity of **18,000 $\mu\text{W}/\text{cm}^2$** (UV LED) or **7,000 $\mu\text{W}/\text{cm}^2$** (blue light LED) at 15 inches (38 cm)
- Blue light LED with patented thin-film dichroic lens filters out long-wave visible light
- Electronic Intensity Stabilizer ensures consistent performance. Beam strength will not weaken between charges!
- Instant-on operation. Lamp reaches full intensity immediately!
- Lightweight, cordless, ergonomic design eliminates fatigue
- Powered by a rechargeable NiMH battery. Provides 90 minutes of continuous inspection between charges (smart AC and DC chargers included).



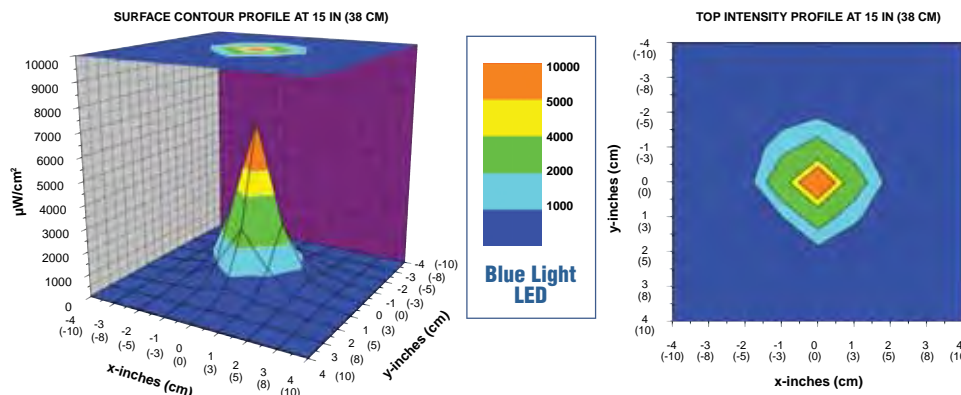
UV-A LED INSPECTION LAMPS

OPK-300N Multi-Lite™ Inspection Kit comes complete with three storage pouches for the LED lamp heads, smart AC and DC battery chargers, UV-absorbing spectacles, fluorescent-enhancing, yellow spectacles and a padded carrying case.

UV-A BEAM PROFILE



BLUE LIGHT BEAM PROFILE



LAMP SPECIFICATIONS

Style	Cordless flashlight body with three interchangeable LED lamp heads
Length	9.0 inch (22.9 cm)
Weight (with Battery)	15.3 oz (434 g)
Power Requirement	3.6V, 2 AH NiMH internal battery stick (rechargeable)
Run Time	90 minutes (continuous)
Charge Time	4 hours
Spectacles	UVS-30 UV-absorbing, clear UVS-40 fluorescent-enhancing, yellow



TRI-365 Series

TRITAN™ 365 Multi-LED, Broad-Beam UV-A Inspection Lamps

Feature three ultra-hi-flux UV-A LEDs for fluorescent inspection, plus a convenient white light LED to scan for surface flaws and illuminate dark work areas. Their broad-beam configuration provides an extremely wide coverage area, while a compact head design allows access into areas inaccessible to larger UV inspection lamps.

Available in three models to meet your specific NDT inspection requirements: high-intensity, standard-intensity and standard-intensity with integral black light filters.



- Choice of one high-intensity model with a nominal steady-state UV-A intensity of **9,000 $\mu\text{W}/\text{cm}^2$** or two standard-intensity models, both with a maximum UV-A intensity of less than 5,000 $\mu\text{W}/\text{cm}^2$ at 15 inches (38 cm)
- Large 4 inch (10 cm) diameter coverage area at 15 inches (38 cm), with a minimum UV-A intensity of **2,000 $\mu\text{W}/\text{cm}^2$**
- Low visible light emission — less than 2 foot-candles (22 lux)
- Grip-mounted, three-way rocker switch (white light/off/UV) for easy control of light sources
- Built-in fans keep LEDs cool to maintain optimum light output during extended use
- Long-lasting UV-A lenses reduce the rate of solarization
- Rubber bumper with Borofloat® glass lens protects LEDs from damage
- Modular construction for easy servicing in the field
- Choice of standard 8 foot (2.4 m) or extra-long 20 foot (6.1 m) heavy-duty power cord with AC plug and rubber boot. Also available: Optional in-line power supply or industrial power supply with cord sets (sold separately).
- Meets ASTM UV-A intensity and wavelength specifications for LPT and MPT
- **Certificate of compliance** for both wavelength and output measurements supplied with every lamp
- UV-absorbing spectacles and soft carrying case included



TRITAN™ 365 faceplate shown with (left) and without (right) integral black light filters.



TRITAN™ 365 shown with optional PS-200A (above) and PS-300A (below) power supplies.



Also Available:

TRITAN™ 365 M-Series portable, battery-operated AC/DC lamp kits. Include TRITAN™ 365 UV lamp, rechargeable NiMH battery pack, power supply adapter with AC and DC cord sets, smart AC charger, UV-absorbing spectacles and soft carrying case.

Model	Nominal steady-state UV-A (365 nm) intensity at 15 inches (38 cm) ①	Visible light measurement	Diameter of UV-A coverage area at 15 inches (38 cm)
TRI-365HB High intensity, with clear filter	9,000 $\mu\text{W}/\text{cm}^2$	< 2 foot-candles (22 lux)	4 inch (10 cm)
TRI-365DB Standard intensity, with clear filter	< 5,000 $\mu\text{W}/\text{cm}^2$ maximum ②	< 1 foot-candle (11 lux)	4 inch (10 cm)
TRI-365DBB Standard intensity, with integral black light filters	< 5,000 $\mu\text{W}/\text{cm}^2$ maximum ②	< 0.5 foot-candle (5 lux)	4 inch (10 cm)

Light Source:	3 UV-A LEDs, 1 White Light LED
Lamp Style:	Pistol grip
Lamp Head Diameter:	3.25 in (8.25 cm)
Length:	8.0 in (20.3 cm)
Weight:	1 lb (454 g)
White Light LED Intensity:	400 foot-candles (4,306 lux)
Power Requirements:	
AC Lamp (TRI-365DB, TRI-365DBB, TRI-365HB)	120VAC*
AC/DC Lamp (TRI-365MDB, TRI-365MDBB, TRI-365MHB)	120VAC*/12VDC
Battery Pack:	
Type	12V, NiMH (rechargeable)
Run Time	3.5 hours (continuous)
Charge Time	2 hours

* Also available in 230V, 240V and 100V versions.

① All UV-A intensity readings were taken with the Spectroline® AccuMAX™ Series meter, and are factory set to the values shown

② To address aerospace industry concerns



Replacement Parts & Accessories

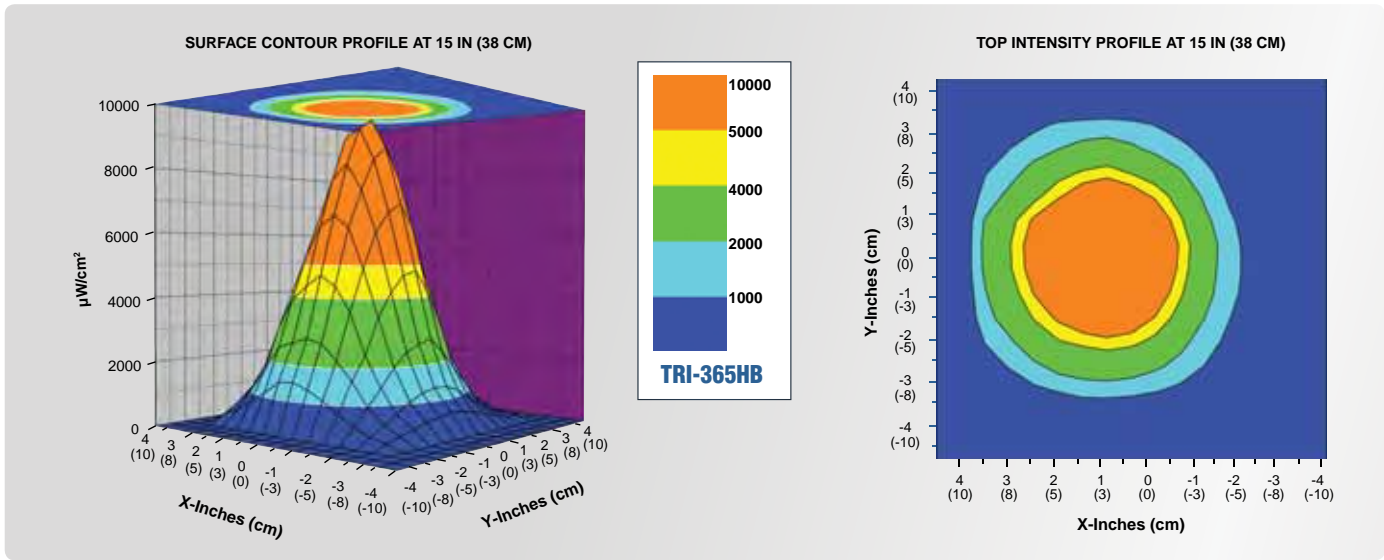
129141	Standard, 8 foot (2.4 m) AC power cord
129145	Extra-long, 20 foot (6.1 m) AC power cord
129162	3.5 foot (1.1 m) DC power cord for "M" series lamps
127933	Particulate filter assembly
127955	Standard faceplate
128196	Faceplate with integral black light filters
BP-30	Battery pack with 12V rechargeable NiMH battery
BR-150A	Smart AC charger
CC-370A	Soft carrying case
FP-365	Rubber bumper with Borofloat® glass
PSA-250A	AC/DC power supply adapter for "M" series lamps
PS-200A	Industrial power supply. Primary cord: 8 feet (2.4 m); secondary cord: 20 feet (6.1 m).
PS-300A	In-line power supply. Primary cord: 8 feet (2.4 m); secondary cord: 8 feet (2.4 m).
UL-100	UV-A Lens
UVS-30	UV-absorbing spectacles

HIGH-INTENSITY MODEL

UV-A BEAM PROFILE

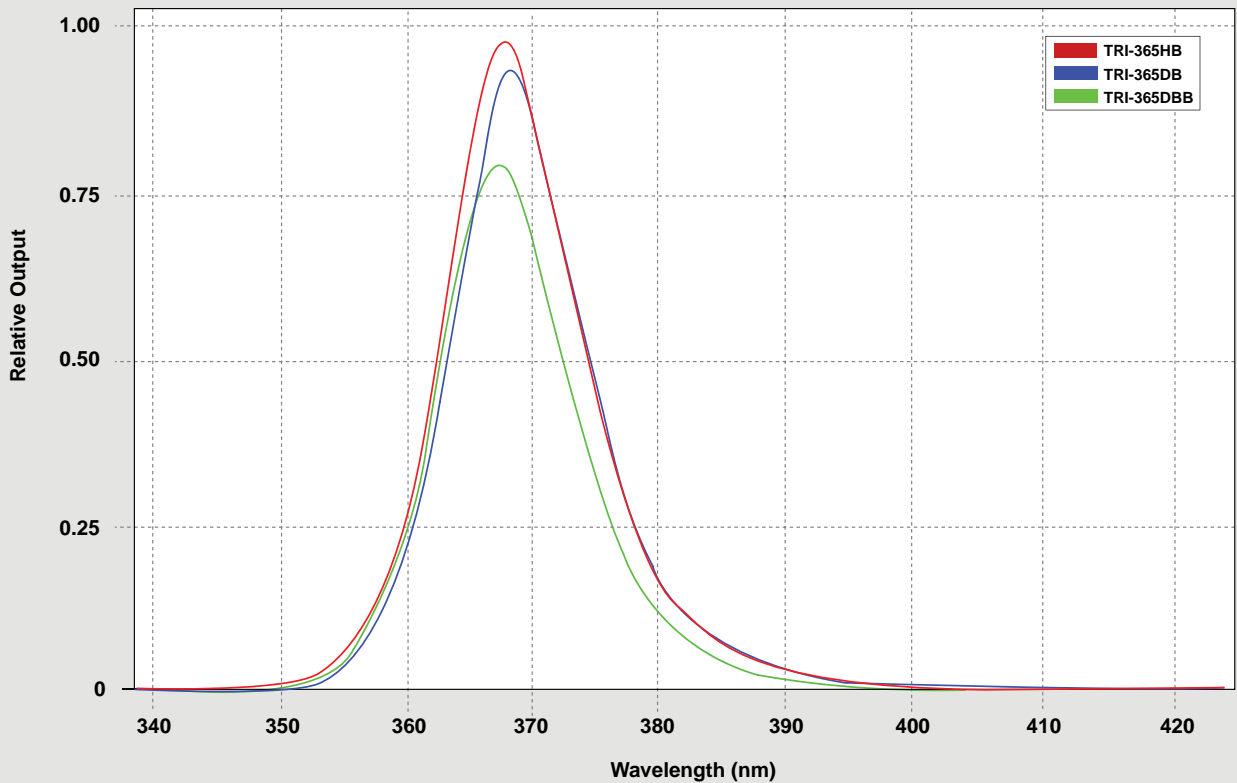
The TRITAN™ 365 lamp is available in a **high-intensity** model specifically designed for NDT inspection applications requiring high UV-A output.

The TRI-365HB comes equipped with a clear glass filter and is “tuned” to provide a nominal steady-state UV-A intensity of **9,000 $\mu\text{W}/\text{cm}^2$** at 15 inches (38 cm).



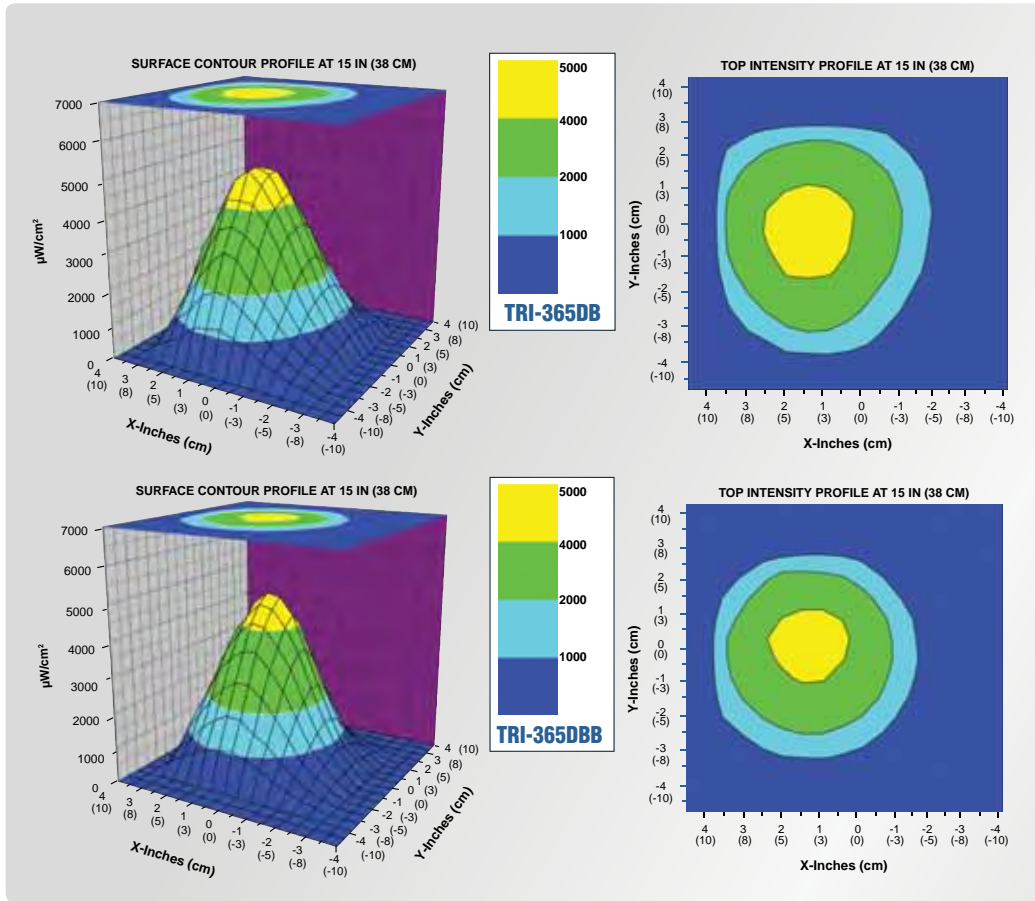
NORMALIZED UV IRRADIANCE

Typical wavelength output profile of TRITAN™ 365 Series with and without integral black light filters.



STANDARD-INTENSITY MODELS

UV-A BEAM PROFILES

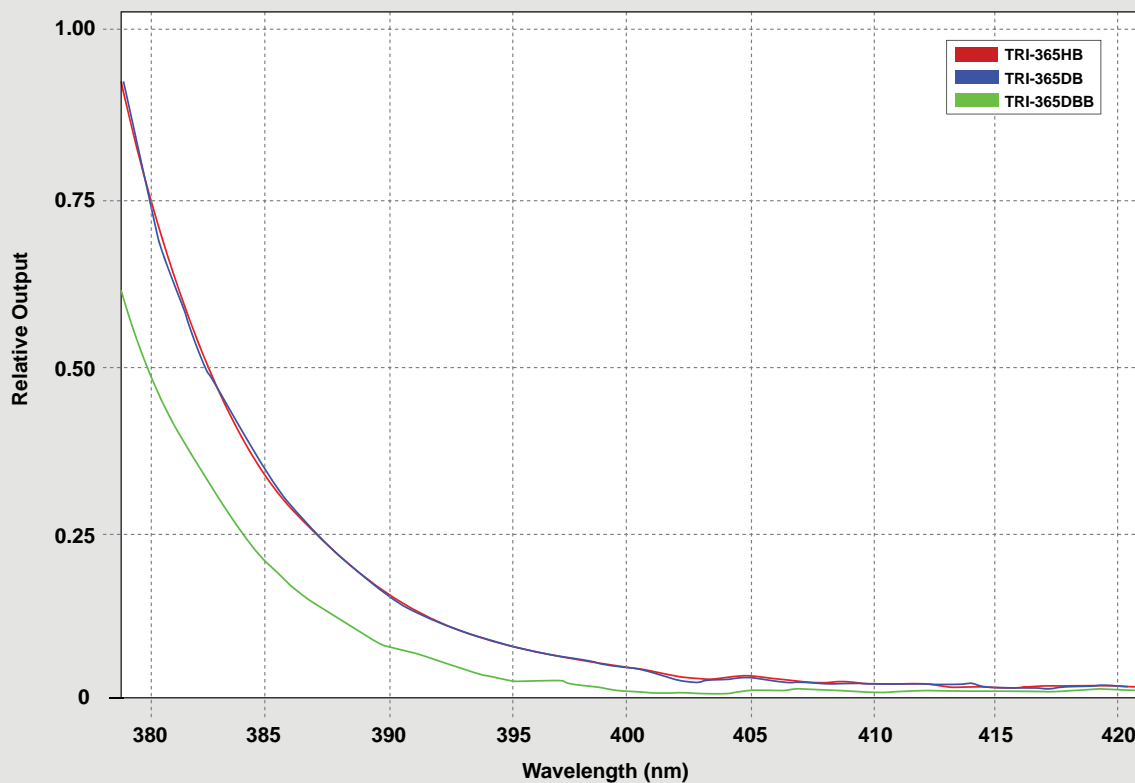


The **TRITAN™ 365** lamp is also available in two *standard-intensity* models that are designed for inspection applications requiring limited UV-A output.

The **TRI-365DB** is fitted with a clear glass filter. The **TRI-365DBB** is equipped with a faceplate with integral black light filters that cover each of the LEDs and reduce the output of wavelengths longer than 400 nm. This addresses aerospace industry concerns.

Both versions are “tuned” to ensure that they provide a maximum steady-state UV-A intensity of less than 5,000 $\mu\text{W}/\text{cm}^2$ at 15 inches (38 cm).

SELECT WAVELENGTHS WITH AND WITHOUT BLACK LIGHT FILTER



As the wavelength of the **TRITAN™ 365** moves into the visible light range, the black light filters significantly reduce the output of the lamp at 400 nm.



TRI-365SBLC

TRITAN™ 365 UV-A Inspection Lamp

Key Features:

- ▶ Nominal steady-state UV-A intensity of less than $5,000 \mu W/cm^2$ at 15 inches (38 cm).
- ▶ Large 4 inch (10 cm) diameter coverage area at 15 inches (38 cm), with a minimum UV-A intensity of $2,500 \mu W/cm^2$.
- ▶ Low visible light emission—less than 0.5 foot-candle (5 lux).
- ▶ Long-lasting UV-A lenses reduce the rate of solarization.
- ▶ Thermal cut-off circuitry prevents lamp from going out of compliance when internal temperature exceeds specifications.
- ▶ Certificate of compliance and **full serialized validation report** for both output and wavelength measurements supplied with each lamp.

LONG-LASTING UV-A LENSES
reduce the rate of solarization

RUBBER BUMPER
with Borofloat® glass lens
protects LEDs from damage

BUILT-IN FANS
maintain optimum light output

Faceplate with **INTEGRAL BLACK LIGHT FILTERS**

EASY CONTROL
Grip-mounted, three-way rocker switch (white light/off/UV)

THERMAL CUT-OFF CIRCUITRY
prevents lamp from going out of compliance when internal temperature exceeds specifications

TWO CORD CHOICES!
Standard or Extra-Long with AC plug and rubber boot

TRI-365

- Faceplate with integral blacklight filters reduce output of wavelengths longer than 400 nm.
- White light LED allows for scanning of surface flaws or illuminating dark work spaces.
- Grip-mounted, three-way rocker switch (white light/off/UV) for easy control of light sources.
- Built-in fans keep LEDs cool to maintain optimum light output during extended use.
- Choice of standard 8 foot (2.4 m) or extra-long 20 foot (6.1 m) heavy-duty power cord with AC plug and rubber boot.
- Meets ASTM UV-A intensity and wavelength specifications for LPT and MPT.
- UV-absorbing spectacles and soft carrying case included.

Model	Nominal steady-state UV-A (365 nm) intensity at 15 inches (38 cm) ①	Visible light measurement	Diameter of UV-A coverage area at 15 inches (38 cm)
TRI-365SBLC	< 5,000 $\mu\text{W}/\text{cm}^2$ maximum	< 0.5 foot-candle (5 lux)	4 inch (10 cm)

Light Source:	3 UV-A LEDs, 1 White Light LED
Lamp Style:	Pistol grip
Lamp Head Diameter:	3.25 in (8.25 cm)
Length:	8.0 in (20.3 cm)
Weight:	1 lb (454 g)
White Light LED Intensity:	400 foot-candles (4,306 lux)
Power Requirements:	120VAC* Power Cord

*Also available in 230V, 240V and 100V versions.

① All UV-A intensity readings were taken with the Spectroline® AccuMAX™ Series meter, and are factory set to the values shown



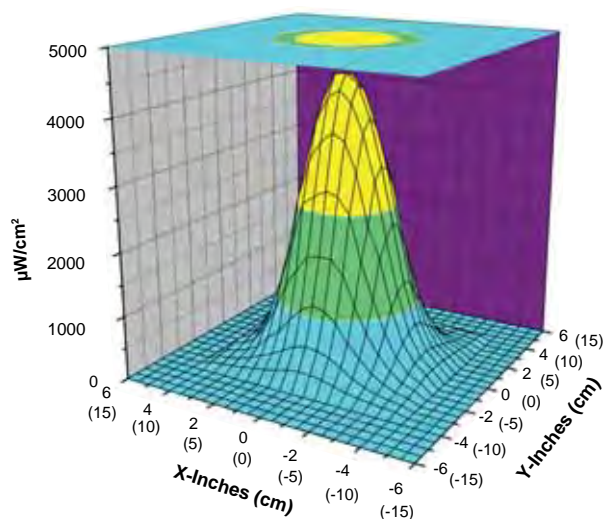
FULL SERIALIZED VALIDATION REPORT



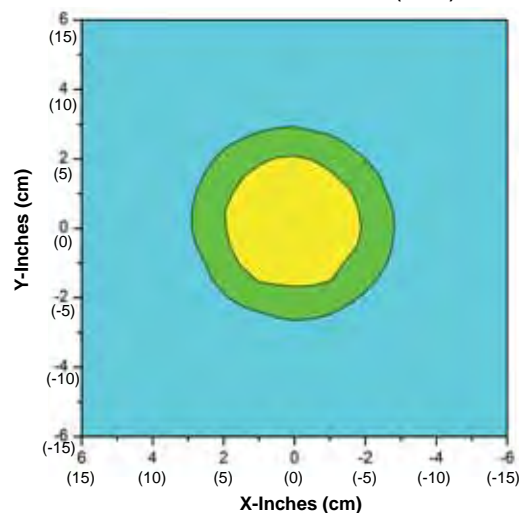
CERTIFICATE OF COMPLIANCE

UV-A BEAM PROFILE

SURFACE CONTOUR PROFILE AT 15 IN (38 CM)



TOP INTENSITY PROFILE AT 15 IN (38 CM)



QDR-365 Series

QUADRAN™ 365

Versatile, Dual-Intensity, Multi-LED, Broad-Beam NDT Inspection Lamps!

Feature four ultra-hi-flux UV-A LEDs plus a convenient white light LED to quickly switch between fluorescent inspection and flaw location. A unique dual-intensity feature provides both high and standard UV-A and white light output for added versatility.

The lamps' broad-beam configuration produces an extremely wide coverage area, making them ideal for both in-line and hand-held applications. Models are available either with or without integral black light filters to meet your specific inspection requirements.



The **QUADRAN™ 365** can be quickly mounted for in-line inspections using various Spectroline® accessories (FA-100 flexible arm shown).

- Dual-intensity capability: High setting produces a nominal steady-state UV-A intensity as high as **8,000 $\mu\text{W}/\text{cm}^2$** ; standard setting produces a nominal steady-state intensity of **4,500 $\mu\text{W}/\text{cm}^2$** , both at 15 inches (38 cm)
- Extremely large coverage area of up to 6 inches (15 cm), with a minimum UV-A intensity of **2,000 $\mu\text{W}/\text{cm}^2$**
- Low visible light emission — less than 2 foot-candles (22 lux)
- Conveniently located rocker switches for quick and easy control of light sources
- Built-in fan keeps LEDs cool to maintain optimum light output during extended use
- Rubber bumper with Borofloat® glass lens protects LEDs from damage
- Rugged, modular construction allows for easy field serviceability
- Lamp handle pin receptacle allows for easy attachment of various Spectroline® mounting accessories for in-line inspection applications (accessories sold separately)
- Choice of standard 8 foot (2.4 m) or extra-long 20 foot (6.1 m) heavy-duty power cord with AC plug and rubber boot. Also available: Optional industrial power supply or in-line power supply with cord sets (sold separately).
- UV-absorbing spectacles and soft carrying case included





QUADRAN™ 365 faceplate shown with (top) and without (bottom) integral black light filters.



Model	Nominal steady-state UV-A (365 nm) intensity at 15 inches (38 cm) ①	Visible light measurement	UV-A coverage area (at minimum 2,000 µW/cm²)
QDR-365A Standard Intensity, with clear filter	4,500 µW/cm² maximum	< 1 foot-candle (11 lux)	5 in (13 cm)
High Intensity, with clear filter	8,000 µW/cm²	< 2 foot-candles (22 lux)	6 in (15 cm)
QDR-365BLA Standard Intensity, with integral black light filters	4,500 µW/cm² maximum	< 0.5 foot-candle (5 lux)	4 in (10 cm)
High Intensity, with integral black light filters	7,000 µW/cm²	< 1 foot-candle (11 lux)	6 in (15 cm)

Light Source: 4 UV-A LEDs, 1 White Light LED
Lamp Style: Pistol grip
Lamp Head (WxH): 6 x 5.5 in (15 x 14 cm)
Length: 10 in (25 cm)
Weight: 3 lb (1.36 kg)
White Light LED Intensity:
 High setting: 300 foot-candles (3,229 lux)
 Low setting: 10 foot-candles (108 lux)

Power Requirement:
AC Lamp (QDR-365A, QDR-365BLA) 120VAC* power cord supplied with lamp

AC/DC Lamp (QDR-365MA, QDR-365MBLA) 120VAC*/12VDC

Battery Pack: 12V, NiMH (rechargeable)

Run Time
 High intensity: 2.5 hours (continuous)
 Standard intensity: 4.5 hours (continuous)

Charge Time 2 hours

*Also available in 230V, 240V and 100V versions.

① All UV-A intensity readings were taken with Spectroline® AccuMAX™ Series meter, and are factory set to the values shown



Also Available:

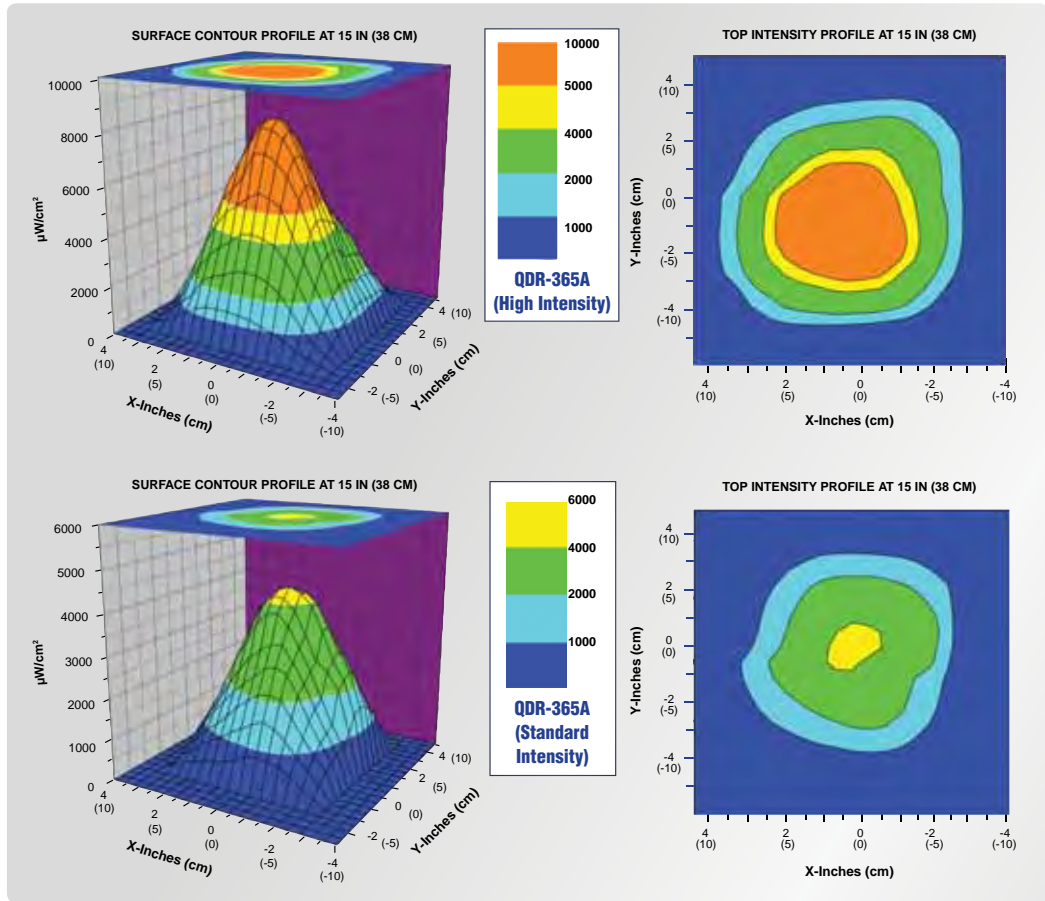
QUADRAN™ 365 M-Series portable, battery-operated AC/DC lamp kits. Include QUADRAN™ 365 UV lamp, rechargeable NiMH battery pack, power supply adapter with AC and DC cord sets, smart AC charger, UV-absorbing spectacles and soft carrying case.

QDR-365A MODELS UV-A BEAM PROFILES

When the **QDR-365A** is in **high intensity** mode, the lamp provides a nominal steady-state UV-A intensity of **$8,000 \mu\text{W}/\text{cm}^2$** at 15 inches (38 cm).

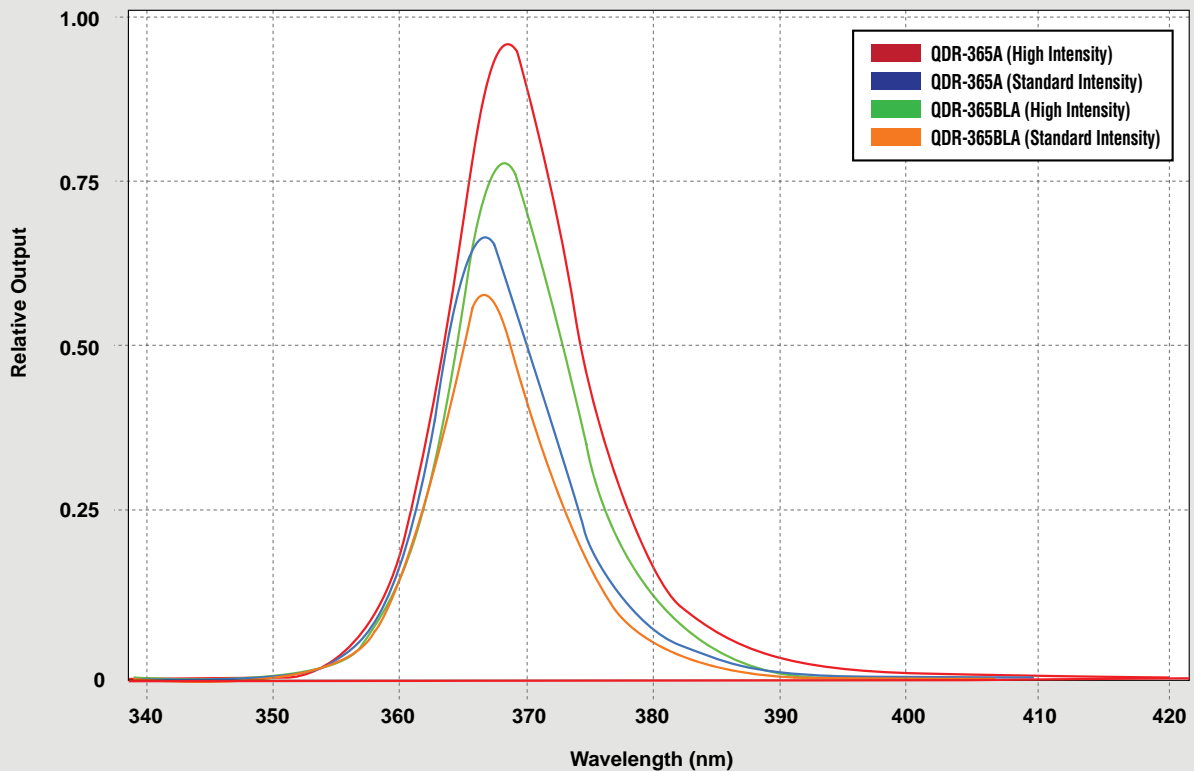
When switched to the **standard intensity** mode, the **QDR-365A** provides a nominal steady-state UV-A intensity of **$4,500 \mu\text{W}/\text{cm}^2$** at 15 inches (38 cm).

In addition, the lamp has a high/low switch to control the white light LED output.



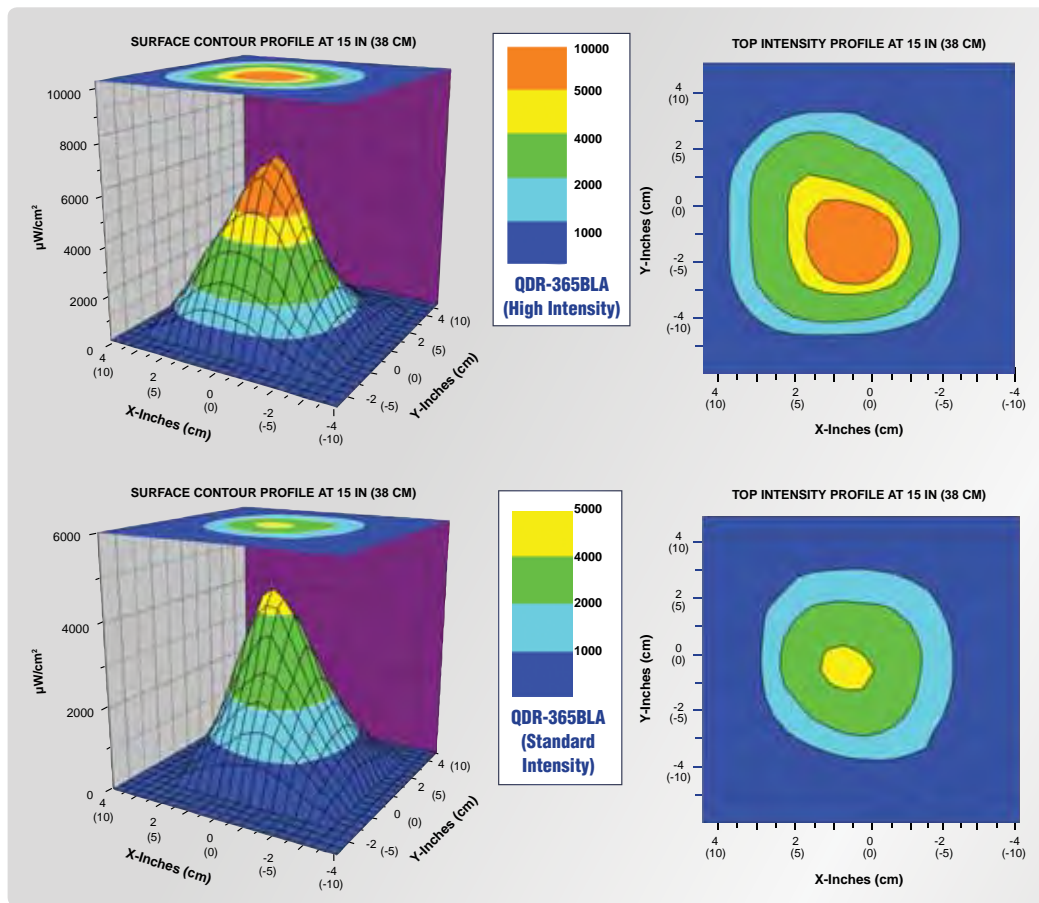
NORMALIZED UV IRRADIANCE

Typical wavelength output profile of QUADRAN™ 365 with and without intergral black light filters, with peak at 365 nm.



QDR-365BLA MODELS

UV-A BEAM PROFILES



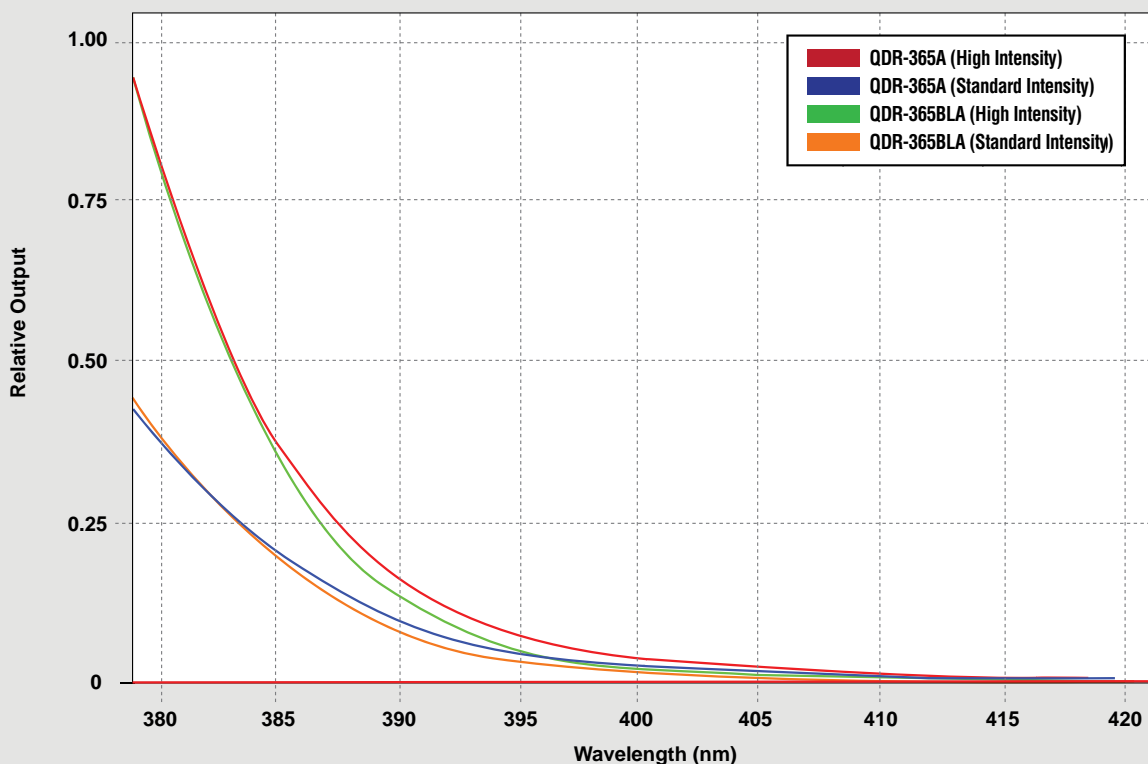
The **QDR-365BLA** is equipped with integral black light filters that reduce the output of wavelengths longer than 400 nm. When in the **high intensity** mode, the lamp provides a nominal steady-state UV-A intensity of **7,000 $\mu\text{W}/\text{cm}^2$** at 15 inches (38 cm).

