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# Wall Thickness Measurement on Thin Walled Steel Tubes

## Ultrasonic Application Solutions

### Application

In many manufacturing processes very thin steel tubes are used. In order to ensure the stability of these thin walled tubes their thickness has to be determined. This can be done using ultrasonic frequencies above 40 MHz. However, in this frequency range the sound attenuation affects the accuracy and the reproducibility.

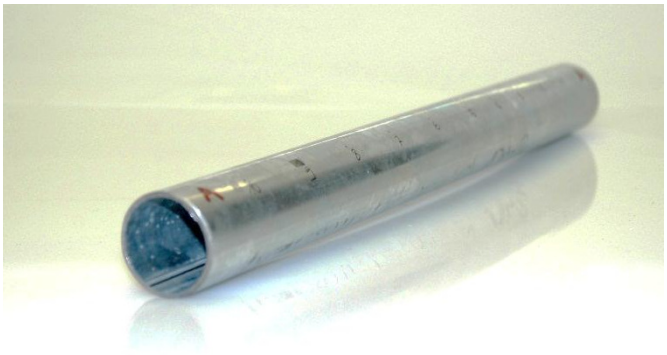

Figure 1: Steel tube with s = 0,3mm

### Solution

A method called Resonance Thickness Measurement (RTM) is used for carrying out precision thickness measurement on very thin components.

Wall thickness is usually determined on the basis of the time of flight of a sound pulse; where the wall thickness corresponds to half of the sound path. This is also called the pulse-echo method. However, this method only works if the wall thickness is larger than the wave length.

Figure 2: The probe CLF 4 (15MHz)

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## Results

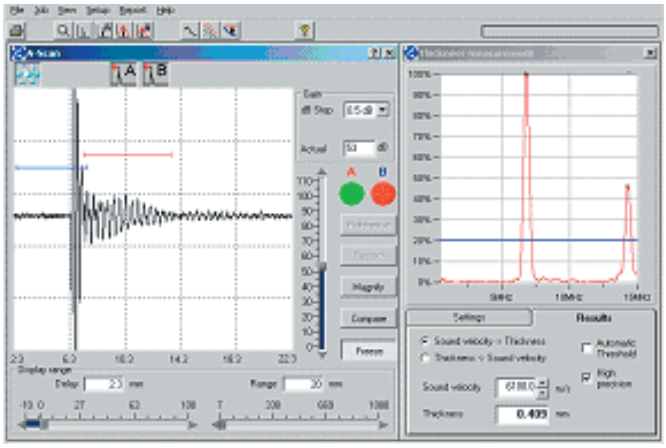

Figure 3: Thickness s = 0.409mm

The RTM enables thickness readings of thin walls in the range of 0.3mm using a frequency of 15MHz. This generates a wavelength of 0.4 mm in steel. In this case, no echo sequence can be generated in the time domain . Only a resonance signal is observed, see fig 3.

With the RTM method the frequency spectrum is calculated and the wall thickness is determined from the peak frequency. This can be done using the USLT2000 instrument in combination with the plug in program USLT-RTM.

This additional software extends the range of functions of the USLT 2000; opening up new fields of application. This RTM method yields a very high measuring precision in the range of ± 2 µm.

## General solution information

- Flaw Detector: USLT USB incl. Software: USLT (plug-in RTM)
- Probe: CLF 4 (15 MHz)

## Your benefit

- Ensure high quality
- Precise wall thickness measurement
- Save money by eliminating destructive testing and by improving your process

**Part numbers**

| | | | |
|---|---|---|---|
| USLT USB | 0036752 | CLF 4 15 MHz | 0054261 |

GE imagination at work

Contact the GE European Solutions Center for your individual inspection problems:

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