



Wall Thickness Measurements of Metal Pipes and Tubes

Ultrasonic thickness gauges can provide advantages when a mill operator or end user needs to verify wall thickness of a pipe or tube, since the measurements are not limited to the accessible ends of the pipe. In the mill, nondestructive wall thickness measurements can be made to detect out-of-tolerance conditions. Concentricity of a continuously formed pipe can be monitored on a constant and automatic basis with no need to cut the pipe or to shut down the manufacturing process. Similarly, when a process requires accurate measurement of thin-walled tubing, ultrasonics enable nondestructive thickness measurements along the total length.

Ultrasonic Equipment Used for Wall Thickness Measurements of Metal Pipes and Tubes

For manual thickness measurements, the [38DL PLUS™](#) gauge and [45MG gauge with Single Element software](#) provide instant digital readings of typical metal pipes and tubes to a calibrated accuracy of ± 0.001 in. (± 0.025 mm). When combined with appropriate transducers, these gauges can measure most metal tube and pipe walls ranging from less than 0.020 in. to greater than 2 in. (0.50 to 50 mm). Precision gauges can also be used with delay line transducers to make thickness measurements to a calibrated accuracy of ± 0.0002 in. or ± 0.005 mm.

If the diameter of a tube is less than 0.200 in. (5 mm), we recommend the 38DL PLUS gauge or 45MG gauge with Single Element software along with an immersion transducer. The RBS-1 bubbler system is a helpful tool for making ultrasonic thickness measurements with immersion transducers.

For metal pipes or tubes that are badly corroded on either the inside or outside surface, the wall thickness measurements should be made with the 38DL PLUS or 45MG gauge using [dual element transducers](#). Learn more about corrosion gauging in [this application note](#).

For thin metal tubes with thicknesses below 0.008 in. (0.203 mm), the 72DL PLUS™ high-frequency thickness gauge is recommended. As a high-speed instrument, the 72DL PLUS gauge features a waveform update rate of 60 Hz and a measurement rate of up to 2 kHz. It offers a large, full color touch screen for great visibility from different angles and supports wireless LAN and Bluetooth® for modern connectivity and integration.

The image below shows an example waveform using the 72DL PLUS gauge with the M2104 (125 MHz) transducer to measure thin steel (0.0015 in. or 0.0381 mm).



72DL PLUS gauge measures thin steel (0.0015 in. or 0.0381 mm) using the M2104 (125 MHz) transducer

Related Products



27MG

The 27MG is a basic ultrasonic thickness gauge designed to make accurate measurements from one side on internally corroded or eroded metal pipes and parts. It is lightweight, durable, and ergonomically designed for easy, one-hand operation.

Learn More ► <https://www.olympus-ims.com/27mg/>



38DL PLUS

The 38DL PLUS is an advanced ultrasonic thickness gauge. Uses dual element transducer for internal corrosion applications, and has features that include THRU-COAT technology and echo-to-echo. Uses single element transducers for very precise thickness measurements of thin, very thick, or multilayer materials.

Learn More ► <https://www.olympus-ims.com/38dl-plus/>



45MG

The handheld 45MG ultrasonic thickness gauge is packed with measurement features and software options. This unique instrument is compatible with the complete range of Olympus dual element and single element transducers, making this gauge an all-in-one solution for virtually every thickness gauge application.

Learn More ► <https://www.olympus-ims.com/en/45mg/>



72DL PLUS

The 72DL PLUS™ advanced ultrasonic thickness gauge delivers precision thickness measurements at high speed in a portable, easy-to-use device. Compatible with single element transducers up to 125 MHz, this innovative instrument is ideally suited to measure the thickness of ultra-thin materials, including multilayer paint, coatings, and plastic. It can simultaneously display the thickness of up to 6 layers.

Learn More ► <https://www.olympus-ims.com/72dl-plus/>