When switched to the **standard intensity** mode, the **QDR-365BLA** provides a nominal steady-state standard UV-A intensity of **4,500 $\mu\text{W}/\text{cm}^2$** at 15 inches (38 cm).

In addition, the lamp has a high/low switch to control the white light LED output.

UV-A LED INSPECTION LAMPS

SELECT WAVELENGTHS WITH AND WITHOUT BLACK LIGHT FILTER



As the wavelength of the QUADRAN™ 365 moves into the visible light range, the black light filters significantly reduce the output of the lamp at 400 nm.

QDR-365 S-Series

QUADRAN™ 365

Powerful, Multi-LED, Broad-Beam NDT Inspection Lamps!



QUADRAN™ 365 S-Series lamps can be quickly mounted for in-line inspections using various Spectroline® accessories (*FA-100 flexible arm shown*).

Feature four ultra-hi-flux UV-A LEDs plus a convenient white light LED to quickly switch between fluorescent inspection and flaw location. For increased flexibility, a unique dual-intensity feature provides high/low white light output control.

The lamps' broad-beam configuration produces an extremely wide coverage area, making them ideal for both in-line and hand-held applications. Two models are available, either with or without integral black light filters to meet your specific NDT inspection requirements.

- Choice of two models, both with a maximum standard UV-A intensity of **4,500 $\mu\text{W}/\text{cm}^2$** at 15 inches (38 cm)
- Extremely large coverage area of up to 5 inches (13 cm), with a minimum UV-A intensity of **2,000 $\mu\text{W}/\text{cm}^2$**
- Low visible light emission — less than 1 foot-candle (11 lux)
- Conveniently located rocker switches for quick and easy control of light sources
- Built-in fan keeps LEDs cool to maintain optimum light output during extended use
- Long-lasting UV-A lenses reduce the rate of solarization
- Rubber bumper with Borofloat® glass lens protects LEDs from damage
- Rugged, modular construction allows for easy field serviceability
- Lamp handle pin receptacle allows for easy attachment of various Spectroline® mounting accessories for in-line inspection applications (accessories sold separately)
- Choice of standard 8 foot (2.4 m) or extra-long 20 foot (6.1 m) heavy-duty power cord with AC plug and rubber boot. Also available: Optional industrial power supply or in-line power supply with cord sets (sold separately).
- Meets ASTM UV-A intensity and wavelength specifications for LPT and MPT
- **Certificate of compliance** for both wavelength and output measurements supplied with every lamp
- UV-absorbing spectacles and soft carrying case included





QUADRAN™ 365 S-Series faceplate shown with (top) and without (bottom) integral black light filters.



Model	Nominal steady-state UV-A (365 nm) intensity at 15 inches (38 cm) ①	Visible light measurement	UV-A coverage area (at minimum 2,000 μW/cm²)
QDR-365SA	4,500 μW/cm² maximum ②	< 1 foot-candle (11 lux)	5 in (13 cm)
QDR-365SBLA With integral black light filters	4,500 μW/cm² maximum ②	< 0.5 foot-candle (5 lux)	4 in (10 cm)

Light Source: 4 UV-A LEDs, 1 White Light LED
Lamp Style: Pistol grip
Lamp Head (WxH): 6 x 5.5 in (15 x 14 cm)
Length: 10 in (25 cm)
Weight: 3 lb (1.36 kg)
White Light LED Intensity:
 High setting: 300 foot-candles (3,229 lux)
 Low setting: 10 foot-candles (108 lux)

Power Requirement:
AC Lamp (QDR-365SA, QDR-365SBLA) 120VAC* power cord supplied with lamp
AC/DC Lamp (QDR-365MSA, QDR-365MSBLA) 120VAC*/12VDC
Battery Pack:
Type 12V, NiMH (rechargeable)
Run Time 4.5 hours (continuous)
Charge Time 2 hours

*Also available in 230V, 240V and 100V versions.

- ① All UV-A intensity readings were taken with Spectroline® AccuMAX™ Series meter, and are factory set to the values shown
- ② To address aerospace industry concerns



Also Available:
QUADRAN™ 365 MS-Series portable, battery-operated AC/DC lamp kits. Include QUADRAN™ 365 UV lamp, rechargeable NiMH battery pack, power supply adapter with AC and DC cord sets, smart AC charger, UV-absorbing spectacles and soft carrying case.

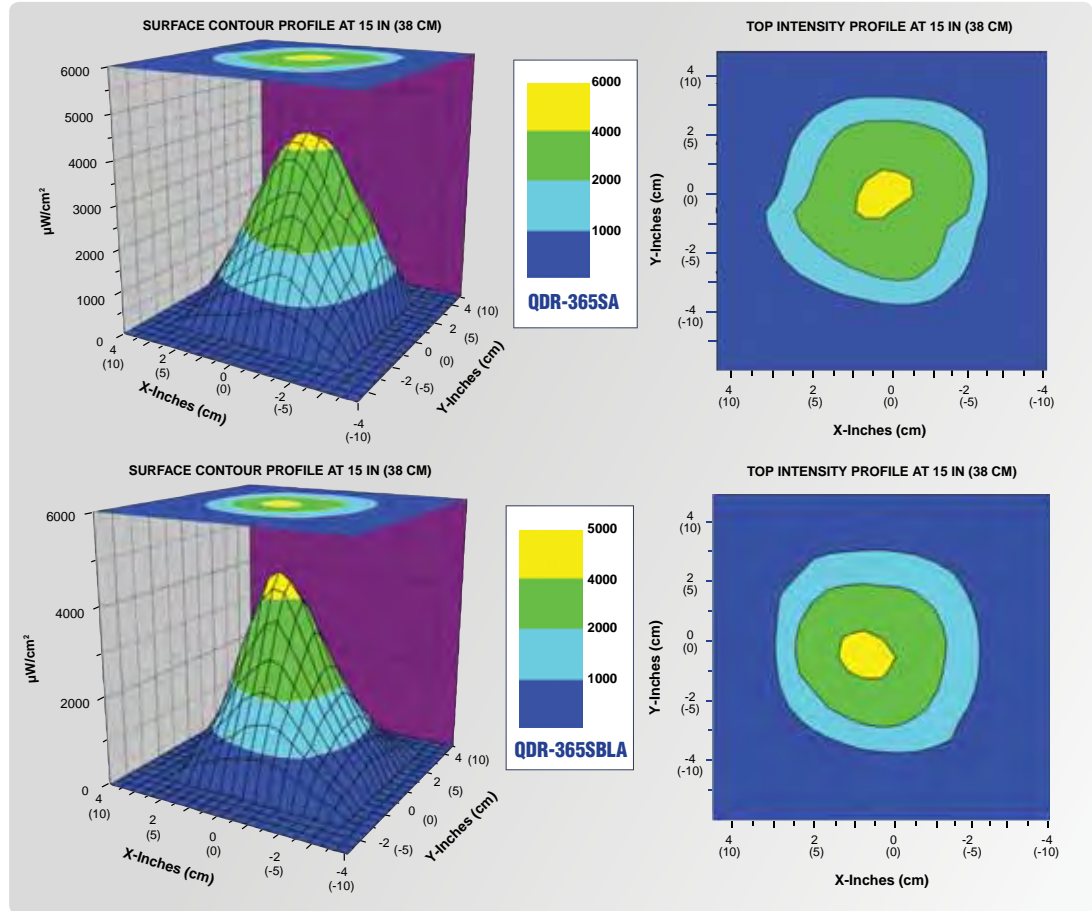
UV-A BEAM PROFILES

QUADRAN™ 365 S-Series lamps are available in two models (**QDR-365SA** and **QDR-365SBLA**).

Both are designed for NDT inspection applications requiring limited UV-A output. The **QDR-365SA** comes with a standard faceplate. The **QDR-365SBLA** is equipped with a faceplate containing integral black light filters that reduce the output of wavelengths longer than 400 nm.

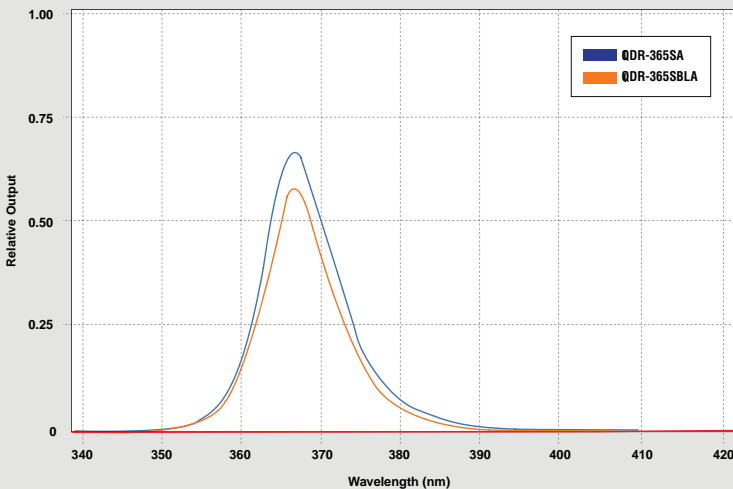
Both lamps are “tuned” to provide a nominal steady-state UV-A intensity of **4,500 $\mu\text{W}/\text{cm}^2$** at 15 inches (38 cm). This addresses aerospace industry concerns.

In addition, both lamps have a high/low switch to control the white light LED output.



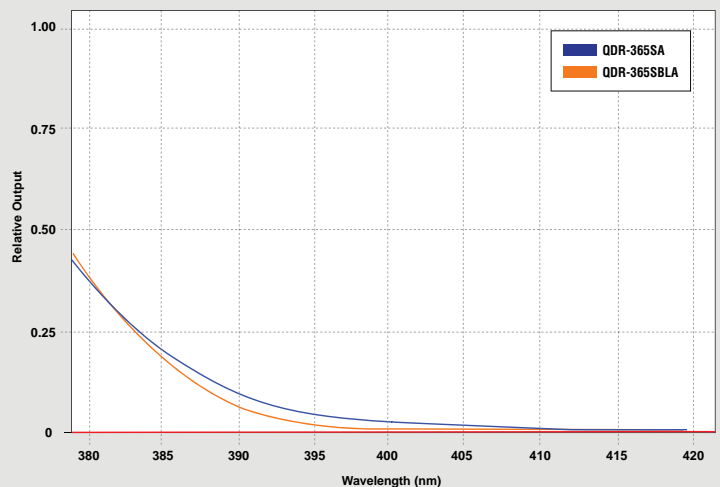
NORMALIZED UV IRRADIANCE

Typical wavelength output profile of QUADRAN™ 365 S-Series lamps with and without black light filters.



SELECT WAVELENGTHS WITH AND WITHOUT BLACK LIGHT FILTER

As the wavelength of the QUADRAN™ 365 S-Series moves into the visible light range, the black light filters significantly reduce the output of the lamp at 400 nm.



All QUADRAN™ 365 S-Series lamps are ideal for performing both in-line and hand-held inspections!

Each lamp can easily be attached to a variety of Spectroline® mounting accessories, as well as to our optional in-line power supplies.



UV-A LED INSPECTION LAMPS



QUADRAN™ 365 lamp shown with optional PS-200A (left) and PS-300A (right) power supplies.

Replacement Parts & Accessories for the QDR-365 & QDR-365 S-Series

129141	Standard, 8 foot (2.4 m) AC power cord
129145	Extra-long, 20 foot (6.1 m) AC power cord
129162	3.5 foot (1.1 m) DC power cord for "M" series lamps
127922	Particulate filter assembly
127944	Standard faceplate
128094	Faceplate with integral black light filters
B-6	Bench mount
BP-30	Battery pack with 12V rechargeable NiMH battery
BR-150A	Smart AC charger
CC-400	Soft carrying case

FA-100	Flexible arm
FP-550	Rubber bumper with Borofloat® glass
PSA-250A	AC/DC power supply adapter for "M" series lamps
PS-200A	Industrial power supply. Primary cord: 8 feet (2.4 m); secondary cord: 20 feet (6.1 m).
PS-300A	In-line power supply. Primary cord: 8 feet (2.4 m); secondary cord: 8 feet (2.4 m).
W-6	Wall mount with pin
WM-100	Wall mounting bracket
UL-100	UV-A Lens
UVS-30	UV-absorbing spectacles



EK-3000

UV-A/White Light LED Inspection Kit

(U.S. patent: 8,616,722; CN patent ZL201010265212.4)

***Palm-Sized, Cool-Running,
Hands-Free Light Source!***

**Ideal for fluorescent magnetic particle
and penetrant testing, mining inspection
and a variety of other specialized
applications!**



**Spray and inspect
in one simple step!**

- Compact, lightweight lamp with two ultra-high intensity UV-A (365 nm) LEDs for inspection, plus a three-LED white light assembly for general illumination
- Adjustable strap allows lamp to be worn on a hard hat or directly on the head for hands-free operation
- Unique lamp mount/sprayer attachment permits lamp and spray can to be mounted together for convenient, single-handed fluorescent yoke inspection
- Built-in fan keeps lamp cool to maintain optimum UV-A intensity during extended use
- Long-lasting UV-A lenses reduce the rate of solarization
- Splash guard with integral particulate filter protects UV lenses and cooling fan from damage
- Powered by a rechargeable lithium-ion battery (included). Provides up to 75 minutes of continuous inspection between charges.
- **Certificate of compliance** for both wavelength and output measurements supplied with every lamp



EK-3000 EagleEye™ Kit comes with a lanyard, two replacement splash guards with integral particulate filters, two spare batteries, battery charging cradle with AC and DC cord sets, UV-absorbing spectacles and soft carrying case.

LAMP SPECIFICATIONS

Product Number:
EE-365

Light Sources:
2 UV LEDs, 3 white light LEDs

Dimensions:
Length 3.75 in (9.5 cm)
Width 2.25 in (5.7 cm)
Height 1.85 in (4.7 cm)

Weight with Battery: 8 oz (227 g)

Power Requirement:
One 3.7V 2200mA/Hr lithium-ion battery (rechargeable)

Run Time:
75 minutes (continuous)

Charge Time:
4 hours (two batteries)

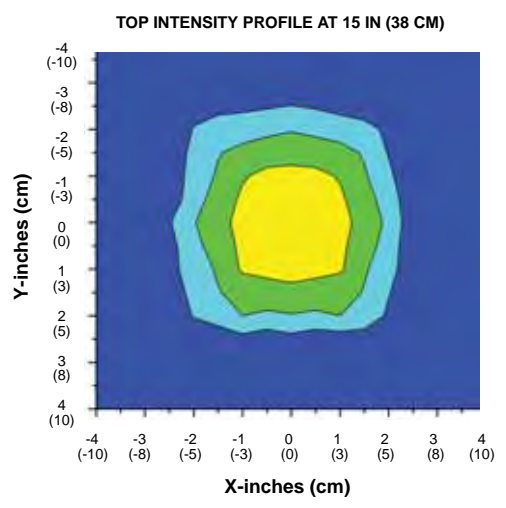
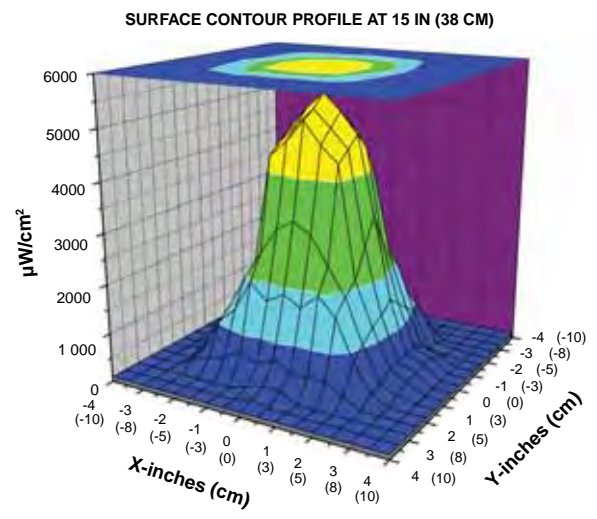
Charging Cradle:
Two-battery capability with AC and DC cord sets.

Nominal Steady-State UV-A (365 nm) Intensity:
6 in (15 cm) — 20,000 $\mu\text{W}/\text{cm}^2$
15 in (38 cm) — 4,500 $\mu\text{W}/\text{cm}^2$
24 in (61 cm) — 2,000 $\mu\text{W}/\text{cm}^2$
36 in (91 cm) — 1,000 $\mu\text{W}/\text{cm}^2$

NOTE: All UV-A intensity readings taken with a Spectroline® AccuMAX™ Series meter



UV-A BEAM PROFILE



Replacement Parts & Accessories

EE-365	UV-A/white light LED lamp	128225	DC cord set for 128217
LMS-100	Lamp mount/sprayer	127568	Lithium-ion battery (rechargeable)
HS-100	Head strap	UL-100	UV-A Lens
SG-100	Splash guard with integral particulate filter (set of three)	UVS-30	UV-absorbing spectacles
128217	Battery charging cradle with AC cord	CC-370A	Soft carrying case

PM-1600 Series

PowerMAX™ 365

UV-A LED Panel Flood Lamps *Designed Specifically for NDT Professionals!*

PowerMAX™ 365 Series flood lamps feature a panel of 16 powerful UV-A (365 nm) LEDs specially engineered for non-destructive testing applications. These versatile, stationary light sources can be installed overhead or in-line, and can be ganged together to provide an even wider coverage area.

Available in four models to meet your specific inspection needs: high-intensity and standard-intensity versions, each with or without a black light filter. Ideal for NDT inspection booths, fluorescent penetrant and magnetic particle inspection, screening of fluorescent particles, wash station inspection and many other applications requiring maximum uniformity of UV-A coverage over a large area.



- Choice of two high-intensity models with a nominal steady-state UV-A intensity as high as **8,000 $\mu\text{W}/\text{cm}^2$** or two standard-intensity models with a maximum UV-A intensity of **4,500 $\mu\text{W}/\text{cm}^2$** at 15 inches (38 cm)
- Large coverage area of 15 inches by 6 inches (38 cm x 15 cm), with a minimum UV-A intensity of **2,000 $\mu\text{W}/\text{cm}^2$**
- Low visible light emission — less than 2 foot-candles (22 lux)
- Easily mountable for overhead inspection or in-line applications
- Built-in fans keep LEDs cool to maintain optimum light output during extended use
- Customizable — multiple lamp units can be “ganged” together longitudinally or back-to-back for a larger coverage area to meet your specific inspection requirements!
- Both high- and standard-intensity versions available with or without black light filter
- Standard-intensity lamps meet ASTM UV-A intensity and wavelength specifications for LPT and MPT, and come with a ***certificate of compliance*** for both wavelength and output measurements





For applications requiring extremely large coverage areas, the PowerMAX™ 365 can be quickly ganged together longitudinally (top) or back-to-back (below) using customized, easy-to-install connecting plates and brackets.



Model	Nominal steady-state UV-A (365 nm) intensity at 15 inches (38 cm) ①	Visible light measurement	UV-A coverage area (at minimum 2000 μW/cm²)
PM-1600UVH High intensity, with clear filter	8,000 μW/cm²	< 2 foot-candles (22 lux)	15 in by 6 in (38 cm x 15 cm)
PM-1600BLH High intensity, with black light filter	6,500 μW/cm²	< 1 foot-candle (11 lux)	15 in by 6 in (38 cm x 15 cm)
PM-1600UV Standard intensity, with clear filter	4,500 μW/cm² maximum ②	< 1 foot-candle (11 lux)	15 in by 6 in (38 cm x 15 cm)
PM-1600BL Standard intensity, with black light filter	4,000 μW/cm² maximum ②	< 0.5 foot-candle (5 lux)	15 in by 6 in (38 cm x 15 cm)

Light Source: 16 UV-A (365 nm) LEDs
Lamp Style: Panel flood lamp
Dimensions: 5.5 x 13.75 x 6 in (14 x 35 x 15 cm) (W x L x H)
Weight: 9 lb (4 kg)
Power Requirement: AC power (main AC power cord supplied with the unit)

① All UV-A intensity readings were taken with Spectroline® AccuMAX™ Series meter, and are factory set to the values shown
 ② To address aerospace industry concerns



Replacement Parts & Accessories

128177	AC power cord
BF-365PM	Black light filter assembly
CF-100	Clear glass filter assembly
127918	Particulate air filter
127935	Retainer, LED assembly face plate
CC-200	Connector cable for ganging lamps
CP-100	Top connecting plate for ganging lamps longitudinally
CP-200	Top connecting plate for ganging lamps back-to-back (Two required)
CP-300	Side connecting bracket for ganging lamps longitudinally (Two required)
UL-100	UV-A lens
UVF-80	Face shield, UV-absorbing
UVG-50	Goggles, UV-absorbing
UVS-30	Spectacles, UV-absorbing

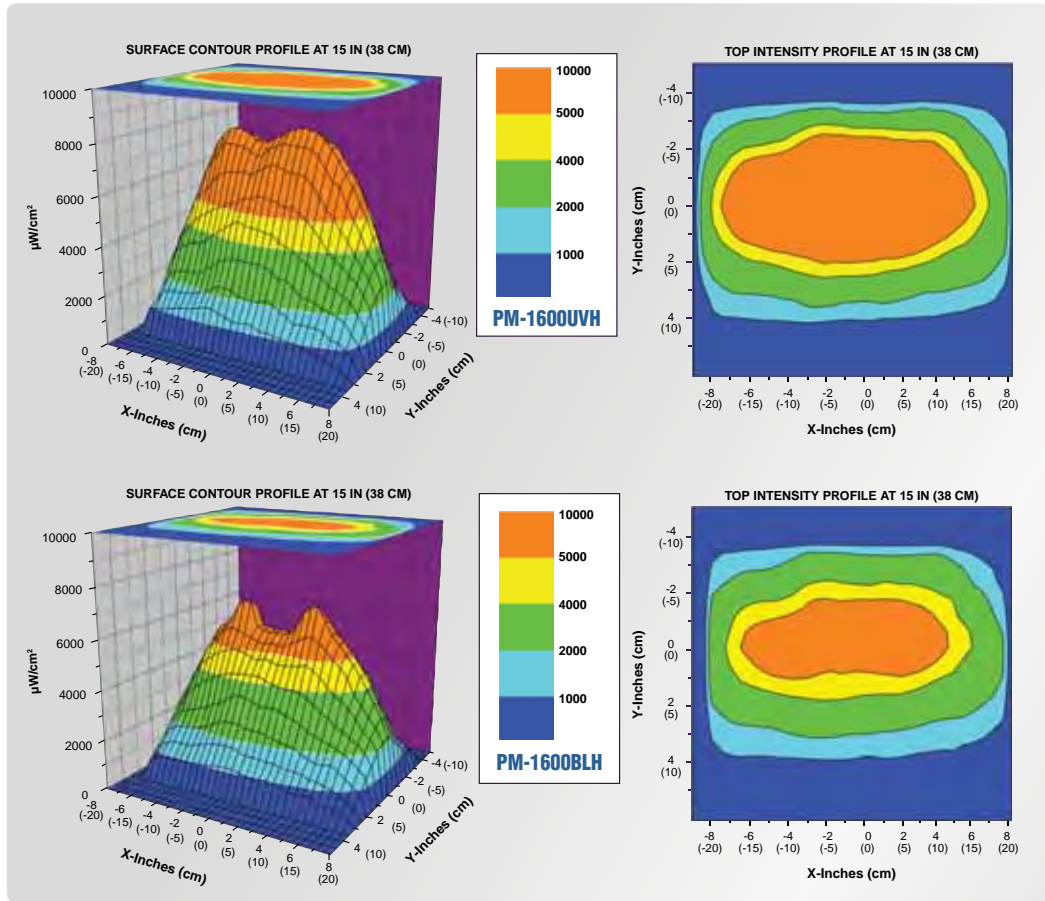
UV-A STATIONARY LAMPS

HIGH-INTENSITY MODELS UV-A BEAM PROFILES

PowerMAX™ 365 Series UV-A LED panel flood lamps are available in two *high-intensity* models that are specifically designed for NDT inspection applications requiring high UV-A output.

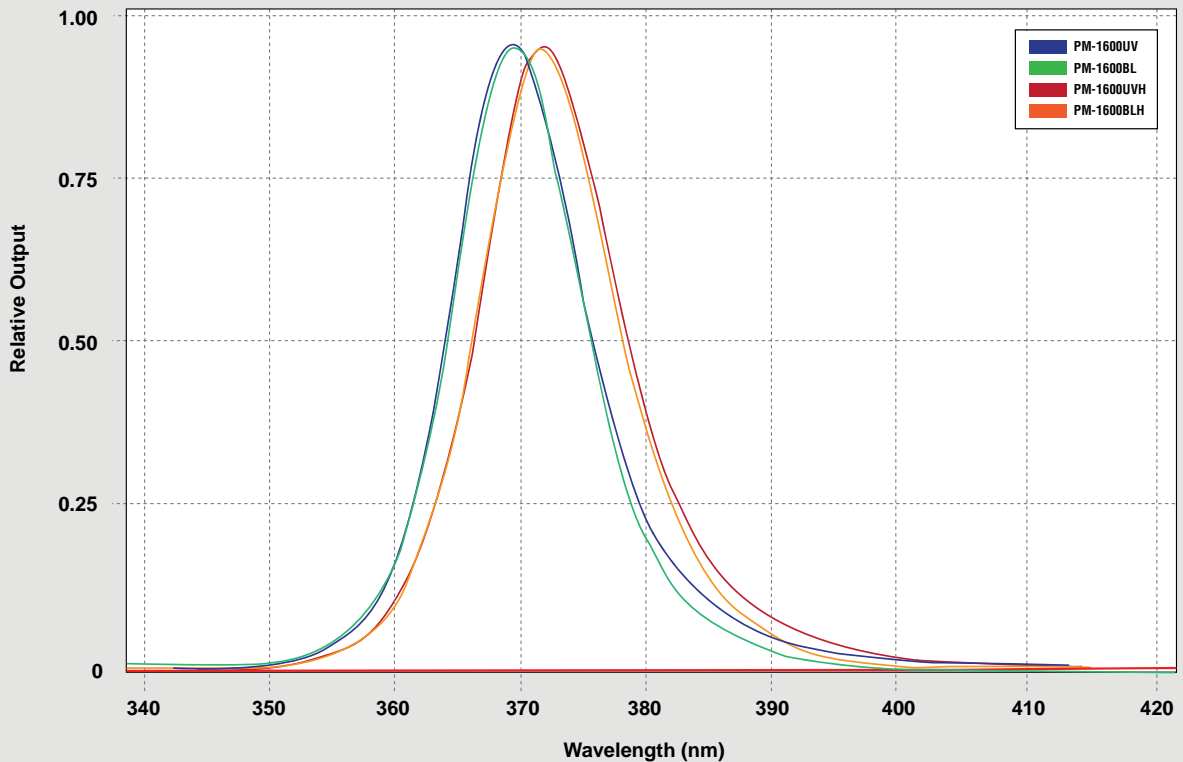
The **PM-1600UVH** is equipped with a clear glass filter and provides a nominal steady-state UV-A intensity of **8,000 $\mu\text{W}/\text{cm}^2$** at 15 inches (38 cm).

The **PM-1600BLH** is equipped with a black light filter that reduces the output of wavelengths longer than 400 nm. It provides a nominal steady-state UV-A intensity of **6,500 $\mu\text{W}/\text{cm}^2$** at 15 inches (38 cm).



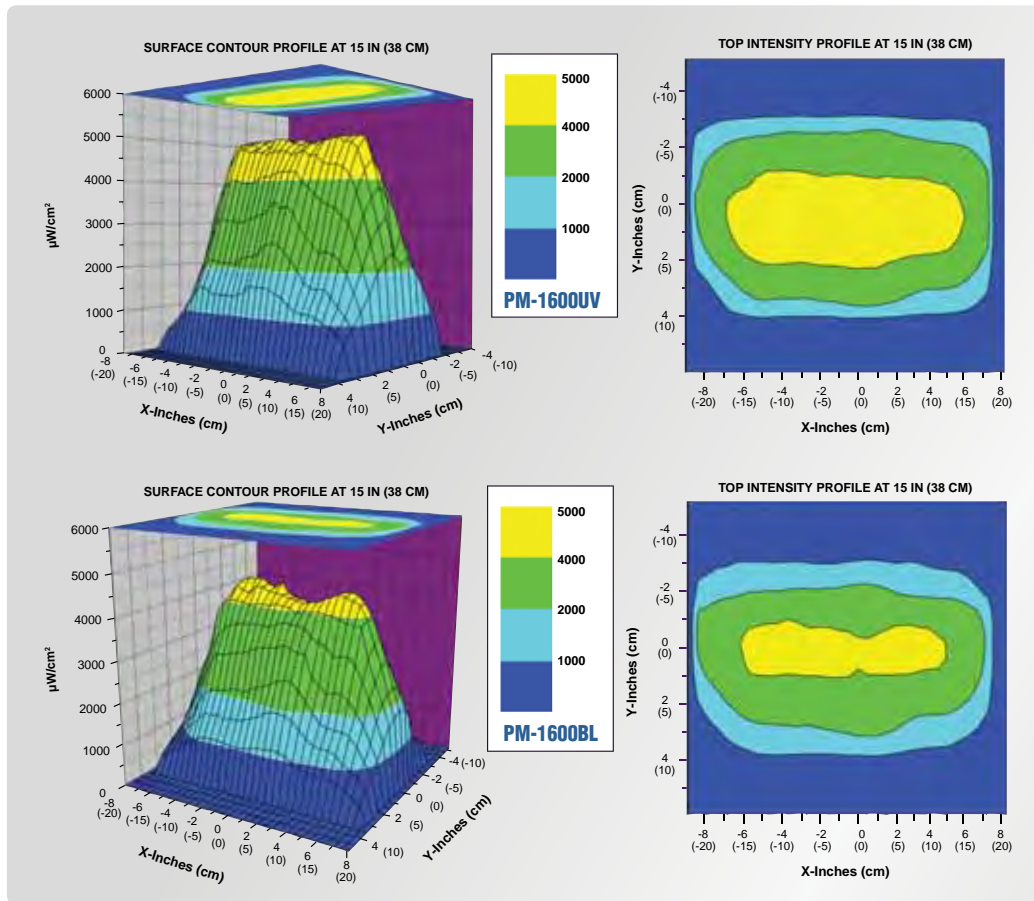
NORMALIZED UV IRRADIANCE

Typical wavelength output profile of PowerMAX™ 365 Series with and without black light filter.



STANDARD-INTENSITY MODELS

UV-A BEAM PROFILES



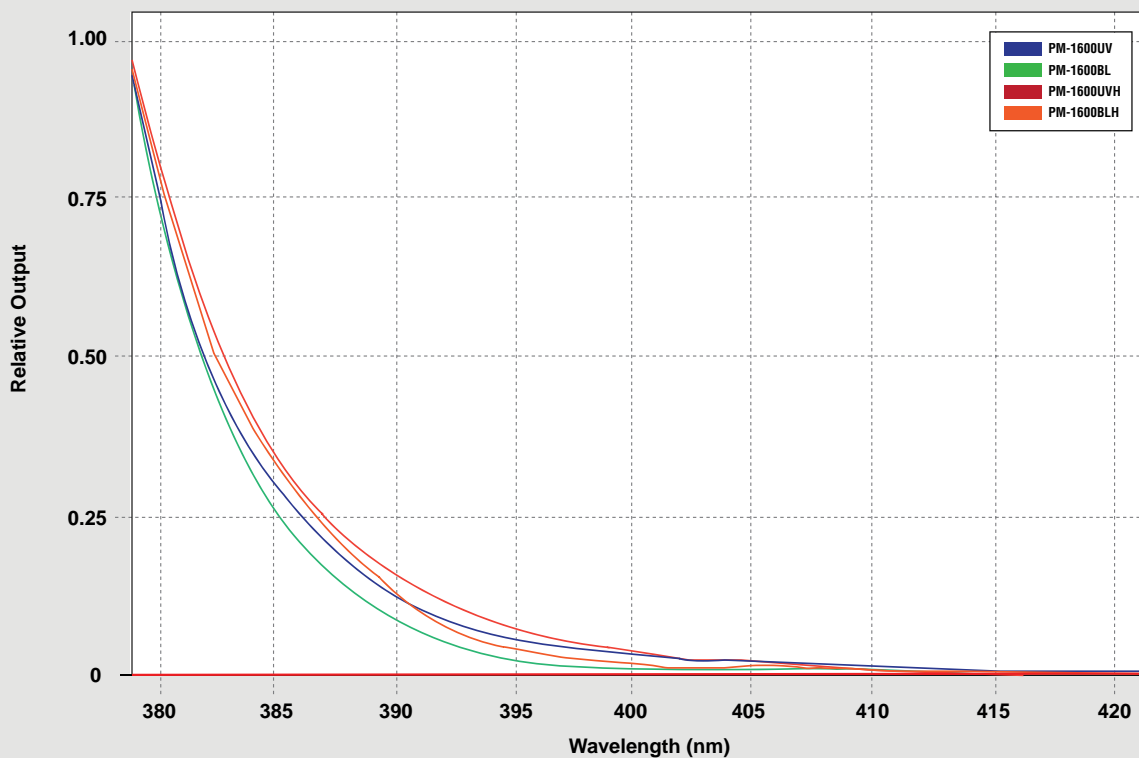
PowerMAX™ 365 Series UV-A LED panel flood lamps are also available in two **standard-intensity** models that are designed for NDT inspection applications requiring limited UV-A output.

The **PM-1600UV** is equipped with a **clear glass filter** and provides a nominal steady-state UV-A intensity of **4,500 μW/cm²** (maximum) at 15 inches (38 cm).

The **PM-1600BL** is equipped with a **black light filter** that reduces the output of wavelengths longer than 400 nm. It provides a nominal steady-state UV-A intensity of **4,000 μW/cm²** (maximum) at 15 inches (38 cm). This addresses aerospace industry concerns.

UV-A STATIONARY LAMPS

SELECT WAVELENGTHS WITH AND WITHOUT BLACK LIGHT FILTER



As the wavelength of the PowerMAX™ 365 moves into the visible light range, the black light filter significantly reduces the output of the lamp at 400 nm.

UV-400 Series SuperFlood™

Our Most Powerful UV-A Flood Lamps Designed Specifically for NDT

These super-powerful and versatile lamps have been specially engineered for fluorescent penetrant and magnetic particle inspection, parts degreasing inspections and wash station inspections.

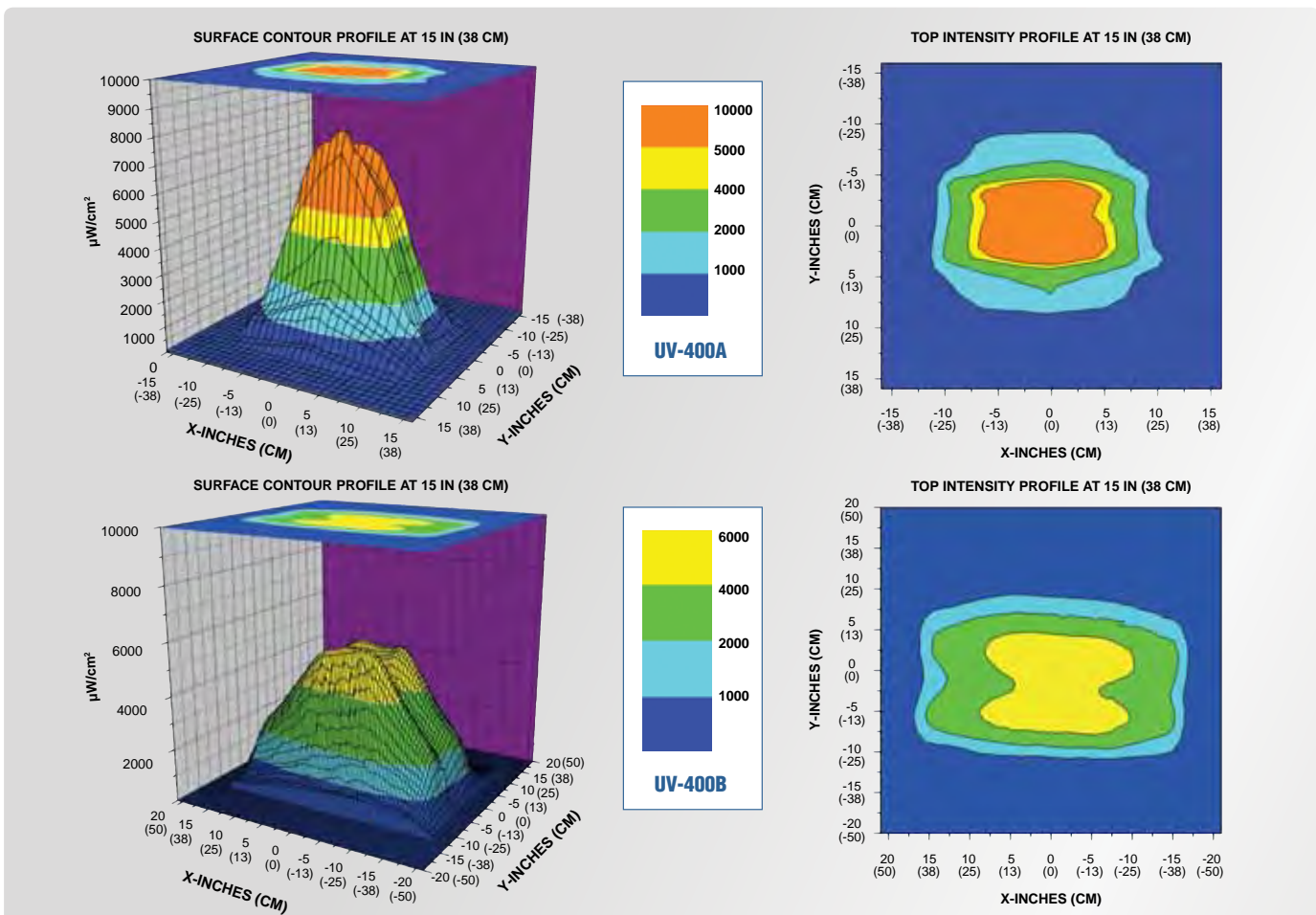
- Powerful, 400-watt metal halide bulb, combined with tempered, heat-resistant low solarization UV filters provide the highest intensity over the largest area
- Unique twin-filter system eliminates hazardous UV-B and UV-C radiation escaping from lamp
- Easily mounts over automated magnetic particle systems or above penetrant inspection booths for the most accurate inspections of even the largest parts
- Compact design and built-in mounting features allow lamps to be positioned anywhere — even in previously inaccessible areas



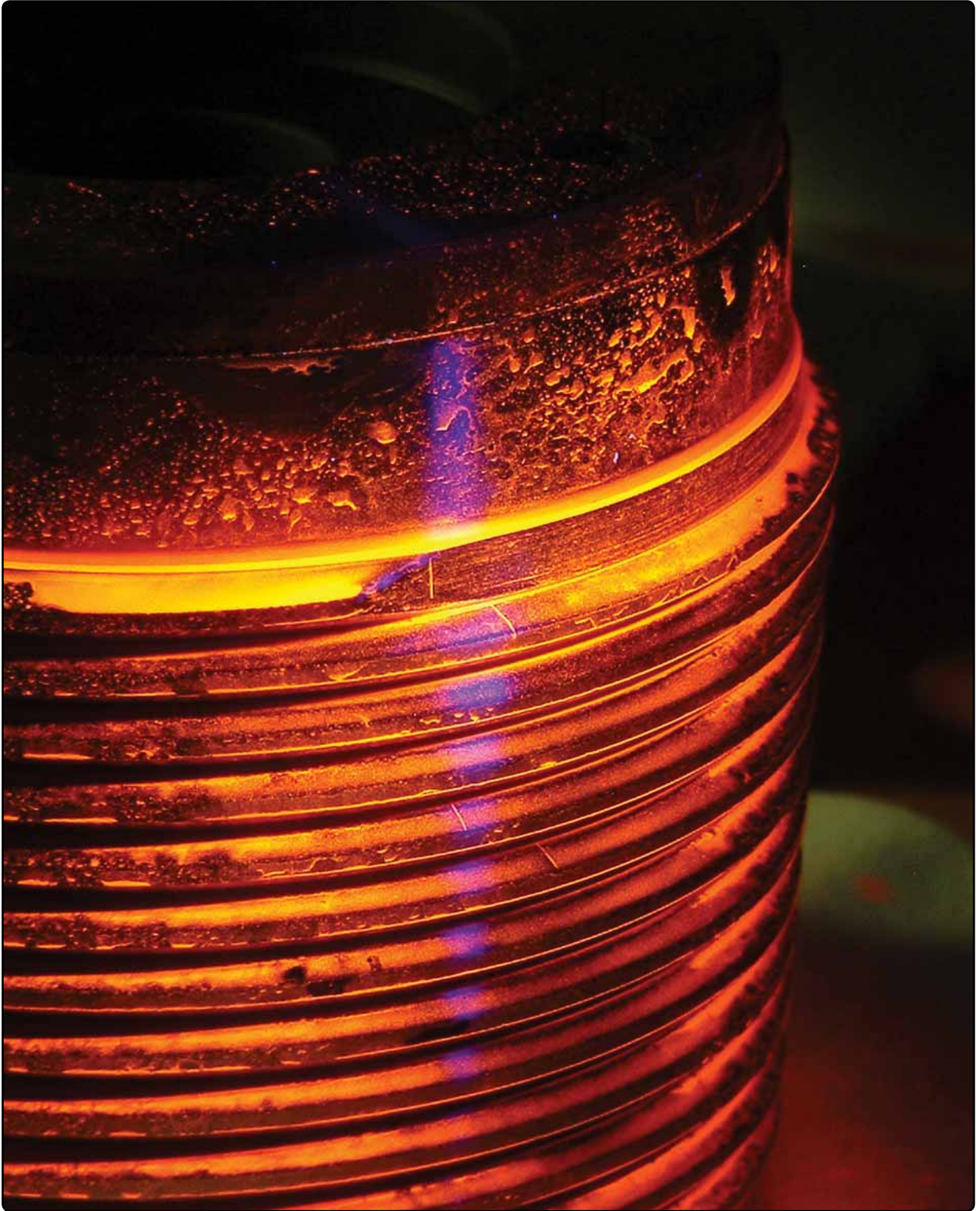
The **UV-400A** features a concentrated-beam reflector designed to assure the highest concentrated UV-A intensity available. It has a peak steady-state UV-A intensity of **8,000 $\mu\text{W}/\text{cm}^2$** within the lamp's center area, measured at 15 inches (38 cm). The lamp irradiates an area as large as 16" x 10" (41 cm x 25 cm), producing a nominal steady-state UV-A irradiance of not less than **2,000 $\mu\text{W}/\text{cm}^2$** .

