

Electromagnetic Pipe Xaminer® V (EPX™ V) Tool

PIPE INTEGRITY INSPECTION FOR THE WHOLE WELL

OVERVIEW

The new Halliburton Electromagnetic Pipe Xaminer® V (EPX™ V) pipe inspection tool quantifies metal loss in one to five concentric strings of pipe in a wellbore using accurate High-Definition Frequency (HDF) technology. This capability enables customers to examine the whole well in one trip and assess pipe condition quickly. This unmatched capability also enables customers to reduce diagnostic time and have comprehensive information for monitoring programs and determining the right solution for any nonconformity in their completion.

The EPX V tool has an outside diameter of 1¹¹/₁₆ in. and operates by inducing HDF electromagnetic energy into the surrounding pipe, which propagates through the concentric well strings with no wellbore fluid influences. The interaction with the metal of the pipe returns signals to the tool, yielding information on the metal loss present in the tubulars.

The magnitude and location of corrosion-induced defects are identified by the use of HDF variance algorithms of the returning electromagnetic waves. This information leads to a quick total-thickness calculation determining the overall condition of the pipe structure. Information on each string is also in the HDF signal, providing the state on metal loss in each pipe.

The EPX V tool operates off mono-conductor wireline or in memory mode on slickline, enabling more efficient wellsite operations through the use of cased-hole or slickline service equipment. This benefit also enables rigless intervention and conveyance flexibility to address multiple well construction and operational challenges.

Additionally, the EPX V tool is combinable with our other diagnostic services, such as the Acoustic Conformance Xaminer® (ACX™) tool, production logging, other corrosion inspection tools, pulsed-neutron logs, and bond logs. Halliburton used the EPX V tool after finding a well leak with the ACX tool as the customer needed to determine the extent of the repair job.

BENEFITS

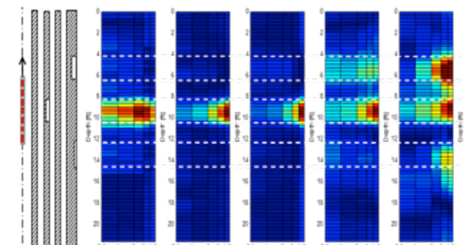
- » HDF technology provides accurate results
- » Determines percent metal loss in one to five concentric pipes
- » One-trip diagnostics, reduces operating costs
- » Achieves fast results
- » Operates in deviated or horizontal wells through multiple conveyance systems

FEATURES

- » HDF technology
- » Combinability
- » Memory logging mode
- » Temperature probe detects thermal variations



The Electromagnetic Pipe Xaminer® V tool has been thoroughly tested in multiple casing scenarios, helping to ensure that the technology is characterized and delivers an accurate metal-loss assessment. The above image corresponds to a four-casing setup, including 5-in. OD, 9⁵/₈-in. OD, 13³/₈-in. OD, and 16-in. OD casings.



The EPX™ V tool uses several frequencies, and through HDF technology is able to resolve casing defects or corrosion. In this illustration, a side cross section of the well is presented showing defects in the walls of the concentric pipes. The readings are indicating the length of the defects and have already started to enhance the length resolution of the defect. This enhancement would proceed to the individual pipes to fully resolve defects.

Electromagnetic Pipe Xaminer® V (EPX™ V) Performance Specifications

General Tool Specifications	
Tool Length	17.34 ft (5.18 m)
Tool OD	1.69 in. (42.93 mm)
Tool Weight	87.00 lb (39.46 kg)
Maximum Pressure	15,000 psi (103 MPa)
Maximum Temperature	350°F (176°C)
Measurement Range	
Minimum Tubular OD	2.38 in. (60.45 mm)
Maximum First Tubular OD for Maximum Resolution	7.00 in. (177.8 mm)
Maximum First Tubular ID	24.00 in. (609.6 mm)
Maximum Casing Size*	24.00 in. (609.6 mm)
Maximum Total Metal Thickness*	2.5 in. (63.5 mm)
Thickness Measurement Accuracy & Detection	Percent, Relative to Defect
1st Pipe Defect Detection	1%
1st Pipe (2 cs**) Accuracy	2% or 0.015 in. (.38 mm)
Total Metal Thickness 1.2 in. (3 cs) Overall Average	7%
Total Metal Thickness 1.8 in. (4 cs) Overall Average	10%
Operational Specifications	
Current Maximum Logging Speed (1 String)	15.0 ft/min (4.57 m/min)
Tool Positioning	Centralized

* Definitions at current time, expected to increase

** Concentric strings

Accuracy based on smaller tubulars, pipes

For more information, contact your local Halliburton representative or visit us on the web at www.halliburton.com

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