

## Ultrasonic Thickness Measurement

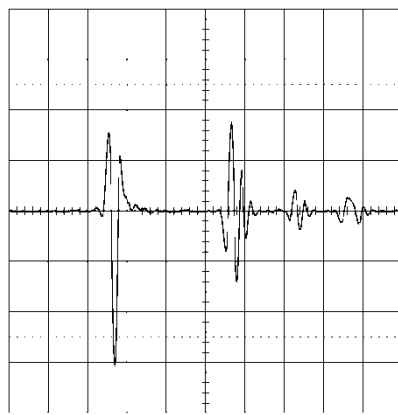
### Procedure

The measurement of the time of flight  $\Delta t$  between the entrance echo and the backwall echo allows – with the help of the sound velocity  $c$  – the determination of the thickness  $d$  of a sample:

$$d = 0.5 c \Delta t$$

### Example: Aluminium Plate

- Frequency = 20 MHz, immersion technique
- Sound velocity  $c = 6.32$  km/s
- Evaluation: A-scan  $\rightarrow \Delta t = 0.60 \mu\text{s} \rightarrow d = 1.9$  mm



- Time:  $0.2 \mu\text{s}/\text{Div}$
- Voltage:  $0.2 \text{ V}/\text{Div}$

### Example: Steel Step Wedge (5-10 mm)

- Frequency = 10 MHz, immersion technique
- Sound velocity  $c = 5.92$  km/s
- Evaluation: D- and B-scan  $\rightarrow$  e.g.  $\Delta t = 1.69 \mu\text{s} \rightarrow d = 5.0$  mm