The **UV-400B** features a unique broad-beam reflector designed to provide NDT inspectors with maximum uniformity of coverage over the largest area. It has a peak steady-state UV-A intensity of **5,000 $\mu\text{W}/\text{cm}^2$** within the lamp's center area, measured at 15 inches (38 cm). The lamp irradiates an area as wide as 27" x 15" (69 cm x 38 cm) with unmatched uniformity, producing a nominal steady-state UV-A irradiance of not less than **2,000 $\mu\text{W}/\text{cm}^2$** .

UV-A BEAM PROFILE



A weld defect...



Revealed by the MAXIMA™ ML-3500S UV-A inspection lamp using the liquid penetrant method.

ML-3500 Series MAXIMA™

Ultra-High Intensity UV-A Lamps

These super-powerful lamps make NDT inspections easier, safer and more reliable. They feature state-of-the-art micro discharge light (MDL) technology with a fatigue-free ergonomic design.

- Powerful, 35 watt high-intensity MDL bulb
- Deliver up to 10 times the UV-A output of conventional HID inspection lamps
- Prefocused at the factory
- Instant on/off/restrike
- Lightweight, solid-state ballast
- Integral bulb/reflector assembly
- Stay-cool, impact-resistant and dent-proof housing
- Battery-operated versions available
- All bulbs feature a rated life of 2,000 hours
- Come complete with both UV-absorbing and fluorescent-enhancing spectacles

The MAXIMA™ series consists of three models:

- » The **ML-3500S** with a spot reflector has a nominal steady-state UV-A intensity of **50,000 $\mu\text{W}/\text{cm}^2$** at 15 inches (38 cm). Works even in direct sunlight!
- » The **ML-3500D** with a spot reflector and diffusing filter has a nominal steady-state UV-A intensity of **14,000 $\mu\text{W}/\text{cm}^2$** at 15 inches (38 cm).
- » The **ML-3500FL** with a flood reflector has a nominal steady-state UV-A intensity of **4,500 $\mu\text{W}/\text{cm}^2$** at 15 inches (38 cm).

All models come standard with 8 foot (2.4 m) primary and secondary cords. Lamps are also available with extended length primary cords or with a 35 foot (10.7 m) secondary cord housed in a retractable “flying” reel.

In addition, all MAXIMA™ lamps are available in battery-operated “M” versions. Each includes a 12-volt, 7 amp/hr rechargeable battery that will operate the lamp for a full two hours. A battery charger and carrying case are included.



Line voltage model

All models come standard with 8 foot (2.4 m) primary and secondary cords. Lamps are also available with extended length primary cords or with a 35 foot (10.7 m) secondary cord housed in a retractable “flying” reel.

In addition, all MAXIMA™ lamps are available in battery-operated “M” versions. Each includes a 12-volt, 7 amp/hr rechargeable battery that will operate the lamp for a full two hours. A battery charger and carrying case are included.

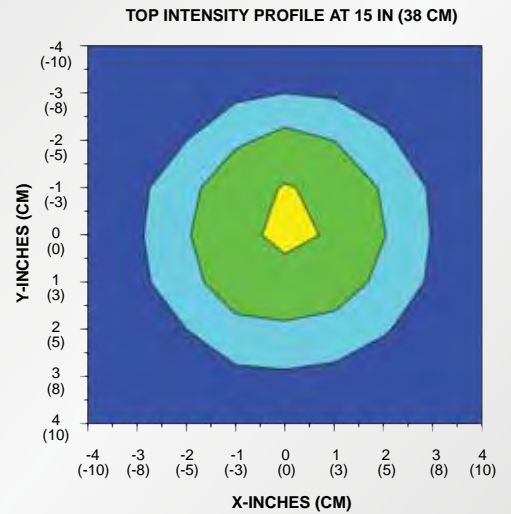
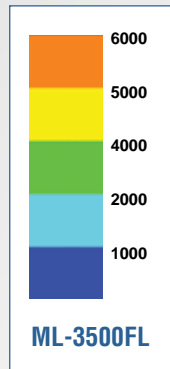
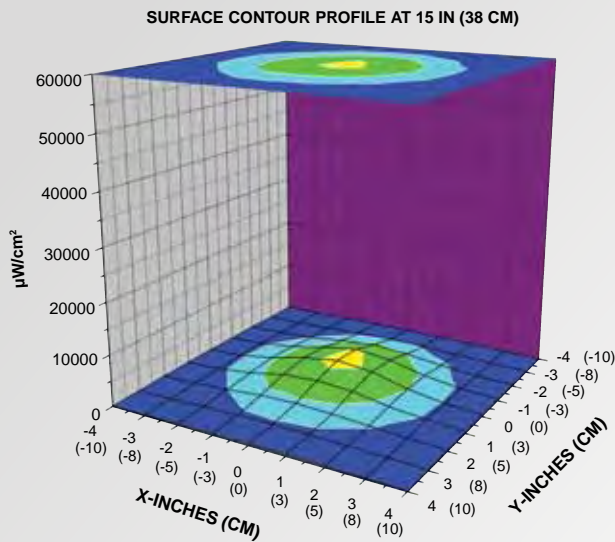
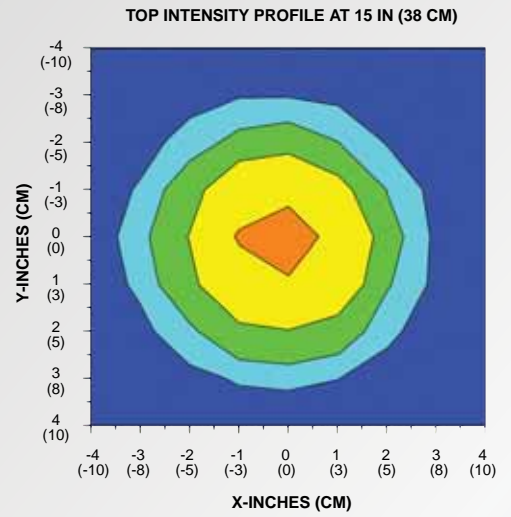
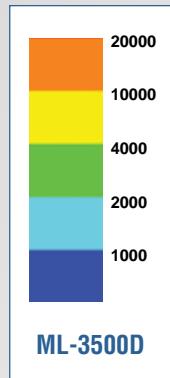
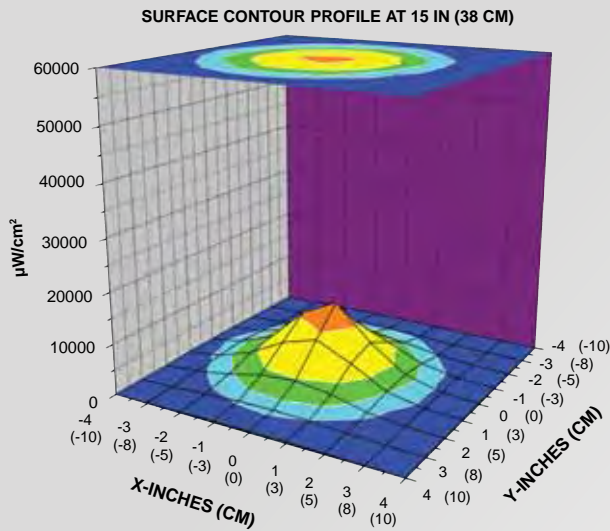
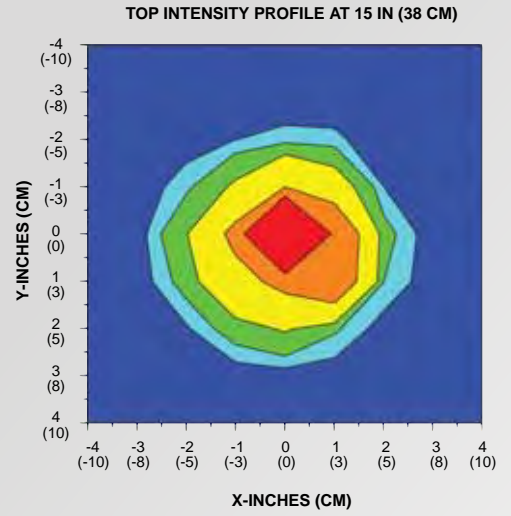
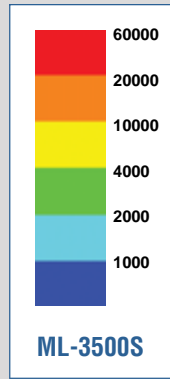
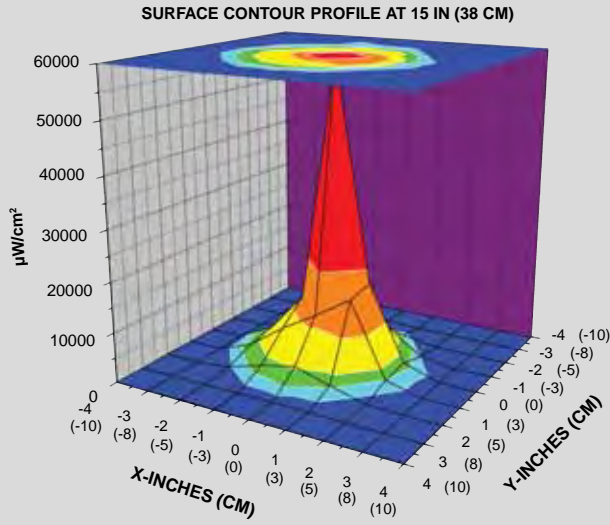


Battery-operated “M” version



ML-3500® Series lamp with 35 foot (10.7 m) secondary cord housed in a retractable “flying” reel

UV-A BEAM PROFILES



UV-A MDL INSPECTION LAMP

ONT-365 On-Trak™ Modular Inspection System

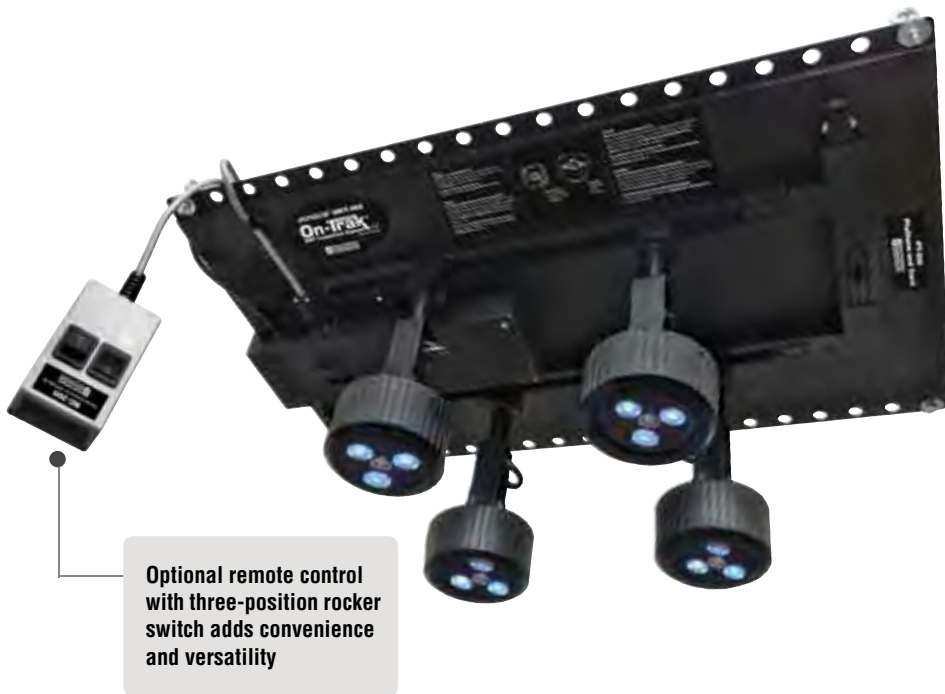
(U.S. and foreign patents pending)

The **ONT-365 On-Trak™** is an innovative, track light-style modular inspection system. It features four broad-beam lamps, each of which utilizes three powerful, ultra-high-flux UV-A (365 nm) LEDs for inspection plus one white light LED for general illumination. This overhead lighting system allows inspectors to customize lamp beam patterns to suit their individual needs. Two lamp head assemblies can be added, as desired, to increase the coverage area. Perfect for NDT inspection booths, pre-inspections and screening applications requiring maximum uniformity of coverage over large areas.



- Cool-running, energy-efficient LEDs
- Broad-beam profiles provide wide coverage area
- Electronic Intensity Stabilizers ensure consistent LED performance
- Instant-on operation; lamps reach full intensity immediately
- Built-in fans keep LEDs cool to maintain optimum UV-A intensity during extended use
- Long-lasting UV-A lenses reduce the rate of solarization
- Produces less than 2 foot-candles of visible light
- Filter protectors with rubber bumpers and Borofloat® glass lenses prevent damage to LEDs
- Easily customizable! Move, adjust and add up to two lamp heads according to your specific inspection requirements (additional lamp heads sold separately)
- Optional remote control with three-position rocker switch provides added convenience and versatility
- Comes complete with UVS-30 UV-absorbing spectacles





Optional remote control with three-position rocker switch adds convenience and versatility

LAMP SPECIFICATIONS

Product Number:
ONT-365

Light Sources:
3 UV-A LEDs and 1 white light LED per lamp head

System dimensions: (L x W x H)
28.5 x 18.3 x 11 in (72 x 46 x 28 cm)

Lamp:
Head diameter: 3.25 in (8.3 cm)
Length: 9.5 in (24 cm)

Platform Dimensions: (L x W x H)
28.5 x 18.3 x 2.5 in (72 x 46 x 6 cm)

Platform Weight:
13 lb (5.9 kg)

Power Supply Cord:
8 ft (2.4 m)

Power Supply:
Input: 100-240 VAC 50/60 Hz
Output: 12 VDC

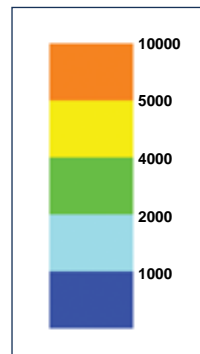
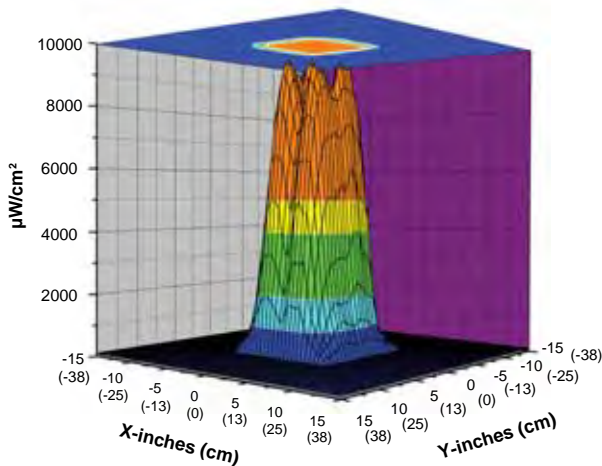
Nominal Steady-State UV-A (365 nm) Intensity:
15 in (38 cm) — 9,000 $\mu\text{W}/\text{cm}^2$

NOTE: UV-A intensity reading taken with a Spectroline® AccuMAX™ Series meter

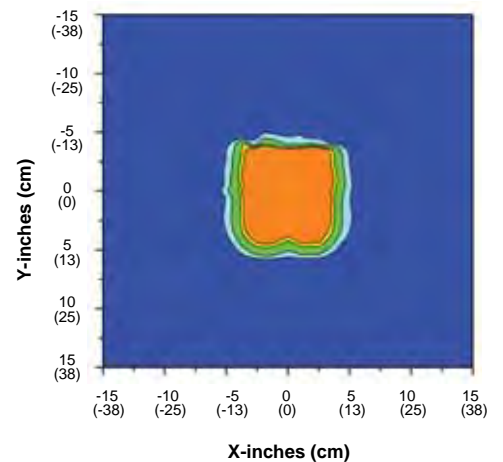
UV-A/WHITE LIGHT LED
MODULAR INSPECTION SYSTEM

UV-A BEAM PROFILE

SURFACE CONTOUR PROFILE AT 15 IN (38 CM)



TOP INTENSITY PROFILE AT 15 IN (38 CM)



Replacement Parts & Accessories

LA-365 UV-A/white light LED lamp head assembly

PT-200 Platform and track assembly

FP-100 Filter protector with rubber bumper and Borofloat® glass lens

AF-200 Air filter (package of 24)

PS-100A Power supply module

RC-200 AC remote control with 8 foot (2.4 m) cord

UL-100 UV-A Lens

UVS-30 Spectacles, UV-absorbing

UVG-50 Goggles, UV-absorbing

UVF-80 Face shield, UV-absorbing

LED Light Sources in Blue Light Wavelengths!

The importance of high-intensity UV-A black lights for proper magnetic particle or penetrant NDT inspection is well established. However, a concern for UV safety has always existed. Our new blue light inspection lamps and modular systems address this concern. While still no substitute for UV-A lamps, blue light does provide the safety and convenience desired for quick pre-inspection or screening of fluorescent particles in operating conditions with ambient light, saving time and limiting the use of black lights to only when necessary.



OPTIMAX™ 450

Cordless & Lightweight Flashlight!



TRITAN™ 450

Powerful, Broad-Beam Lamp!



PowerMAX™ 450

Versatile, Stationary Flood Lamp!



On-Trak™ 450

Powerful, Customizable Track Light System!

OPX-450

OPTIMAX™ 450 Rechargeable Blue Light LED Flashlight

(U.S. patent no. 5,905,268; foreign patents pending)

This versatile, cordless inspection lamp features a high-intensity, 450 nm blue light LED, a black anodized lamp body and our patented, thin-film dichroic lens to filter out long-wave visible light.

- Nominal steady-state blue light intensity of **7,000 $\mu\text{W}/\text{cm}^2$** at 15 inches (38 cm)
- Patented, thin-film dichroic lens improve contrast and fluorescent response
- Electronic Intensity Stabilizer assures consistent performance. Beam strength will not weaken between charges!
- Instant-on operation. Lamp reaches full intensity immediately!
- Lightweight, cordless, ergonomic design eliminates fatigue
- Portable and rugged. Anodized aluminum lamp body minimizes corrosion and stands up to years of heavy use.
- Powered by a rechargeable NiMH battery. Provides 90 minutes of continuous inspection between charges.



OPTIMAX™ 450 comes complete with smart AC and DC chargers, fluorescent-enhancing, yellow spectacles, belt holster and rugged, padded carrying case.

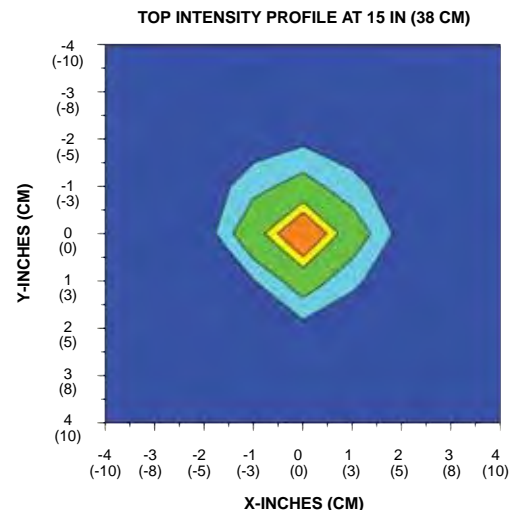
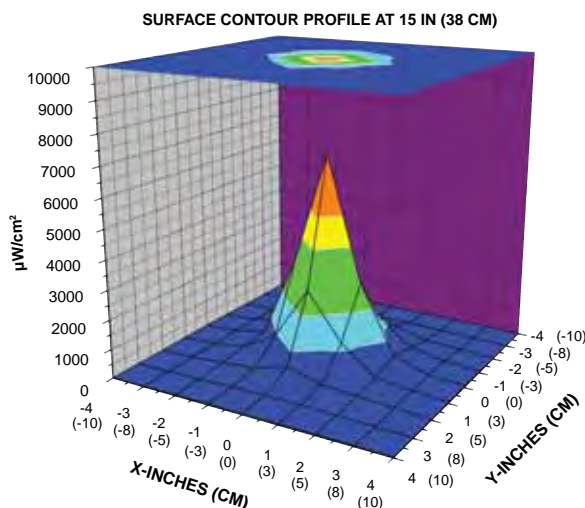
LAMP SPECIFICATIONS

Style	Cordless flashlight
Lamp Head Diameter	2.0 inch (5.1 cm)
Length	8.0 inch (20.3 cm)
Weight (with Battery)	11.8 oz (335 g)
Power Requirement	3.6V, 2 AH NiMH internal battery stick (rechargeable)
Run Time	90 minutes (continuous)
Charge Time	4 hours



BLUE LIGHT LED INSPECTION LAMPS

BLUE LIGHT BEAM PROFILE



TRI-450B Series

TRITAN™ 450 Multi-LED, Broad-Beam Blue Light Lamp

(U.S. patent no. 5,905,268; foreign patents pending)

Feature three cool-running, ultra-high flux 450 nm blue light LEDs with a broad-beam configuration. This powerful lamp provides a wider coverage area than conventional inspection lamps, while its compact head design allows access into areas inaccessible to larger inspection lamps. Ideal for most non-destructive testing applications.



- Nominal steady-state blue light intensity of **9,500 $\mu\text{W}/\text{cm}^2$** at 15 inches (38 cm)
- Large 5 inch (13 cm) diameter coverage area at 15 inches (38 cm) with a minimum intensity of **2,000 $\mu\text{W}/\text{cm}^2$**
- Rubber bumper with patented thin-film dichroic lens filters out long-wave visible light
- Electronic Intensity Stabilizer ensures consistent LED performance
- Built-in fans keep LEDs cool to maintain optimum light output during extended use
- Instant-on operation. Lamp reaches full intensity immediately!
- Rugged, ergonomic, angled lamp body provides safe, fatigue-free handling
- Choice of standard 8 foot (2.4 m) or extra-long 20 foot (6.1 m) heavy-duty power cord with AC plug and rubber boot. Also available: Optional in-line power supply or industrial power supply with cord sets (sold separately).
- Includes fluorescent-enhancing, yellow spectacles and soft carrying case





Also Available:

TRITAN™ 450MB portable, battery-operated AC/DC lamp kit. Includes TRITAN 450 blue light LED lamp, rechargeable NiMH battery pack, power supply adapter with AC and DC cord sets, smart AC charger, fluorescent-enhancing, yellow spectacles and soft, lightweight carrying case.

LAMP SPECIFICATIONS

Style	Pistol grip
Light Source	3 blue light LEDs
Lamp Head Diameter	5 in (13 cm)
Length	8.0 in (20.3 cm)
Weight	1 lb (454 g)
Power Requirements:	
AC lamp	(TRI-450B) 120VAC*
AC/DC lamp	(TRI-450MB) 120VAC*/12VDC
Battery Pack:	
Type	12V, NiMH (rechargeable)
Run Time	3.5 hours (continuous)
Charge Time	2 hours

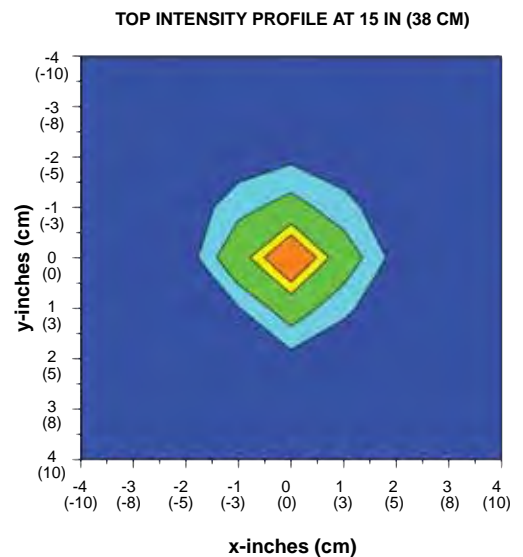
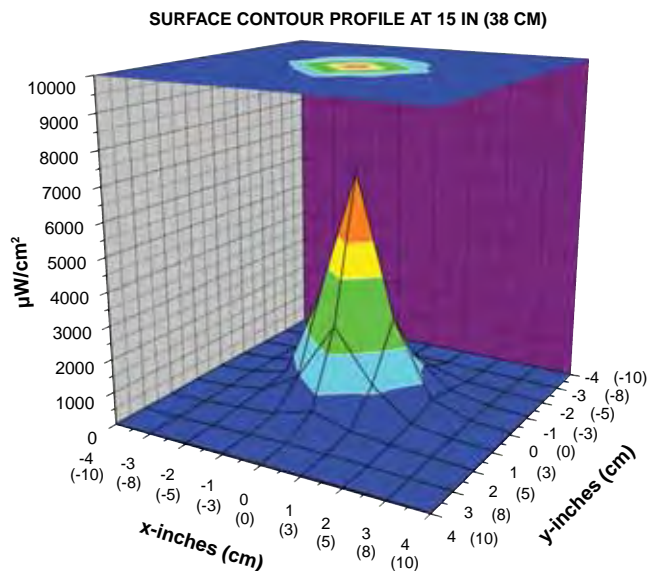
*Also available in 230V, 240V and 100V versions.



Replacement Parts & Accessories

129141	Standard, 8 foot (2.4 m) AC power cord
129145	Extra-long, 20 foot (6.1 m) AC power cord
129162	3.5 foot (1.1 m) DC power cord for "M" series lamps
127933	Particulate filter assembly
BP-30	Battery pack with 12V rechargeable NiMH battery
BR-150A	Smart AC charger
CC-370A	Soft carrying case
FP-450	Rubber bumper with dichroic lens
PSA-250A	AC/DC power supply adapter for "M" series lamps
PS-200A	Industrial power supply. Primary cord: 8 feet (2.4 m); secondary cord: 20 feet (6.1 m).
PS-300A	In-line power supply. Primary cord: 8 feet (2.4 m); secondary cord: 8 feet (2.4 m).
UVS-40	Fluorescent-enhancing spectacles, yellow

BLUE LIGHT BEAM PROFILE



PM-1600B

PowerMAX™ 450

Blue Light LED Panel Flood Lamp

Designed Specifically for NDT Professionals!

PowerMAX™ 450 flood lamp features a panel of 16 powerful blue light (450 nm) LEDs specially engineered for non-destructive testing applications when limiting the use of UV-A light is a requirement. This versatile, stationary light source can be installed overhead or in-line, and can be ganged together to provide an even wider coverage area.

Ideal for NDT inspection booths, quick pre-inspection or screening of fluorescent particles in ambient light conditions and any other applications requiring maximum uniformity of blue light coverage over a large area.



- Nominal steady-state blue light intensity of **14,000 $\mu\text{W}/\text{cm}^2$** at 15 inches (38 cm)
- Large coverage area of 18 inches by 8 inches (46 cm x 20 cm) with a minimum blue light intensity of **2,000 $\mu\text{W}/\text{cm}^2$**
- Patented, thin-film dichroic lens to filter out long-wave visible light
- Easily mountable for overhead inspection or in-line applications
- Built-in fans keep LEDs cool to maintain optimum light output during extended use
- Customizable — multiple lamp units can be “ganged” together longitudinally or back-to-back for a larger coverage area to meet your specific inspection requirements!





Top View

LAMP SPECIFICATIONS

Style	Panel flood lamp
Light Source	16 blue light (450 nm) LEDs
Dimensions (WxLxH)	5.5 x 13.75 x 6 in (14 x 35 x 15 cm)
Weight	9 lb (4 kg)
Power Requirement	AC power (main AC power cord supplied with the unit)



For applications requiring extremely large coverage areas, the PowerMAX™ 450 can be quickly ganged together longitudinally (top) or back-to-back (bottom) using customized, easy-to-install connecting plates and brackets.



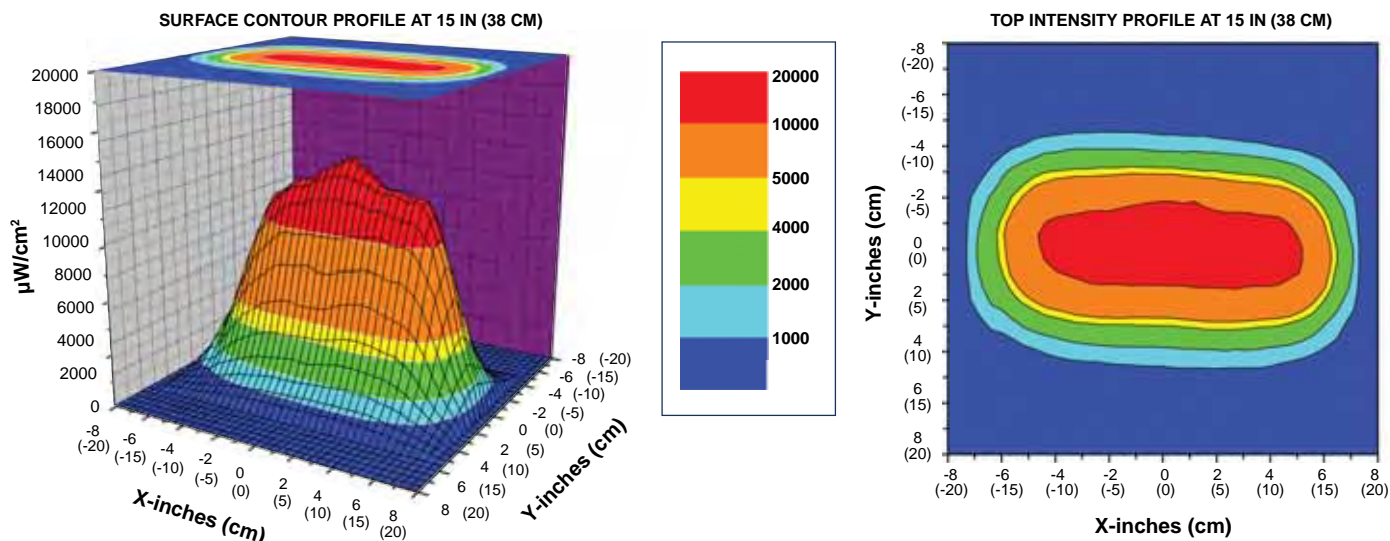
Top View

Replacement Parts & Accessories

128177	AC power cord
127918	Particulate air filter
127935	Retainer, LED assembly face plate
DF-450PM	Dichroic filter assembly
CC-200	Connector cable for ganging lamps
CP-100	Top connecting plate for ganging lamps longitudinally
CP-200	Top connecting plate for ganging lamps back-to-back (two required)
CP-300	Side connecting bracket for ganging lamps longitudinally (two required)
UVS-40	Fluorescent-enhancing spectacles, yellow

BLUE LIGHT LED INSPECTION LAMPS

BLUE LIGHT BEAM PROFILE



ONT-450 On-Trak™

Modular Inspection System

(U.S. and foreign patents pending)

Blue Light LED Inspection System

The **ONT-450 On-Trak™** is an innovative, modular, track light-style inspection system. It features four broad-beam lamps, each of which utilizes three powerful, blue light (450 nm) LEDs. This overhead lighting system provides a fast, safe and effective alternative to UV-A light. It allows inspectors to customize lamp beam patterns to suit their individual needs, and provides the ability to add two additional lamp head assemblies to further increase the coverage area. Perfect for NDT inspection booths, pre-inspections and screening of fluorescent particles in operating conditions with ambient light or any application requiring maximum uniformity of coverage over large areas.



- Powerful, cool running, energy-efficient blue light LEDs
- Broad-beam profiles provide wide coverage area
- Electronic Intensity Stabilizers ensure consistent LED performance
- Instant-on operation; lamps reach full intensity immediately
- Built-in fans keep LEDs cool to maintain optimum light output during extended use
- Rubber bumpers with patented thin-film dichroic lenses filter out long-wave visible light while preventing damage to the LEDs
- Easily customizable! Move, adjust and add up to two additional lamp heads according to your specific inspection requirements (additional lamp heads sold separately)
- Optional remote control with two-position rocker switch provides added convenience and versatility
- Comes complete with UVS-40 fluorescence-enhancing spectacles

LAMP SPECIFICATIONS

Product Number:
ONT-450

Light Sources:
3 blue light LEDs per lamp head

System dimensions: (L x W x H)
28.5 x 18.3 x 11 in (72 x 46 x 28 cm)

Lamp:
Head diameter: 3.25 in (8.3 cm)
Length: 9.5 in (24 cm)

Platform Dimensions: (L x W x H)
28.5 x 18.3 x 2.5 in (72 x 46 x 6 cm)

Platform Weight: 13 lb (5.9 kg)

Power Supply Cord: 8 ft (2.4 m)

Power Supply:
Input: 100-240 VAC 50/60 Hz
Output: 12 VDC

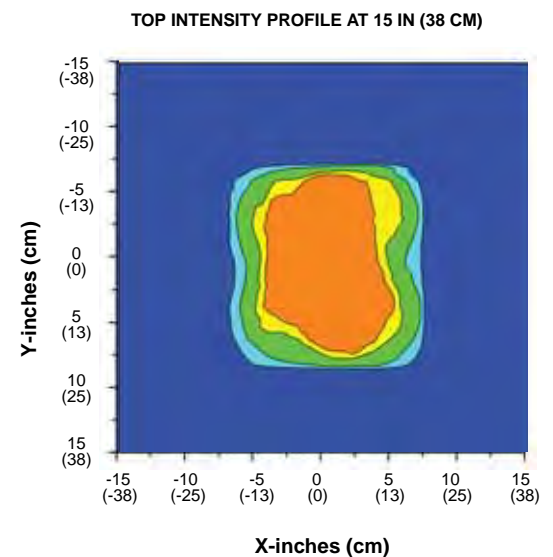
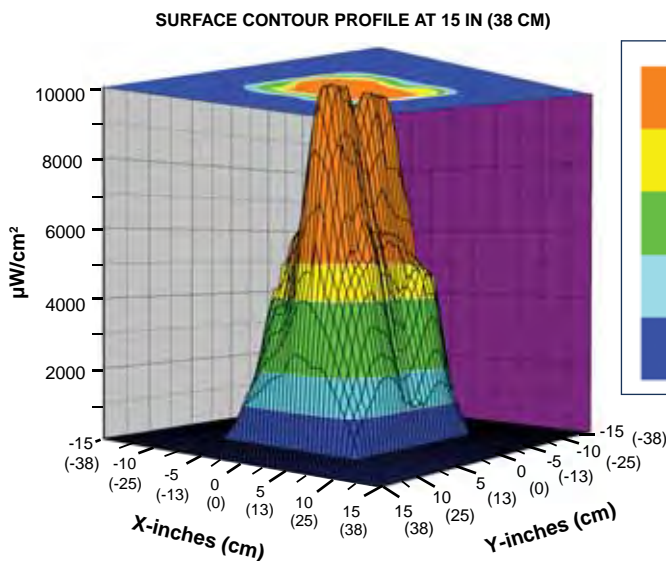
Nominal Steady-State Blue Light (450 nm) Intensity:
15 in (38 cm) — 9,500 $\mu\text{W}/\text{cm}^2$

NOTE: Blue light intensity reading taken with a Spectroline® AccuMAX™ Series meter



Optional remote control with two-position rocker switch adds convenience and versatility

BLUE LIGHT BEAM PROFILE



Replacement Parts & Accessories

LA-450	Lamp head assembly with three blue light LEDs
PS-100A	Power supply module
PT-200	Platform and track assembly
RC-300	AC remote control with 8 foot (2.4 m) cord

FP-200	Filter protector with rubber bumper and thin-film dichroic lens
UVS-40	Fluorescence-enhancing spectacles, yellow
AF-200	Air filter (package of 24)

AccuPRO™ Series

Digital Radiometer/Photometers

The **AccuPRO™ Series** meters feature an advanced, microprocessor-controlled readout unit calibrated to accurately measure and display both UV-A and visible light readings for non-destructive testing applications.

Available in two versions: The AccuPRO™ (XP-2000) readout unit features a single dual-wavelength sensor detector designed to measure both ultraviolet and visible light. The AccuPRO™ Plus (XP-4000) features a single 3-in-1 multi-purpose sensor that measures ultraviolet, visible and blue light.

These compact, lightweight, battery-operated units are ideal for use in the field, the factory or anywhere accurate light measurements are needed!



- Large, easy to read, LCD screen with 4-digit autoranging display
- Both units provide accurate readouts for UV-A irradiance as well as visible illuminance. AccuPRO™ Plus unit also measures blue light
- Simply to use, three-button interface. Toggle between light measurement modes.
- Overall accuracy greater than $\pm 5\%$ per NIST standards
- Superior band-pass interference filter provides excellent cosine response
- One-touch PEAK with reset functions
- User-defined power save and automatic shutoff
- User-selectable, multilingual display settings at any operational level. Choose from English, French, German, Chinese and Spanish.
- Rugged meter features protective rubber housing for better grip and to help prevent accidental breakage
- Sealed sensor with water-resistant housing
- Multi-wavelength sensor directly attached to meter by 3 ft (0.9 m) cord
- Complies with ASTM specifications for LPT and MPT
- Convenient on-board recharging
- Powered by four rechargeable “AAA” nickel-metal hydride batteries (included)
- Come complete with AC charger and padded carrying case



The AccuPRO™ meter features a dual-wavelength UV/visible light sensor, while the AccuPRO™ Plus (shown) features a 3-in-1 sensor that measures UV, visible and blue light.

SPECIFICATIONS

Readout Unit

Resolution	4-digit autoranging display
Screen	128 x 64 dot pixel chip on glass STN transmissive monochrome LCD 2.25 in (5.7cm) diagonal illuminated (backlit)
Read Update	2 Hz
Overall Accuracy	Better than $\pm 5\%$ with reference to NIST standards
Temperature Coefficient	$\pm 0.025\%/^{\circ}\text{C}$ (0 to 50°C)
Power Requirements	Four "AAA" nickel-metal hydride batteries (rechargeable). AC charger included. Available in 120V, 230V, 240V or 100V versions.

Dimensions

Length	6.0 in (15.2 cm)
Width	3.0 in (7.6 cm)
Thickness	1.0 in (2.5 cm)
Weight	8 oz (227 g)

Sensor Detector

Length	3.0 in (7.6 cm)
Width	2.0 in (5.1 cm)
Thickness	0.5 in (1.3 cm)
Weight	5.6 oz (159 g)

Spectral Range

UV-A Sensor	320-400 nm
Visible Sensor	460-675 nm
Blue Light Sensor	410-475 nm

XP-2000 AccuPRO™

Dual Sensor (UV-A/VIS)

Sensitive to UV and Visible Light

Wavelength/Measurement Range

UV-A (365 nm) Irradiance	0-100 mW/cm ²
Visible (555 nm) Illuminance	0-5,382 Lux (0-500 fc)

XP-4000 AccuPRO™ Plus

3-in-1 Sensor (UV-A/VIS/Blue)

Sensitive to UV, Visible and Blue Light

Wavelength/Measurement Range

UV-A (365 nm) Irradiance	0-100 mW/cm ²
Visible (555 nm) Illuminance	0-5,382 Lux (0-500 fc)
Blue (450 nm)	0-100 mW/cm ²



XRP-3000 AccuMAX™

Digital Radiometer/Photometer

Features an advanced microprocessor-controlled readout unit with a dual-wavelength sensor detector to measure *both* ultraviolet and visible light.

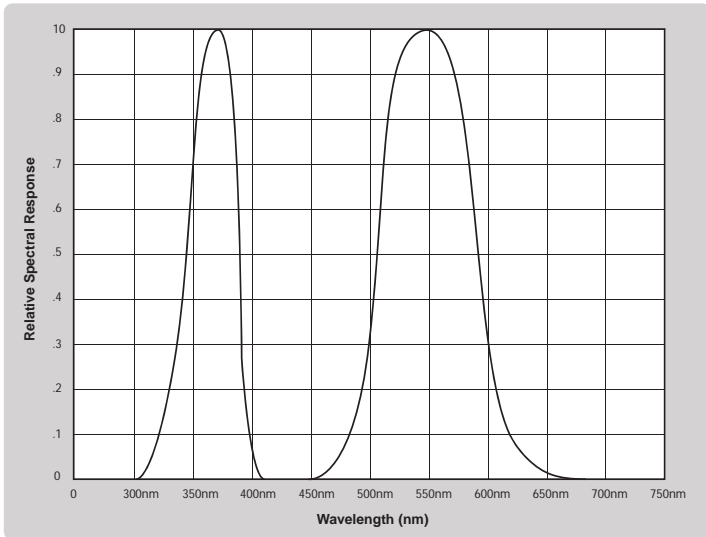
- Large, easy-to-read LCD screen
- Provides readouts for UV-A, visible irradiance or radiance
- Overall accuracy greater than $\pm 5\%$ per NIST standards
- Choice of direct or USB cable connection between sensor detector and readout unit
- Superior bandpass interference filter
- Automatic zeroing, integration and signal hold
- Excellent cosine response
- User-selectable, multilingual display settings. Choose from English, French, German and Spanish.
- User-defined power save and automatic shutoff
- Rugged meter housing features removable, protective rubber boot for better grip and to help prevent accidental breakage
- Sealed sensor housing and USB connection with water-resistant adapter
- Compact, lightweight and battery-operated for convenient use in the factory, field or anywhere measurements are needed
- Complies with ASTM specifications for LPT and MPT
- Comes complete with readout unit, dual-wavelength sensor detector, USB cable with water-resistant adapter, protective rubber boot, two 9V alkaline batteries and padded carrying case.



