NDT Global

EVO 1.0 UMp

Inline Inspection of Clad and Lined Pipes

CRA Pipes for Oil & Gas

The use of corrosion resistant alloys (CRAs) in pipelines has significantly increased in the past decades. When compared to carbon steel, CRA materials can prevent corrosion under certain conditions. Their effectiveness depends on the selection of the proper alloy for the expected operational conditions of the pipeline. Clad and lined pipes typically consist of a low-cost carbon-steel backing substrate and an inner CRA material metallurgically or mechanically bonded to it. Clad pipes show a good balance of material costs, mechanical properties of the carbon-steel backing and corrosion resistance of the internal CRA layer.

Despite resistance to general corrosion of the CRA material, localized corrosion, manufacturing anomalies and imperfections can lead to metal loss of the clad during operational life. Metal loss dimensions in CRA are typically smaller when compared to carbon steel pipe. Through-wall pittings and crevice corrosion in the CRA layer often lead to much larger areas of metal loss in the carbon steel.

Inspection Solutions

NDT Global's ultrasonic metal loss in-line inspection (ILI) tools for pitting resolution deliver excellent results for CRA clad pipe inspection. The different material properties of the clad and carbon-steel backing base material do not typically affect ultrasonic inspection performance. The ability to customize the configuration of NDT Global's EVO 1.0 high-resolution ultrasonic pitting tools makes them the most suitable for the detection of localized metal loss in CRA pipes. This customization is enabled through the introduction of industry-leading circumferential resolution, data sampling rates and sizing accuracies.

NDT Global's data analysis has an extensive track record for producing high-quality results for ultrasonic metal loss inspection in CRA clad and lined pipes. The successful application of the technology has helped operator integrity management programs by detecting, sizing, and assessing all types of features occurring in CRA clad and lined pipes including metal loss, clad layer disbondment and weld anomalies.

Axial Cracks

Circumferential Cracks

Metal Loss

Geometry Ovalities

Mapping

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Specifications

Key Tool Specifications: EVO 1.0 UMp⁺

Tool sizes	6" to 48"	6" to 48"
Pipeline medium	Liquid	Liquid
Max. operation speed	4 m/s	9 mph
Temperature range	-10 to +50 °C	14 to 122 °F
Max. pressure	120 bar	1740 psi
Min. bend radius	1.5 D 90°	1.5 D 90°
Min. axial sampling distance	0.75 mm	0.03 in
Circumferential sensor spacing	4 mm	0.16 in

Max. operating speed and min. axial sampling distance depend on specific ILI tool set-up. Special configurations for high-temperature, high-pressure, multi-diameter and bi-directional inspections available upon request.

Defect Location Accuracy

| Axial from nearest girth weld	±0.1 m	±3.94 in
Circumferential		
• for Ø < 20"	±10°	±10°
• for Ø ≥ 20"	±5°	±5°

Key Performance Specifications (referring to API 1163)

| Detection of corrosion and metal loss features with ≥ 90%		
• Min. diameter	5.0 mm	0.20 in
• Min. depth	0.8 mm	0.03 in
Discrimination internal/external	Yes	Yes
Depth sizing accuracy	±0.4 mm	±0.02 in
Wall thickness determination	±0.4 mm	±0.02 in
Mid-wall features, laminations and inclusions		
• Min. diameter	10.0 mm	0.39 in

Internal pitting in CRA

Internal pitting extending into the substrate
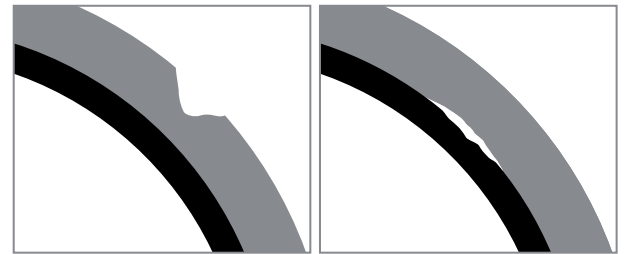
External corrosion

Disbonding

Metal Loss Feature Classification Chart (according to POF 2016)
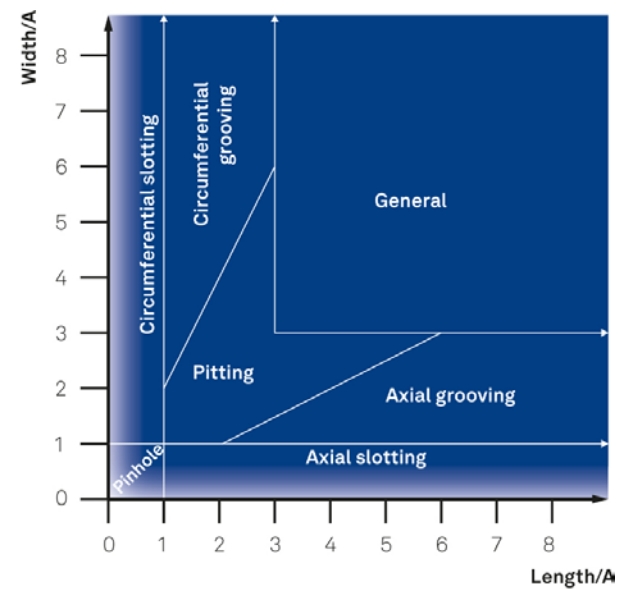
A = wall thickness or 10 mm (0.39 in), whichever value is greater.

Please note: Tool and performance specifications depend on inspection and pipeline conditions. Please contact your local NDT Global representative for further information. NDT Global reserves the right to introduce modifications and changes without prior notice.

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