

Technical
Specifications

ALTERNATING CURRENT FIELD MEASUREMENT FOR GALVANIZED STEEL INSPECTIONS

Enhancing safe operation of civil structures with fast and reliable detection and sizing of fatigue cracks in galvanized steel welds.

COMPLETE THE TOOLBOX FOR CIVIL STRUCTURES INTEGRITY INSPECTION

The ACFM galvanized steel, or GS, inspection solution is a significant milestone in the industry, providing the first truly effective method to assess fatigue cracks in galvanized steel structures. It ensures reliable crack detection and accurate length and depth sizing of cracks that penetrate conductive coatings up to 300µm thick. It can also detect fatigue cracks that develop underneath the coating, allowing for length and depth sizing after the coating is removed.

PROVEN HARDWARE WITH FRESH KNOW-HOW

Drawing upon ACFM's proven track record in structural weld inspections, the innovative GS inspection solution combines standard hardware with configurations specifically engineered for this application. The Amigo2 with any 5kHz single-element ACFM Sensu 2 probe featuring the "GS" designation incorporates the additional required parameters to detect and size cracks in galvanized steel.



Figure 1: Amigo™ 2 offers lightning-fast data processing, 14 times better data range than previous generations, and higher resolution defect detection through thick coatings.

A COMPREHENSIVE WORKFLOW FOR
DEPENDABLE INSPECTIONS

After conducting a preliminary assessment of the zinc coating’s condition and thickness, galvanized steel ACFM inspections follow a similar process to standard ACFM inspections. The usual inspection workflow is applied, using the configuration specifically designed for the more common case where fatigue cracks penetrate the coating.

To address the lower risk presented by cracks that may have developed under the coating, an additional scan can be performed using the configuration designed for such cases. For accurate length and depth sizing of these cracks, it is recommended to remove the conductive coating within a 50 mm (2 in) radius around the crack and employ a standard configuration.

FEATURES AND BENEFITS

- Detects cracks, whether they break through the conductive zinc coating or not
- Accurate crack sizing facilitates informed decision-making for asset integrity and optimized repairs
- Compatible with standard ACFM hardware

SPECIFICATIONS

GENERAL	
Compatible instruments	Amigo2, Amigo2 SE, U41D, U41DA
Compatible probes	Any mini, single element Sensu 2, 5KHz probe ¹
Maximum recommended zinc coating thickness	300 µm
Typical smallest detectable coating-breaking crack ²	5 x 0.5mm (0.2 x 0.02in) (length x depth)
Typical smallest detectable crack through zinc coatings ³	10 x 1mm (0.4 x 0.04in) (length x depth)



1 Compatible probes include ACFM-TMWP005-GS-22, ACFM-TMRA005-GS-22, ACFM-TMST005-GS-22, ACFM-TMTR005-GS-22, ACFM-UMWP005-GS-40-50, ACFM-UMWP005-GS-21-05, ACFM-UMTA005-GS-21-05, ACFM-UMRA005-GS-40-50, ACFM-UMST005-GS-40-50, ACFM-UMTR005-GS-40-50, ACFM-UMRA005-GS-21-05, ACFM-UMST005-GS-21-05, ACFM-UMTR005-GS-21-05.

2 These numbers are based on known ACFM mini sensor performance when inspecting typical structural welds without coating, acknowledging that detection is enhanced with the presence of a conductive coating. This information serves as a guideline and may vary depending on factors such as weld condition, zinc coating condition, crack pattern, and orientation.

3 This estimation is based on comparing the noise signal obtained from a high roughness weld with a 220 µm thick hot-dip galvanization coating to the signal obtained from a defect covered with a 220 µm thick zinc sheet. It is important to note that these values are provided as guidelines and may vary depending on factors such as the condition of the weld, the quality of the zinc coating, and the characteristics of the crack pattern and orientation.