XR-1000 readout unit with dual-wavelength sensor detector connected directly to unit



XR-1000 readout unit with dual-wavelength sensor detector connected to unit via USB cable



SPECIFICATIONS

Readout Unit (XR-1000)

Resolution	4-digit autoranging display
Screen	128 x 64 dot pixel chip on glass STN transmissive monochrome LCD 2.8 in (7.1 cm) diagonal illuminated (backlit)
Sample Rate	7.5 Hz (single sensor) 15 Hz (dual sensor)
Read Update	2 Hz
Overall Accuracy	Better than $\pm 5\%$ with reference to NIST standards
Temperature Coefficient	$\pm 0.025\%/^{\circ}\text{C}$ (0 to 50°C)
Power Requirements	Two 9V alkaline batteries (included)

Dimensions

Length	7.75 in (19.7 cm)
Width	4.25 in (10.8 cm)
Thickness	1.25 in (3.2 cm)
Weight	0.8 lb (360 g)



Dual UV-A/Visible Sensor Detector (XDS-1000)

Irradiance Range	
UV-A Sensor	0-100 mW/cm ² (0-100,000 μW/cm ²)
Visible Sensor	0-5,300 lux (0-500 fc)
Spectral Range	
UV-A Sensor	320-400 nm
Visible Sensor	460-675 nm
Dimensions	
Length	4.75 in (12.1 cm)
Width	2.0 in (5.1 cm)
Thickness	7/8 in (2.2 cm)
Weight	0.22 lb (100 g)
USB Cable (Length)	5 ft (1.5 m)

DM-365XA

Digital UV-A Radiometer

Provides increased accuracy for more repeatable results.

- Measures UV-A light sources with overall accuracy of $\pm 5\%$ per NIST standards
- Autozeroing, excellent linearity and cosine response, solid-state design, compact, durable, simple operation, battery-level indicator
- Sealed silicone photodiode protects against shock and humidity
- Sensor housing is constructed with series of baffles and unique self-sealing mechanism to eliminate light leakage
- Compact, lightweight and battery operated so measurements can be taken anywhere
- Complies with ASTM specifications for LPT and MPT



SPECIFICATIONS

Readout Unit

Resolution	10 $\mu\text{W}/\text{cm}^2$
Screen	4½ digit, 7 segment, LED display 0.5 in (1.3 cm) high
Overall Accuracy	Better than $\pm 5\%$ with reference to NIST standards
Temperature Coefficient	$\pm 0.025\%/^{\circ}\text{C}$ (0 to 50°C)
Irradiance Range	0-19,900 $\mu\text{W}/\text{cm}^2$
Spectral Range	320-400 nm
Power Requirements	Two "AA" alkaline batteries (included)
Length	7¼ in (18.4 cm)
Width	3.5 in (8.9 cm)
Thickness	2 in (5.1 cm)
Weight	1 lb (0.45 kg)



Sensor Detector

Length	3 in (7.6 cm)
Width	2 in (5.1 cm)
Thickness	0.70 in (1.8 cm)
Weight	1¼ lb (0.57 kg)
Cord Length	3 ft (91.4 cm)

REPLACEMENT PARTS & ACCESSORIES



BP-12A BATTERY PACK

Complete with RB-12S Smart Charger with Cordset, 12 Volt Rechargeable NiMH Battery and Nylon Carrying Case for MAXIMA™ ML-3500 Series Lamps. (120V)*



BP-30 BATTERY PACK

Complete with BR-150A Smart Charger, 12 Volt Rechargeable NiMH Battery for QUADRAN™ QDR-365M, TRITAN™ TRI-365M and TRI-450MB AC/DC Lamp Kits. (100-120V)*



CC-120A CARRYING CASE

for BIB-150P Series. FC-Series and SB-100P Series Lamps



CC-350 CARRYING CASE

for MAXIMA™ ML-3500 Series Lamps



CC-365 CARRYING CASE

for OPTIMAX™ OPX-365 and OPX-450 Flashlights



CC-370A CARRYING CASE

for EagleEye™ and TRITAN™ Series Lamp Kits



CC-400 CARRYING CASE

for QUADRAN™ 365 Series Lamp Kits



UVS-30 SPECTACLES

UV-Absorbing



UVS-40 SPECTACLES

Fluorescence-Enhancing



UVF-80 FACE SHIELD

UV-Absorbing



UVG-50 GOGGLES

UV-Absorbing

*For other voltages, please see price list.

Using genuine Spectrolite® replacement parts ensures that lamps will operate at their optimum performance.



BLE-35PRA
MDL BULB/POLISHED
REFLECTOR ASSEMBLY

for MAXIMA™ ML-3500 Series Lamps



BLE-35RA
MDL BULB/COATED REFLECTOR
ASSEMBLY

for MAXIMA™ ML-3500 Series Lamps



BLE-35RAF
MDL BULB/ANODIZED
REFLECTOR ASSEMBLY

for MAXIMA™ ML-3500 Series Lamps
for CH-50P/12 and MAXIMA™ ML-3500
Series Lamps



BLE-400
METAL HALIDE BULB

400 Watt for SuperFlood™ UV-400 Series
Lamps



119584
MDL BULB

35 Watt for MAXIMA™ ML-3500 Series
Lamps



120344
COATED SPOT REFLECTOR

for MAXIMA™ ML-3500 Series Lamps



120514
ANODIZED FLOOD REFLECTOR

for MAXIMA™ ML-3500 Series Lamps



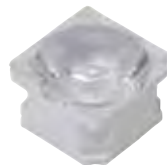
123378
POLISHED REFLECTOR

for MAXIMA™ ML-3500 Series Lamps



127423
DOME LENS

for OPTI-LUX™ 365 Series LED Flashlights



UL-100
UV-A LENS

for all UV-A (365 nm) LED Lamps,
except TRITAN™ 365 TRI-365SBLC



UL-110
UV-A LENS

for TRITAN™ 365 TRI-365SBLC Lamp



OF-300W
LED LAMP HEAD, WHITE LIGHT

for OPTIMAX™ OPK-300N Multi-Lite™ Lamp



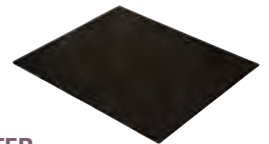
OF-365UV
LED LAMP HEAD, UV (365 nm)

for OPTIMAX™ OPK-300N Multi-Lite™ Lamp



OF-450BD
LED LAMP HEAD, BLUE LIGHT (450 nm)

with dichroic lens for OPTIMAX™ OPK-300N
Multi-Lite™ Lamp



2F110
UV-A FILTER

for SuperFlood™ UV-400 Series Lamps



2F350
DIFFUSING FILTER

for FC-Series and MAXIMA™ ML-3500
Series Lamps



2F400B
UV-B BLOCKING FILTER

for SuperFlood™ UV-400 Series Lamps



2F958
UV-A FILTER

for BIB-150P Series, FC-Series and
MAXIMA™ ML-3500 Series Lamps



125565
RUBBER LAMP PROTECTOR

for OPTIMAX™ Flashlights



127796
RUBBER LAMP PROTECTOR

for OPTI-LUX™ 365 Flashlight



BF-365LX
EXTERNAL BLACK LIGHT FILTER
WITH RUBBER BUMPER

for OPTI-LUX™ 365 Flashlight



DF-365
DIFFUSING FILTER

for OPTIMAX™ OPX-365 Flashlight



FP-100
FILTER PROTECTOR

with Rubber Bumper/Borofloat® glass
lens for ONT-365 On-Trak™ Inspection
System Lamps



FP-200
FILTER PROTECTOR

with Rubber Bumper/Dichroic glass
lens for ONT-450 On-Trak™ blue light
Inspection System Lamps



FP-365
FILTER PROTECTOR

with Rubber Bumper/Borofloat® Glass for
TRITAN™ 365 Series Lamps



FP-450
FILTER PROTECTOR

with Rubber Bumper/Dichroic Filter for
TRITAN™ 450 Series Lamps



HS-100
HEAD STRAP

for EagleEye™ Lamp



LMS-100
LAMP MOUNT/SPRAYER

for EagleEye™ Lamp



SG-100
SPLASH GUARDS WITH INTEGRAL
PARTICULATE FILTER

for EagleEye™ Lamp (3 pack)



127243
HOLSTER

for OPTIMAX™ OPX-365 and OPX-450
Flashlights



127574
BELT HOLSTER

For OPTI-LUX™ 365 Series Flashlights



**124826
CORD SET**

2 Foot (0.6 m), 7 Pin for MAXIMA™
ML-3500 Series Lamps. (12V DC version)



**124827
CORD SET**

8 Foot (2.4 m), 7 Pin for MAXIMA™
ML-3500 Series Lamps. (230V version)



**124828
CORD SET**

8 Foot (2.4 m), 7 Pin for MAXIMA™
ML-3500 Series Lamps. (115V and 100V
versions)



**129141
AC CORD SET**

8 Foot (2.4 m) for QUADRAN™ A and
TRITAN™ B Series Lamps. (100-120V)*



**129145
AC CORD SET**

20 Foot (6.1 m) for QUADRAN™ A and
TRITAN™ B Series Lamps. (100-120V)*



**129162
DC CORD SET**

3.5 Foot (1.1 m) for QUADRAN™ A and
TRITAN™ B “M” Series Lamps



**128217
BATTERY CHARGING CRADLE**

with AC cord for Eagle-Eye™ Inspection
Lamp and OPTI-LUX™ 365 Series
Flashlights. (100-120V)*



**128225
DC CORD SET**

for Eagle-Eye™ Inspection Lamp and
OPTI-LUX™ 365 Series Flashlights



**BR-150A
SMART BATTERY CHARGER**

for BP-30 Battery Pack. (100-120V)*



**PS-200A
INDUSTRIAL POWER SUPPLY**

with cord sets for QUADRAN™ 365 and
TRITAN™ Series Lamps. (100-120V)*



**PS-300A
IN-LINE POWER SUPPLY**

for QUADRAN™ 365 and TRITAN™
Series Lamps. (100-120V)*



**PSA-250A
POWER SUPPLY ADAPTER**

with AC and 12V DC connections for
QUADRAN™ and TRITAN™ “M” Series
Lamps. (100-120V)*



**RB-12S
SMART BATTERY CHARGER**

for BP-12A Battery Pack. (120V)*



**RB-300
SMART AC CHARGER**

for OPTIMAX™ OPK-300N, OPX-365 and
OPX-450 Flashlights. (100-120V)*

*For other voltages, please see price list.

REPLACEMENT PARTS & ACCESSORIES



RB-300DC 12V DC CHARGER

for OPTIMAX™ OPK-300N, OPX-365 and OPX-450 Flashlights.



RC-200 AC REMOTE CONTROL

for On-Trak™ ONT-365 UV-A Inspection System with 8 foot (2.4 m) cord



RC-300 AC REMOTE CONTROL

for On-Trak™ ONT-450 Blue Light Inspection System with 8 foot (2.4 m) cord



125608 BATTERY STICK WITH TAILCAP

for OPTIMAX™ OPK-300N, OPX-365 and OPX-450 Flashlights



127568 LITHIUM-ION BATTERY

Rechargeable for EagleEye™ Lamp and OPTI-LUX™ 365 LED Flashlights



XCB-100 WATER-RESISTANT USB CABLE WITH ADAPTER

for AccuMAX™ Meter



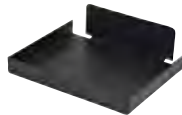
XCC-100 CARRYING CASE

for AccuMAX™ XRP-3000 Meter



XRB-100 RUBBER BOOT

for AccuMAX™ XR-1000 Readout Unit



AB-100 ADAPTER BRACKET

for Mounting Transformer-Based Spectroline® HID Lamps onto a Magnaflux® Wet Horizontal Mag Machine



B-6 BENCH MOUNT

for all Spectroline® HID, QUADRAN™ and TRITAN™ Series Lamps



FA-100 FLEXIBLE ARM

for all Spectroline® HID, QUADRAN™ and TRITAN™ Series Lamps



LH-200 LAMP HOLDER

for OPTIMAX™ OPX-365 and OPX-450 Flashlights (for use with VF-100A)



LH-300A LAMP HOLDER

for TRITAN™ Series Lamps (for use with VF-100A, FA-100, WM-100, B-6 and W-6)



VF-100A SPEC-STIK™ VERIFICATION FIXTURE

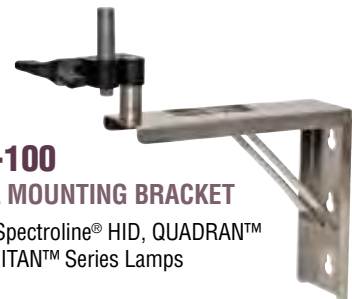
for all Spectroline® sensors, as well as HID, QUADRAN™, TRITAN™ and OPTIMAX™ Series Lamps.

NOTE: Lamp mounting accessories for TRITAN™ and OPTIMAX™ Series Lamps are sold separately (see LH-200 and LH-300A)



W-6 WALL MOUNT

for all Spectroline® HID and TRITAN™ Series Lamps



WM-100 WALL MOUNTING BRACKET

for all Spectroline® HID, QUADRAN™ and TRITAN™ Series Lamps

Using genuine Spectroline® replacement parts ensures that lamps will operate at their optimum performance.

**REPLACEMENT PARTS & ACCESSORIES
(HID LAMPS*)**



**100S
SPOT BULB**

Ad-Medium Base, 100 Watt for SB-100P and FC-Series Lamps



**100S/M
SPOT BULB**

Medium Base, 100 Watt for SB-100P and FC-Series Lamps



**100S/M-PQL
UPGRADED, PREMIUM QUALITY
LIGHTING SPOT BULB**

Medium Base, 100 Watt for SB-100P and FC-100 Series Lamps



**BLE-150BS-115/M
BROAD-BEAM BULB**

Self-Ballasted, 150 Watt for BIB-150P Series Lamps (115 volt version)



**BLE-150CS-100/M
CONCENTRATED SPOT BULB**

Self-Ballasted, 150 Watt for BIB-150P Series Lamps (100 volt version)



**BLE-150CS-115/M
CONCENTRATED SPOT BULB**

Self-Ballasted, 150 Watt for BIB-150P Series Lamps (115 volt version)



**BLE-150CS-230/M
CONCENTRATED SPOT BULB**

Self-Ballasted, 150 Watt for BIB-150P Series Lamps (230 volt version)



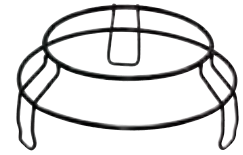
**BLE-150FC-115/M
CONCENTRATED SPOT BULB**

Self-Ballasted, 150 Watt for FC-150 Lamp (115 volt version)



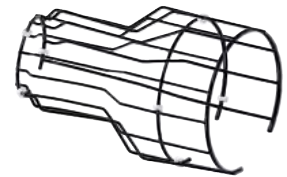
**BLE-150FC-230/M
CONCENTRATED SPOT BULB**

Self-Ballasted, 150 Watt for FC-150 Lamp, (230 volt version)



**FP-175
FILTER PROTECTOR/LAMP
STAND**

for BIB-150PR and FC-Series Lamps



**HGS-100A
HEAT GUARD/STAND**

for SB-100P Series Lamps



**HGS-150A
HEAT GUARD/STAND**

for BIB-150P and BIB-150PX Lamps

*Mercury Vapor Bulbs.

COMPANY BACKGROUND

Spectronics Corporation is the world's leading manufacturer of ultraviolet equipment and fluorescent materials. Spectronics supplies over 1,000 different products for the nondestructive testing, laboratory, biotechnology, industrial, electronics, semi-conductor, forensics, financial, automotive, HVAC/R and other markets.

Spectronics' modern, 100,000 square-foot manufacturing facility and office headquarters is located in Westbury, New York. Nearly 200 personnel are involved in all phases of research and development, manufacturing, sales, marketing, customer service, and logistical and technical support.

Over five decades since its inception, the goal of Spectronics is still the same — to produce effective, top-quality products with the utmost dedication to customer satisfaction.



SPECTRONICS CORPORATION

Warranty

All equipment is warranted against defects in manufacture. Spectronics Corporation's obligation under this warranty is limited to repairing or replacing, at the option of Spectronics Corporation, any part(s) of the product which, if properly installed, used and maintained, proves upon factory examination to have been defective in materials or workmanship within 12 months from the date of delivery to the customer, including LEDs.

This warranty does not apply to any component which (1) is normally consumed in operation or (2) has a normal life inherently shorter than the warranty stated. For example, bulbs, filters and rechargeable batteries are warranted for 30 days; the 100S/M-PQL bulb is warranted for 90 days. In addition, Spectronics Corporation does not warrant any instrument that has been subjected to misuse, negligence or accident, or has been repaired or altered by anyone other than Spectronics Corporation.

This warranty is in place of all other warranties of quality. There are no other warranties either oral, written, express, implied or statutory. **IMPLIED WARRANTIES OF FITNESS FOR PURPOSE AND MERCHANTABILITY ARE EXCLUDED.** This warranty and your remedies thereunder are solely as stated in this form. In no event shall Spectronics Corporation be liable for special, indirect, incidental or consequential damages, nor for any damages arising out of delay in shipment or production.

Product Specifications

Spectronics Corporation reserves the right to alter product specifications without notice. Spectronics is under no obligation to make similar changes in its products previously produced.

Product/Customer Support & Technical Assistance

Product literature, instructions and a full staff of trained customer service representatives and technical service engineers are available for support. Additional product information and support are available on our website.



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Distributors**

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UV-A LED INSPECTION LAMPS

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 OLX-365BFL 5
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NONDESTRUCTIVE TESTING EQUIPMENT

BLUELINE MODEL FL5000™ INSPECTION LIGHT

The BlueLine Model FL5000 is a revolutionary new flashlight for fluorescent NDT inspection. It does the job that you are used to doing with high powered UV lights, but does it with much more *convenience*.



- *Compact, lightweight*
- *Instant on/off*
- *High intensity, low power consumption*
- *Flashing mode for ambient light inspection*
- *Doesn't get hot*
- *No bulb to break or burn out*
- *Safe blue wavelengths*
- *Rugged, waterproof*

Three styles of filter glasses, all ANSI-certified safety glasses



Model FG1



Model FG2



Model FG3



WHITE LIGHT



BLUE LIGHT



BLUE LIGHT + YELLOW FILTER

6805 COOLRIDGE DR ■ TEMPLE HILLS MD 20748
301-449-7300 ■ 800-638-0554 ■ FAX 301-449-7011

EMAIL: sales@detek.com



NONDESTRUCTIVE TESTING EQUIPMENT

Features

- Two high intensity 3W LEDs with current-regulated output
- Focusing optics for intense spot beam
- Matched with BlueLine filter glasses for maximum contrast
- Two operating modes – steady and flashing
- Non-breakable locking switch prevents accidental actuation
- Integral pistol style grip
- Front lens protected by heavy rubber boot for drop protection
- Tough, non-corroding ABS and polycarbonate plastic construction
- Rubber sleeve wrist lanyard
- Environmentally sealed - waterproof to 500 feet

Specifications

- Intensity: $>3,500 \mu\text{W}/\text{cm}^2$ at 15"
- Lamp life: $>10,000$ hours
- Batteries: 4 C cell alkaline
- Weight: 25 oz. (0.7 kg)
- Size: 5" L x 3.2" D (12.7 cm L x 8.1 cm D)

6805 COOLRIDGE DR ■ TEMPLE HILLS MD 20748
301-449-7300 ■ 800-638-0554 ■ FAX 301-449-7011
EMAIL: sales@detek.com

ITI V5 VIDEOSCOPE SYSTEM



POINT.

CLICK.

VIEW.



ITI has one word for Remote Viewing: **EASY.**

ITI V5 VIDEOSCOPE SYSTEM

5 **EASY** Features:

- **EASY TO USE** - Just push the button
- **DURABLE** - Practically eliminates the cost of downtime and repairs
- **PORTABLE** - For inspections on site, any site, any time
- **AFFORDABLE** - Highest quality performance without the bells and whistles you don't need and you don't need to pay for!
- **SUPERIOR IMAGE QUALITY** - Clear, bright images

Call us @ 1-800-561-3606
www.Scopes.com/V5



4" DETACHABLE LCD DISPLAY (optional)



HEAD-UP DISPLAY (optional)

MADE IN U.S.A.

V5 System

Case Dimensions	18-1/2" x 14" x 7"
Weight	25 lbs
Power Requirements	AC: 110V or 220V DC: 2 - 12V NiMH Batteries

Videoscope Probe

Diameters Available	6mm & 8mm
Working Lengths Available	2M to 7.6M

CCD Camera

Image Sensor	1/6 inch CCD
Pixels	373,000 NTSC; 438,000 PAL
Shutter Speed	Up to 1/10,000 sec
White Balance	Auto Set or Manual (2800 to 6500K)

Digital Recorder

Video	Motion - JPEG (Quicktime MOV files, CIF Format) NTSC - 320 x 240, 30fps PAL - 384 x 288, 25fps (2) settings: 33 mins (4mbps/, 30fps) w/2GB CF card 66 mins (2mbps/, 15fps) w/2GB CF card
Still	JPEG NTSC - 640 x 480 PAL - 768 x 576 Std Quality (128KB) High Quality (256KB)
Media	CompactFlash™ Type I & II Cards 512MB (included) up to 2GB available

LCD Monitor

Diagonal Display	10.4 inch TFT LCD
Viewing Angle	Horiz - 140°, Up Side - 45°, Down Side - 55°
Luminance	450 CD/M2 (450 NITS)
Contrast Ratio	600:1
Monitor Resolution	VGA 640H x 480V

Light Source

Lamp	24 Watt Solarc Lamp
Color Temperature	5500°K
Lamp Light	500 Hours
Dimming System	Manual Shutter

Tip Articulation

Up/Down	130° min
Left/Right	130° min

Video Signal

Input	S-Video (Y/C) 4-pin mini-DIN
Output	S-Video (Y/C) 4-pin mini-DIN Composite Video

Misc Features

Electronic Zoom	1X, 1.5X, & 2X Digital Zoom
Image Reverse	0° & 180°
Longtime Exposure	From 1/30th sec to 2.1 sec
Brightness Control	Automatic & Manual
Keyboard Input	PS/2 6-pin mini-DIN
Overlay	10 lines x 25 characters

Operating Environment

Probe Operating Temp	-13°F to 176°F
System Operating Temp	-5°F to 115°F
Storage Temp	-15°F to 140°F
Relative Humidity	95% Maximum



ITI V5+ Videoscope System



Simple to use



Includes battery pack



Portable



Compact



Lightweight



Superior image quality

VERSATILE, COMPACT, DURABLE

The ITI V5+ Videoscope System is ready for use whenever and wherever you need it at a price you can afford.

- Superior image quality
- Complete system in a lightweight 12 lb. package
- Simple to operate
- Industrial videoscope with 4-way articulation
- Compact and portable for easy on-site inspections
- Durable design limits downtime
- Affordable, high quality performance incorporating only the functions you need

GOOD THINGS COME IN SMALL PACKAGES

Superior performance in a complete, compact system designed for easy use.

- High resolution, 6.5 inch TFT LCD display
- Integrated 24 watt Solarc light source
- Electronic control board
 - LED back-illuminated for low light use
 - Durable, sealed touch board operates in all weather conditions
- Digital zoom, image inversion, automatic/manual white balance
- Integrated digital recorder for video or still photography stored on Compact Flash card
- A/C or D/C (battery included) power source



PROTECH® articulation system guards against accidental over-torque damage of the control cable. This prevents expensive repairs while limiting downtime. High impact sealed body, fingertip control and 2X electronic zoom.

4-way flexible articulation to maximize viewing options with single hand operation. Available working lengths of 2M to 7.6M. Tungsten braid assures maximum durability and performance in difficult environments.



Easily interchangeable viewing heads with both forward and right angle line-of-sight. Fields of view of 40°, 80°, and 120° are available.



ITI V5+ Videoscope System

Technical Specifications

V5+ System

Dimensions	14" x 11 1/8" x 6 5/8" (35cm x 28cm x 17cm)
Weight	12 lbs. 6 oz. (5.6kg)
Power Input	88-264VAC, 47-63Hz, 1.1Amps
Battery Runtime	12VDC (10.8Ahr NiMH Battery), 5.1Amps 1 hr. 50 mins.

Videoscope Probe

Diameters	6mm, 8mm
Working Lengths	2M (6.6'), 3M (9.8'), 4M (13.1'), 5M (16.4'), 6M (19.7'), 7M (23.0') and 7.6M (25.0')
Optics	Interchangeable Heads: 40°, 80°, 120° FOV Fwd and RA LOS

Tip Articulation

Up/Down	130° minimum
Left/Right	130° minimum

CCD Camera

Image Sensor	1/6" CCD
Pixels	373,000 NTSC; 438,000 PAL
Shutter Speed	Up to 1/10,000 sec.
White Balance	Auto and Manual (2800°K to 6500°K)

Digital Recorder

Video	Motion-JPEG (Quicktime MOV files, CIF format) NTSC - 320 x 240, 30fps PAL - 384 x 288, 25fps Two recording rate settings: 33mins (4mbit/s, 30fps) w/ 2Gb CF card 66mins (2mbit/s, 15fps) w/ 2Gb CF card
-------	--

Audio	Audio annotations recorded w/video
-------	------------------------------------

Stills	JPEG file type NTSC - 640 x 480 PAL - 768 x 576 Two image snap settings: Standard Quality (128kb file size) High Quality (256kb file size)
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Storage Media	CompactFlash™ Type I & II Cards, 1Gb (included) up to 2Gb
---------------	--

LCD Display

Size and Type	6.5" TFT Color LCD
Viewing Angle	Horiz - 140°, Vert - 120°
Luminance	500 cd/m ² (500 NITS)
Contrast Ratio	600:1
Resolution	VGA (640H x 480V)

Light Source

Lamp	24 Watt Solarc
Color Temperature	5500° K
Lamp Life	500 hrs.
Attenuation	Manual graduated shutter

Video and Accessory I/O

Video Input	S-Video (Y/C), 4-pin mini-DIN
Video Output	S-Video (Y/C), 4-pin mini-DIN Composite (CVBS), BNC Scope mounted ITI monitor
Keyboard Input	USB jack
Audio Headset Input	3.5mm phone jack

Misc. Features

Electronic Zoom	2X Digital Zoom
Image Inversion	Left to Right Mirror
Longtime Exposure	1/30th sec. to 2.1 secs.
Display	Freeze Frame 4-Image tiled mosaic Color/Black & White Positive/Negative
Image Text Overlay	10 lines x 25 characters

Operating Environment

Probe Operating Temp	-13°F to 176°F (-25°C to 80°C)
Control System Temp	-5°F to 115°F (-20°C to 46°C)
Storage Temp	-15°F to 140°F (-26°C to 60°C)
Relative Humidity	95% Maximum



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IT'S PATENTED,

IT'S INNOVATIVE AND

IT'S LIGHT YEARS AHEAD

OF THE COMPETITION.



ITI's **ProTech[®]** over-torque design significantly reduces costly accidental cable damage within the fiberscope that occurs when:

- The operator tries to articulate the tip when the tip is constrained.
- The operator tries to withdraw the fiberscope from an access hole before the tip has been straightened.

ProTech[®] over-torque prevention feature virtually eliminates such common breakage. The benefits are clear:

- Longer scope life
- Reduced downtime and repair costs
- Less operator fatigue
- Overall lower lifetime cost yielding lower inspection costs

Also featuring ITI's superior body design that is easy to use with one hand (left or right). With finger tip control of articulating knobs and ratchet locks.

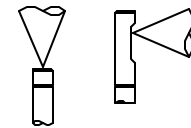
The best in overall optical performance - ensured by using extremely small diameter fibers densely packed to yield maximum resolution.

Every ITI Fiberscope design is cycle tested to insure extended field life. Fiberscopes are articulated over 200,000 cycles, with and without the tip constrained. The design is validated only when the tested scope meets its original articulation specifications.

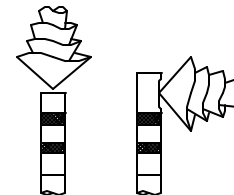
Available with urethane or tungsten outer jackets:

- **Urethane** is a tough plastic jacket with ITI's exclusive insertion scale printed on the jacket's exterior for convenient determination of insertion depth.
- **Tungsten** is an extremely flexible and durable braided jacket for the difficult and/or abrasive environments.

Viewing Heads



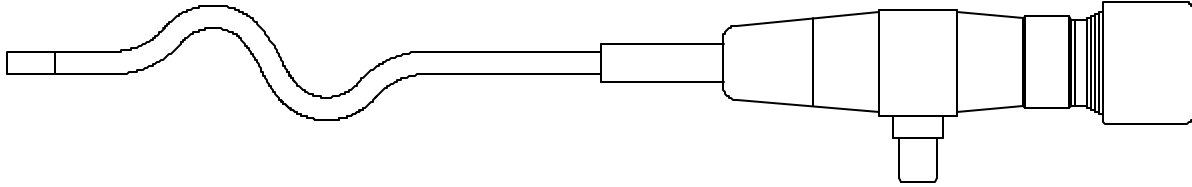
3, 4 & 5mm dia Fiberscopes
Interchangeable Viewing Heads to provide either Forward (F) or Right Angle (RA) Line-of-Sight



6, 8 & 12mm dia Fiberscopes
Eight (8) Interchangeable Viewing Heads to provide four (4) different Fields-of-View (FOV) in either Forward (F) or Right Angle (RA) Line-of-Sight

Model Number	Diameter		Standard Working Length [Meters] (optional lengths available)						Articulation		Standard Viewing Heads		Interchangeable Viewing Heads		
	mm	inch	0.4	1.0	1.5	-	-	-	2-way	4-way	FOV	LOS	Model	FOV	LOS
127003	3	.120"	0.4	1.0	1.5	-	-	-	±100°	-	50°	F	127003	50°	RA
127004	4	.165"	0.4	1.0	1.5	-	-	-	±130°	-	40°	F	127004	40°	RA
127005	5	.200"	0.5	1.0	1.5	-	-	-		U/D±130° R/L±130°	60°	F	127005	60°	RA
127006	6	.250"	0.5	1.0	1.5	2.0	2.5	3.0	-	U/D±130° R/L±130°	60°	Interchangeable F	127006	20° 40° 60° 100°	F & RA
127008	8	.325"	0.5	1.0	1.5	2.0	2.5	3.0	-	U/D±130° R/L±130°	60°	Interchangeable F	127008	20° 40° 60° 100°	F & RA
127012	12	.470"	0.5	1.0	1.5	2.0	2.5	3.0	-	U/D±130° R/L±130°	60°	Interchangeable F	127012	20° 40° 60° 100°	F & RA

When ordering, please specify model number/diameter/working length and viewing heads. **Example:** 127008/8mm/2M with 127108/60°/RA

MODEL 131040 GENERAL PURPOSE (GP) FIBERSCOPE KIT

Specifically designed for those with an occasional need for a fiberscope.

Model 131040 maintains the performance associated with ITI Series 124700 Micro Fiberscopes. This scope features excellent image quality, focusing and bright fiber optic illumination. Its a favorite among mechanics and inspectors. The 4mm (0.158") diameter is standard with an 18 inch working length and is forward looking, with an optional Model 131045 Right Angle Head.

GP Fiberscope Kit Includes:

- (1) Model 131040 GP Fiberscope
- (1) Model 125070 C Cell Battery Light Source
- (1) Rubber Eyeguard
- (1) Spare Lamp
- (1) Protective Carrying Case

***Scope Specifications:***

<u>Feature</u>	<u>Model 131040</u>
Probe Diameter	4mm (0.158 in)
Working Length	18 in
Line of Sight	Forward (0°)
Field of View	50°
Articulation	None

Optional Accessories:

<u>Model No.</u>	<u>Description</u>
131045	Right Angle Head
125010	150W Light Source
125500/6	Fiber Light Guide, 6 Ft

SERIES 124000 BORESCOPIES



Camera-Dedicated:

Change from Video Camera to Eyepiece Instantly with the ITI Quick Disconnect Feature.

- Direct coupling of either 1/4" or 1/3" video camera
- Elimination of eyepiece distortion
- Unmatched video performance

Series 124300 Rigid Micro Borescopes with gradient rod lenses.

For viewing and/or inspecting into extremely small, straight, restricted areas, ITI Rigid Micro Borescopes feature gradient rod lenses that produce exceptionally clear images. Unlike regular lenses that depend on lens curvature and glass index for image formation, gradient rod lenses form images through a variable (gradient) glass index.

Series 124500 Semi-Rigid Micro Borescopes with fused quartz image guides in stainless steel sheathing.

For applications that require greater stamina or longer working lengths than standard rod lens Rigid Micro Borescopes provide, ITI's Semi-Rigid Micro Borescopes provide the practical, workable solution by combining the protective stainless steel outer tube of a Rigid Micro Borescope with the high resolution fused image guide of a Semi-Flexible Micro Fiberscope.

Series 124700 Semi-Flexible Micro Fiberscopes with fused quartz image guides in flexible sheathing.

Precision, high image quality is an ITI mark of distinction. Because optimal resolution is based on the tightest pixel density, ITI uses the best fused image guides possible. In the process of manufacturing, glass fibers are drawn to the smallest diameter possible, packed to maximum density, then fused back together for structural strength. Maximum density is therefore achieved, resulting in highest possible image quality in a semi-flexible image guide.



Color-Corrected Magnification System:

- Designed to match critical video camera requirements
- Bright, sharp, uniform images
- Superior visual performance
- Greater edge illumination

124300			
Diameter	WL (cm)	FOV	LOS
0.5mm	6	45°	F
1.0mm	6 & 10	45°	F-FO-RA
1.7mm	6, 10 & 15	20°-45°-60°	F-FO-RA
2.2mm	6, 10 & 15	20°-45°-60°	F-FO-RA
3.2mm	7.5, 17 & 27	20°-40°-70°	F-FO-RA

124500			
Diameter	WL (cm)	FOV	LOS
1.0mm	7.5, 15 & 30	55°	F-FO
1.7mm	7.5, 15 & 30	20°-45°-60°	F-FO-RA
2.2mm	7.5, 15 & 30	20°-45°-60°	F-FO-RA
3.2mm	12.5, 25 & 50	20°-60°-80°	F-FO-RA

124700			
Diameter	WL (M)	FOV	LOS
.4 mm	.25	55°	F
.7 mm	0.25 – 1.5	70°	F
1.5 mm	0.25 – 2.0	55°	F-FO-RA
2.0 mm	0.25 – 2.0	20°-45°-60°	F-FO-RA
4.0 mm	0.25 – 2.0	20°-60°-80°	F-FO-RA

ITI Micro Borescopes

Bring cutting edge technology

to hands-on reality.

Remote viewing

into small diameter, restricted areas can be tackled with precision, accuracy, and ease thanks to ITI's unique selection of micros.



When ordering, please specify model number/diameter/working length/FOV/LOS.

Example: 124317/1.7mm/10cm/40°/F-RMS



INSTRUMENT TECHNOLOGY, INC.

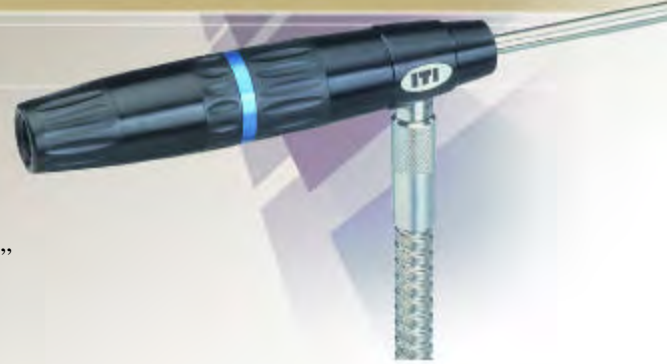
SERIES 123000 BORESCOPIES



ITI Rigid Borescopes

lead the industry with the **clearest optical images**, the **most innovative** features, and the **greatest cost-effective, top quality dependability** on the market today.

Thousands of models offering many exceptional advances.



Camera-Dedicated: Change from Video Camera to Eyepiece Instantly with the ITI Quick Disconnect Feature.

- ✂ Direct coupling of either 1/4" or 1/3" video camera
- ✂ Elimination of eyepiece distortion
- ✂ Unmatched video performance

High Performance Optical System

- ✂ Designed to match critical video camera requirements
- ✂ Bright, sharp, uniform images
- ✂ Superior visual performance
- ✂ Greater edge illumination

Choose from five (5) body styles: Standard, or...

Orbital Scan

Complete panoramic examinations can be conducted with minimum effort. The ITI Orbital Scan rotates 375° around the axis of the borescope without rotation of the fiber cable.

Axial Scan

Axial Scan acts as 3-scopes-in-1 with panoramic illumination to fully cover the total viewing area. In-line with the borescope probe, the scan allows viewing from 40° (FO) LOS to 125° (RO) quickly and efficiently.

Zoom

Unlike other instruments with zoom eyepieces that result in FALSE magnification and loss of apparent illumination, only ITI offers a true 4X zoom borescope with dependable, exact performance.

In low power it provides 40° FOV for orientation. In high power, it zooms to 10° FOV for critical inspection; thus offering a true zoom objective with a 4X change in FOV with a constant f/#. Magnification, therefore, is real. Performance, therefore, is unequalled.

Scan/Zoom

ITI's Scan/Zoom option combines the features of a variable axial scan with the features of a variable FOV (Zoom). Scan in low power for overall coverage, zoom to high power for high-resolution detail examination. This unique dual-capability offers the best of the best all in one superior borescope.

Model Number	Diameter		RMS ^o Diameter		Working Length			Body Style				
	mm	inch	mm	inch	cm (inch)			Std	OS	AS	ZM	SZ
123004	4	.159"	4.8	.187"	18 (6.9)	28 (11)	38 (15)	X	X			
123006	6	.238"	7.6	.300"	23 (9.2)	36 (14.4)	49 (19.5)	X	X			
123008	8	.315"	9.5	.375"	35 (13.8)	56 (22.2)	77 (30.3)	X	X	X		
123010	10	.396"	11.1	.437"	56 (22.2)	77 (30.3)	98 (38.6)	X	X	X		
123016	16	.625"	17.5	.687"	50 (20)	80 (32)	110 (44)	X		X	X	X
123019	19	.750"	22.2	.875"	50 (20)	80 (32)	110 (44)	X		X	X	X

Body Style	Field of View (FOV)	Line of Sight (LOS)
Standard (Std)	20°, 40°, 60° & 100°	F, FO, RA & RO
Orbital Scan (OS)	20°, 40°, 60° & 100°	FO, RA & RO
Axial Scan (AS)	35°	Variable from 40° - 125°
Zoom (ZM)	Variable from 10° - 40°	F, FO, RA & RO
Scan/Zoom (SZ)	Variable from 10° - 40°	Variable from 40° - 125°

Line of Sight – LOS
F - 0°
FO - 45°
RA - 90°
RO - 120°

Rotary Mirror Sleeves (RMS) are available on F LOS Standard Body scopes.

When ordering, please specify model number/diameter/working length/FOV/LOS.

Example: 123010/10mm/40cm/40°/F-RMS

SERIES 122000 EXTENDABLES



Extendable Borescopes are extremely versatile instruments, combining the highest optical quality and illumination technology. For use in inspection of internal surface areas, they are durably built and designed for adjustable configurations.

ITI Extendable Borescopes offer your choice of five (5) interchangeable Viewing Heads, with normal field of view, and can be used in their Basic Length from 15" to 52" or with optional Extender Sections with maximum lengths to 100 feet.

Ideal for field, laboratory and plant applications, Extendable Borescopes are best suited for use in long cylinders and tubes, such as heat exchangers, gun barrels and pipelines. With seven (7) diameters, your choice of Basic Lengths, several Extender Sections and additional custom lengths available, and various Viewing Heads to choose from, you have all that you need to meet demanding inspection requirements.

ITI Extendable Borescopes

rugged
stainless steel construction
coupled with exceptional image quality
makes these instruments ideal for industrial applications.

Choose from these product options:

Model Number	Dia (In)	Length (In)						Field Of View*	Viewing Heads					Max Length (Ft)
		Basic		Extender Sections										
122300	3/8	15	33	18	36	72	40°	-	FO	RA	RO	P	20	
122400	1/2	15	33	18	36	72	40°	-	FO	RA	RO	P	30	
122500	3/4	20	45	24	48	72	30°	F	FO	RA	RO	P	50	
122600	1	20	45	24	48	72	30°	F	FO	RA	RO	P	70	
122700	1 1/4	28	66	36	72	-	30°	F	FO	RA	RO	P	80	
122800	1 1/2	40	-	48	96	-	30°	F	FO	RA	RO	P	90	
122900	1 3/4	52	-	60	120	-	30°	F	FO	RA	RO	P	100	

STANDARD KITS:



3/8" Model 122310	3/4" Model 122510
7½ foot Operating Length, includes:	10 foot Operating Length, includes:
33 inch Basic Length	45 inch Basic Length
18 & 36 inch Extender Sections	24 & 48 inch Extender Sections
4 Viewing Heads (FO, RA, RO & P)	5 Viewing Heads (F, FO, RA, RO & P)
Case, Power Supply & Cords	Case, Power Supply & Cords

When ordering, please specify model number/diameter/basic & extender section lengths/viewing heads.
Example: 122500/3/4"/20" BL & (2) 48" Ext/FO & RA Heads. *60° wide field of view is an available option.

