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.

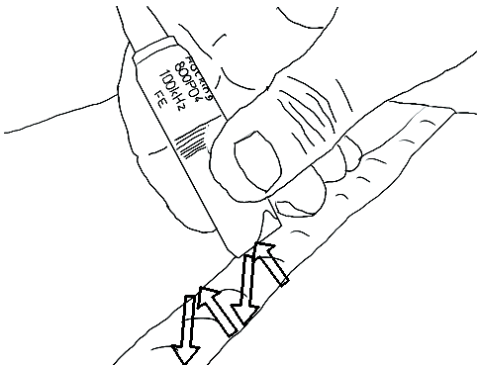
This design of probe greatly reduces the problems of inspecting uneven and undressed weld surfaces where there may also be changes in coating thickness.

The illustrations below show typical scan patterns for the cap of the weld, the toe of the weld and the Heat Affected Zone (HAZ).

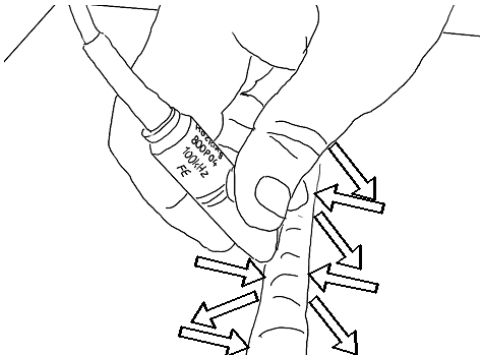
The application is set up so that the probe is driven at a frequency of 100kHz, and a Steel Reference Block is used to set the sensitivity required, using the three EDM slots and the relevant thickness of shims (to take into account coating (paint) variations). In the majority of applications the 1mm 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 optimises 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



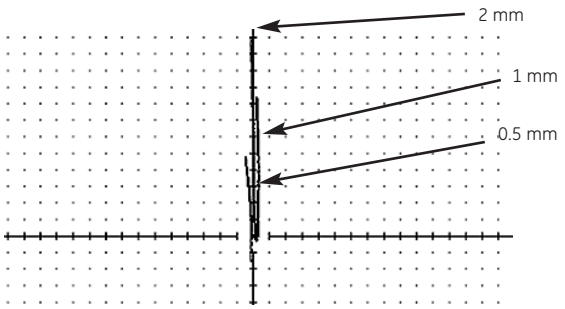
Scanning Weld Toe and HAZ

Other Applications

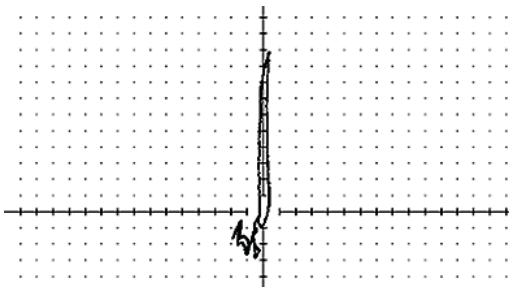
GE Hocking also provide WeldScan probes, which can be used to inspect Aluminum and Stainless Steel Welds.

WeldScan probes are utilized on other steel structures and are commonly used in Shipping, Rail and Civil Engineering Industries.

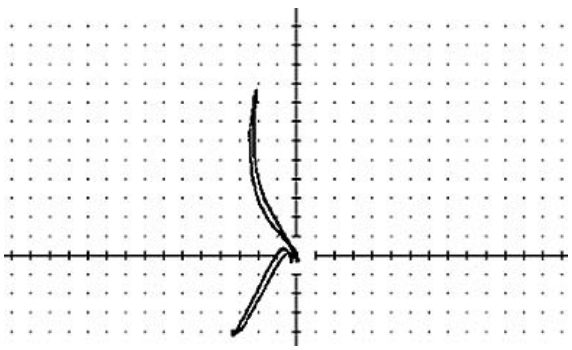
- The traces below show typical responses from the reference block and actual cracks in the weld.



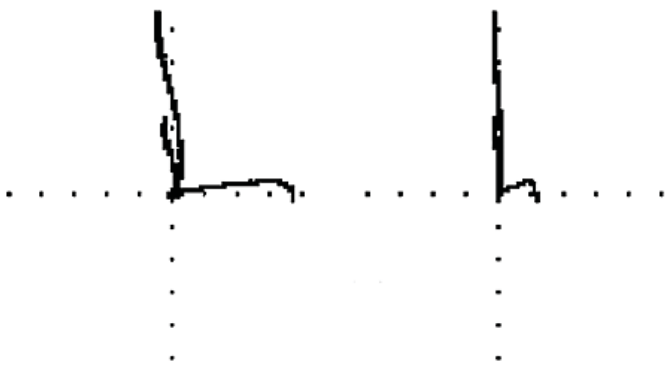
Reference block with 0.5, 1.0 & 2.0 mm notches



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

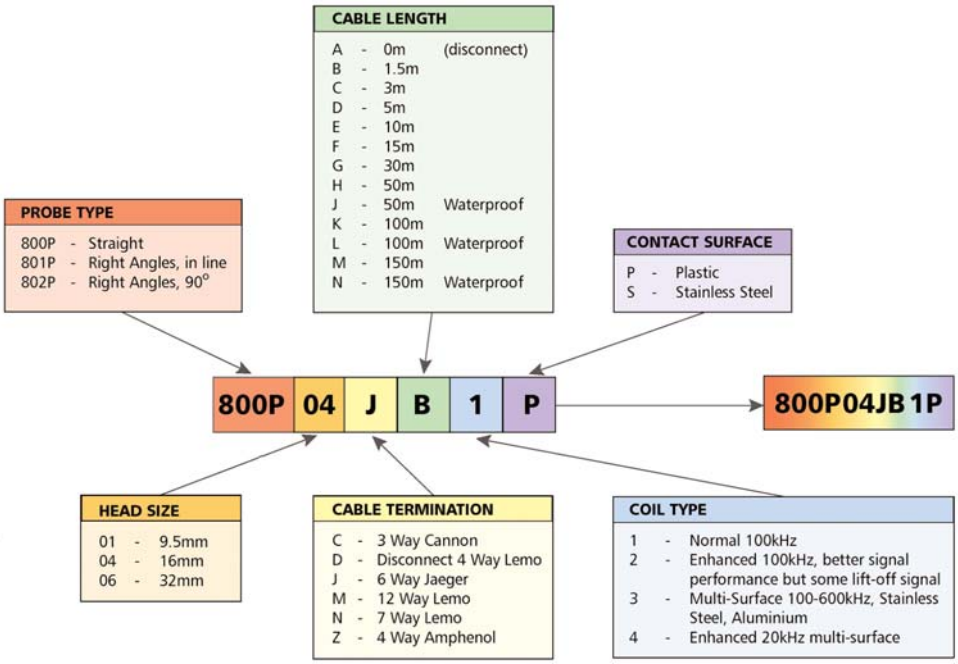
Typical Dimensions for an 801P and 802P style probes:
PRN example: 801P04JD1P
Tip radius - 8 mm
Tip diameter - 15.9 mm
Handle diameter - 15.9 mm
Total tip length - 20 mm Length to rear of strain relief - 170 mm
Length from tip to rear of handle - 129.5 mm
PRN example 802P01JD1P
Tip radius - 5.5 mm
Tip 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, Phasec 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 Phasec 2d PRN 40K200
- WeldScan probe: GE Hocking PRN 800P04MB1P. 100kHz probe with 16mm head and 1.5m integral cable with connector for Locator 3s/Phasec 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/Phasec 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

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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.

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