



Wanddickenmessung von Automobil Tanks



Application: Measurement of individual layers and total thickness in multilayer plastic automobile fuel tanks.

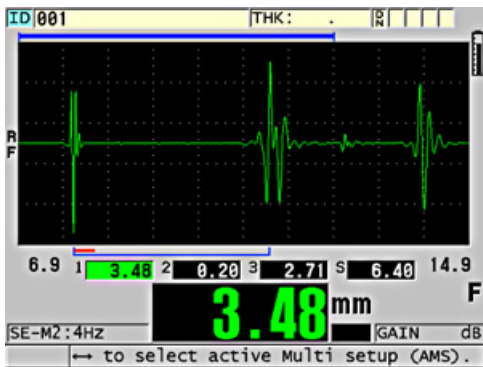
Background: Many contemporary automobile fuel tanks are fabricated with a multilayer plastic construction, typically made of two structural layers of high density polyethylene (HDPE) surrounding a thin gas barrier layer made of ethylene vinyl alcohol (EVOH). The purpose of the barrier layer is to prevent the slow leakage of gasoline vapor

through the polyethylene wall. The HDPE structural layers are typically in the thickness range 0.1" to 0.2" (2.5 to 5 mm), and the EVOH barrier layer is typically 0.004" to 0.012" (0.1 to 0.3 mm). Tank manufacturers need to measure both the thickness and the depth of the barrier layer.

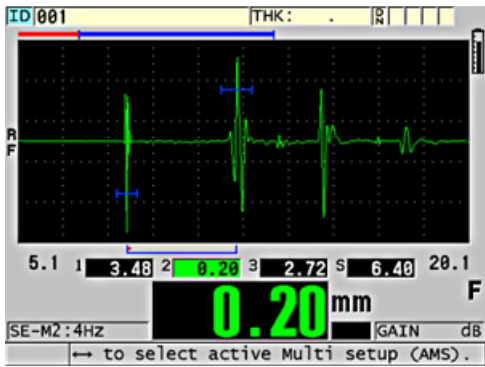
Equipment: The **Model 38DL PLUS ultrasonic thickness gage** with the Multi-Measurement software option is recommended for simultaneous measurement of individual layers and total part tank thickness in this application. With this software, the 38DL PLUS gage is capable of using separately programmed setups (including sound velocity, gain, and blanking settings) for each layer being measured to optimize performance. In this test, the gage is most often used with an M116-RM (20 MHz) **contact transducer**.

Typical Procedure: The waveforms below show measurements of structural and barrier layers in a typical automobile fuel tank. The gage's frequency-based barrier measurement mode is used to read the barrier layer whenever its thickness is less than approximately 0.010" (0.25 mm). Barrier depth is measured with a conventional Mode 1 setup, and the thickness of the inner polyethylene layer is measured in Mode 2. Thick barrier layers, greater than approximately 0.010" (0.25 mm) may also be measured in Mode 2. Note that because of low pass filtering effects in the outer polyethylene wall, the minimum measurable barrier thickness will usually be approximately 0.004" (0.100 mm).

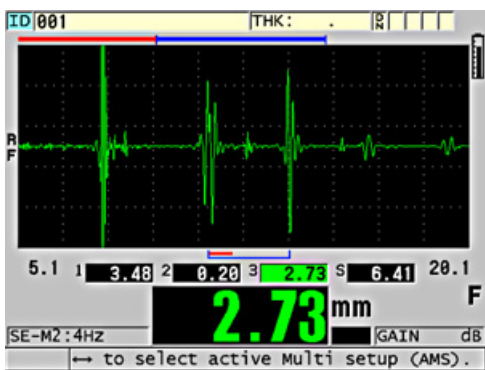
The reflection ratio at the boundary between any two materials is determined by the relative acoustic impedances of those materials. Because virgin and regrind material have essentially identical acoustic impedances, it is not possible to separately measure regrind layers. Also, adhesive layers adjacent to barrier layers are generally too thin and/or too closely impedance matched to measure with ultrasonic techniques and cannot be resolved.



outer polyethylene layer



barrier layer (frequency domain measurement)



inner polyethylene layer

As with any ultrasonic thickness measurement, accuracy is dependent on proper sound velocity calibration. Velocity calibration must be performed for each material being measured, on samples of known thickness.



38DL PLUS Dickenmessgerät

Das vielseitig einsetzbare 38DL PLUS Messgerät kann mit Sender-Empfänger-Messköpfen zur Messung korrodierter Rohre bis hin zur sehr präzisen Dickenmessung von dünnen oder mehrschichtigen Materialien mit einem Einzelschwingermesskopf verwendet werden.

Mehr erfahren ► [https://www.olympus-ims.com/\\$lang/38dl-plus/](https://www.olympus-ims.com/$lang/38dl-plus/)



45MG Dickenmessgerät

Der 45MG ist ein hochmodernes Ultraschall-Dickenmessgerät mit Standard-Messfunktionen und Softwareoptionen. Dieses einzigartige Dickenmessgerät ist mit allen unseren Sender-Empfänger-Messköpfen und Einzelschwingermessköpfen kompatibel.

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Magna-Mike 8600 Dickenmessgerät

Das Magna-Mike 8600 Hall-Effekt-Dickenmessgerät verwendet einen magnetischen Messkopf, um die Dicke von nicht ferritischen und dünnen Materialien, wie Plastikflaschen, genau zu messen.

Mehr erfahren ► <https://www.olympus-ims.com/magna-mike8600/>



72DL PLUS

Das hochmoderne 72DL PLUS Ultraschall-Dickenmessgerät liefert präzise Dickenmessungen mit hoher Geschwindigkeit in einem portablen, bedienerfreundlichen Gerät. Dieses innovative Dickenmessgerät ist mit Einzelschwinger-Messköpfen bis zu 125 MHz kompatibel und eignet sich zur Messung der Dicke von sehr dünnen Werkstoffen, einschließlich mehrschichtiger Anstrichfarbe, Beschichtungen und Kunststoffen. Es kann die Dicke von bis zu 6 Schichten gleichzeitig anzeigen.

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