MODEL 131030 GENERAL PURPOSE (GP) BORESCOPE KIT***Specifically designed for those with an occasional need for a borescope.***

The 50° field of view slightly forward of right angle makes this scope ideal for the inspection of many hard to see areas, such as piston engine cylinders, the in-process assembly of small parts and general machinery maintenance operations.

This borescope kit is pre-packaged and available for immediate delivery. The 11mm (7/16") probe diameter fits easily into one-half inch diameter holes, or larger. The 115 or 230 VAC variable power supply allows for illumination intensity adjustments. This scope is moisture sealed, which makes the instrument rugged for most field or shop applications.

GP Borescope Kit Includes:

- (1) Model 131030 GP Borescope
- (1) Power Supply with 10 foot cable
- (1) Rubber Eyeguard
- (1) Spare Lamp
- (1) Protective Carrying Case

***Scope Specifications:***

<u>Feature</u>	<u>Model 131030</u>
Probe Diameter	11mm (7/16 in)
Working Length	18 in
Line of Sight	Right Angle (85°)
Field of View	50°
Depth of Field	0.25 in to ∞
Magnification	1X at 3 in

Power Requirements:

<u>ITI P/N</u>	<u>Model No.</u>
C108515-1	115 VAC, 60 Hz
C108515-2	230 VAC, 50 Hz



From the Inventor of the revolutionary Portable Hardness Tester "Equotip"

The new Equotip Piccolo 2 / Bambino 2 with patented single loading-release mechanism.



Piccolo 2: For real-time monitoring and user specific conversions

Application Example 1: Metal heat treatment allows mechanical properties to be changed so that the metal will be harder, stronger and more resistant to impact. The Piccolo 2 is used to monitor and document the strengthening of high integrity metal components for the automobile industry.

"We have been using Equotip for many years, but this application is the first one with a real time management of the measurement data by an automated system. It also minimizes human error."
QSE Manager, Saint-Jean Industries

Application Example 2: Automotive Lifting Technology are subject to stringent requirements that need to be met by an automotive lift manufacturer. The portability of the Piccolo 2 is ideal for testing bulky lift components.

"The device is very easy to use with diverse applications. Data transfer connection with the PC can be established quickly, making the Piccolo 2 ideal for our applications in automotive lifting". Quality Manager, Blitz Rotary

Bambino 2: For quick on-site hardness checks

Application Example 1: Scuffing can lead to catastrophic failure in engineering components. E.g. in turbines of power plants where wearable parts are required to endure high mechanical stress. The Bambino 2 with the DL probe can be used to ensure that stressed recesses, joints and edges are of the correct hardness to minimize scuffing.

"The high repeatability of measurements singles out Equotip from competitor products. The Bambino 2 offers accessibility to constricted spaces on studs through the slim DL tip". Voith Siemens Hydro Power Generation

Application Example 2: Cold rolling is often used to decrease the thickness of sheet metal. To avoid spall fracture, Equotip and Equotip's Leeb hardness unit HL are used as a standard for roll testing in rough environments. The light-weight Equotip Bambino 2 lends itself to quick intermittent checks of rolls.

Monitoring the Hardness of Metals

Metals undergo different processes before being converted into a final product. Each process can have an effect on the mechanical and chemical attributes of metal. For example, the strength of steel is determined by its chemical composition and microstructural transformations. Macroscopic variables are used to control the final product quality. Hardness is one characteristic of metal that can be easily monitored. In 1975, Proceq invented the revolutionary portable metal hardness tester "Equotip". The standardized Leeb principle, also invented by Proceq, makes measuring metal hardness very simple. The Equotip Piccolo 2 / Bambino 2 continue Proceq's fine tradition of inventing best-in-class products.



The Differences between Piccolo 2 and Bambino 2

The Equotip Piccolo 2 and Bambino 2 are both suited for on-site hardness checks of metals where the test indentation should be as small as possible. The robust design and large display allow the user to work at dusty worksites with low visibility. Both products also display metal hardness in all common scales.

The Equotip Piccolo 2 offers the same features as the Equotip Bambino 2, but has the following additional features:

- 1) user defined hardness conversions
- 2) Piccolink software for:
 - a) systematic real-time monitoring of hardness
 - b) automated testing during serial production
 - c) evaluation and processing of measured data
 - d) remote controlling of Piccolo 2 settings

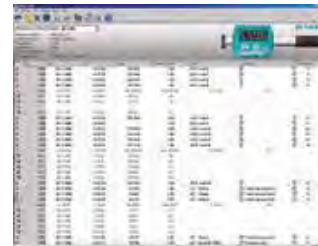
Equotip Piccolo 2 and Bambino 2 are supplied with a D impact device. It can be interchanged with an optional DL impact device, which is useful for measurements in restricted areas.



Equotip Piccolo 2



Equotip Bambino 2



Piccolink software

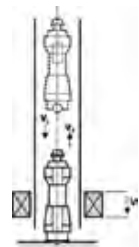
Essential Equotip Requirements

Surface preparation of the sample	
Roughness class ISO	N7
Maximum roughness depth Rt	10 µm
Centre line average Ra, CLA, AA	2 µm
Indentation on sample at 760 HLD (600 HV, 55 HRC)	
Diameter	0.45 mm
Depth	17 µm

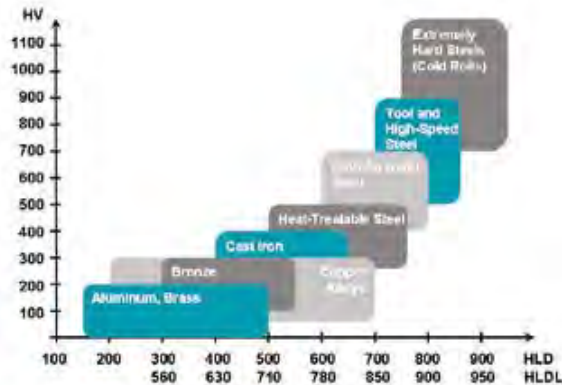
Minimum weight of sample	
Compact sample shape	5 kg
Sample on solid support	2 kg
Sample coupled to solid support	0.1 kg
Minimum thickness of sample	
Uncoupled / Coupled	25 mm / 3 mm
Surface layer thickness	0.8 mm

Leeb Rebound Principle of Equotip Hardness Testers

The portable hardness testers used most commonly for metals are based on the Leeb rebound method invented by Proceq SA. The Equotip Piccolo 2 / Bambino 2 operate according to the Leeb principle, in which the hardness value is calculated from comparing the energy of a test body before and after impacting on a sample. This Energy QUotient (EQUO) is quoted in the hardness unit HL and is calculated from comparing the impact and rebound velocities (v_i, v_r) of the impact body. It rebounds faster from harder samples than from softer ones, resulting in a greater energy quotient which is defined as $1000 \cdot v_r / v_i$.



Immediate Conversion to established Metal Hardness Scales



Metal hardness can be displayed in different hardness scales: HL (Leeb), HRC (Rockwell C), HB (Brinell), HV (Vickers) and so forth. The Equotip Piccolo 2 / Bambino 2 enables measurements to be rapidly taken and displayed in any chosen hardness scale.

The Equotip Piccolo 2 has an additional feature that lets the user customize conversion curves for special alloys and also allows the user to convert hardness readings into tensile strength.

Key Accessories



Equotip DL Accessory Kit - This is a unique feature offered by Proceq. It allows the user of a Piccolo 2 / Bambino 2 to quickly and easily interchange the D and DL impact devices.



Test Blocks - It is necessary to regularly conduct 3 to 10 test impacts on a reference hardness object to verify the correct operation of the Equotip device. Various test blocks are available depending on the users' hardness requirements. For added convenience, the test blocks also indicate the reference hardness value in different hardness scales.







Support Rings - Leeb rebound testers only work correctly when the impact body is held at a proper distance from the test surface during impact. The wide range of support rings permits testing on a great variety of part geometries, i.e. flat surfaces, concave or convex cylindrical surfaces, spherical test surfaces.

Technical Specifications

	With Impact device D	With Impact device DL
Measuring range	150-950 HLD	250-970 HLDL
Instrument dimensions	147.5 x 44 x 20 mm (5.71 x 1.75 x 0.79 inches)	203 x 44 x 20 mm (7.99 x 1.75 x 0.79 inches)
Instrument weight	142 g (5 ounces)	152 g (5.4 ounces)
	General Specifications (applicable to both Equotip Piccolo 2 and Equotip Bambino 2)	
Conversions	80-955 HV, 81-678 HB, 20-70 HRC, 38-102 HRB, 30-100 HS (Equotip Piccolo 2 only: 274-2193 N/mm ²)	
Resolution	1 HLD / HLDL, 1 HV, 1 HB; 0.1 HRC, 0.1 HRB, 0.1 HS (Equotip Piccolo 2 only: 1 N/mm ² Rm)	
Measuring accuracy	± 4 HLD / HLDL (0.5% at 800 HLD / HLDL)	
Maximum test hardness	890 HLD (955 HV, 68 HRC)	
Impact direction / energy	Automatic compensation / 11 Nmm	
Ball indenter	Tungsten carbide (approx. 1'500 HV), 3 mm (0.12 inches) diameter	
Housing	Scratch-proof, hard-coated zinc alloy	
Battery	Rechargeable Li ion, operation period over 20'000 impacts, charging current 100 mA	
Integrated memory	Non-volatile, RAM 32 kBytes, ~ 2'000 measured values (Equotip Piccolo 2 only)	
Operating conditions	Temperature: -10 to +60 °C (14 to 140 °F), Humidity: 90% max.	
IP classification	IP52	

Ordering Information

Part No.	Description	
352 10 001	Equotip Piccolo 2 Hardness Tester, unit D Equotip Piccolo 2 device with impact body D, small (D6a) and large (D6) support rings, cleaning brush, USB charger and cable, carry case, Proceq neck / wrist strap (lanyard), Equotip product CD (includes operating and firmware upgrade instructions), product certificate <i>AND Piccolink Software</i>	
352 20 001	Equotip Bambino 2 Hardness Tester, unit D Equotip Bambino 2 device with impact body D, small (D6a) and large (D6) support rings, cleaning brush, USB charger and cable, carry case, Proceq neck / wrist strap (lanyard), Equotip product CD (includes operating and firmware upgrade instructions), product certificate	
352 10 002	Equotip Piccolo 2 Hardness Tester, unit D with Proceq test block D Equotip Piccolo 2 device with impact body D, small (D6a) and large (D6) support rings, cleaning brush, USB charger and cable, carry case, Proceq neck / wrist strap (lanyard), Equotip product CD (includes operating and firmware upgrade instructions), product certificate <i>AND Piccolink Software</i> <i>AND Equotip test block D/DC, Proceq calibrated (~775HLD/-630HV/~56HRC) with certificate</i>	
352 20 002	Equotip Bambino 2 Hardness Tester, unit D with Proceq test block D Equotip Bambino 2 device with impact body D, small (D6a) and large (D6) support rings, cleaning brush, USB charger and cable, carry case, Proceq neck / wrist strap (lanyard), Equotip product CD (includes operating and firmware upgrade instructions), product certificate <i>AND Equotip test block D/DC, Proceq calibrated (~775HLD/-630HV/~56HRC) with certificate</i>	

Accessories

General	
352 95 021	Equotip DL Accessory Kit
350 01 015	Equotip coupling paste

Test Blocks	
357 11 100	Equotip test block D/DC, calibrated by Proceq (<500HLD/<225HV/<220HB)
357 12 100	Equotip test block D/DC, calibrated by Proceq (~600HLD/~335HV/~325HB/~35HRC)
357 13 100	Equotip test block D/DC, calibrated by Proceq (~775HLD/~630HV/~56HRC)
357 11 120	Equotip test block DL, calibrated by Proceq (<710HLDL/<225HV/<220HB)
357 12 120	Equotip test block DL, calibrated by Proceq (~780HLDL/~335HV/~325HB/~35HRC)
357 13 120	Equotip test block DL, calibrated by Proceq (~890HLDL/~630HV/~56HRC)
357 10 109	Equotip test block add-on calibration D/DC
357 10 129	Equotip test block add-on calibration DL

Support Rings	
350 03 000	Set of Equotip support rings (12 pcs.) suitable for D/DC/C/E/D+15
350 03 001	Equotip support ring Z 10-15
350 03 002	Equotip support ring Z 14,5-30
350 03 003	Equotip support ring Z 25-50
350 03 004	Equotip support ring HZ 11-13
350 03 005	Equotip support ring HZ 12,5-17
350 03 006	Equotip support ring HZ 16,5-30
350 03 007	Equotip support ring K 10-15
350 03 008	Equotip support ring K 14,5-30
350 03 009	Equotip support ring HK 11-13
350 03 010	Equotip support ring HK 12,5-17
350 03 011	Equotip support ring HK 16,5-30
350 03 012	Equotip support ring UN

Warranties

Standard warranty	Electronic indicating unit: 24 months Mechanical & electromechanical parts & accessories: 6 months
Extended warranty	When acquiring an Equotip Piccolo 2 / Bambino 2 unit, max. 36 additional months of warranty can be purchased for the electronic indicating unit. The additional warranty must be requested at time of purchase or within 90 days of purchase.

Standards and Guidelines applied

DIN 50156 (2007), DGZfP Guideline MC 1 (2008), VDI / VDE Guideline 2616 Paper 1 (2002), ISO 18625 (2003), ASTM A956 (2006), ASTM E140 (2013), GB/T 17394 (1998), JB/T 9378 (2001), JIG 747 (1999), CNAL T0299 (2008), JIS B7731 (2000)

Subject to change without notice.

All information contained in this documentation is presented in good faith and believed to be correct. Proceq SA makes no warranties and excludes all liability as to the completeness and/or accuracy of the information. For the use and application of any product manufactured and/or sold by Proceq SA explicit reference is made to the particular applicable operating instructions.



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EMAIL: sales@detek.com



Equotip® 540 Overview



Proceq's Equotip 540 is the entry model of our Equotip family with best-in-class features and a compelling upgrade path to the sophisticated Equotip 550 models. It is the essential tool for regular basic usage without extensive reporting needs.

		Equotip 540 (Leeb D: 356 20 002 / UCI: 356 20 005)	Equotip 550 (Leeb D: 356 10 002 / UCI: 356 10 005)
Software	Best-in-class measuring performance in accordance to international standards	●	●
	Wide array of data saving and exploring features on unit	●	●
	Intuitive touchscreen navigation and personalized views	●	●
	Quick shift conversions (UCI)	●	●
	Default PDF reports	●	●
	Customizable PDF reports		●
	Data export to PC via Equotip Link		●
	Connect additional probes		●
	Automatic compensation for impact direction (Leeb D)		●
	Custom conversion curves		●
	Interactive wizards		●
	Password protection for device lock		●
	Multi-language support	●	●
	Hardware	Powerful touchscreen with rugged housing	●
Equotip Leeb D resp. UCI HV1-10 probe with cables		●	●
Rugged carrying case		●	●
Compatible with other Equotip probes			●
Test block			●
Surface roughness comparator plate			●
Coupling paste			●
Upgrade from Equotip 540 to Equotip 550 to unlock all software features by simply purchasing an activation key (Leeb D: 356 00 115 / UCI: 356 00 116) from your Proceq sales network. Hardware items to be purchased separately.		—————→	

Please note:

- Equotip 540 firmware updates can be done via Equotip Link PC software
- Included operating instructions and quick start guides refer to full Equotip 550 functionalities



Subject to change without notice. All information contained in this documentation is presented in good faith and believed to be correct. Proceq AG makes no warranties and excludes all liability as to the completeness and/or accuracy of the information. For the use and application of any product manufactured and/or sold by Proceq AG explicit reference is made to the particular applicable operating instructions.

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proceq

🇨🇭 Solutions since 1954

equotip[®]

Portable Hardness Testing Leeb – Rockwell – UCI



Patent pending - Patent pending
Patent pending
Patent pending - Patent pending

- ASTM
- DIN
- EN
- ISO
- GB/T
- JB/T



Measuring Performance

- High accuracy
- Custom conversions
- Combined methods

Powerful Hardware

- Rugged housing
- High capacity battery
- Versatile connectivity



Ease of Use

- Large touchscreen
- Personalized views
- Custom reports

equotip[®]

The All-In-One Portable Hardness Testing Solution



Leeb

[Find out more](#)
(Page 5)



**Portable
Rockwell**

[Find out more](#)
(Page 7)



UCI

[Find out more](#)
(Page 9)



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Covering Broad Application Range



	Leeb	Portable Rockwell	UCI
	Dynamic Rebound	Static Rockwell	Ultrasonic Contact Impedance Method
Av. Roughness R_a (μm / μinch)	7 / 275	2 / 80	12.5 / 500
Min. Mass (kg / lbs)	0.02 / 0.045	No requirement	0.3 / 0.66
Min. Thickness (mm / inch)	1 / 0.04	10 x ind. depth	5 / 0.2

Oil & Gas



Weld, Base Material & HAZ		○		●
Pressure Vessels		○	●	○
Flanges	●	○	●	○
Pipes		○	●	○
Wellhead Equipment		○	●	○

Automotive



Engine Blocks	●			
Shafts	●		●	●
Panels		○	●	○
Gears	●			●
Brake Systems		○	●	○

Aerospace



Turbine Blades			●	○
Casings / Housings			●	
Panels			●	
Cast Objects	●			
Landing Gears	●			

Manufacturing and Machinery



Rolls	●		●	
Coils	●		●	●
Bars / Pipes	●			●
Heat Treatment / Casting	●			
Wires			●	

Combining methods

Extends the application range to confined spaces, non-ideal samples and for correlating one method with another.

○ Leeb & Portable Rockwell
○ UCI & Portable Rockwell



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Equotip® 550 Touchscreen Unit Built for Demanding Environments

Scratch-resistant solid touchscreen
with Gorilla® Glass technology



Shock-absorbing, dust and water proof
(IP 54) rugged housing



Functional at a wide temperature range
from -10 °C to +50 °C



Connectors and circuits are protected
against dust and voltage spikes



Standards

ASTM A956 / A370

ISO EN 16859

DIN 50156

GB/T 17394

JB/T 9378

Conversion Standards

ASTM E140

Guidelines

ASME CRTD-91

DGZFP Guideline MC 1


VDI / VDE Guideline 2616 Paper 1

Nordtest Technical Reports
99.12, 99.13, 99.36



Equotip® 550 Leeb

The global industry standard

 **Highly accurate ±4 HL**



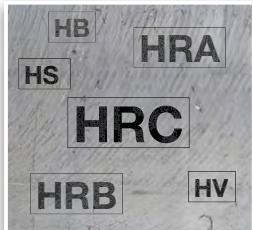
Wide Measurement Range

Leeb impact devices are best suited for on-site testing of heavy, large or already installed parts.



Impact Devices & Accessories

Proceq offers a wide variety of impact devices along with support rings to serve most hardness testing requirements.



Broad Hardness Scales Coverage

The measurements are automatically converted to all common hardness scales (HV, HB, HRC, HRB, HRA, HS) as required.



Test Blocks Portfolio

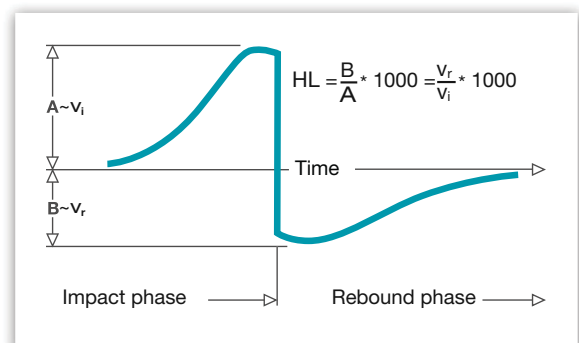
Extensive range of precise hardness test blocks available for each impact device with different hardness levels for regular verification.

 [Equotip Test Blocks Flyer](#)

The Leeb Measuring Principle – Invented by Proceq







Leeb hardness principle is based on the dynamic (rebound) method. An impact body with a hard metal test tip is propelled by spring force against the surface of the test piece. Surface deformation takes place when the impact body hits the test surface, which results in loss of kinetic energy. This energy loss is detected by a comparison of velocities v_i and v_r when the impact body is at a precise distance from the surface for both the impact and rebound phase of the test, respectively.

Velocities are measured using a permanent magnet in the impact body that generates an induction voltage in the coil which is precisely positioned in the impact device. The detected voltage is proportional to the velocity of the impact body. Signal processing is then providing the hardness reading.



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Equotip® Leeb Impact Devices

									
			D/DC	DL	S	E	G	C	
Impact energy			11 Nmm	11 Nmm	11 Nmm	11 Nmm	90 Nmm	3 Nmm	
Indenter			Tungsten carbide 3 mm	Tungsten carbide 2.8 mm	Ceramics 3 mm	Polycrystalline diamond 3 mm	Tungsten carbide 5 mm	Tungsten carbide 3 mm	
Scope			Most commonly used probe. For the majority of applications.	Narrow indenter (probe) tip for measurement on hard reach areas or spaces with limited access.	For measurements in extreme hardness ranges. Tool steels with a high carbide content.	For measurements in extreme hardness ranges. Tool steels with high carbide content.	Large and heavy components, e.g. casts and forged parts.	For surface hardened components, coatings, thin or impact-sensitive parts.	
Test blocks			<500 HLD ~600 HLD ~775 HLD	<710 HLDL ~780 HLDL ~890 HLDL	<815 HLS ~875 HLS	~740 HLE ~810 HLE	~450 HLG ~570 HLG	~565 HLC ~665 HLC ~835 HLC	
Measuring Range	Steel and cast steel	Vickers Brinell Rockwell Shore Rm N/mm ²	HV HB HRB HRC HRA HS σ1 σ2 σ3	81-955 81-654 38-100 20-68 30-99 275-2194 616-1480 449-847	80-950 81-646 37-100 21-68 31-97 275-2297 614-1485 449-849	101-964 101-640 22-70 61-88 28-104 340-2194 615-1480 450-846	84-1211 83-686 20-72 61-88 29-103 283-2195 616-1479 448-849	90-646 48-100 305-2194 618-1478 450-847	81-1012 81-694 20-70 30-102 275-2194 615-1479 450-846
	Cold work tool steel	Vickers Rockwell	HV HRC	80-900 21-67	80-905 21-67	104-924 22-68	82-1009 23-70	*	98-942 20-67
	Stainless steel	Vickers Brinell Rockwell	HV HB HRB HRC	85-802 85-655 46-102 20-62	*	119-934 105-656 70-104 21-64	88-668 87-661 49-102 20-64	*	*
	Cast iron lamellar graphite GG	Brinell Vickers Rockwell	HB HV HRC	90-664 90-698 21-59	*	*	*	92-326	*
	Cast iron, nodular graphite GGG	Brinell Vickers Rockwell	HB HV HRC	95-686 96-724 21-60	*	*	*	127-364 19-37	*
	Cast aluminium alloys	Brinell Vickers Rockwell	HB HV HRB	19-164 22-193 24-85	20-187 21-191	20-184 22-196	23-176 22-198	19-168 24-86	21-167 23-85
	Copper/zinc alloys (brass)	Brinell Rockwell	HB HRB	40-173 14-95	*	*	*	*	*
	CuAl/CuSn-alloys (bronze)	Brinell	HB	60-290	*	*	*	*	*
	Wrought copper alloys, low alloyed	Brinell	HB	45-315	*	*	*	*	*
	Test Piece Requirements	Surface preparation	Roughness grade class ISO 1302	N7		N9		N5	
Max. roughness depth R _a (µm / µinch)			10 / 400		30 / 1200		2.5 / 100		
Average roughness R _a (µm / µinch)			2 / 80		7 / 275		0.4 / 16		
Minimum sample mass		Of compact shape (kg / lbs)	5 / 11		15 / 33		1.5 / 3.3		
		On solid support (kg / lbs)	2 / 4.5		5 / 11		0.5 / 1.1		
		Coupled on plate (kg / lbs)	0.05 / 0.2		0.5 / 1.1		0.02 / 0.045		
Minimum sample thickness		Uncoupled (mm / inch)	25 / 0.98		70 / 2.73		15 / 0.59		
		Coupled (mm / inch)	3 / 0.12		10 / 0.4		1 / 0.04		
		Surface layer thickness (mm / inch)	0.8 / 0.03				0.2 / 0.008		
Indentation size on test surface		With 300 HV, 30 HRC	Diameter (mm / inch)	0.54 / 0.021		1.03 / 0.04		0.38 / 0.015	
	Depth (µm / µinch)		24 / 960		53 / 2120		12 / 480		
	With 600 HV, 55 HRC	Diameter (mm / inch)	0.45 / 0.017		0.9 / 0.035		0.32 / 0.012		
		Depth (µm / µinch)	17 / 680		41 / 1640		8 / 2560		
	With 800 HV, 63 HRC	Diameter (mm / inch)	0.35 / 0.013				0.30 / 0.011		
		Depth (µm / µinch)	10 / 400				7 / 280		

*Custom conversion curve / correlation



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Equotip® 550 Portable Rockwell

Standards

DIN 50157

Conversion Standards

ASTM E140

ISO EN 18265

Guidelines

DGZfP Guideline MC 1

VDI / VDE Guideline 2616 Paper 1



*World-Class
Portable Static
Hardness Testing*



**Advanced algorithm option
for faster measurement**



**Probe can be connected
directly to PC**



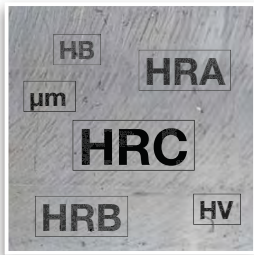
Specially For Thin Parts

Particularly suited for scratch-sensitive and polished parts or on thin parts, profiles and pipes. The required minimum thickness for a reliable hardness reading is ten times the indentation depth. For the mass there is no minimum requirement.



Suits Various Sample Geometries

Unique measuring clamp and support feet are available for the probe allowing tests to be carried out on various geometries.



Broad Hardness Scales Coverage

Measurements in HRC and HV with automatic integrated conversions to HB, HRA, HRB and many more common scales in compliance to ASTM E140 and ISO 18265.

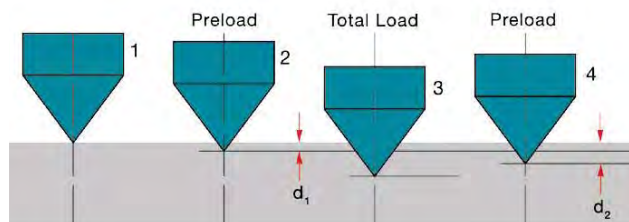


For Any Environment

The Equotip 550 Portable Rockwell can be utilized for on-site, factory and lab environment with almost no limitation.


The Rockwell Measuring Principle

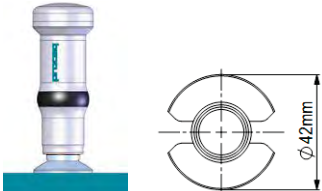
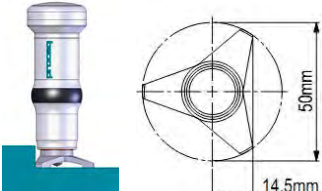
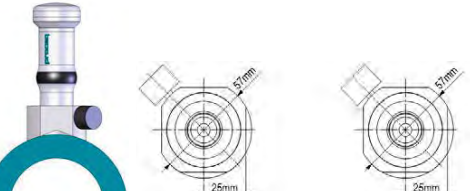
The test principle of the Equotip Portable Rockwell follows the traditional Rockwell static test method. During measurements with the Equotip Portable Rockwell Probe, a diamond indenter is forced into the test piece using a precisely controlled force. The indentation depth of the diamond is continuously measured while a load is applied and released. From the indentation depths d_1 and d_2 recorded at two defined loads, the difference is calculated: $\Delta = d_2 - d_1$. This is traditionally referred to as plastic deformation.



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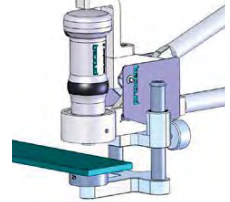
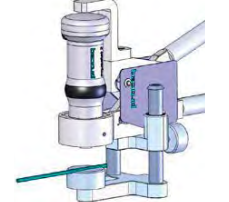
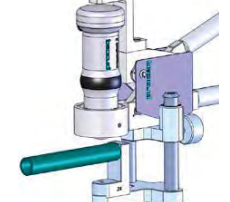

Equotip® Portable Rockwell Probe and Accessories

	Measuring range	0-100 µm; 19-70 HRC; 35-1'000 HV
	Resolution	0.1 µm; 0.1 HRC; 1 HV
	Measuring accuracy	± 0.8 µm; ~ ± 1.0 HRC over entire range
	Test loads	Preload 10 N / Total Load 50 N
	Diamond indenter	Angle 100.0° ± 0.5°, diameter of flat area of 60 µm ± 0.5 µm
	Dimensions	Ø 40 mm, Length 115 mm

		
<p>Round standard foot (magnetic) Ideal for flat parts, and test locations more than 10 mm from an edge.</p>	<p>Tripod foot Designed for tests that require accurate positioning (welds, heat-affected zones).</p>	<p>Special feet RZ 18-70 and 70-∞ Designed for curved test pieces such as cylindrical parts, tubes, pipes.</p>

The Portable Rockwell Measuring Clamp



Clamp Adapters	
	
<p>Support Z1 for flat parts max. 40 mm thickness</p>	<p>Support Z2 for thin cylindrical parts, wires, bolts min. Ø 3 mm</p>
	
<p>Support Z4 for tubes and pipes up to Ø 28 mm</p>	<p>Support Z4+28 for tubes and pipes over Ø 28 mm</p>



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Equotip® 550 UCI

Standards

ASTM A1038

DIN 50159

Conversion Standards

ASTM E140

ISO 18265

Guidelines

DGZfP Guideline MC 1

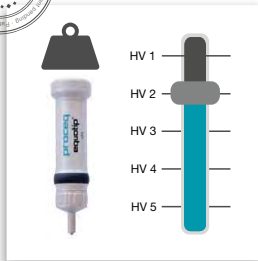
VDI / VDE Guideline 2616 Paper 1

ASME CRTD-91



*Most Flexible
and Convenient
Ultrasonic Hardness Tester*

 **One-Step Calibration**



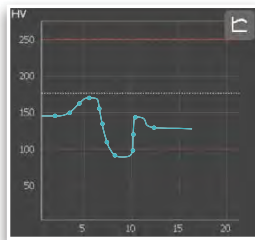
Adjustable test load

With this unique and patented feature a wide range of applications can be covered offering test loads ranging from HV1 to HV5, eliminating the need to purchase more than one UCI probe.



Quick & Reliable Measurements

User guidance enables reliable and accurate hardness readings to be obtained quickly and easily.



Unique Software Features

Additional features such as the profile view and industry specific settings allow for a very smooth workflow.

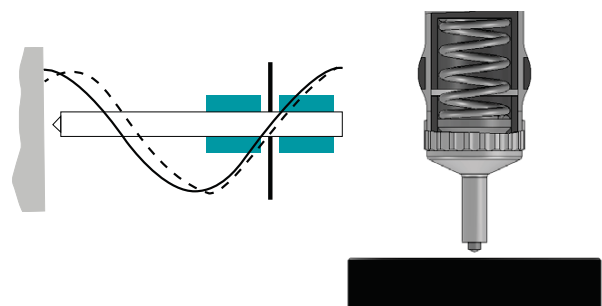


Broad Hardness Scales Coverage

Measurements in HV with automatic integrated conversions to HB, HRA, HRB, HRC and many more common scales in compliance to ASTM E140 and ISO 18265.


The UCI Measuring Principle

The UCI (Ultrasonic Contact Impedance) method uses the same pyramid-shaped diamond as a conventional Vickers hardness tester. Unlike Vickers testing, no optical evaluation of the indentation is required, enabling fast and portable measurements. The UCI method excites a rod into an ultrasonic oscillation. The test load is applied by a spring and typically ranges from 1 to 5 kg of force (HV1 – HV5). As the diamond is forced into the material, the frequency of the rod oscillation changes in response to the contact area between the diamond and the material under test. The instrument detects the shift in frequency, converts it to a hardness value which is immediately displayed on the screen.



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Equotip® UCI Probe and Accessory

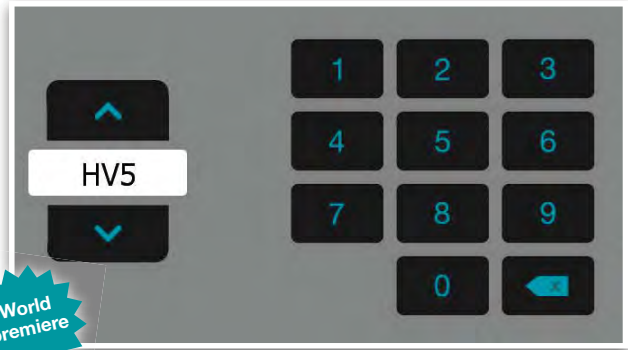
	Measuring range	20 – 2000 HV
	Resolution	1 HV (UCI), 0.1 HRC
	Measuring accuracy	± 2 % (150 – 950 HV)
	Test loads (in 10 N steps)	Selectable: HV1, HV2, HV3, HV4, HV5
	Diamond indenter	Vickers diamond according to ISO 6507-2
	Dimensions	155 x ø 40 mm (6.1 x ø 1.57 inches) without foot

Adjustable test load

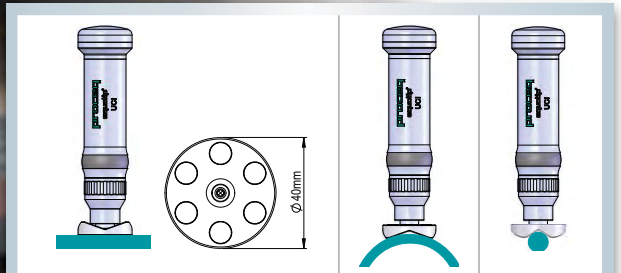
The required test load can be selected by the user in the settings menu. For each measurement series, the force can be chosen from five levels between HV1 and HV5 (~10 N and ~50 N), to fit a wide range of applications. The minimum required mass for reliable UCI measurements is 0.3 kg (0.66 lbs), and a thickness of at least 5 mm (0.2 inch).

Examples:

HV1	Precision parts, thin coatings, hardened layers
HV5	Large components, HAZ, forging parts



Special Foot



The optionally available special foot increases the measurement repeatability. It can be used for flat or curved surfaces. For curved surfaces there are two different apertures, one for diameters from 5 to 25 mm and one for larger diameters from 20 to 70 mm.



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Equotip® 550 Touchscreen Unit

Unique Features

Equotip 550 takes advantage of a new generation full color, dual processor Touchscreen Unit with enhanced software capabilities. The instrument offers a unique range of functions which ultimately help speed up on-site and laboratory inspections and analysis.



Best-in-class reliability arising from 40 years of experience

Equotip solutions are recognised worldwide for providing best-in-class durability, high long-term accuracy and premium service.



Increased accuracy through conversion curve options

Select from preloaded established conversions. Create, edit and verify material conversion curves directly on the instrument (one-point, two-point shift or polynomial). PC software allows to share conversions with customers, suppliers and associated companies.

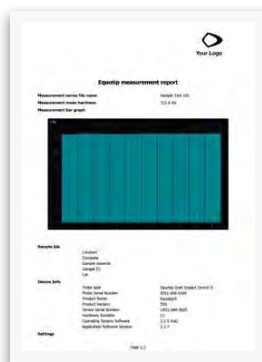


Reduce incorrect measurements with interactive guides

Intelligent on-screen notifications to obtain the most relevant settings for any application and to recognize and prevent faulty usage.



Time saving through customized reports



The Equotip 550 allows to easily create pdf reports on-site directly on the instrument and export to a USB stick.

The reports can be fully configured and enhanced with customer specific information and company logo.



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Equotip® 550 Touchscreen Unit

Unique Features

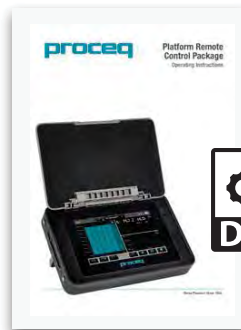


Traceable precision by verification management

Step by step verification wizard in line with applicable standards helps to regularly check the proper functioning of the instrument over time.



Optimized production process with automation package



Comprehensive software tools and libraries help to easily include the Equotip 550 into existing production chains. Feed the measurement results directly into data management systems.



Reduced costs due to a future proof all-in-one solution

The high versatile Equotip 550 gives the possibility to apply three measuring principles and to connect nine different probes to only one device. There is no need to buy several instruments from now on.



Enlarged application range by combining methods

The step by step combined method wizard allows automatic on-site correlation of two different measuring principles to reduce dependencies on material and geometries.



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Equotip® 550 Touchscreen Unit

Unmatched User Experience

Touchscreen Features

For simplified and improved usability on high resolution display



Personalized Screens

Arrange the view according to your needs

Elaborated User Interface

Designed by industry experts for smooth operation

Display	7" color display 800x480 pixels	Battery	3.6 V, 14.0 Ah
Memory	Internal 8 GB flash memory	Battery Lifetime	> 8 h (in standard operating mode)
Regional Settings	Metric and Imperial units, multi-language and timezone supported	Humidity	< 95 % RH, non condensing
Power Input	12 V +/-25 % / 1.5 A	Operating Temperature	-10 °C to +50 °C
Connectors	Probe, USB host / device and Ethernet	IP	54
Dimensions	250 x 162 x 62 mm	Certification	CE
Weight	1525 g (incl. Battery)		




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Proceq – A Story of Success over more than 60 Years



Market Leader

Proceq SA, founded 1954 in Switzerland, is the global leader in portable measurement solutions for the non-destructive testing of material properties of metal, concrete, rock, paper and composites.

 Find out more on the Proceq history

INVENTOR OF LEEB

INDUSTRY STANDARD

NON-DESTRUCTIVE

equotip®

INVENTED IN 1975

PORTABLE

LEEBS

ROCKWELL

UCI



Worldwide Local Support

Our team of dedicated experts are available to advise you on our instruments and their applications. In addition you may take further benefits from our instructional videos, evaluation tools, online webinars and of course our live seminars globally.

ISO 9001

Swiss Made

Proceq instruments are developed, designed and manufactured in Switzerland. Since 1994, Proceq has been certified to the ISO 9001 standards that guarantee highest quality of processes, products and services.



Experience

Proceq has been a proud innovator in the field of portable non-destructive testing, developing solutions that have conquered the inspection industry for decades. Most famous brands are Equotip®, Schmidt®, Pundit®, Profometer® and Carboteq®.



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New Equotip 550 Interactive Animation

Simulate a real measurement situation right now! Get an insight into the software features, unique user interface and innovative wizards!



