



Conventional Non-Destructive Examination (NDE)

Capabilities:

- Ultrasonic Testing & Shear Wave
- Magnetic Particle
- Dye Penetrant Testing
- Pipe to Soil, Soil Resistivity & pH
- Pit Depth Gauging
- MIC and Coating Inspection

Ultrasonic Testing (UT Thickness & Shear Wave):

Conventional UT is widely considered the workhorse of the NDE industry. The most common applications of conventional UT include: UT Thickness and Shear Wave.

In UT Thickness applications, a single transducer (single or dual element) is used to measure remaining wall thickness. Shear Wave is used to identify mid-wall defects, size internal defects, and characterize subsurface discontinuities.

Our technicians are trained to locate, size and evaluate volumetric discontinuities in welds, base metal, castings and forging. Test results are highly repeatable and reliable.

The minimum detectable flaw size is dependent upon the type of material being tested and the type of flaw under consideration.



Ultrasonic Testing

Magnetic Particle Inspection (MPI):

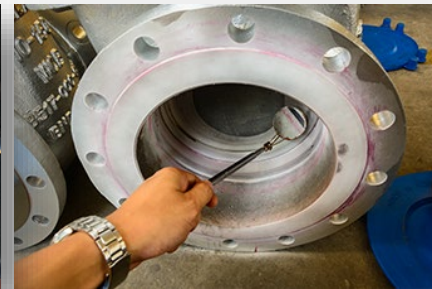
MPI is a process for detecting surface and slightly subsurface discontinuities in ferromagnetic materials such as iron, nickel, cobalt, and some of their alloys.

The process puts a magnetic field into the test object. When the part is magnetized, flaws perpendicular to the magnetic field direction cause flux leakage. If a lapse or a crack is present the magnetic particles will be attracted to the flawed area, a term known as indication.

Our experienced technicians will then evaluate the indication to assess the location, size, shape and extent of these imperfections.



Magnetic Particle Inspection



Dye Penetrant Testing

Dye Penetrant Testing:

Inspection utilizes the application of dyes under visible light or under ultraviolet light conditions. Under application, the dye penetrates into surface discontinuities via capillary action. After the excess material is removed from the work piece, indications will appear.

Evaluation and classification of material is based on code or customer requirements.

Direct Assessment

Our technicians are trained to perform Internal Corrosion Direct Assessment (ICDA) and External Corrosion Direct Assessment (ECDA) in conjunction with other NDE anomaly evaluations.

Technicians are fully equipped with pipe to soil instruments, soil resistivity, and pH testers as part of a comprehensive corrosion assessment. The technician records all measurements and captures high resolution images of corrosion of found, coating condition, and soil information.

In addition, a GPS coordinate can be collected to better document the excavation location as part of an overall Integrity Management Plan.



Integrity Dig

Pit Depth Gauging

Pit gauges are a technique used to measure surface variations and can be used to conveniently measure pit depth or material loss.

There are pit gauge instruments and techniques available to ensure compliance with corrosion allowances.



Pipe to Soil Resistivity

Soil resistivity influences the corrosion of metals installed underground and can serve as an indicator of corrosiveness.

From corrosion engineering perspective, the lower the resistivity, the higher the corrosivity and vice versa. The Wenner method requires the use of four metal probes or electrodes, driven into the ground along a straight line, equidistant from each other. Soil resistivity measures are derived from the voltage drop between the center pair of pins, with current flowing between the two outside pins.



Soil Resistivity Measurement

MIC and Coating Inspection

Even a small amount of oxidation corrosion can be sufficient to allow several different types of bacteria to come together to create a colony and start the Microbiologically Influenced Corrosion (MIC) cycle.

The process utilized tests for two common types of bacteria using the PIPELINE PIT, FILM, & MIC BACTERIA KIT.

APBs - Acid Producing Bacteria
SRBs - Sulfate Reducing Bacteria
pH of Pit, Film, and MIC Areas



Pipeline Pitting

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Advanced Non-Destructive Examination (NDE)

Eddy Current Array (ECA):

When it comes to pipeline crack detection, Magnetic Particle Inspection (MPI) is often used. However, MPI has known limitations and inefficiencies that include: surface preparation, manual length sizing, no depth sizing, and lack of digital data.

