

# Evident/Olympus

## Precision Coating Inspection with Ultrasonic Thickness Gauges

Because rail vehicles may operate through demanding conditions – such as rain and snow – as well as be exposed to rapidly changing temperatures, the lifespan of materials is a key issue in the rail industry.

In particular, the exterior coating must be able to withstand varying weather conditions, high mechanical stresses and airborne contamination while maintaining its aesthetics and protection capability.

Coatings are used for a wide variety of applications including to enhance the aesthetics of rail vehicles and to protect rail vehicles from corrosion. Although coatings can significantly increase the longevity of rail components, it is essential that they are applied properly to ensure maximal function. Specifically, thickness must be within the defined limits to ensure appropriate protection and aesthetics and minimally applied to avoid significant financial implications.

Coating inspection of rail vehicles not only ensures proper application during manufacturing but can also periodically evaluate quality, such as wear and tear of coatings and

remaining thickness after rework. Ultrasonic thickness gauges offer a fast, reliable and non-destructive method for coating or substrate assessment that requires access to only one side of the test material. While ultrasonic approaches have previously been limited by their minimum thickness capabilities, Evident introduced the Olympus 72DL PLUS gauge which combines a robust design, streamlined interface, and the ability to measure thinner materials than ever before.

### Measuring Microns with Higher Frequencies

An ultrasonic thickness gauge measures how long it takes a sound

pulse to travel through a sample (or test piece) and reflect back from the inside surface or wall. Generally, higher-frequency sound pulses enable the measurement of thinner materials.

Historically, most precision ultrasonic thickness gauges have been limited to a maximum of ~20MHz frequency and to a corresponding minimum thickness capability of ~0.005 inches (0.125mm). However, improvements to technology have allowed increasing frequencies to be used in ultrasonic thickness gauges. For instance, the 72DL PLUS gauge drives frequencies up to 125MHz to measure ultra-thin materials – as low as 0.001 inches (0.025mm).



Olympus 72DL PLUS

## Measuring Multiple Layers

In practice, the thickness capability of an ultrasonic thickness gauge depends on the type of material. Given the numerous types of coatings used in the rail industry, it is important that ultrasonic thickness gauges can handle a range of materials.

The 72DL PLUS gauge can precisely measure numerous materials including paint, plastics, metals and coatings with exceptional minimum thickness capability. Single-layer steel, for example, can be measured to as little as 0.008 inches (0.20mm) while single layer plastic can be measured to 0.0005 inches (0.0127mm).

Additionally, the measurement of multilayer materials may be required during the manufacturing of rail parts. For example, anti-corrosion coatings may be applied prior to a paint layer. With the Multilayer Measurement Software option, the 72DL PLUS gauge can measure and simultaneously display the thickness of up to six layers.

## Optimising Coating Inspection

Optimising manufacturing workflows can result in time, cost and labour savings in any industry. Therefore, it is important that thickness gauges are not only precise with adequate minimum thickness capabilities but also quick, easy to use and provide simple to interpret data.

Decreasing time to result is one of the ways thickness gauges can help optimise inspection workflows. The 72DL PLUS instrument delivers reliable, lab-quality measurements using speeds of up to 2kHz increasing throughput and maximising productivity on the production floor or in the field. The ability to preset user-defined protocols for quick launch of routine thickness measurements further expedites inspection workflows.

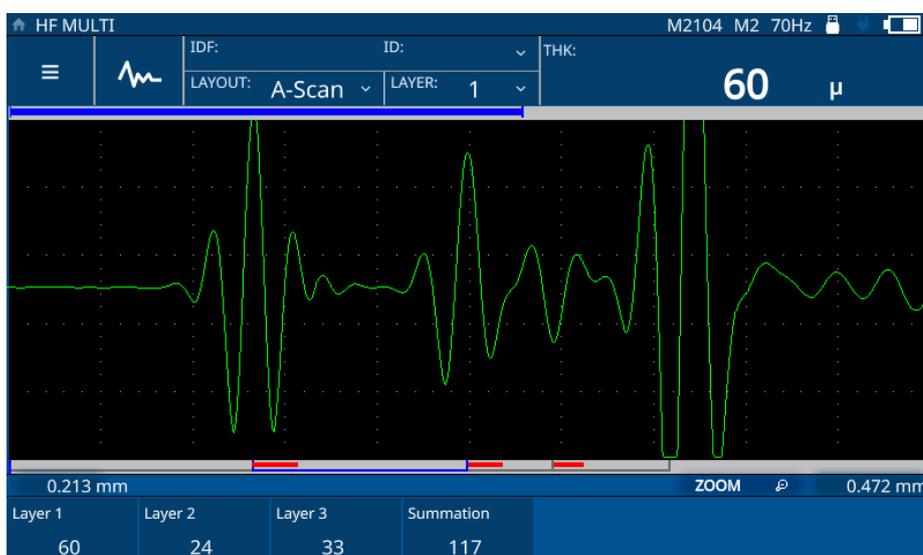
Additionally, the 72DL PLUS gauge combines a full-colour, 7-inch touch screen with five measurement layout options (A-Scan, B-Scan, A/B-Scan, Trend, and Zoom) to facilitate

fully visualisation and tracking of thickness changes. Combined with military-grade ruggedness (MIL-STD-810G) to protect against accidental drops or impacts and resistance against dust and moisture (designed to meet IP65), the 72DL PLUS gauge is ideal for industrial manufacturing and maintenance environments that demand precise measurements.

## Managing, Reviewing and Documenting with Ease

Typically, data from rail inspection workflows must be logged and stored to ensure compliance with regulations. This is automatic and seamless with the 7DL PLUS gauge's built-in data logging and onboard file management. Additionally, the PC Interface Application includes intuitive tools to review and manage data for multiple devices and parts streamlining the overall review and documentation procedure.

Finally, the gauge supports wireless LAN and Bluetooth® and is cloud-enabled with wireless connection to the Olympus Scientific Cloud™ (OSC) and compatible OSC apps. This means connecting, uploading and documenting rail inspection data is simple, quick and seamless.



Multilayer measurement of paint thickness using the 72DL PLUS gauge with an M2104 transducer

Contact us for more information.

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