[Click here to start the interactive Equotip Demo!](#)

Overcome the limitations of stationary hardness testing

- 100% portable and extremely flexible
- No interruptions in production due to 24h availability
- Equally reliable, accurate and standardized








Ordering Information

Contact us for an on-site demo

Prepacked Units

All units include: Equotip Touchscreen incl. Battery, Power Supply, USB Cable, Surface Roughness Comparator Plate, DVD with Software, Documentation, Carrying Strap and Carrying Case

Equotip® 550	Equotip® 550 Leeb D	Equotip® 550 Leeb G	Equotip® 550 Portable Rockwell	Equotip® 550 UCI
356 10 001	356 10 002	356 10 003	356 10 004	356 10 005
				
For flexible probe configuration and for existing owners of Equotip and Equostat 3 probes	Additionally includes Equotip Leeb Impact Device D, Impact Device Cable, Test Block ~775 HLD / ~56 HRC, Coupling Paste, Cleaning Brush	Additionally includes Equotip Leeb Impact Device G, Impact Device Cable, Test Block ~570 HLG / ~340 HB, Coupling Paste, Cleaning Brush	Additionally includes Equotip Portable Rockwell Probe 50 N, Protective Rubber Sleeve, Probe Cable, Test Block ~62 HRC	Additionally includes Equotip UCI Probe HV1-HV5, UCI Probe Cable, UCI Test Block ~850 HV

2-in-1 Kits Special Offers

356 10 020: Equotip 550 Portable Rockwell & UCI Kit
 356 10 021: Equotip 550 Portable Rockwell & Leeb D Kit
 356 10 022: Equotip 550 Leeb D & UCI Kit

Impact Devices & Probes

Equotip Leeb Impact Devices

356 00 500	Equotip Leeb Impact Device C
356 00 100	Equotip Leeb Impact Device D
356 00 110	Equotip Leeb Impact Device DC
356 00 120	Equotip Leeb Impact Device DL
356 00 400	Equotip Leeb Impact Device E
356 00 300	Equotip Leeb Impact Device G
356 00 200	Equotip Leeb Impact Device S

Equotip Portable Rockwell Probe

356 00 600	Equotip Portable Rockwell Probe 50N (for Equotip 550 or PC)
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Equotip UCI Probe

356 00 700	Equotip UCI Probe HV1-HV5
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Accessories

Equotip Leeb Accessories

353 03 000	Set of Support Rings
356 00 080	Equotip Impact Device Cable 1.5 m (5 ft)
353 00 086	Equotip Impact Device Cable 5 m (15 ft)

Equotip Portable Rockwell Accessories

354 01 200	Equotip Portable Rockwell Measuring Clamp
354 01 130	Equotip Portable Rockwell Tripod
354 01 250	Equotip Portable Rockwell Special Foot RZ 18 - 70
354 01 253	Equotip Portable Rockwell Special Foot RZ 70 - ∞
354 01 243	Equotip Portable Rockwell support Z2 for measuring clamp
354 01 229	Equotip Portable Rockwell Support Z4+28 for measuring clamp (for tubes and pipes over Ø 28 mm)
354 01 228	Equotip Portable Rockwell support Z4 for measuring clamp (for tubes and pipes up to Ø 28 mm)

Equotip UCI Accessories

356 00 720	Equotip UCI Special Foot
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Ordering Information



Test Blocks

Equotip Leeb Test Blocks Calibrated by Proceq	
357 11 500	Equotip Test Block C, ~565 HLC / <220 HB
357 12 500	Equotip Test Block C, ~665 HLC / ~325 HB
357 13 500	Equotip Test Block C, ~835 HLC / ~56 HRC
357 11 100	Equotip Test Block D/DC, <500 HLD / <220 HB
357 12 100	Equotip Test Block D/DC, ~600 HLD / ~325 HB
357 13 100	Equotip Test Block D/DC, ~775 HLD / ~56 HRC
357 13 105	Equotip Test Block D/DC, ~775 HLD, one side
357 11 120	Equotip Test Block DL, <710 HLDL / <220 HB
357 12 120	Equotip Test Block DL, ~780 HLDL / ~325 HB
357 13 120	Equotip Test Block DL, ~890 HLDL / ~56 HRC
357 13 400	Equotip Test Block E, ~740 HLE / ~56 HRC
357 14 400	Equotip Test Block E, ~810 HLE / ~63 HRC
357 31 300	Equotip Test Block G, <450 HLG / <200 HB
357 32 300	Equotip Test Block G, ~570 HLG / ~340 HB
357 13 200	Equotip Test Block S, ~815 HLS / ~56 HRC
357 14 200	Equotip Test Block S, ~875 HLS / ~63 HRC

Equotip Portable Rockwell Test Blocks	
357 41 100	Equotip Portable Rockwell Test Block ~20 HRC, ISO 6508-3 HRC Calibration
357 42 100	Equotip Portable Rockwell Test Block ~45 HRC, ISO 6508-3 HRC Calibration
357 44 100	Equotip Portable Rockwell Test Block ~62 HRC, ISO 6508-3 HRC Calibration

Equotip UCI Test Blocks	
357 51 100	Equotip UCI Test Block ~300HV, ISO 6507-3 HV5 Calibration
357 52 100	Equotip UCI Test Block ~550HV, ISO 6507-3 HV5 Calibration
357 54 100	Equotip UCI Test Block ~850HV, ISO 6507-3 HV5 Calibration

Additional Test Block Calibrations

Factory Calibrations by Proceq	
357 10 109	Equotip Leeb Test Block Additional Calibration HLD / HLDC
357 10 129	Equotip Leeb Test Block Additional Calibration HLDL
357 10 209	Equotip Leeb Test Block Additional Calibration HLS
357 10 409	Equotip Leeb Test Block Additional Calibration HLE
357 10 509	Equotip Leeb Test Block Additional Calibration HLC
357 30 309	Equotip Leeb Test Block Additional Calibration HLG

By Accredited Institutes	
357 90 909	Equotip Leeb Test Block Additional Calibration HL (DIN 50156-3)
357 90 919	Equotip Leeb Test Block Additional Calibration HB (ISO 6506-3)
357 90 929	Equotip Leeb Test Block Additional Calibration HV (ISO 6507-3)
357 90 939	Equotip Leeb Test Block Additional Calibration HR (ISO 6508-3)

By Accredited Institutes	
357 90 918	Equotip Portable Rockwell Test Block Additional Calibration HB (ISO 6506-3)
357 90 928	Equotip Portable Rockwell Test Block Additional Calibration HV (ISO 6507-3)

By Accredited Institutes	
357 90 940	Equotip UCI Test Block Additional Calibration HB, ISO 6506-3
357 90 941	Equotip UCI Test Block Additional Calibration HR, ISO 6508-3
357 90 942	Equotip UCI Test Block Additional Calibration HV1, ISO 6507-3

Service and Support

Proceq is committed to providing the best support and service available in the industry through the Proceq certified service centers worldwide. This results in a complete support for Equotip by means of our global service and support facilities.

Warranty Information


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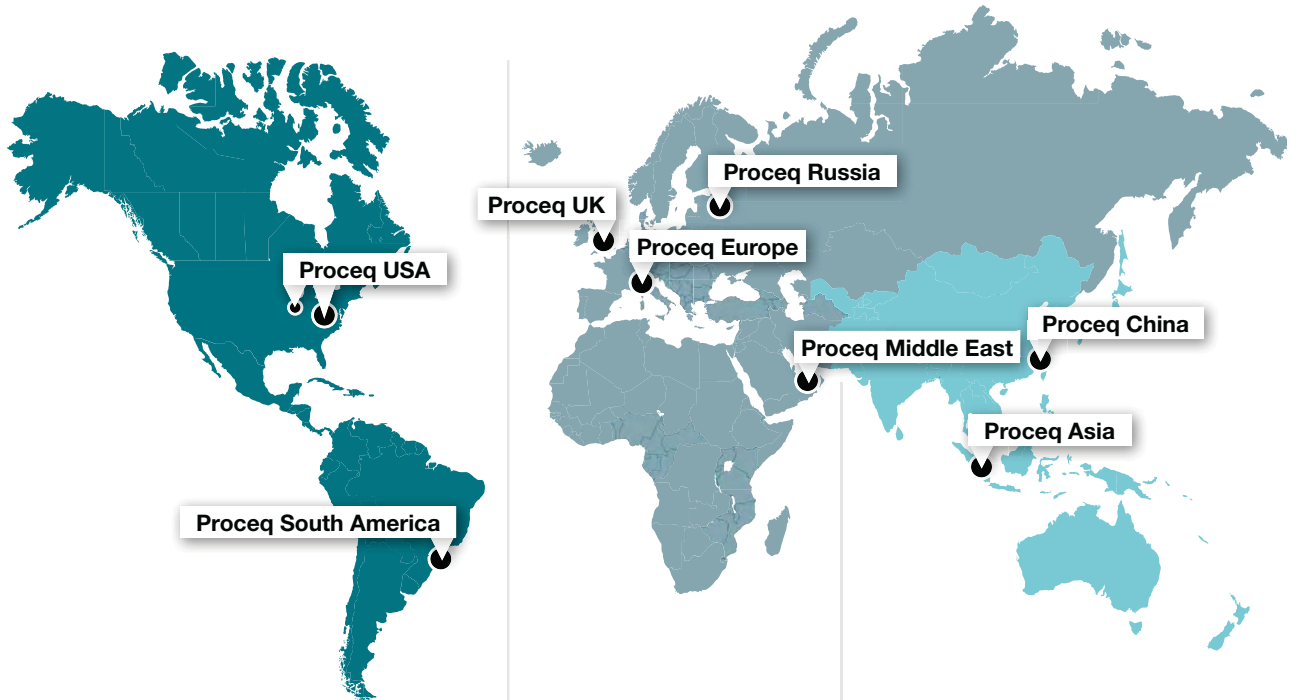
- » Electronic portion of the instrument: 24 months
- » Mechanical portion of the instrument: 6 months

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equotip[®]live

Smart Portable Wireless Leeb Hardness Solution

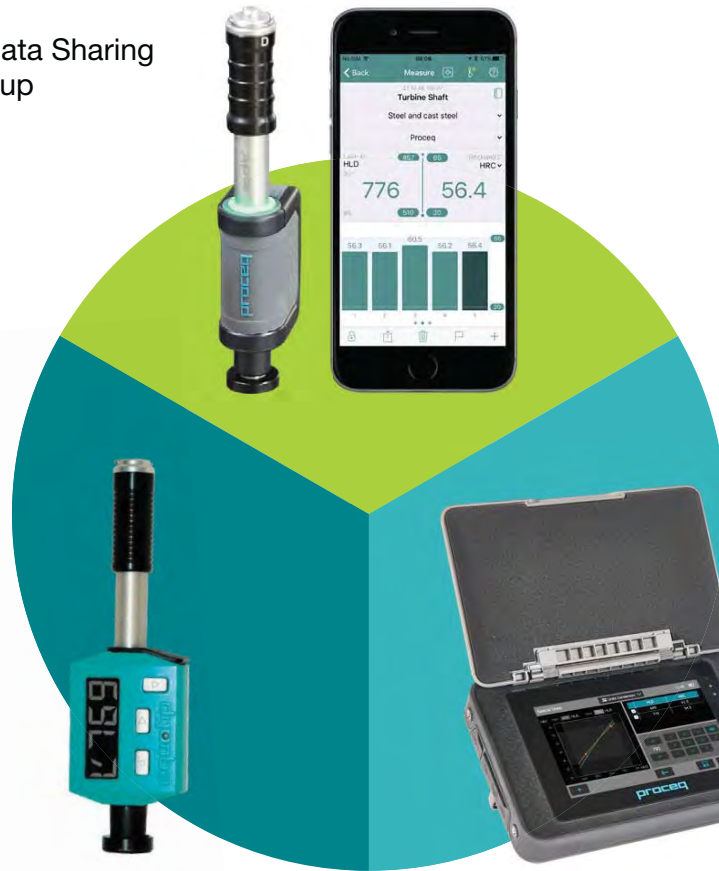
From the
inventor of Leeb



Equotip® Leeb D Complete Portfolio

Equotip® Live

- Wireless
- Real-time Data Sharing
- Cloud Backup



Equotip® 550

- Expandable
- Heavy Duty

Equotip® Piccolo / Bambino 2

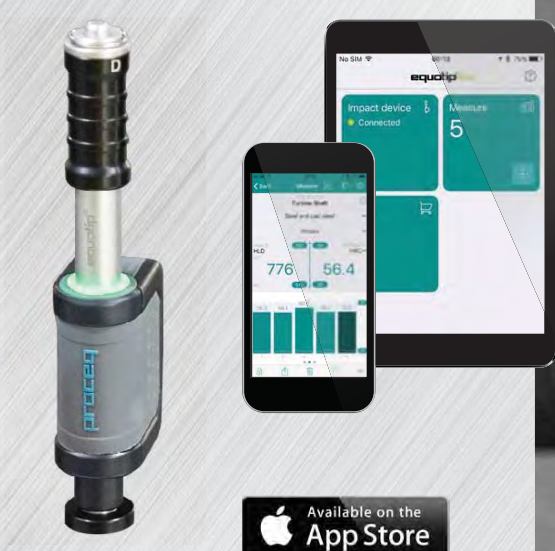
- Integrated



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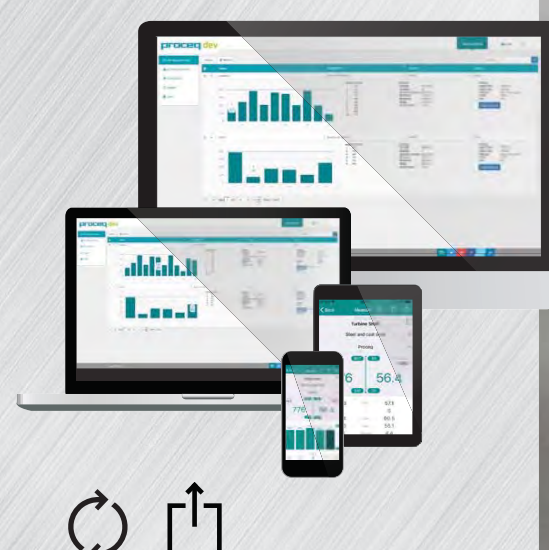
The global industry standard reinvented



The image shows a physical impact device on the left, which is a handheld tool with a black handle and a silver body. To its right are two mobile devices: a smartphone and a tablet. Both screens display the equotip live mobile app interface, which includes a 'Measure' button, a 'Connected' status indicator, and a large number '5'. Below the mobile devices is an 'Available on the App Store' badge.

Measure
New generation wireless impact device and mobile app

[Find out more](#)
(Page 4)

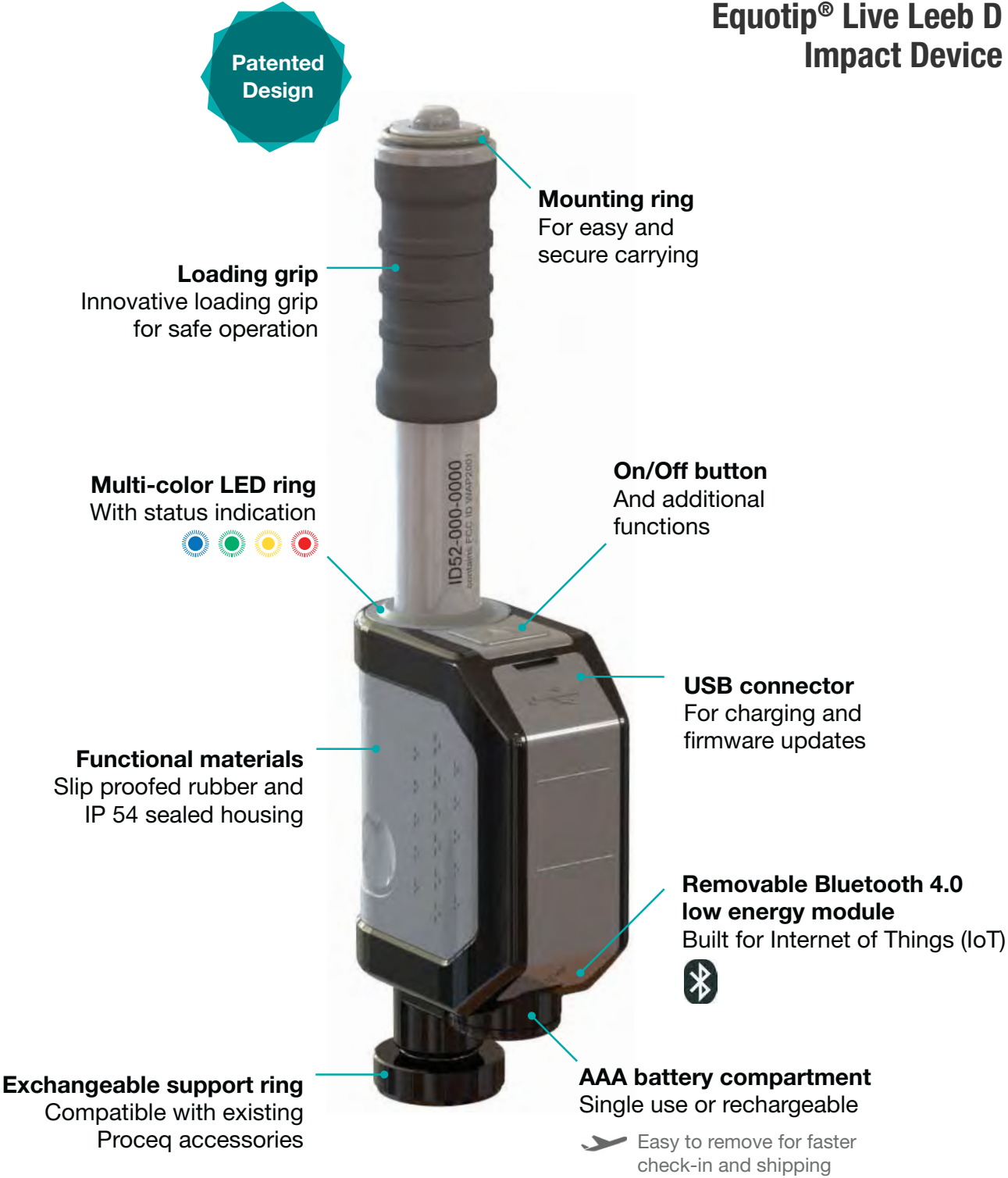


The image shows a laptop and a tablet displaying the equotip live web interface. The laptop screen shows a dashboard with a bar chart and a table. The tablet screen shows a 'Carbon Footprint' report with a bar chart and a table. Below the devices are icons for a refresh cycle and a share button.

Sync and share
Quick and easy data review and sharing

[Find out more](#)
(Page 9)

Equotip® Live Leeb D Impact Device



- + Following Proceq's known high quality standards and ensuring an accuracy of ± 4 HL
- + Ultra portable wireless device perfect for confined spaces on-site
- + Multiple users can share same impact device / Use multiple impact devices with the same app



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Developed for Challenging Environments

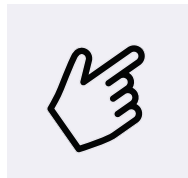


- IP 54 protected Equotip Live Leeb D Impact Device
- Special mobile covers and gloves to further increase protection
- Ultra portable solution with wireless connection
- Suitable for confined spaces

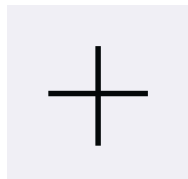
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Equotip® App

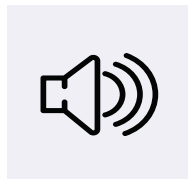
Hardness Testing Made Simple



User interface designed by experts for intuitive hardness testing



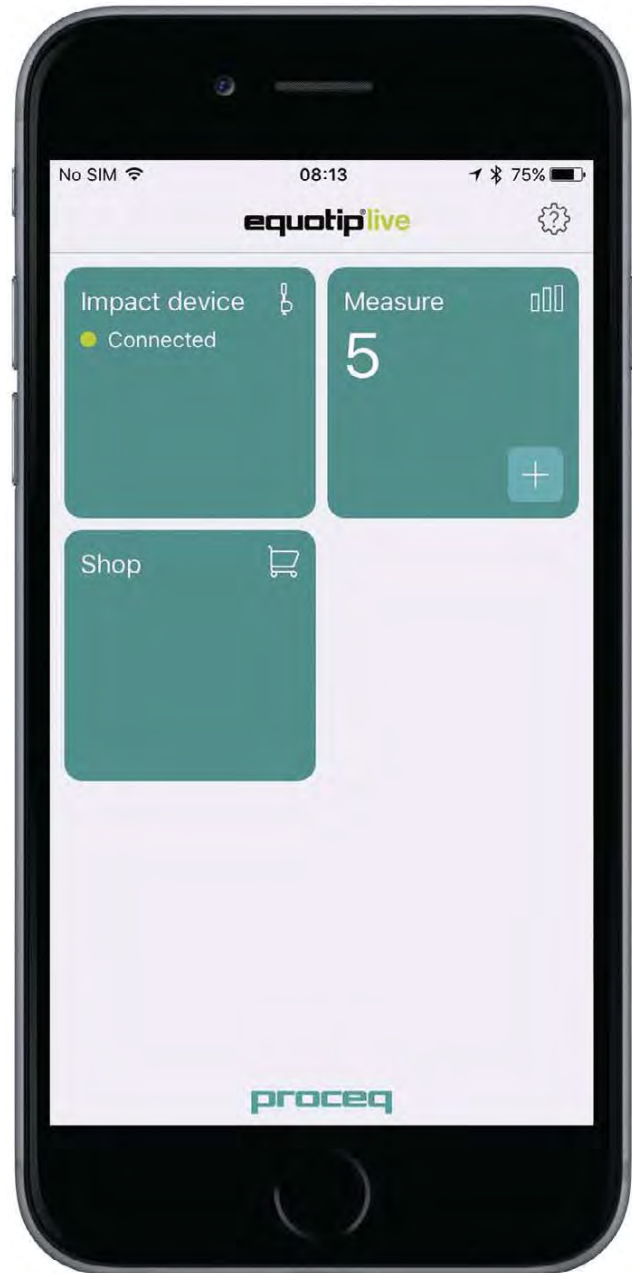
Hotspots: Predefined shortcuts for fast measuring and handling



Audio output of readings allow to keep mobile device in the pocket



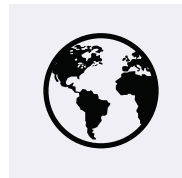
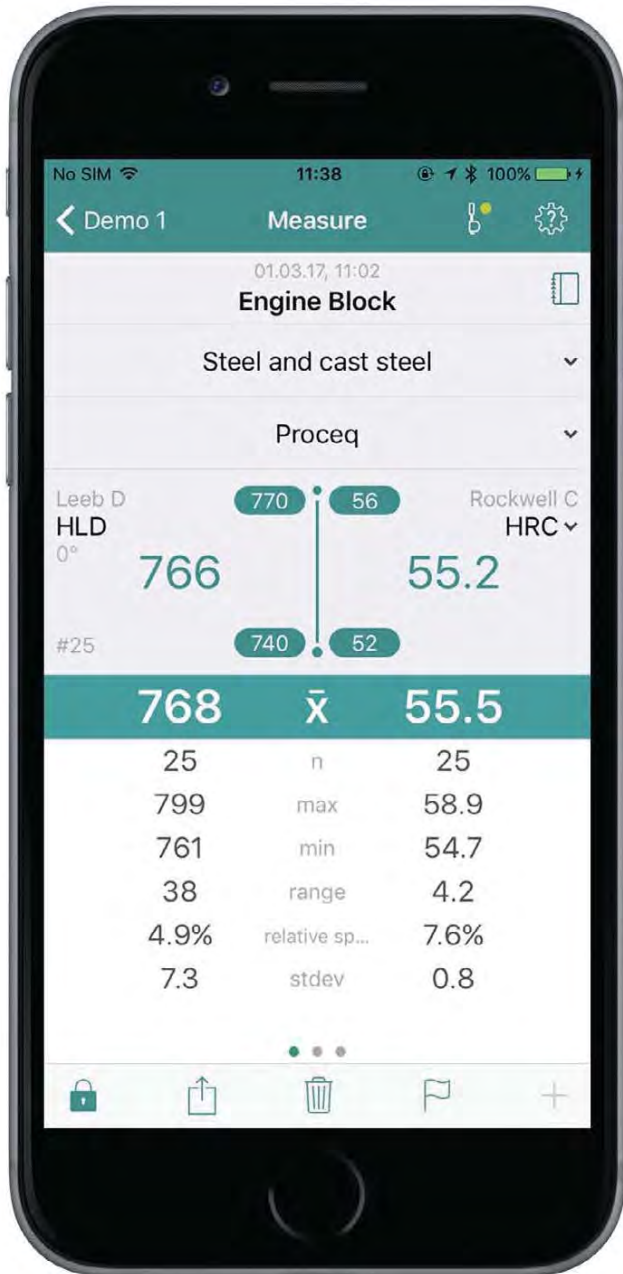
On-screen help through measuring and settings steps



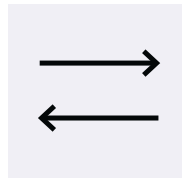
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Equotip® App

A New Measuring Experience



Globally accessible measuring data via live.proceq.com



Custom conversion curve options to increase accuracy on exotic materials



Verification and calibration information for increased reliability

- + Full traceability of data
- + Try out app: Download for free and review Proceq's training data set
- + Visit live.proceq.com for compatibility information



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Equotip® Live App Logbook for Full Control and Review

Geolocation

Timeline with activities

Assign voice recordings to your readings

Take and insert pictures

Measurement Close

Equotip Live D
S/N: ID52-001-0015
BTM S/N: BT01-001-0015
Verified: 23.01.17
Contract valid until: 26.04.19
Operator: Thomas Schlegel

31.01.17

#1 380 HLD / 372 HLE added

#2 353 HLD / 346 HLE added

Photo added

Text comment added
Deleted on 17.10.16, 08:56

New message

Proceq Live Sync

Fast and Secure Report Generation



- + Secure web platform live.proceq.com
- + Centralized report template and profile management
- + Full data traceability with continuous online backup to prevent data loss



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Equotip® Live

First Internet of Things (IoT) Hardness Testing Solution



✓ **Flexible budgeting**
Initial set-up contribution and small monthly fee to preserve capital for your business

✓ **Unbeatable value for your hardness solution**
Latest technology from the inventor of Leeb for a fraction of the cost

✓ **Predictable cost planning**
Fixed fee to help you plan well in advance

✓ **Protect your investments**
Use existing mobile devices to leverage your IoT and Industry 4.0 investments

Experience the Equotip® Live
At your Place

 Contact us
to try it out

- Get professional advice and helpful hints from our experienced experts
- Global network of Proceq subsidiaries and certified business partners
- Thousands of satisfied customers worldwide thanks to superior service

Proceq – A Story of Success

Market Leader

Proceq SA, founded 1954 in Switzerland, is the global leader in portable measurement solutions for the non-destructive testing of material properties of metal, concrete, rock, paper and composites.



 Find out more on the Proceq history

INVENTOR OF LEEB

INDUSTRY STANDARD

NON-DESTRUCTIVE

equotip®

INVENTED IN 1975

PORTABLE

LEEBS

ROCKWELL

UCI



Worldwide Local Support

Our team of dedicated experts are available to advise you on our instruments and their applications. In addition you may take further benefits from our instructional videos, evaluation tools, online webinars and of course our live seminars globally.



Swiss Made

Proceq instruments are developed, designed and manufactured in Switzerland, that guarantees the highest product and service quality. Since 1994, the management system of Proceq SA is also certified according to ISO 9001.



Experience

Proceq has been a proud innovator in the field of portable non-destructive testing, developing solutions that have conquered the inspection industry for decades. Most famous brands are Equotip®, Schmidt®, Pundit®, Profometer® and Carboteq®.

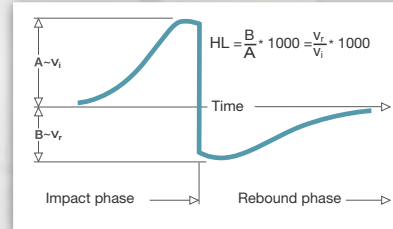


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The Leeb Measuring Principle Invented by Proceq



Leeb hardness principle is based on the dynamic (rebound) method. An impact body with a hard metal test tip is propelled by spring force against the surface of the test piece. Surface deformation takes place when the impact body hits the test surface, which results in loss of kinetic energy. This energy loss is detected by a comparison of velocities v_i and v_r when the impact body is at a precise distance from the surface for both the impact and rebound phase of the test, respectively.



Velocities are measured using a permanent magnet in the impact body that generates an induction voltage in the coil which is precisely positioned in the impact device. The detected voltage is proportional to the velocity of the impact body. Signal processing is then providing the hardness reading.

	Scales	Units	Range	
Measuring Range	Steel and cast steel	Vickers Brinell Rockwell	HV HB HRB HRC HS σ1 σ2 σ3	81-955 81-654 38-100 20-68 30-99 275-2194 616-1480 449-847
	Cold work tool steel	Vickers Rockwell	HV HRC	80-900 21-67
	Stainless steel	Vickers Brinell Rockwell	HV HB HRB HRC	85-802 85-655 46-102 20-62
	Cast iron lamellar graphite GG	Brinell Vickers Rockwell	HB HV HRC	90-664 90-698 21-59
	Cast iron, nodular graphite GGG	Brinell Vickers Rockwell	HB HV HRC	95-686 96-724 21-60
	Cast aluminium alloys	Brinell Vickers Rockwell	HB HV HRB	19-164 22-193 24-85
	Copper/zinc alloys (brass)	Brinell Rockwell	HB HRB	40-173 14-95
	CuAl/CuSn-alloys (bronze)	Brinell	HB	60-290
	Wrought copper alloys, low alloyed	Brinell	HB	45-315
	» Other combinations possible through custom conversions			

Test Piece Requirements	Surface preparation	Roughness grade class ISO 1302	N7
		Max. roughness depth R_z (µm / µinch)	10 / 400
		Average roughness R_a (µm / µinch)	2 / 80
	Minimum sample mass	Of compact shape (kg / lbs)	5 / 11
		On solid support (kg / lbs)	2 / 4.5
		Coupled on plate (kg / lbs)	0.05 / 0.2
	Minimum sample thickness	Uncoupled (mm / inch)	25 / 0.98
		Coupled (mm / inch)	3 / 0.12
		Surface layer thickness (mm / inch)	0.8 / 0.03
	Indentation size on test surface	With 300 HV, 30 HRC	Diameter (mm / inch) Depth (µm / µinch)
	With 600 HV, 55 HRC	Diameter (mm / inch) Depth (µm / µinch)	0.45 / 0.017 17 / 680
	With 800 HV, 63 HRC	Diameter (mm / inch) Depth (µm / µinch)	0.35 / 0.013 10 / 400

Technical Specifications

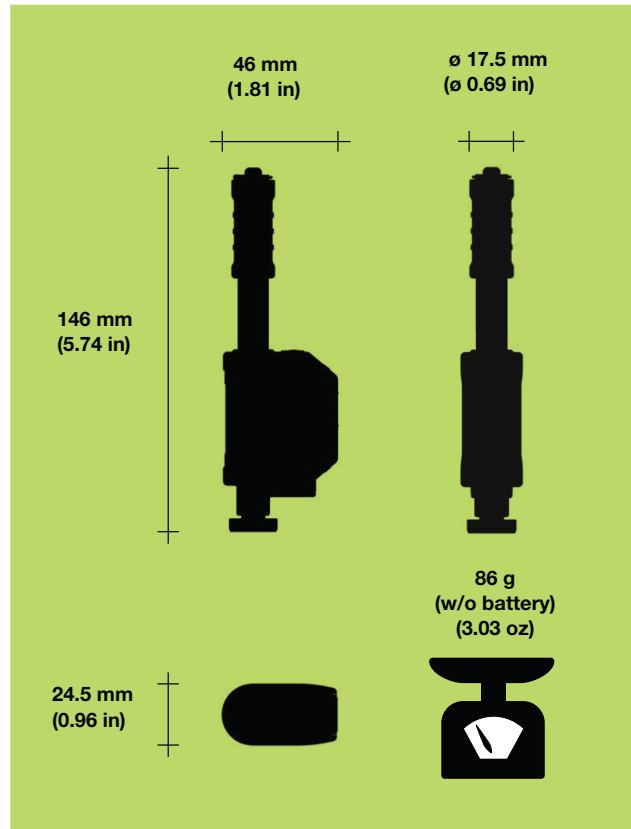
Full Standard Compliance and Traceability

Measuring

Measuring range	100 - 1000 HLD
Measuring accuracy	± 4 HL (0.5 % at 800 HL)
Measuring resolution	1 HL / HV / HB 0.1 HRC / HRB / HS 1 N/mm ² Rm
Impact direction	Automatic compensation (± 5°)
Storage temperature	-20 to 60° C (-4 to 140° F)
Operating temperature	-10 to 50° C (14 to 122° F)
Charging temperature	0 to 40° C (32 to 104° F)
Humidity	90% max.
IP rating	IP 54

General

Battery type	1x rechargeable AAA NiMH 1000 mAh
Operating hours	> 20 h continuously measuring (1 impact/5 sec)
Communication	USB 2.0, Bluetooth 4.0 Low Energy
Connector	Micro-USB B



Full Traceability

In combination with the Equotip Leeb test blocks, hardness testing with the Equotip Live solution is fully traceable.

Standards

ASTM	A956 / A370
ISO	16859
DIN	50156 (withdrawn)
GB/T	17394
JB/T	9378

Conversion Standard

ASTM	E140
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Guidelines

- ASME CRTD-91
- DGZfP Guideline MC 1
- VDI / VDE Guideline 2616 Paper 1
- Nordtest Technical Reports 421-1, 424-2, 424-3

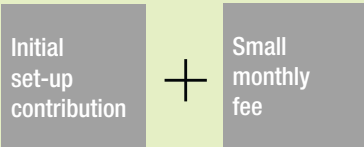


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Ordering Information

Live Unlimited

Equotip® Live Leeb D



- ✓ Low System Replacement Costs
- ✓ Regular Updates

358 99 002 **Rental Unlimited of Equotip Live Leeb D** consisting of Equotip Live Bluetooth module, full functionality of Equotip Live Leeb D Kit incl. usage of cloud infrastructure. Requires additionally Equotip Live Leeb D Kit.

358 10 001 **Equotip Live Leeb D Kit** consisting of Equotip Live Leeb D Basic Impact Device, Equotip Impact Body D/DC, Support Ring D6, Micro USB Cable, Cleaning Brush, Rechargeable AAA battery, Documentation, Carrying Strap and Carrying Case. Requires additionally Rental Unlimited of Equotip Live Leeb D.

Accessories

358 00 101	Equotip Live Leeb D Impact Device Basic
350 01 004	Equotip Impact Body D/DC
341 80 112	USB charger
350 01 015	Equotip coupling paste
350 01 010	Equotip support ring D6a
353 03 000	Set of support rings

Equotip Leeb Test Blocks Calibrated by Proceq

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357 13 100	Equotip Test Block D/DC, ~775 HLD / ~56 HRC
357 13 105	Equotip Test Block D/DC, ~775 HLD, one side

Additional Test Block Calibrations

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357 90 919	Equotip Leeb Test Block Additional Calibration HB (ISO 6506-3)
357 90 929	Equotip Leeb Test Block Additional Calibration HV (ISO 6507-3)
357 90 939	Equotip Leeb Test Block Additional Calibration HR (ISO 6508-3)

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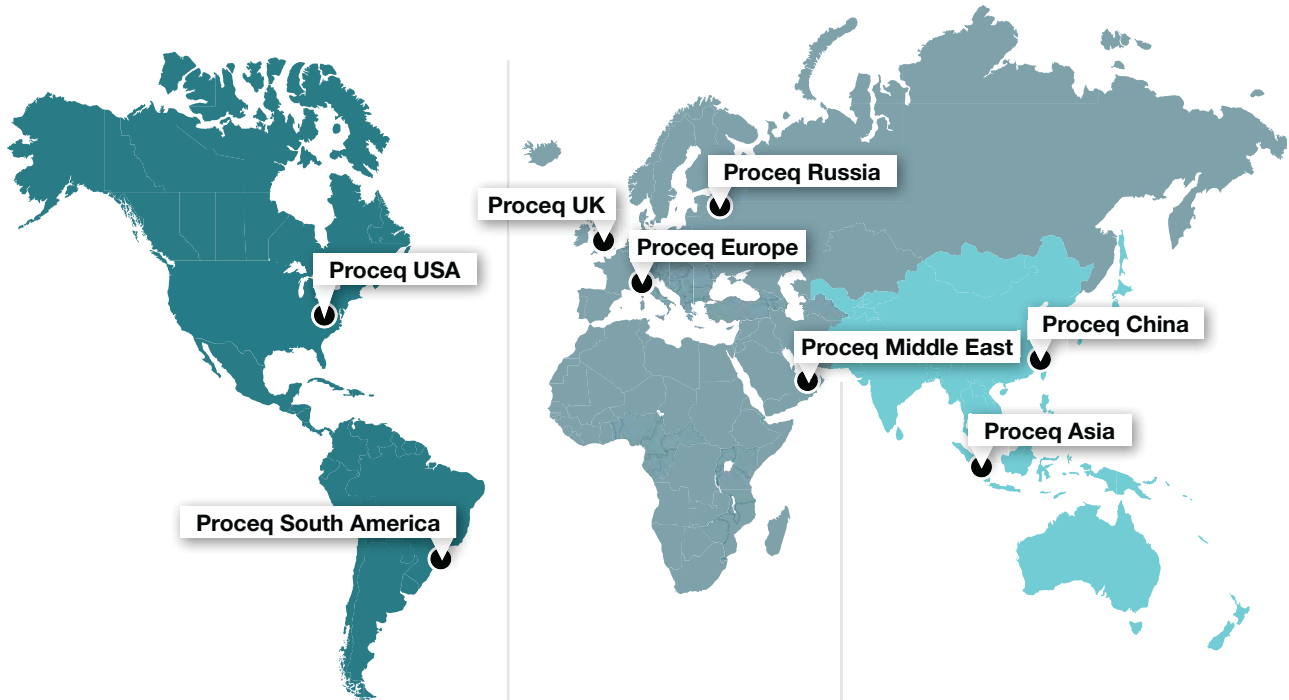
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How to improve your leak testing RESULTS GUARANTEED...



Leak-Tec®
DETECTS LEAKS
SAFE — SURE — FAST

Formula
for Air Conditioning
and Refrigeration

FLAMMABLE
EXPLO

Leak-Tec

THIN FILM BUBBLE TESTING LIQUID

A Formula specifically designed for each application

Formulas meet the requirements of ASTM E-515

16-OX

For gaseous oxygen systems at normal temperature. Exceeds MIL-L-25567 Type 1. Low viscosity, low residue (.4% by weight evaporation residue) making it easy to paint over surfaces tested with 16-OX. Can detect very low pressure leaks. Sensitivity 1×10^{-6} std cc/second. Temperature range +35 to 160°F. National Stock Numbers 6850-00-621-1820, 6850-00-185-0423, 6850-00-051-5052 and 6850-00-186-2963. Corrosion Index V.

OX-65-C

For gaseous oxygen systems at low temperature. Exceeds MIL-L-25567 Type II. Sensitivity 1×10^{-5} std cc/second. Temperature range -65 to +180°F. National Stock Numbers 6850-00-621-1819 and 6850-00-880-9109. Corrosion Index V.

415

For very high temperature testing. Used with hot gas chromatography and other uses where cooling wastes time or hides leaks. Also used for high temperature immersion testing. Sensitivity 5×10^{-5} std cc/second. Temperature range +120°F to 410°F. (210°C). Corrosion Index V.

112

For chlorine systems, including water purification and sewage disposal.

When leak-indicating bubbles burst, puffs of white smoke are emitted. Sensitivity 1×10^{-5} std cc/second. Temperature range +35 to 160°F. Corrosion Index V.

277

For use with polyethylene pipes and rubber seals.

Will not stress crack polyethylene pipes and fittings, or rubber seals in gas system; Has medium viscosity so liquid spreads evenly and stays in place for a period sufficient for careful inspection. Sensitivity 1×10^{-5} std cc/second. Temperature range +35 to 160°F. Corrosion Index V.

277C

For refinery and natural gas systems.

Spreads well, covering complex welds and penetrating surface oil films. Will not harm rubber. Sensitivity 1×10^{-5} std cc/second. Temperature range +35 to 160°F. National Stock Number 6850-00-825-0542. Corrosion Index IV.

277NE

For nuclear applications; for dissimilar metal joints; for electrical systems)

1. Meets the requirements of ANSI N45.2.1-1973 and Stone & Webster 2BVS-901 and NMP2-M060A and 211.160. Fully certified for use with high performance metal alloys like stainless, nickel and titanium. Halogens, sulfur and water leachable chlorides less than 4 ppm. One year shelf life for this application.

2) Has a specific resistance of 100,000 to 200,000 ohms which resists current seepage when testing electrical/electronic systems and does not promote electrolytic corrosion between dissimilar metals. Shelf life for electrolytic applications is 6 months. Where high electrolytic resistance is required, 277NE is available as a concentrate in returnable gallons. Sensitivity 1×10^{-6} std cc/second. Temperature range is +35 to 160°F. Corrosion Index II, I, V.

METAL CORROSION INDEX	
Because the mechanisms of corrosion are not always the same, Leak-Tec solutions have been formulated with different types of inhibitor systems.	
INDEX	DESCRIPTION
I	Inhibits stress corrosion cracking of stainless steels, magnesium and titanium alloys.
II	Inhibits electrolytic corrosion between dissimilar metals.
III	Inhibits surface corrosion on cast iron and mild steels. This system is poisonous and is not required for most steels. It may even cause slight corrosion on aluminum, copper, and brass.
IV	Inhibits normal corrosion on aluminum, copper, brass and on most metals.
V	Meets the corrosion and faying edge requirements of MIL-L-25567.

GUARANTEE

30 day free trial

If Leak-Tec doesn't completely satisfy you, return the unused portion for a complete refund.

372E

For general purpose applications involving compressed air and stable gases.

Stable gases including but are not limited to carbon dioxide, carbon monoxide, argon, sulfur hexafluoride, propane, butane, nitrogen, hydrogen, helium and ammonia. Relatively viscous allowing for easy testing of vertical surfaces. Sensitivity 1×10^{-5} std cc/second. Temperature range +35 to 160°F. National Stock Numbers 6850-00-543-7692, 6850-01-247-1327 and 6850-00-056-7901. Corrosion Index IV.

372E-HV

For general purpose applications involving testing on vertical surfaces.

Used with stable gases including but are not limited to carbon dioxide, carbon monoxide, argon, sulfur hexafluoride, propane, butane, nitrogen, hydrogen, helium and ammonia. Highly viscous allowing for easy testing of vertical surfaces. Sensitivity 1×10^{-5} std cc/second. Temperature range +35 to 160°F. Corrosion Index IV.

372G

For air conditioning/refrigeration systems, vacuum box testing and medium low/high temperature testing.

Will not boil easily under vacuum and can be applied to seams well in advance of testing. It is often used for vacuum box testing. Will bubble even in the presence of liquid halocarbons. Sensitivity 1×10^{-4} std cc/second. Temperature range -35 to 190°F. Corrosion Index IV.

372H

For very low temperature testing.

Temperature range -65 to +180°F. Sensitivity 5×10^{-4} std cc/second. National Stock Number 6850-00-552-9172. Corrosion Index IV.

FM-1

For missile fuel and oxidizer systems.

Inert to nitrogen dioxide, hydrazines, hydrogen peroxide, liquid oxygen, other oxidizers, and concentrated nitric and sulfuric acids. Meets ABMA-PD-M-44.

Sensitivity 1×10^{-6} std cc/second. Temperature range +32 to +160°F. Corrosion Index V.

PACKAGING OPTIONS:

All formulas are available in 4 oz. squeeze bottles, 1 gallon jugs, 5 gallon carboys, and 55 gallon drums. Many are available in 10 oz. aerosols, 8 oz. squeeze bottles, bottles with daubers, and 16 oz. bottles with pump sprayers.

