



Application Note

Measuring Manufactured Plastic Pipes

This application note will explain how to determine the wall thickness and concentricity of plastic pipes. Discover the recommended ultrasonic gauging equipment and procedure for plastic pipe and tube measurements.

Manufacturers of plastic pipes must monitor the uniformity of wall thickness around the circumference to meet product specifications. If a pipe is too thin, it may fail in use. But if it is too thick, the manufacturer can waste money on excess resin. Ultrasonic gauging provides a quick and reliable way to measure wall thickness with no need to access the inside diameter (ID) or cut the pipe. Pipe thickness can also be measured after installation if needed.

Ultrasonic Equipment Used for Plastic Pipe Measurements

The recommended instruments for plastic pipe and tube measurements are ultrasonic thickness gauges such as the 45MG gauge with Single Element software and the 38DL PLUS™ gauge. Various transducers are used, so select a transducer according to the diameter and wall thickness of the pipe or tube being measured.

For common sizes of plastic pipes, use the M112 (10 MHz) transducer for polyethylene and PVC wall thicknesses from approximately 0.020—1 in. (0.5—25 mm) and the M1036 (2.25 MHz) transducer for thicknesses greater than approximately 1 in. or 25 mm. Contact us for specific recommendations.

For very small diameter tubing (less than approximately 0.125 in. or 3 mm diameter), refer to the information for the 72DL PLUS™ high-frequency thickness gauge. Very small tubing and hot pipes are special cases. Learn more in these application notes:

- [Thickness of Small-Diameter Tubing](http://www.olympus-ims.com/applications/thickness-small-diameter-tubing) (www.olympus-ims.com/applications/thickness-small-diameter-tubing)
- [High-Temperature Ultrasonic Testing](http://www.olympus-ims.com/applications/high-temperature-ultrasonic-testing) (www.olympus-ims.com/applications/high-temperature-ultrasonic-testing)

Ultrasonic Gauging Procedure for Plastic Pipe Thickness Measurement

Plastic pipe thickness measurement is a common application for ultrasonic gauges. It usually involves a simple pulse/echo test where a gauge measures the round-trip pulse transit time and uses that time measurement plus the speed of sound in the test material to calculate thickness.

As with any ultrasonic test, sound velocity must be calibrated on a sample of the material being measured according to the simple procedure described here. Once that is done, inspectors only need to apply a drop of liquid couplant to the test point, touch the transducer to the surface, and obtain a reading. Measurements take only a few seconds each and can be recorded on gauge data loggers for documentation and analysis.

For more information on plastic pipe thickness measurement or other ultrasonic test applications, contact Olympus.

Products used for this application



38DL PLUS

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



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.



72DL PLUS

The 72DL PLUS advanced precision ultrasonic thickness gauge using a single element transducer up to 125 MHz. It features a large high-resolution touch screen display and is ideally suited to measure the thickness of very thin materials, including multilayer paint, coatings, and plastic. It can simultaneously display the thickness of up to 6 layers.

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