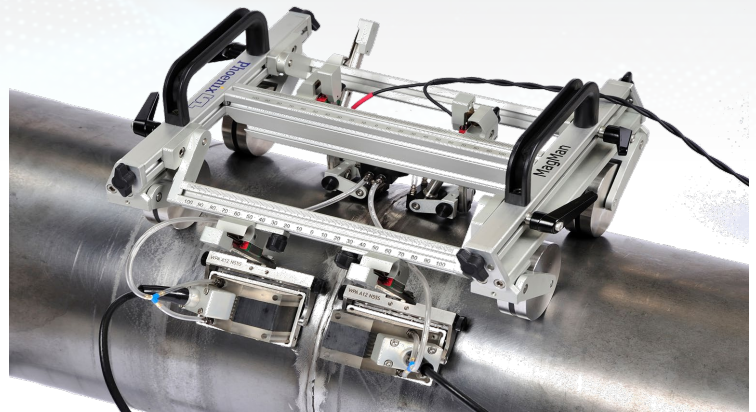
Eddy Current Array (ECA) is a digital electromagnetic NDE technique that has proven to be a more efficient alternative.



Eddyfi Spyne™ Reddy ECA

The Eddyfi Spyne™

The Eddyfi Spyne™ is an adaptable surface ECA screening tool designed specifically to maximize productivity for the detection of stress-corrosion cracking (SCC), subsurface defects, and pitting in pipelines. With a higher PoD than MPI, its ultrafast capabilities pave the way to unprecedented efficiency. The Spyne™ works in combination with Reddy®, a rugged portable ECA instrument with a large multi-touch screen displaying the color-coded maps (C-scans) generated by the tool.



Phased Array UT (PAUT)

Phased Array UT (PAUT)

PAUT instruments produce accurate, detailed cross-sectional pictures of internal structures at fast inspection speeds. PAUT technology uses multiple ultrasonic elements and electronic time delays to create beams that can be focused electronically for fast inspection, full data storage, and multiple angle inspections. PAUT technology provides precise measurement with the most reliable results. PAUT applications include manual and encoded weld scanning. Encoded scans offer extremely accurate sizing of weld flaws along with cross sectional planar views of the entire encoded scan area.

Automated ID Corrosion Mapping:

PAUT corrosion mapping systems utilize 64 transducer elements versus conventional corrosion mapping systems, which typically have only one. This provides the accuracy of PAUT with an acquisition speed five times faster than that of conventional systems.

SCAN, ANALYZE, REPORT

- High resolutions capture all corroded areas
- Fast surface acquisition to increase efficiency
- Ideal scanning performance for small features such as pitting
- Feature pipe detection using real geometry
- Automatically applied interaction rules
- Estimated burst pressure calculation
- Virtual pit gauge capabilities near welds and obstacles
- Reports include worst-case profile and predicted failure path
- Export to CSV available for further analysis
- Mesh export available
- Snapshot tool for 3D reporting



Creaform HandySCAN 3D™



Silverwing MFL Floor Scanner

OD ANOMALY ASSESSMENT

We combined our Creaform laser scanner and Pipecheck software to provide extremely accurate (up to 50 micron) and repeatable results with acquisition speeds up to 80 times faster than manual pit depth gauging.

Corrosion: The Pipecheck corrosion module offers very fast and reliable data processing that generates instant, on-site results. In comparison with traditional measurement that are beyond expectations. methods, this software offers accuracy and repeatability.

Mechanical Damage: The Pipecheck mechanical damage module has been developed specifically for pipeline mechanical damage analysis. This module features numerous key functionalities that increase dent understanding and facilitate the decision-making process.

Corrosion in Mechanical Damage: Pipecheck software is the one and only solution on the market to offer sophisticated tools able to extract corrosion depth that is located within a mechanical damage. This confidence will result in lower maintenance cost and reduced risk of costly failure.

OES (Optical Emission Spectroscopy)

Lab results from the field Portable OES offers chemical analysis, material composition, and carbon equivalency. New technology is allowing advancements in development and use of smaller, more portable, hand-held analyzers.

Instrumented Indentation Testing (IIT)

Unlike existing destructive measurement equipment and evaluating method, Frontics AIS Series delivers IIT testing method which is non-destructive, economic and an efficient measuring method to provide reliable Ultimate Tensile and Ultimate Yield Strength Testing. Our stated tolerance is +/- 10% of Ultimate Yield and Tensile Strengths. The result of the testing allows an MAOP certification to be obtained to satisfy PHMSA Mega Rule requirements.

Other NDE services offered

- Pipeline Integrity Rehab NDE
- External Corrosion Direct Assessment (ECDA)
- Internal Corrosion Direct Assessment (ICDA)
- Stress Corrosion Cracking Direct Assessment (SSCDA)
- Re-Coat Project NDE Services
- NACE CIP Level II Coating Inspection



Eddy Current (Spyne Technology)

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