OX-315

For liquid oxygen systems.

LOX compatible (residue will not cause explosion with liquid oxygen). Less than 0.35% evaporation residue. Meets MSFC-SPEC-384A, and exceeds AMS-3159. Sensitivity 1×10^{-6} std cc/second. Temperature range +35 to +160°F. Corrosion Index IV, V.

OX-315 III

For applications where metal corrosion is a severe problem.

Originally developed for NASA to combat corrosion on the aluminum alloy of the shuttle. It works well on carbon steel and galvanized metals to prevent corrosion. Meets the requirements of Martin Marietta Y824-1. Sensitivity 1×10^{-5} std cc/second. Temperature range +35 to 160°F. Corrosion Index III.

577V

For fluorescent and vacuum testing.

Highly fluorescent under black light. Widely used for vacuum testing in the nuclear industry. If the interior of the evacuated systems is not visible the fluorescence can easily be seen on disassembly of critical parts showing defective o-rings, gaskets, etc. Sensitivity 5×10^{-6} std cc/sec 1×10^{-5} torr liters/sec. Temperature range +35 to 160°F. Corrosion Index I, IV.

72V

For high pressure gross leaks and vacuum leaks.

An aerosol foam that captures large high pressure leaks causing a bubbling action of the foam. Also widely used as a vacuum leak detector; the foam craters at the point of a leak. Temperature range +35 to 170°F.

Sensitivity 5×10^{-4} std cc/sec, 1×10^{-3} torr liters/sec. Corrosion Index V.



Partial list of Leak-Tec Users:

Abbott Laboratories
Aberdeen Proving Ground
Aer Lingus
Air India
Air New Zealand
Alabama Power
Alaska Airlines
Alcoa
Allied Signal
Ames Laboratories
Atlas Chemical
Bethlehem Steel Corp.
Birmingham Steel
The Boeing Company
Bendix Corp.
Boise Cascade
Brookhaven National Labs
Carolina Power & Light
Celanese Canada
Chrysler
Clorox Co.
Consolidated Edison Co., of N.Y.
Continental Can Co.
Deere, John Co.
Detroit Diesel
Dow Chemical
Dow Corning
E.I. Dupont
Eastman Kodak Co.

Elf Atochem
Eli Lilly and Company
Exxon
Flambeau Paper Corp.
Florida Power & Light
Ford Motor Co.
GAF Corp.
General Dynamics
General Electric
General Foods Corp.
General Motors
Georgia-Pacific Corp.
Goodrich
Goodyear
GTE Automatic Electric
Gulfstream Aerospace
Hamilton Standard
Hershey Chocolate
Hoffman-La Roche Inc.
Honeywell Inc.
IBM
International Harvester
ITT Corp.
Iberia Air Lines of Spain
Idaho Power
International Paper Co.
Jet Propulsion Labs
Johns-Manville Co.

Kaiser Aluminum Co.
Kellogg Co.
Kelly Springfield Tire Co.
Kennecott Copper Co.
Kimberly Clark Co.
Libbey Owens Ford
Lockheed Martin Corp.
McDonnell Aircraft
Merck, Sharpe & Dohme
Minneapolis-Honeywell Reg.
Mobil Oil Co.
Monsanto Chemical Co.
Motorola, Inc.
Miller Brewing Co.
3M Company
Northrop Grumman
Oak Ridge National Lab
Occidental Chemical
Ohio Edison Co.
Pacific Gas & Electric Co.
Phelps Dodge Mining
Pratt & Whitney Aircraft
Procter & Gamble Co.
Polaroid Co.
Quaker Oat Co.
Raytheon Mfg. Co.
R.C.A.
Rockwell International

Remington Arms Co.
Reynolds Metals Co.
Robert Shaw Controls Co.
Shell Oil Co.
So California Edison Co.
Sperry Rand Corp.
Stone & Webster
Tecumseh Products
Texas Instruments Inc.
Texas Power & Light Co.
TRW Inc.
Texaco Inc.
Thiokol Corp
Transcontinental Gas Pipe Line
Union Carbide
U.S. Air Force
U.S. Navy
U.S. Rubber
U.S. Steel
United Air Lines
U.S. Gypsum Corp.
United Nuclear Corp
University of California
Virginia Power
W. R. Grace
Westinghouse Electric Corp.
Whirlpool Corp.
Woods Hole Institute
Wyeth-Ayerst

ENGINEERED TO SAVE

Everything which is manufactured to contain gas or liquids is subject to leakage at material junctions, such as, seams, connectors, and fittings. This leakage can often cause warranty returns, production shutdowns, and loss of human life. With spiraling liability judgements and increased costs of reworking finished products, reliable leak testing saves *time and money!* In addition, leak testing is a major factor in the fight to save energy. Testing can locate leakage of fuels, like natural gas, as well as leakage of indirect energy such as steam and compressed air. Because leak testing saves time, saves money, and saves energy, it has assumed an important industrial role.

Bubble testing is the most common and one of the most reliable methods of detecting and locating leaks. As scientific leak testing has grown in importance, so has bubble testing. Bubble testing has many inherent advantages:

- It is easy to use and requires little operator training.
- It is inexpensive to use and not subject to break down like complex instrumentation.
- It operates immediately and continues to give indications.
- It can be extremely sensitive, finding leaks down to 1×10^{-6} (.000001) standard cc/second. The equivalent of losing a pound of Freon every 2,700 years.

With the increasing importance of bubble testing, the old time standby - soap and water - is gone forever. Soap and water has low sensitivity and tends to obscure small leaks by foaming when applied. Many industrial companies and organizations, such as the USAF, ASTM and ASME have banned the use of soap. These companies and organizations use only synthetic bubble solutions like Leak-Tec.

Over the last forty-five years, Leak-Tec bubble solutions have become synonymous with quality leak testing. With over 6,000 customers (including almost all of the Fortune 500 Industrials) depending upon us, we are called upon repeatedly to solve difficult leakage problems. As a result, we have developed, and continue to improve upon, the most comprehensive line of field proven bubble solutions. With this background of development technology, our products represent the forefront in leak testing science.

In addition to a complete line of scientifically developed formulas, we fully support our products with a comprehensive quality control program, detailed certifications, and process specifications. Our large stock and record for on time delivery makes us easy to deal with and save you *time*.

Besides the bubble solutions described here, we manufacture a great variety of other leak detectors, both electronic and chemical, which are currently being used to solve such problems as:

- 1) Vacuum leak testing
- 2) Hydrostatic testing
- 3) Dangerous gas monitoring & testing
- 4) Internal system leakage
- 5) Production line leak testing
- 6) Immersion testing

If the products in this brochure are not the answer to your leak detection problem, call today. Let us put our expertise to work for you.



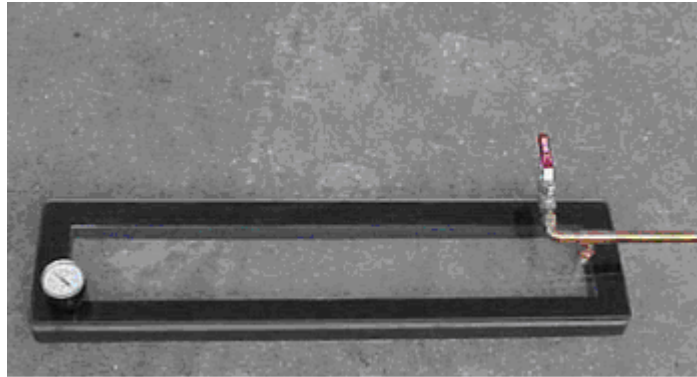
american gas & chemical co. ltd.

220 PEGASUS AVENUE, NORTHVALE, NJ 07647
1-800-288-3647 (201) 767-7300 FAX (201) 767-1741
www.amgas.com



VACUUM LEAK TESTING BOXES

NONDESTRUCTIVE TESTING EQUIPMENT



DEPENDABLE PERFORMANCE

Vacuum Devices are pre-tested to assure maximum reliability. Our designs have been thoroughly field tested for several years in a variety of applications.

SIMPLE TO OPERATE

The air ejector has no moving parts and no lubrication is necessary. After applying leak detection fluid along seam, simply place the vacuum device over the area to be tested and open the air valve.

RUGGED YET LIGHTWEIGHT

Our shockproof Vacuum Devices are built with lightweight acrylic which can be heat formed for special applications. The tough rubber gasket is designed to provide a maximum seal.

FAST, SAFE EVACUATION

Air ejection on standard models is less than 30 seconds. Our ejector is explosion proof. Uses no electricity. Your compressed air supply (60-120 psi) will insure safe, economical operation.

6805 COOLRIDGE DR ■ TEMPLE HILLS MD 20748
301-449-7300 ■ 800-638-0554 ■ FAX 301-449-7011
EMAIL: sales@detek.com



NONDESTRUCTIVE TESTING EQUIPMENT

Flat Bottom Vacuum Box Model Number 30FB

This unit is used primarily for testing the bottom of storage tanks.

Dimensions: 36" X 9" X 5" (including ejector and gauge)
Approx. Weight: 18 lbs.

Corner Vacuum Device Model Number 18CB

These units are specifically designed for testing the inside corner (where the bottom meets the sidewall at 90 degrees) of storage tanks. This unit is designed for use in storage tanks less than 75 feet in diameter. Dimensions: 23" X 7 X 7" (including ejector and gauge) Approx. Weight: 4 1/2 lbs. (2.4kg)

Corner Vacuum Device Model Number 30CB

These units are specifically designed for testing the inside corner (where the bottom meets the sidewall at 90 degrees) of storage tanks. This unit is designed for use in storage tanks 75 feet to 150 feet in diameter. Dimensions: 34"L X 4" W (including ejector and gauge) Approx. Weight: 6 1/2 lbs. (2.9kg)

Corner Vacuum Device Model Number 40CB

These units are specifically designed for testing the inside corner (where the bottom meets the sidewall at 90 degrees) of storage tanks. This unit is designed for use in storage tanks greater than 150 feet in diameter. Dimensions: 44"L X 4 1/2"W (including ejector and gauge) Approx. Weight: 7 1/2 lbs. (3.3kg)

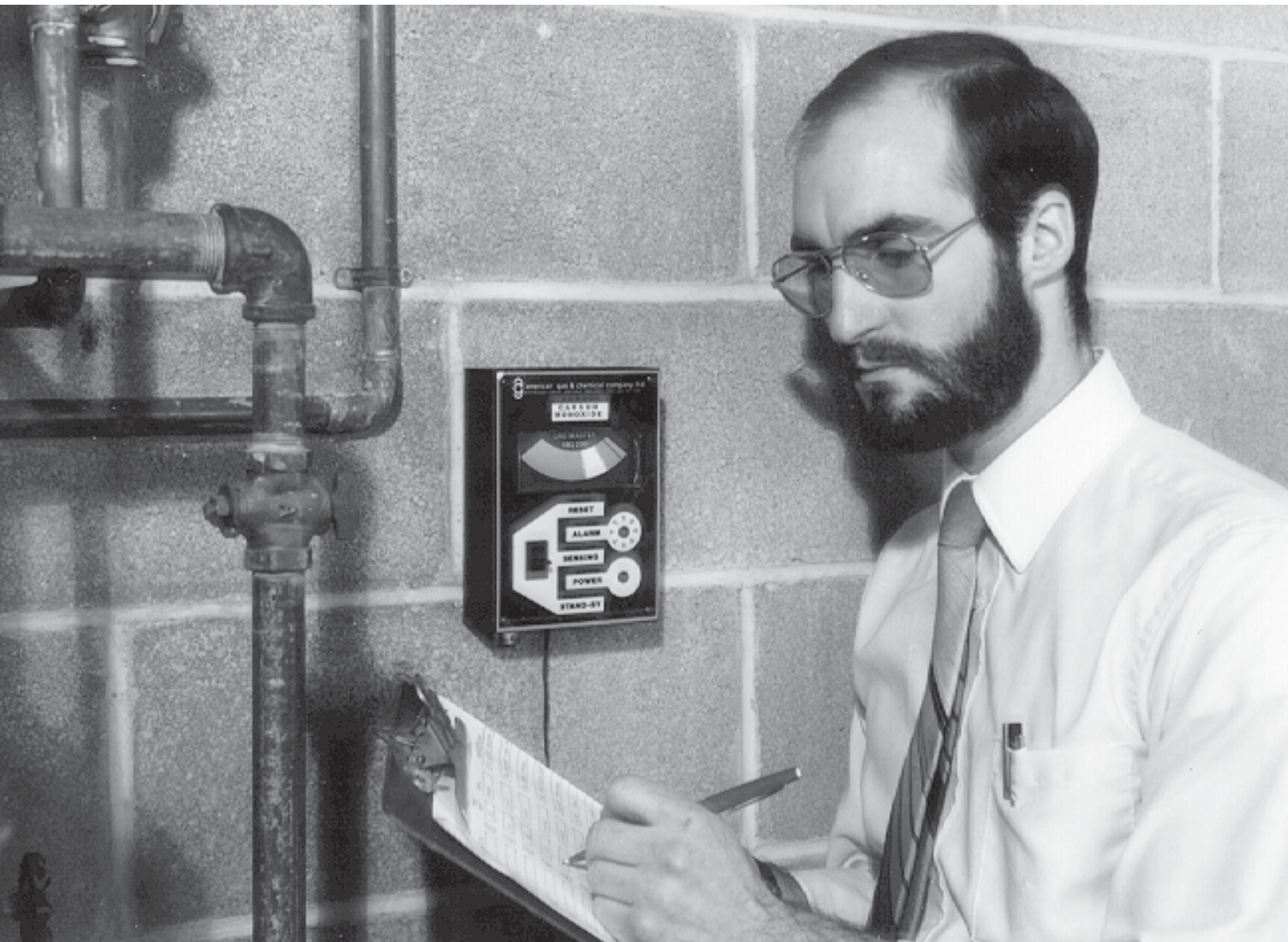
Special Order Devices

We can design and build a Vacuum Device to suit your specific needs. Examples of some of our SPECIALS include: Inside Corner Boxes for use on internal 90 degree corners where the side, end, and bottom of a tank meet. Plates for use on openings in plates, etc. Cubes or Cylinders for use in penetrations protruding above plates, etc

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LOW COST SOLUTION TO MONITORING DANGEROUS GASES & VAPORS

- ❑ **RELIABLE & MAINTENANCE FREE:** State of the art circuitry ensures years of dependable service. Twelve second alarm delay avoids annoying false alarms.
- ❑ **ACCURATE:** Stable sensor temperature compensation delivers accurate performance.
- ❑ **INFREQUENT CALIBRATION NEEDED:** Solid state sensors have less drift and are less subject to poisoning.
- ❑ **SIMPLE TO INSTALL & OPERATE:** Designed to be plugged in and instantly operable. One switch controls all normal functions.



DETECTABLE GASES

Detectors are available to monitor over 100 combustible and toxic gases including

Acetylene	Carbon Monoxide	Hydrogen	Methane	Toluene
Ammonia	Ethylene Oxide	Hydrogen Sulfide	Natural Gas	1,1,1 Trichloroethane
Butane	Gasoline	Methylene Chloride	Propane	Xylene

Monitors are delivered precalibrated to the customer's requirements and ready to plug in.
No complex installation is required.

SBG-200 GAS MASTER

Case
Rust proof Nema 1 case protects the solid state circuitry from damage & yet is small enough to be mounted wherever needed.

Three Position Switch
Sensing: Normal Position
Reset: to acknowledge sound & light alarm after dangerous level detected
Standby: Makes it easy to calibrate & cleanup without triggering local & remote alarms

Remote Function Contact
Has secure plug which prevents accidental disconnects. Allows connection to central panel or to turn on remote alarms & emergency devices.

Power Supply
Sealed 110v power supply requires simple plug in & supplies the monitor with low voltage DC current.

Sensitivity Adjustment
is inside unit in order to avoid accidental changes.

Pulsating Sound Alarm
Taut Band Meter
SAFE: Green
WARNING: Yellow
DANGER: Red

Flashing Red Alarm Light

Power Light

Sensor
Several sensors are available. Many can operate in oxygen deficient environments & cannot be poisoned. Mounted under unit to protect against particulate contamination. Operates by diffusion avoiding breakdown due to pump failure. Very stable over time.

OPTIONS

- Sensor can be mounted remotely from the monitor
- Jack can be mounted for chart recorder output.

THE GAS MASTER GUARANTEE

We guarantee our detector will save you time and money by detecting leaks more easily and quickly. If you are not completely satisfied by the end of the first month, simply return your detector and we will refund your entire purchase price.

GAS MASTER APPLICATIONS

Hospitals, Parking Garages, Factories, Utilities, Laboratories, Blueprint Rooms, Municipalities, Warehouses, Storage Areas, Poultry Farms, Schools, Homes, Hotels, Hookup to Security Systems, Refrigeration Rooms, Boiler Rooms, Wastewater Treatment Plants, Buildings by Landfill Areas, Schools etc.

GAS MASTER SPECIFICATIONS

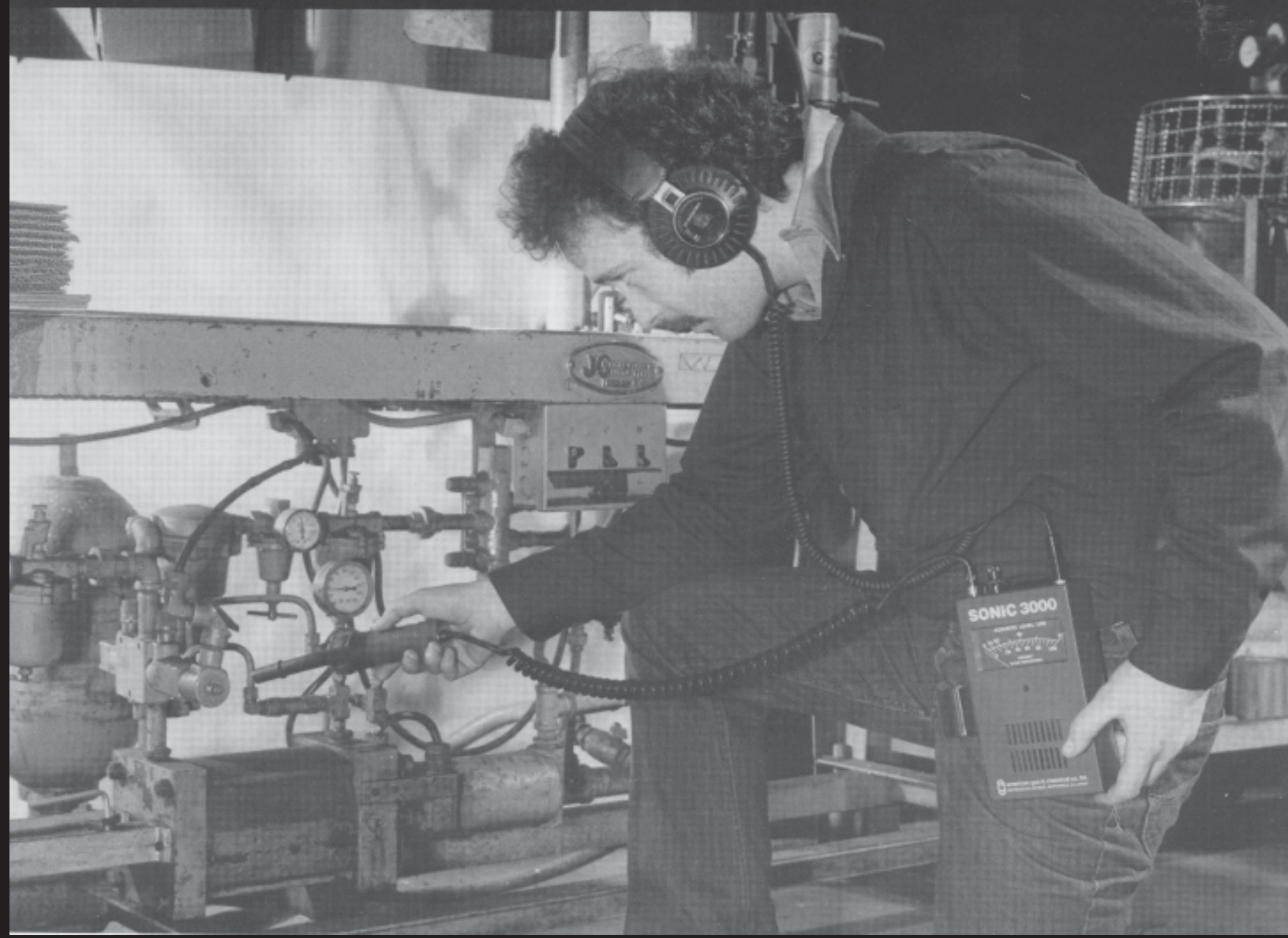
Power Supply	115 volts AC/8.5 volts DC	Sensor Life Expectancy	50,000 exposures (non corrosive vapors)
Dimensions	6 3/4" x 4 7/8" x 2"	Operating Temperature	-10°F to 120°F
Relay	1.0 amps; 120 volts (max)	Sound Alarm Level	85dB min at 30cm
Circuitry	Solid State	Response Time	1.2 seconds
Weight	2 lbs (Shipping weight: 2.5 lbs)	Alarm Delay	12 seconds

american gas & chemical co. ltd.
220 Pegasus Ave, Northvale, NJ 07647 U.S.A.
www.amgas.com

CALL TOLL FREE 1-800-288-3647
In NJ call 201-767-7300 Fax 201-767-1741

The data supplied here is based on information we believe to be reliable. It is offered in good faith but without guarantee of its accuracy. THE FOLLOWING WARRANTY IS MADE IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS OF PURPOSE: AGC's only obligation under this warranty shall be to replace such quantity of AGC products proven to be defectively manufactured or to honor the Gas Master Guarantee. AGC shall not be liable or responsible for any loss, damage, or liability, direct, indirect, incidental, special or consequential arising out of the sale, use or misuse of, or the inability to use products by user.

HOW OUR DETECTOR CAN CUT THE COST OF FINDING LEAKS AND MAINTENANCE PROBLEMS



Why Our Detector Saves You 50%

Ultrasonic Testing Can Save You Time and Money

- 1 Prevent disastrous shutdowns.
- 2 Find leaks which were too difficult to find before.
- 3 Find leaks you didn't have time to find before.
- 4 Do twice as much in half the time.
- 5 Check machinery while it is operating. You don't need to shut down equipment for testing.
- 6 Dispense with time-consuming set-up, dismantling and cleanup.

Users Report Saving of 50% and More

A major producer of marine propulsion units reported a 50% reduction in time required for leak testing (with ultrasonics) compared to the time required to perform hydrostatic tests.*

A large aircraft overhaul facility revealed that the ultrasonic elimination of step-by-step trial and error replacement of aircraft valves has reduced inspections from as long as 8 hours to a maximum of 20 minutes.*

Ultrasonic leak testing is used in production leak testing of the exhaust systems on steam turbines. The test operator ultrasonically scans the exhaust system scrutinizing gaskets, bolted flanges, weldments, and other possible leak sources. This inspection takes approximately 30 minutes. This compares with test time as long as 4 days by other leak testing methods.*

Air conditioning contractors report a reduction in contractor checkout time as great as 80% by using ultrasonics to inspect the integrity of high pressure duct work.*

An airline's pneumatic power systems are inspected with the air probe for leaks at each operational check by a single mechanic in 90 minutes. Testing took up to 8 man hours with previous techniques.*

The ultrasonic method for testing the watertight integrity of compartments and tanks on ships under construction, conversion and repair has reduced inspection costs by 24% at one naval shipyard.*

Why Ultrasonics Works

Ultrasonic (high frequency sound waves) vibrations are measured in terms of Hertz (Hz). Leaks and other vibration sources produce a very broad band of ultrasonic noise. Experiments have shown that peak amplitudes for many of these problem areas are around 45 kilohertz. This frequency is well above the sounds which the human ear can hear. The Sonic 3000 has been set to translate frequencies between 30 and 50 kilohertz; therefore it will not pick up ordinarily deafening factory background noises. Each vibration source or leak has a very distinct sound characteristic. The Sonic 3000 translates these ultrasonic signals into an audible output. As a result the user can quickly identify the source of the problem. The Sonic Owner's Manual contains a detailed explanation of ultrasonics.

The Advantage of Ultrasonics

The Sonic 3000 is therefore an ideal tool to solve a number of different maintenance and quality problems. It has a great number of advantages over other detection techniques:

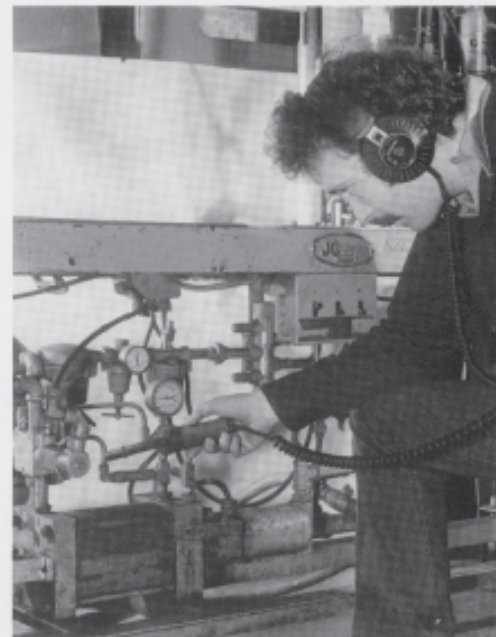
- 1 It can be used to detect a flow or leak of any gas or liquid.
- 2 It can detect leaks rapidly and at distances up to 100 feet.
- 3 It requires little operator training
- 4 It can locate internal as well as external leaks.
- 5 It can accurately locate vacuum or pressure leaks.
- 6 It makes irregular, shaped, or very large fittings easy to test.
- 7 It can detect electrical arcing from faulty electrical equipment and lines.
- 8 It works at high and low temperatures.
- 9 It can find intermittent leaks which many other techniques will not.
- 10 It can detect leaks in overhead lines, buried pipes and in unpressurized areas where other techniques are not viable.
- 11 Its versatility means increased employee productivity and less need for costly specialized equipment.
- 12 It is portable, passive, non-destructive, non-intrusive and requires no time-consuming cleanup.

Detect Electrical Leakage, Corona, Arcing and Insulation Breakdown

The Sonic 3000 with the air probe can easily and safely pick up airborne ultrasonic vibrations from electrical discharges. The focusing extension can pinpoint this energy at considerable distance from the source. The Sonic 3000 is ideal for such problems as: bad generator brushes, transformer shorts, electric cable shorts, R.F. interference. The contact probe is also effective in picking up internal arcing and, because it ignores airborne corona, it can be used to solve quality control problems in such items as high voltage transformers and capacitors safely.



Detect Leaks in Pressurized



*Reprinted from the Nondestructive Testing Handbook, second edition, Volume I, *Leak Testing*. Copyright © 1982, The American Society for Nondestructive Testing. Available from American Gas & Chemical Co. Ltd.

Detect Leaks in Unpressurized Containers and Chambers



Eliminate repeated complaints, lost resources and the expense of reworks by using the Sonic 3000 transmitter to find potential leaks and sources of energy waste in containers that are too large to make pressurizing practical such as automobile and aircraft interiors, heat exchangers, ship compartments, windows and refrigerators. The transmitter, when placed inside the test container, generates ultrasonic sound waves which escape through leaks in much the same way gas or fluid would. The sound waves are picked up by the Sonic 3000 air probe located outside the test chamber.

Detects Steam Trap Malfunctions and Fluid Flow Inside Systems

The Sonic 3000 makes it quick and easy to detect: steam trap problems, fluid flow in piping systems, valve seal leaks, buried pipeline leaks, leaks under insulation or under cement, and ball valve problems. By using the contact probe the Sonic is able to hear fluid flow or malfunctions inside systems.

Each of these cause vibrations which are transmitted through the structure. By coupling the wave guide to a rigid portion of the structure, the Sonic 3000 eliminates expensive rechecking and time-consuming testing. The stable meter needle makes it easy to compare readings and tell the degree of the problem.



Detects Machine and Mechanical Engine Problems

The detector is now often the only method used to check hydraulic systems. It has eliminated the previous step-by-step replacement of valves which took as long as 4 to 8 hours per faulty system. The ultrasonic test now requires 15 to 20 minutes.*

A chemical plant has reduced downtime on a compressor from 32 to about 16 hours a month. Time is saved because a particular valve, or part that is causing trouble can be located immediately, without a full teardown and internal inspection of each part.*

The Sonic 3000 detects costly unplanned downtime by detecting such

mechanical problems as bearing deterioration, forklift engine problems, hydraulic failure, gear breakdown, lubrication failure, deteriorating valve seats and blunted tools. The acoustic vibrations, which the Sonic is designed to receive, indicate the beginning of failure problems long before they are detectable by most vibration methods and long before they are audible. The Sonic 3000 will save the cost of purchasing expensive analyzers, as well as the extensive training and setup time required to use them. The Sonic 3000 can help you make your plant run more economically, efficiently and safely.



or Vacuum Systems

A plant that conducts an annual inspection of several thousand kilometers of air instrumentation networks reports that one person completes the tests during a 10 day shutdown. Before use of ultrasonic leak testing it took 14 people to perform equivalent inspections.*

The Sonic 3000's ability to quickly and accurately locate a wide range of leakage problems can generate a very fast payback for the instrument. Complicated vacuum and compressed gas systems can be frustrating and time-consuming to test. As a result leaks are often overlooked or ignored. The Sonic 3000 air probe can accurately and quickly pinpoint leaks in such components as vacuum lines, vacuum chambers, steam lines, pressurized gas containers and lines, compressed air lines, air conditioning and high pressure ducts, tires and aircraft escape slides. The rubber fine extension allows the air probe to pinpoint difficult to find vacuum leaks and to distinguish between multiple leaks in complex systems.



ASTM ULTRASONIC STANDARD



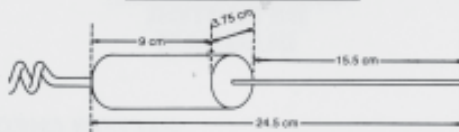
A standard method of calibrating the ultrasonic detector has been developed by the American Society of Testing and Materials. By using the standard, leakage rates can be estimated, detectors can be uniformly regulated for particular functions, and repeatable results can be assured. Calibration can help you avoid mistakes and perform tests that previously required more expensive instruments.

SOUND GENERATOR



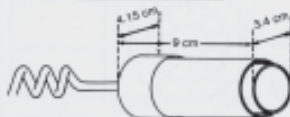
The generator transmits a distinctive ultrasonic signal in the 45 kilohertz region. The generator saturates an area with ultrasound which penetrates small holes and cracks. The air probe uses the escaping sound beams to home in on leaks. The generator is small enough to fit in small openings and powerful enough to make locating potential leaks easy. A light emitting diode flashes when the unit is in operation.

CONTACT PROBE



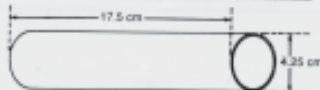
This probe is used to detect ultrasonic sounds which are transmitted along the surface of a rigid structure. The ultra sound may originate inside the structure or it may develop as a result of leakage through the structure. This probe ignores all airborne sound, both sonic and ultrasonic. The long metal stylus (wave guide) has several other advantages: it allows rapid testing, access to hot or dangerous areas and access to difficult to reach locations such as buried pipes. The probe is often used to monitor machinery, locate internal leaks, find electrical arcing and analyze steam trap operation.

AIR PROBE



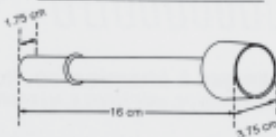
The Sonic 3000 air probe detects airborne ultrasonic signals in a 22° angle from its tuned directional cone. It ignores all sonic background frequencies commonly found in noisy factory areas. The probe takes advantage of high energy, directional beams produced in the 45 kilohertz region. The air probe makes it easy to pinpoint leaks even at great distances.

FOCUSING EXTENSION



This attachment to the air probe focuses ultrasonic energy and narrows the search pattern of the air probe making it easier to spot problems at a distance. It is also used to block background interferences and to permit pinpointing of leakage where it may be dangerous for the operator to get too close to the problem area.

FINE EXTENSION



This attachment to the air probe absorbs interfering noise and narrows the search pattern to a few degrees. It is useful in locating leaks among complex piping especially when there is more than one leakage site. The fine extension makes locating small vacuum leaks easier.

The Sonic 3000 Was Designed Ergonomically

- Lightweight detector with belt clip and probe holder makes it easy to wear. Controls are located on top of the detector unit for easy access.
- The controls and the meter have been designed to be easy to understand, read and record so the Sonic 3000 can be operated by non-technical personnel.
- The high resolution stereo headphones come with individual volume control for each ear. They are comfortable enough to wear all day.

The Sonic 3000 Was Designed to Save You Money

- The low cost of the Sonic 3000 and the savings that can be immediately generated means a rapid payback. Send for our free payback analysis bulletin.
- High sensitivity (exceeds ASTM standards) allowing the Sonic 3000 to detect smaller leaks at greater distances and find maintenance problems earlier.
- The Sonic 3000 M includes an air probe, contact probe and sound generator. This versatility allows you to do more jobs and eliminates the need for single use special purpose equipment.

The Sonic 3000 Was Designed to Save You Time and Trouble

- Our 28 page spiral bound owners manual contains detailed testing procedures, sample record keeping charts, application information, and clear instructions on exactly how to use the unit and how it works.
- Technical assistance is always available on our toll-free number (800-288-3647) to help you get the maximum utilization from your unit from the day you receive it.
- The quality of the Sonic 3000 is so high that we are able to guarantee it for a full two years. This guarantee means a trouble free dependable unit with no repair hassles.

RECHARGEABLE DETECTOR DIAGRAM

SENSITIVITY CONTROL

A 10 turn, 3 digit readout provides precise control of the instrument's gain making measurements easier and assuring repeatable settings. The locking lever protects against accidental changes in settings.

BATTERY CHECK

The battery check and battery light are placed so that checks can be made while the unit is in use without the need to remove it from your belt.

SPEAKER SWITCH

Provides positive control of the sound function making it possible to record good and bad sounds while listening to the sound over the speaker.

QUICK CONNECT SOCKET

Probe attachments lock into place so accidental disconnects during testing are eliminated. Probes have retractable cables which can be extended 5 feet.

DETACHABLE HANDLE

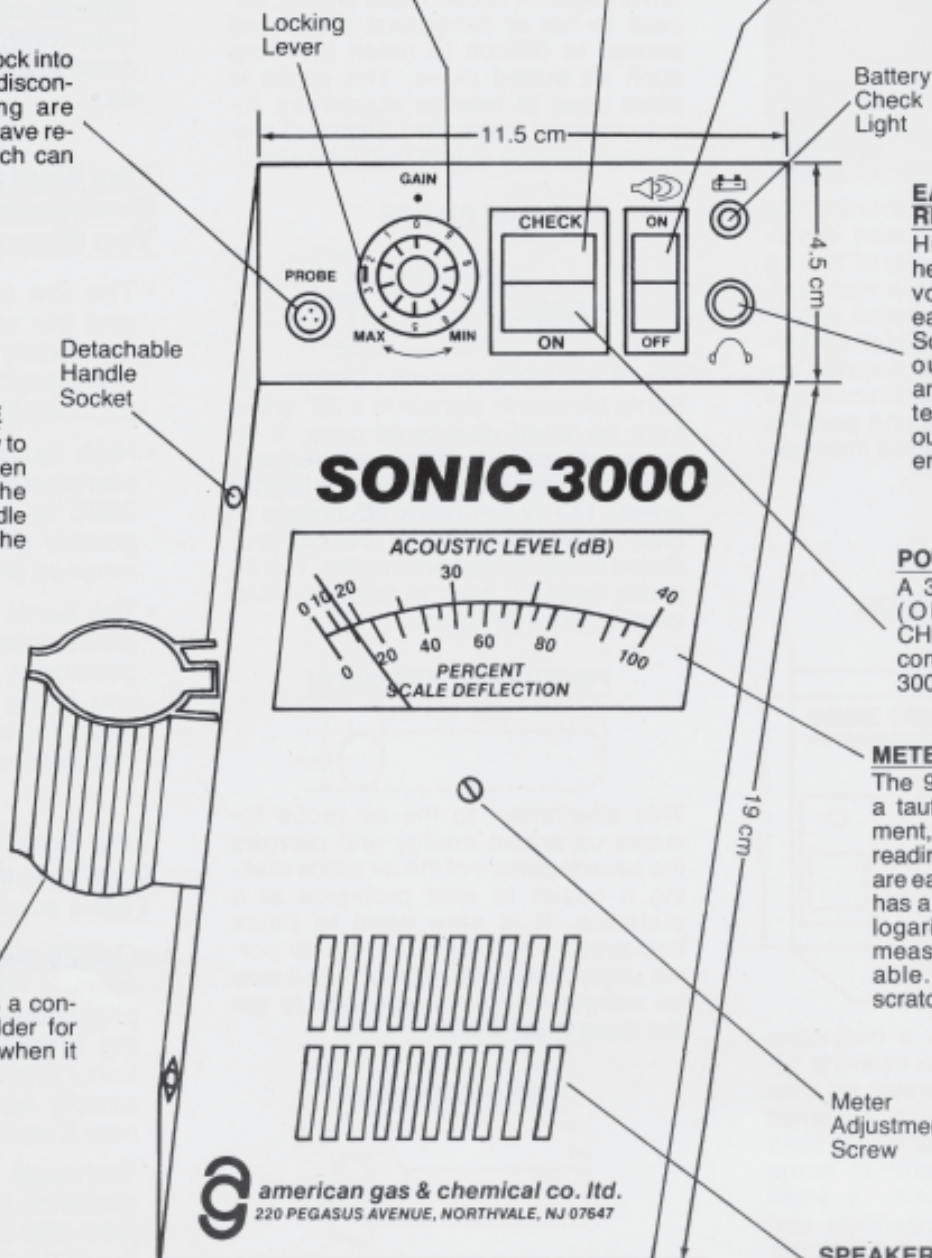
The handle makes it easy to carry and use the unit when it is not attached to the operator's belt. The handle folds back to support the Sonic for bench use.

PROBE HOLDER

The holder provides a convenient non-slip holder for the attached probe when it is not in use.

RECHARGER JACK

The Sonic 3000 is supplied with a 9 volt rechargeable battery and recharger which can be used to continuously charge the unit without damage to the batteries.



EARPHONE RECORDER JACK

High resolution stereo headphones, with individual volume controls for each ear, are included with the Sonic 3000 M. These block out external noise and amplify signals from the detector so that the sound output is easy to hear in all environments.

POWER SWITCH

A 3 function rocker switch (ON/ OFF/ BATTERY CHECK) provides positive control making the Sonic 3000 easier to use.

METER

The 90° analog meter has a taut band needle movement, that eliminates erratic readings so measurements are easier to see. The meter has a linear scale and 40db logarithmic scale making measurements more reliable. The meter face is scratch-resistant acrylic.

Meter Adjustment Screw

SPEAKER

The audible output of the Sonic allows the detector to achieve much of its versatility. Each problem type produces a distinct sound which allows the user to rapidly identify the source and assess the extent of the problem.

SPECIFICATIONS

Detector Battery	Self contained Nickel-Cadmium rechargeable 9 Vdc \pm .7 at 20mA
Transmitter Battery	9 Vdc \pm .7V at 10mA
Sensitivity	10 ⁻² std cc/sec leak rate.
Detector Dimensions	7.5" x 4.5" x 1.75"
Circuitry	Solid State Integrated Circuit.
Temperature Range	- 10°F to 150°F
Meter	100 micro amp 90° taut-band needle movement 0-100 linear scale & 0-40 dB scale
Repeatability	99%
Detector Construction	Rugged .050 Aluminum
Carrying Case Dimensions	19" x 15" x 4"



THE SONIC 3000 GUARANTEE

We guarantee the Sonic 3000 will save you time and money by detecting leaks and other maintenance problems more easily and quickly. If you are not completely satisfied by the end of the first month simply return your instrument and we will refund your entire purchase price.



american gas & chemical co., ltd.
220 Pegasus Avenue, Northvale, NJ 07647



CALL TOLL FREE 1-800-288-3647

201-767-7300 fax:201-767-1741 www.amgas.com

Specifications

Physical	
Dimensions	180 mm H x 92 mm W x 46 mm D (7.1" H x 3.6" W x 1.8" D)
Weight	450g (0.99 lb) (including batteries)
Power	
Power Supply	Three AA batteries
Run Time	8 hours
Operating Environment	
Operating Temperature	0°C to 55°C (32°F to 131°F)
Storage Temperature	0°C to 70°C (32°F to 158°F)
Sealing	Impactant resistant, dust and splash proof, gasket sealed case tested to IP54
Transducer	
GE Part Number	389-024-400



www.gesensinginspection.com

GEIT-20057EN (03/09)



Visual Weld Gages

NONDESTRUCTIVE TESTING EQUIPMENT



ADJUSTABLE FILLET WELD GAGE
with unequal leg measurement feature
Measure 15 weld sizes plus throat thickness
DETEK P/N VWG-009



7 PC. FILLET TYPE GAGE
Measure 11 fillet weld sizes
DETEK P/N VWG-008

Gage now available with markings on both sides upon request.

- Stainless Steel
- Can Be Certified

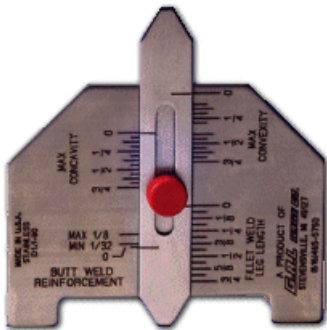
- All Gauges Stainless Steel



- Set Comes with Handy Key Chain and Pocket Pouch

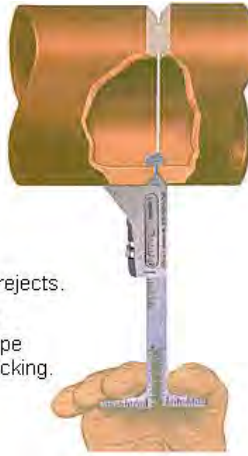
- 11 Different Sizes in Standard Sizes with Metric Equivalent Markings - 1/8" - 1"

POCKET FILLET WELD GAGE SET
DETEK P/N VWG-016



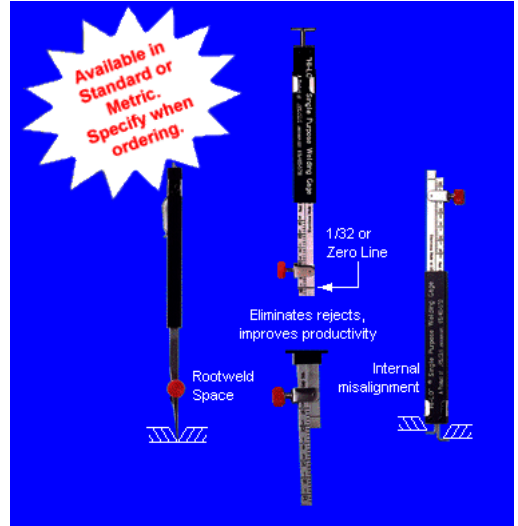
AUTO WELD SIZE TYPE GAGE
Check tolerance of convexity for butt and fillet welds. Pocket size.
DETEK P/N VWG-001

G.A.L. Hi-Lo Welding Gage Measures Internal Alignment

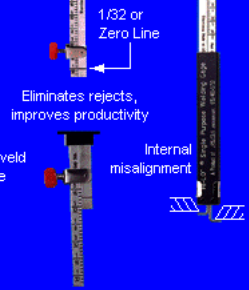


of pipe after fit-up/alignment, cuts radiographic rejects.
Measures internal misalignment of pipe before and after tacking.

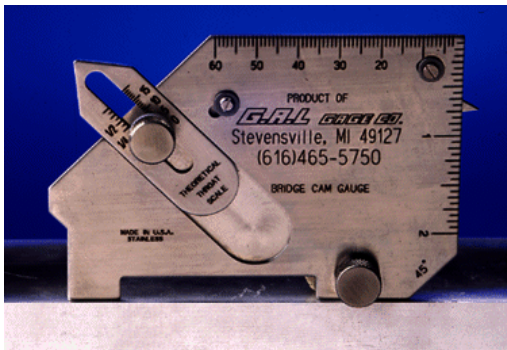
HI-LO WELDING GAGE
DETEK P/N VWG-005



Available in Standard or Metric. Specify when ordering.



SINGLE PURPOSE HI-LO GAGE
DETEK P/N VWG-006



BRIDGE CAM GAGE
Measures angle of prep, Excess weld metal, Undercut depth, Pitting depth, Fillet weld throat size, Fillet weld length, Outside alignment
DETEK P/N VWG-003



- Checks Undercut
- Checks Crown Height
- Checks Pits
- All Stainless Steel

NEW DESIGN

V-WAC UNDERCUT GAGE
DETEK P/N VWG-002



W.T.P.S. TYPE GAGE
Measures .010" deep undercut to tolerances +/- .0005"
DETEK P/N VWG-004

6805 COOLRIDGE DR ■ TEMPLE HILLS MD 20748
301-449-7300 ■ 800-638-0554 ■ FAX 301-449-7011

EMAIL: sales@detek.com



NONDESTRUCTIVE TESTING EQUIPMENT

Welders, CWI Inspectors, Instructors Now You Can Design Your Inspection Tool Kit

*Specify the tools you need from our catalog to suit your particular needs
and we'll put them in kit form with your own personalized nameplates.*

Cat # 12



Wrap-Around Pouch

Measures: 9" X 6 1/2" Open
6 1/2" X 4 1/4" Wrapped – Will fit in Pocket

Tools Included:

V-WAC / Fillet Weld Comp*, 6" General Scale*,
Telescoping Mirror, Penlite, & Single Purpose*

Tool Kit

Measures: 13" X 8" X 3"

Tools Included:

V-WAC Gage*, Magnifier, AWS Type Gauge*,
Hi-Li Gage, Micrometer w/Ball*,
Telescoping Mirror, & 6" Starrett Scale*



(*) Metric or Standard (inches)

NOTE: These are top of the line measuring tools! Prices can vary depending on the tools required.

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NONDESTRUCTIVE TESTING EQUIPMENT

Now You Can Design Your Inspection Tool Kit

Cat # 12



American Welding Society (AWS) Tool Kit

Tools Included:

0-150mm Dial Caliper, 6" Scale w/ Clip,
0-1" Micrometer, 2" Reading Glass,
7 Piece Fillet Weld Set, V-WAC Gage*,
& AWS Type Gauge*

Brief Case Type/Lock & Key

Measures: 18" X 12 1/2" X 3"

Tools Included:

V-WAC Gage*, Fillet Weld, WTPS Gage, Bridge
Cam, Single Purpose*, 6" Starrett Scale*,
Telescoping Mirror, Micrometer w/ Ball*, Hi-Lo Gage,
Skew-T Fillet Weld w/ Calc, AWS Type Gauge*,
ADJ Fillet Weld*, & Magnifier



(*) Metric or Standard (inches)

NOTE: These are top of the line measuring tools! Prices can vary depending on the tools required.

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REBAR DETECTION SYSTEM

- Location and orientation of reinforcing bars
- Measuring concrete cover depth
- Determination of bar diameter
- Compact, user-friendly indicating device with backlight
- ProVista PC software for fast data transfer and editing
- Can be operated in metric and imperial units

PROFOMETER 5⁺ utilizes the non-destructive pulse-induction method

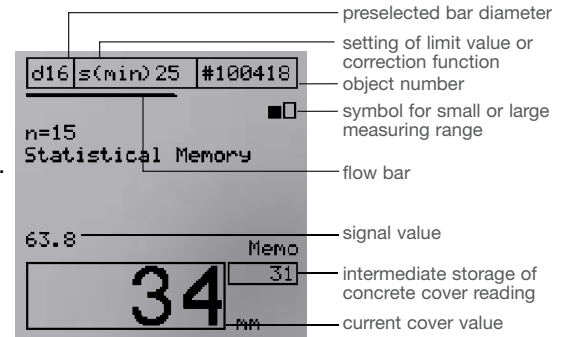


Standards: SN 505 262 • DIN 1045 • DGZfP B2 • BS 1881: Part 204

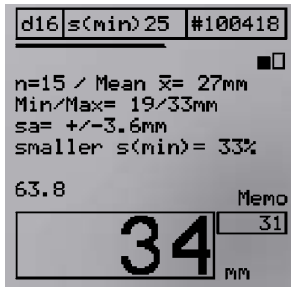
Model S • Basic Instrument

Various location aids are available:

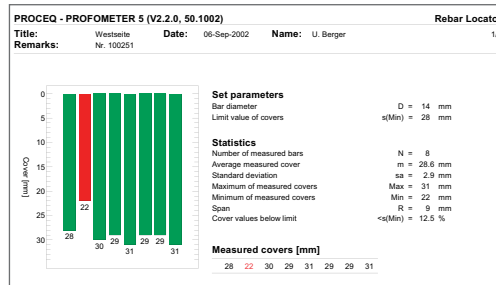
- Current value:** Distance from surface of reinforcement
- Flow bar:** Movement of flow bar indicates approach to metal object
- Beep tone:** Sounds immediately after crossing the bar axis. Selectable in two frequencies.
- Variotone:** The closer the probe to the bar, the higher the tone
- Signal value:** Measure of distance from probe to metal object



«Measuring with statistics» function



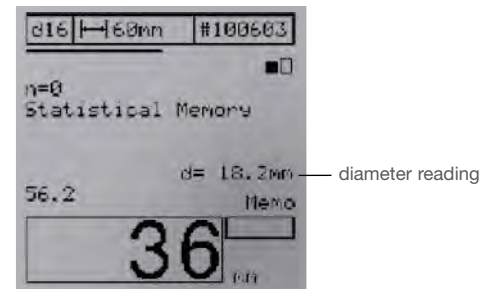
The statistical evaluation of the stored memo values appears when the END button is pressed.



Data transfer to PC and evaluation with ProVista Software

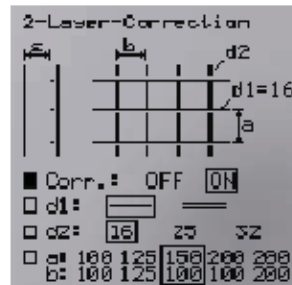
Determine the bar diameter of closely spaced parallel bars

The instrument compensates the influence of the neighboring bars.



Measure the cover depth in congested bar arrangements

Measure the bar spacing and select the measuring mode. The instrument compensates for the influence of the adjacent bars.

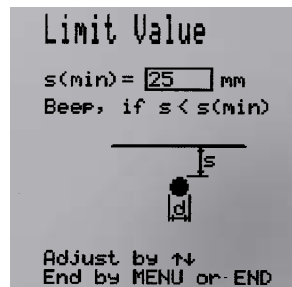


Detect bars with insufficient concrete cover

Suggested applications:

- Check after removing formwork
- Quality assurance
- Evaluation basis for repair

The universal probe can be moved rapidly with the preselected limit value. If the cover is too low, an acoustic warning signal is given.



profometer^R 5⁺

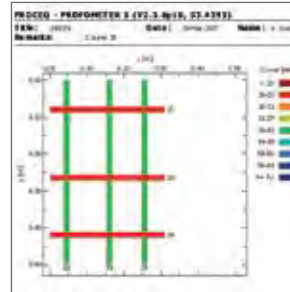
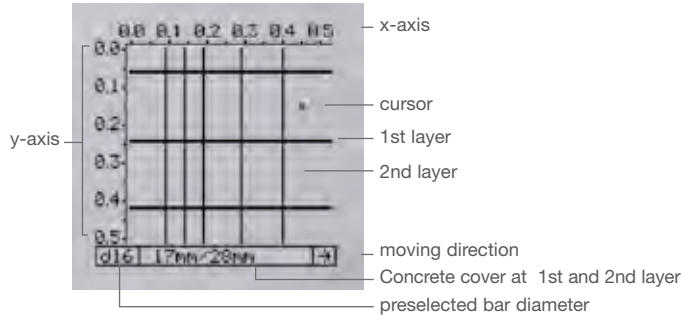
Modell SCANLOG • Identical to Model S - with these additional Features:

- "CyberScan" function to visualize reinforcing bars on the display
- "Measuring with grid" function for grey-scale display of concrete cover
- ScanCar probe cart with integrated path measuring device for scanning



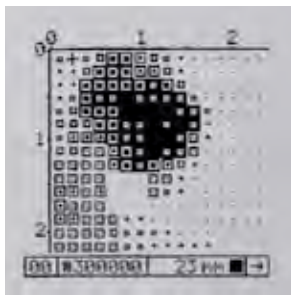
Make reinforcement visible with "Cyber Scan"!

Three scales are available: 0.5 x 0.5m, 1.0 x 1.0m, 2.0 x 2.0m

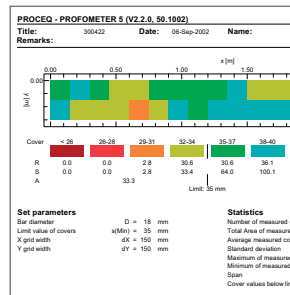


Data transfer to the PC and processing with ProVista Software

«Measuring with grid» function

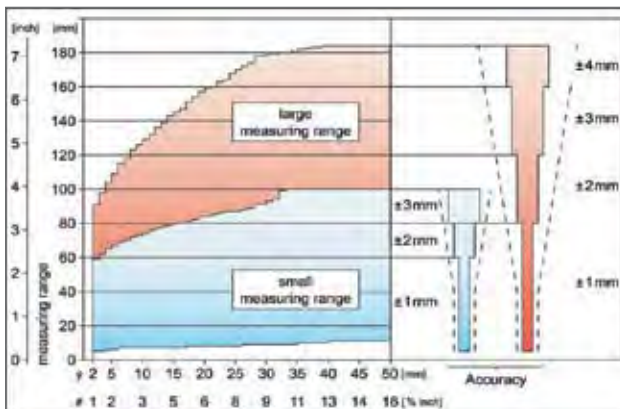


Display

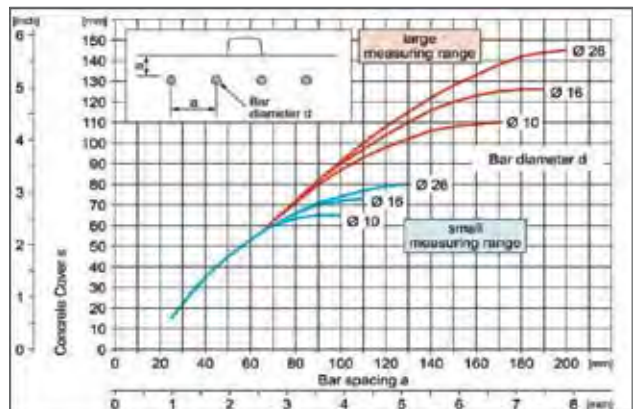


Data transfer to the PC and processing with ProVista Software

Measuring ranges and accuracy of the cover reading for individual bars...



...and unsurpassed resolution



- ∅ bar diameter in mm
- # bar diameter in «Bar size#»
- accuracy required by BS 1881: Part 204: ± 2 mm or ± 5%

The diagram shows the minimum bar spacing (a) at which the bars can still be individually detected as a function of the concrete cover (s).

Example : Bar diameter $d = 16$ mm
 Concrete cover $s = 55$ mm
 Minimum bar spacing $a = 70$ mm

profometer[®]5⁺

Technical Information

Indicating device Model S

MEMORY: non-volatile memory for 40'000 measured values and 60 objects respectively

DISPLAY: LCD with backlight option

INTERFACE: RS232 or with Adapter for USB Port on PC

SOFTWARE: ProVista for downloading data and evaluation on PC

BATTERIES: 6 x 1.5V for 45h operation; 30h with backlight on

TEMPERATURE RANGE: -10° to +60° C

Universal probe

Probe for locating rebars and measuring cover depth in two depth ranges as well as determining rebar diameters.

Indicating device Model SCANLOG

The unit is identical to Model S, with additional features for the Cyberscan and the measuring with grid function.

Memory capacity: 120'000 values in function measurement with grid and a total of 60 objects.

Model S can be upgraded to Model SCANLOG. Contact Proceq for details.

Ordering Information

UNIT MODEL S

390 00 050 Rebar Detection System PROFOMETER 5+ Model S
Includes Indicating device, universal probe, probe cable 1.5 m, transfer cable 1.5 m, adapter RS232/USB, ProVista Software on memory stick, carrying strap, headset, protective sleeve for indicating device, operating instructions, carrying case, total weight 4.2 kg

UNIT MODEL SCANLOG

390 00 054 Rebar Detection System PROFOMETER 5+ Model SCANLOG
identical to Model S, with the additional features plus probe cart ScanCar with path measuring cable 1.55 m, total weight 4.5 kg

ACCESSORIES FOR BOTH MODELS

390 00 270 Test block
390 00 363 Telescopic rod for universal probe or ScanCar
390 00 280 Marking pen for universal probe

REPLACEMENT PARTS

390 00 068 Universal probe
390 00 084 Protective film for universal probe
330 00 470 Protection sleeve for indicating device
390 00 163 Probe cable 1.5 m
390 00 168 Path measuring device cable 1.55 m
330 00 456 Transfer cable 9/9 poles
390 00 542 Adapter RS 232 / USB
390 00 078 Carrying case
820 39 001 Operating instructions

Subject to change without notice.

All information contained in this documentation is presented in good faith and believed to be correct. Proceq SA makes no warranties and excludes all liability as to the completeness and/or accuracy of the information. For the use and application of any product manufactured and/or sold by Proceq SA explicit reference is made to the particular applicable operating instructions.



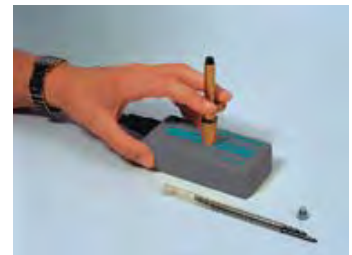
Main components



Test block



Telescopic rod for universal probe or ScanCar



Marking pen for universal probe



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proceq

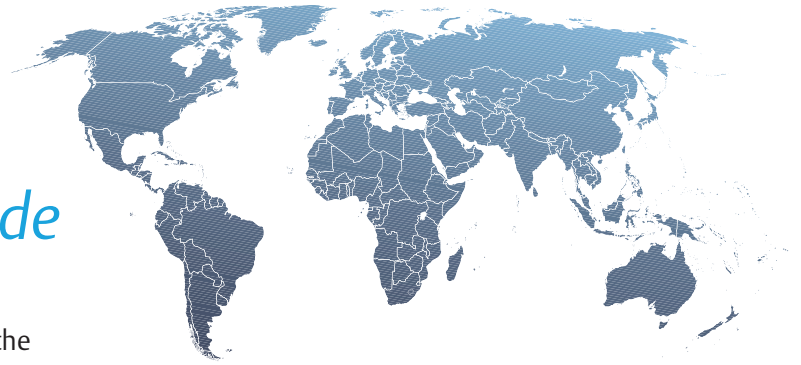
BRANSON



Bransonic® Baths

The simple, reliable solution to quality precision cleaning

BRANSON: A Recognized Leader in Ultrasonics Worldwide



For over 60 years, Branson has been the leader in the development of advanced ultrasonics and its application to a variety of uses.

Branson is recognized worldwide as an innovator, pioneering the use of the rugged, reliable 40 kHz transducers in sweep frequency baths.

Brasonic® baths are used widely in laboratory, light industrial, dental, medical, and specialty applications:

Laboratory/medical/special utilities: Cleaning of instruments or special parts, metal components, glass and ceramic.

Industrial/basic cleaning: Removing soils, contaminants, oils, and compounds from light industrial parts, electronics, jewelry, etc.

Beyond cleaning: Sample preparation; degassing liquids, mixing and homogenization, dissolving solids, cell lysing and dispersion of particles.

The Branson reputation for impeccable quality and reliable ultrasonics is unsurpassed. Our global network of distributors ensures that you will have the machinery, accessories, supplies, and support you need to meet your basic cleaning needs for the most demanding applications.



Branson® Ultrasonic Baths

Branson's innovations include our signature elevated control panel, positioned above and behind the bath to avoid damage and increase operator safety. With our unique sweep frequency technology to eliminate standing waves, and our pioneering 40 kHz industrial transducers, Branson ultrasonic baths have been the industry standard for quality, reliability, and precision cleaning.

The CPX Series

Advanced technology and digital performance in our most robust, versatile, ultrasonics baths.

The CPX Series features a variety of technological enhancements:

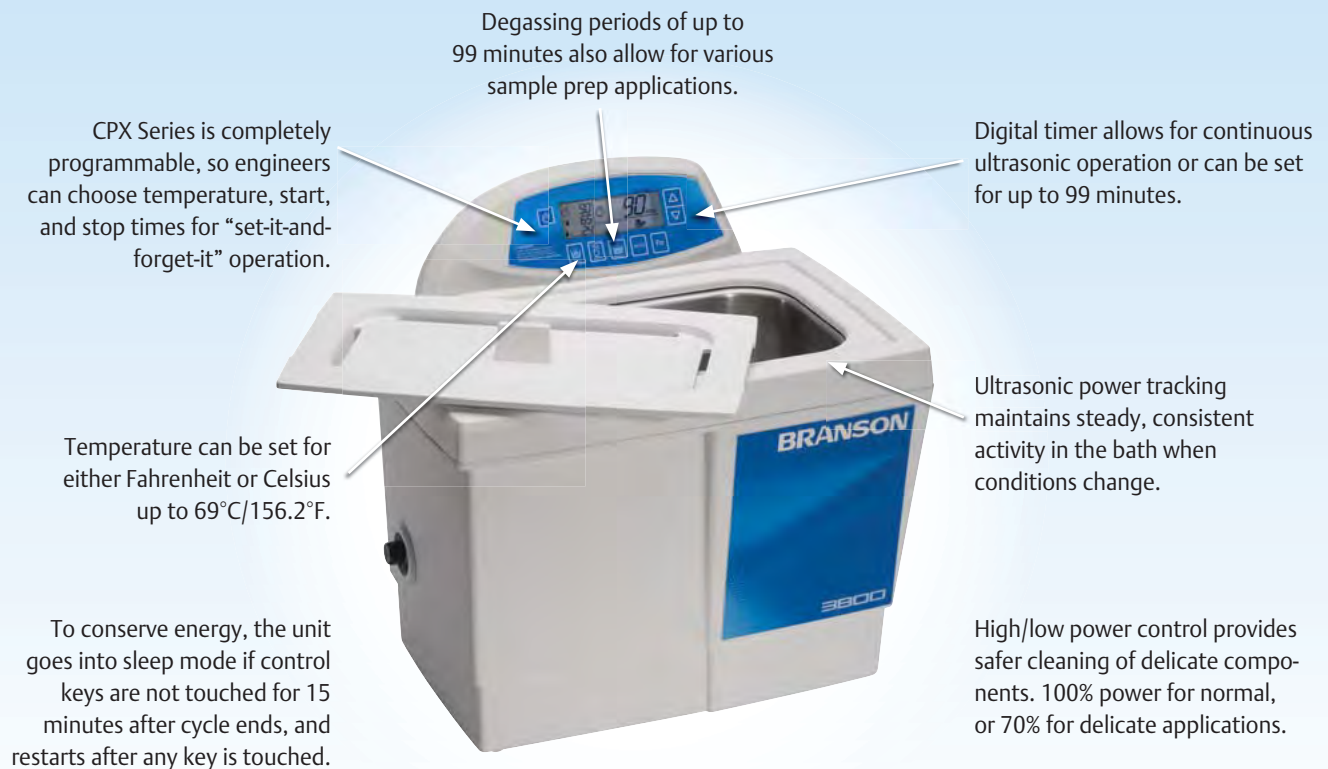
- **Constant activity/power tracking** automatically maintains the same ultrasonic power by adjusting for changes in liquid level and temperature caused by a light or heavy load. This helps ensure more uniform cleaning and consistent performance, even with multiple users or when bath conditions change.
- **Assures uniform, precision cleaning** over the entire surface, and consistent cavitation that reaches and cleans even tiny crevices on the parts.
- **High/low power control** adjusts the acoustic energy in the bath. It can be set at 100% power for normal to heavier loads, or at 70% power for lighter and more delicate applications, helping to protect delicate components from potential damage.
- **Temperature settings** are available up to 69C/156.2F, which can be set in either Celsius or Fahrenheit and programmed through the front panel for easy access and monitoring. This also allows for convenient re-calibration when needed onsite.
- **High-temperature visual alarm/auto shut-off** for added safety.
- **Sleep mode** provides energy savings automatically by shutting off unit if control keys are not touched within 15 minutes of cycle end. To restart, press any key.
- **Degassing and conditioning of solutions** through advanced wave modulation of up to 99 minutes also allow for a variety of sample prep applications.



Branson CPX Series

The CPX Series extended degassing capabilities (up to 99 minutes) allow for “beyond cleaning” applications for sample preparation such as mixing and homogenization, dissolving solids, cell lysing, and particle dispersion.

The CPX Series Features



The M Series

The value leader for quality and reliability.

The Bransonic M Series includes two simple-to-use models: the M and MH Series. Both series are designed for basic yet effective cleaning, with set-it-and-forget-it mechanical timers, which can be set up to 60 minutes or run continuously. MH Series units also offer a heating option. And both series are excellent for use in a variety of applications:

- Laboratories and dental offices
- Electronic components
- Industrial parts
- Jewelry and precious metals



Bransonic M Series

Precision Cleaning for All Types of Applications

Bransonic baths are in use worldwide, providing simple, effective results for the ultimate in ultrasonic cleaning.

Laboratory

Thoroughly removes blood, protein, and contaminants on tools such as glassware, lenses, instruments, and precision components.

Medical and Dental Labs

Offers a safer, more consistent way to clean dental and medical instruments in combination with sterilization.

Industry

Deep cleans to remove dirt, grease, wax, and oils from industrial parts and components of all kinds, including steel, light and nonferrous metals, plastic, and glass.

Electronics

Completely removes flux and contaminants from such precision components as PC boards, SMDs, quartz crystals, capacitors, and many others.

Jewelry

Thoroughly cleans and restores brilliance to watches, chains and charms, settings, coins, fine jewelry, and clockworks.

Optical

Ensures precision cleaning of optics.

Beyond cleaning

Bransonic ultrasonic cleaners also can be used for sample preparation; degassing liquids, mixing and homogenization, dissolving solids, lysing and dispersion of particles.

Accessories and Solutions

Accessories

Bransonic® ultrasonic baths also can be accessorized to best suit your specific cleaning or laboratory needs. Choose the appropriate suspension method for your applications, solid or perforated tray, basket, support rack, and beaker holder to customize each unit as needed.

The Right Cleaning Solution

It's the most important decision you can make. A large variety of excellent formulations are available, designed for specific applications. Proper selection is crucial for acceptable cleaning activity and to preclude undesirable reactivity with the items being cleaned.



BRANSONIC® AQUEOUS SOLUTIONS

Pour on the cleaning power! Always specify Branson aqueous cleaning solutions for your new Branson ultrasonic cleaner. Whether you're gently cleaning delicate optics or stripping rust of oxides, there's a Branson chemistry developed specifically for the job.

NOTE: Sold by the case: 12 quarts per case, 4 gallons per case. Larger sizes available. Ordering numbers are per case.



OC Optical Cleaner	Removes general soils, fingerprints, cerium oxide, pitch, and blocking waxes from optical lenses, and polishing compounds from glass and optical surfaces prior to deposition of coatings.	100-955-722 Quart 100-955-726 Gallon
JC Jewelry Cleaner	Removes general soils, particulates, fingerprints, oils, and oxides that accumulate with normal use.	000-955-214 Quart 000-955-216 Gallon
EC Electronics Cleaner	Removes oils, resins, rosins, and other soils from hard surfaces encountered in the electronic, plating, and other related industries.	100-955-920 Quart 100-955-914 Gallon
IS Industrial Strength Cleaner	Removes grease, oils, and particulates from automotive, aircraft, and similar mechanical components: cleans shop oils and light carbon deposits from valves fittings, and similar components.	000-955-114 Quart 000-955-116 Gallon
OR Oxide Remover	Removes rust and oxides from all metals.	000-955-514 Quart 000-955-516 Gallon
BC Buffing Compound Remover	Removes the most difficult buffing compounds and agents, tripoli, rouge, lime, diamond tripoli, etc.	000-955-314 Quart 000-955-316 Gallon
RSL Rust Stripper	Used for derusting and descaling of ferrous metals.	CPN-955-008 Quart CPN-955-003 Gallon
GP General Purpose	Removes general soils, fingerprints, dust, light oils and greases.	000-955-014 Quart 000-955-016 Gallon
GP General Purpose (Powder)	Removes general soils, fingerprints, dust, light oils and greases.	CPN-955-007 (3) 2 lb. Containers
MC-1 Metal Cleaner	Remove oils, greases and a wide variety of soils from aluminum and aluminum alloys, copper, brass, and steel substrates. Removes fabricating cutting and polishing oils. Displaces soils to allow for easy removal manually, or by use of a skimmer.	100-955-830 Quart 100-955-824 Gallon
MC-2 Metal Cleaner	Removes oils, greases and a wide variety of soils from ferrous metals, steel alloys, titanium alloys, copper and copper alloys and stainless steel (not recommended for aluminum and aluminum alloys).	100-955-840 Quart 100-955-834 Gallon
MC-3 Metal Cleaner	Remove oils, greases and a wide variety of soils from aluminum and aluminum alloys, copper, brass, and steel substrates. Removes fabricating cutting and polishing oils. Emulsifies, preventing soils from redepositing.	100-955-850 Quart 100-955-844 Gallon



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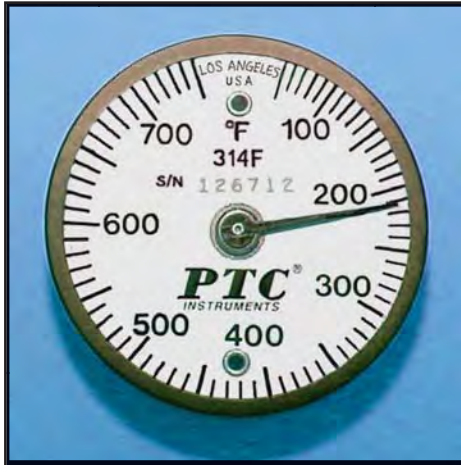
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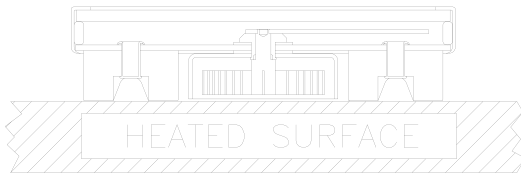
Dual Magnet Mount Surface Thermometers



Made In U.S.A.



Model 314F shown actual size, 2" O.D.



Cutaway view of surface thermometer

- **PTC® Quality -- Made in the U.S.A.**
- **Accuracy of $\pm 2\%$ of Full Scale Range**
- **NIST Certification Available**
- **Every Unit Individually Calibrated**
- **Dual Scale Models Available**
- **Single or Dual Max-Min Hands Available**
- **Dual Magnet Mount Standard -- Four Magnet or Tab Mount Optional**

THE best bimetal surface thermometer on the market for over sixty years. PTC®'s surface thermometers are unrivaled for their combination of accuracy, quality, versatility, and economy. Manufactured from the finest materials, these instruments will continue to give accurate readings for many years. Each thermometer is individually calibrated and serialized. Our thermometers have an accuracy of $\pm 2\%$ of full scale range and are backed by a one year warranty. Certification service using NIST traceable standards and in accordance with ANSI/NCSL Z540-1 is available for all of these units.

Model	Range	Divisions
312F	0°F to 250°F	2°F
313F	0°F to 500°F	5°F
314F	50°F to 750°F	10°F
315F	0°F to 150°F	1°F
330F	-100°F to +160°F	2°F
312C	-20°C to +120°C	1°C
313C	-20°C to +250°C	2°C
315C	-15°C to +65°C	1°C
330C	-70°C to +70°C	2°C

SPECIFICATIONS

1. Accuracy..... $\pm 2\%$ of full scale range.
2. Time constant..... from 0.06 to 1 minute.
(depending on the range)
3. Dimensions:
Diameter..... 2 in. (5.1 cm).
Height..... 1/2 in. (1.3 cm).
4. Weight..... 1-1/2 oz. (43 g).
5. Shipping weight 1 lb. (454 g).
6. Dual Scale models available..... see reverse.
7. Ancillary hand(s)..... see reverse.
8. Tab Mount or 4 Magnet Mount..... see reverse.

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EMAIL: sales@detek.com

Dual Scale Magnet Mount Surface Thermometers



Same great features as the Dual Magnet Surface Thermometers, but with °F & °C dual scale dials

MODEL	RANGES °F & °C	DIV.
312DS	0°F to 250°F -20°C to +120°C	5°F 2°C
313DS	0°F to 500°F -20°C to +260°C	10°F 5°C
314DS	50°F to 750°F 10°C to 400°C	10°F 10°C
315DS	0°F to 150°F -20°C to +65°C	2°F 1°C

Single or Max-Min (Dual) Ancillary Hands



Model 312FMM with Max-Min Ancillary Hands shown

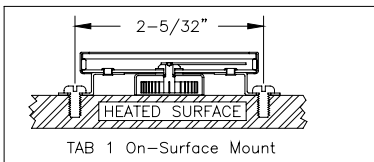
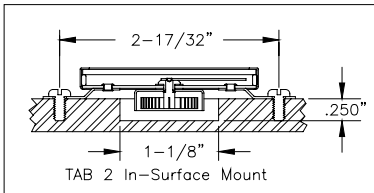
Single Ancillary Hand

This handy, resettable peak reading hand is available as an accessory on PTC's Dual Magnet Mount, Dual Scale, 4 Magnet Mount, and Tab Mount surface thermometers. The ancillary hand is reset by simply turning the reset knob. A magnetic clutch holds the hand in place at either the maximum **or** minimum temperature reached during a cycle.

Max-Min (Dual) Ancillary Hands

Max-Min hands are available on PTC's Dual Magnet Mount, Dual Scale, 4 Magnet Mount, and Tab Mount surface thermometers. This accessory has been designed to provide the user an easy way to obtain maximum **and** minimum temperatures for a given cycle. The hands are easily reset before each temperature cycle by using the reset knob and magnetic wand (Part No. 314.5MM).

Tab Mount Surface Thermometers



Tab Mounted Surface Thermometers

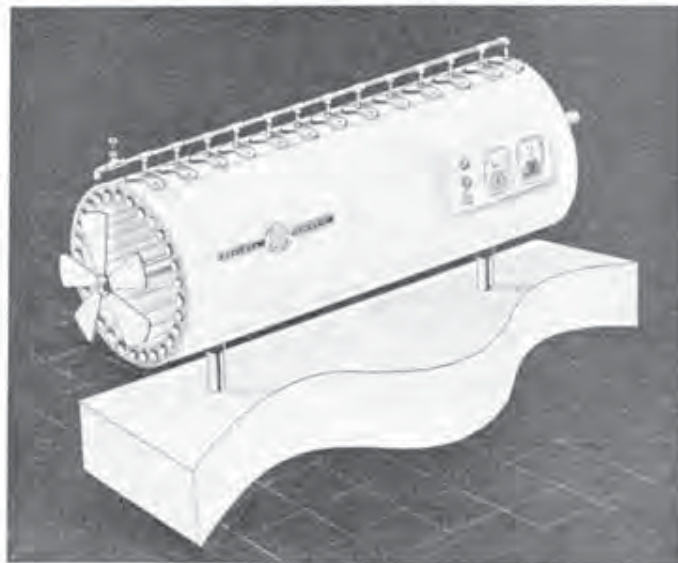
Two types of tabs are available for these thermometers. Tab 1 is for on-surface mounting and Tab 2 for in-surface mounting. The drawings show both methods of mounting. For in-surface mounting, a hole 1-1/8" in diameter by 1/4" deep is machined in the part to be measured. Pilot holes also need to be drilled for mounting screws. The tabs are provided with holes for the screws. When ordering, please specify whether Tab 1 or Tab 2 mounting is required.

6805 COOLRIDGE DR ■ TEMPLE HILLS MD 20748
301-449-7300 ■ 800-638-0554 ■ FAX 301-449-7011
EMAIL: sales@detek.com



Turboencabulator

Dec. 31, 1962



(Photo 290440)

Fig. 1. Turboencabulator

THIS PUBLICATION CONTAINS INFORMATION ON THE FOLLOWING

- FUNCTION
- RATINGS
- SPECIFICATIONS
- OPERATION
- APPLICATION DATA
- DIMENSIONS
- TECHNICAL FEATURES
- ACCESSORIES
- EXTERNAL WIRING

ADDITIONAL INFORMATION

PRICE AND ORDER DATA—Refer to Factory.

WHERE TO BUY—See Handbook Section No. 8006, or contact person listed below.

WHERE TO GET SERVICE OR REPAIR—See Handbook Section No. 8009, or contact person listed below.

TECHNICAL PUBLICATIONS

Order from nearest General Electric Apparatus Sales Office or Distributor.

Copies of this publication	HBK 8359
Specification Guide Forms (Nonrestrictive) with copy of General Electric Specifications, printed herein	None
Installation Instructions	None
Operation and Service Instructions	None
Service Manual	None
Overhaul Instructions	None
MIL-illustrated Parts Breakdown	None
Recommended Spare Parts List	None
Renewal Parts Bulletin	None

(Sales Engineer's or Distributor's Name and Address)



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Dec. 31, 1962

Turboencabulator

FUNCTION

To measure inverse reactive current in unilateral phase detractors with display of percent realization.

OPERATION

Based on the principle of power generation by the modal interaction of magnetoreluctance and capacitive directance, the Turboencabulator negates the relative motion of conventional conductors and fluxes. It consists of a baseplate of prefabricated Amulite, surmounted by a malleable logarithmic casing in such a way that the two main spurving bearings are aligned with the pentametric fan.

Six gyro-controlled antigravimic marzelvanes are attached to the ambifacient wane shafts to prevent internal precession. Along the top, adjacent to the panandermic semi-boloid stator slots, are forty-seven manestically spaced grouting brushes, insulated with Glyptal-impregnated, cyanoethylated kraft paper bushings. Each one of these feeds into the rotor slip-stream, via the non-reversible differential tremie pipes, a 5 per cent solution of reminative Tetraethylodohexamine, the specific pericosity of which is given by $P=2.5C_n^{4/7}$ where "C" is Cholmondeleys annular grillage coefficient and "n" is the diathetical evolute of retrograde temperature phase disposition.

The two panel meters display inrush current and percent realization. In addition, whenever a barescent skor motion is required, it may be employed with a reciprocating dingle arm to reduce the sinusoidal depletion in nofer trunions.

Solutions are checked by Zahn Vis-cosimetry techniques. Exhaust orifices receive standard Blevinometric tests. There is no known Orth Effect.

TECHNICAL FEATURES

- Panandermic semi-boloid stator slots
- Panel meter covers treated with Shure Stat (guaranteed to build up electrostatic charge in less than 1 second).
- Manestically spaced grouting brushes
- Prefabricated Amulite baseplate
- Pentametric fan

STANDARD RATINGS

Rating	Old Catalog No.	New Computer Insensitive Catalog No.
0-1000	6060606G6*	125387GLC1†

* Included Qty. 6 NO-BLO† fuses.

† Includes Magnaglas circuit breaker with polykrapolene-coated contacts rated 75A Wolfram.

‡ Reg. T.M. Little Gem Fuse Blower Corp.

ACCESSORIES

1. 8 ounces 5 per cent Tetraethylodohexamine with 0.01N Halogen tracer solution.
2. Interelectrode diffusion integrator.
3. Noninductive-wound inverse conductance control in little black box.
4. Analog to digital converter with reflected levorotatory BCD output (binary-coded decimal ie; 7, 4, 2, 1).
5. Quasistatic regeneration oscillator with output conductance of 17.8 millimhos.

APPLICATION

Measuring Inverse Reactive Current—

CAUTION: Because of the replenitive flow characteristics of positive ions in unilateral phase detractors, the use of the quasistatic regeneration oscillator is recommended if Turboencabulator is used in explosive atmospheres.

Reduction of Sinusoidal Depletion—

—Before use, the system should be calibrated with a gyro-controlled Sine-Wave Director, the output of which should be of the cathode follower type.

Note: If only Cosine-wave Directors are available, their output must be first fed into a Phase Inverter with parametric negative-time compensators. **Caution:** Only Phase Inverters with an output conductance of 17.8 ± 1 millimhos should be employed so as to match the characteristics of the quasistatic regeneration oscillator.

Voltage Levels Above 750V **Do Not Use** Caged Resistors to get within self-contained rating of Turboencabulator. **Do Use** Sequential Transformers. See HBK-8005.

Multiple Ratings—Optionally available in multiples of $\pi(3,141593)$ and $e(2,71828)$. If binary or other number-base systems ratios are required, refer to factory for availability and pricing.

Goniometric Data—Upon request, curves are supplied, at additional charge, for regions wherein the molecular MFP (Mean free path) is between 1.6 and 19.62 Angstrom units. Curves, relevant to regions outside the above-listed range,

may be obtained from:

Torricelli Barometer Works, Ltd.
Toroidal Turboencabulator Dept.
(TTD-3)
London W.C. 1, England.

In Canada address request to:

Turboencabulateurs
Canadien-Francais Ltee.
468 Jean de Quen, Quebec 10, P.Q.

Reference Texts

1. Zeitschrift fur Physik
Der Zerfall von Dunge LBM-1
H. Sturtzkampfleger, Berlin
2. Svenska Teckniska Skatologika Laro-varken
Dagblad 121—G. Petterson & W. Johansson, Stockholm
3. Journaux de l'Academie Francaise
Numero 606B
T. L'Ouverture, Paris
4. Szkola Polska
Turboencabulatorskiego
Ogloszenie 1411-7
Bogumiel Wroblyski, Warszawa.
5. Texas Inst. of Turboencabulation
AITE Bull. 312-52, J. J. Fleck, Dallas.

SPECIFICATIONS

Accuracy: ± 1 per cent of point

Repeatability: $\pm \frac{1}{4}$ per cent

Drift: less than 3 ft²-hrs/mo

Maintenance Required: Bimonthly treatment of Meter covers with Shure Stat.

Ratings (Standard): None

Ratings (Optional): All

Input Power: Volts-120/240/480/550 a-c

Amps—10/5/2.5/2/2 A

Watts—1200 W

Wave Shape—Sinusoidal
Cosinusoidal, Tangential or
Pipusoidal.

Operating Environment:

Temperature 32F to 150F (0C to 66C)

Max Magnetic Field: 15 Mendelsohn
(1 Mendelsohn = 32.6 Statorsteds)

Case:

Material: Amulite; Tremie-pipes are of
Crapaloy—(tungsten cowhide)
Weight: Net 134 lbs.; Ship 213 lbs.

DIMENSION DRAWINGS

On delivery.

EXTERNAL WIRING

On delivery.