



Testing of Metal Adhesive Bonding

Ultrasonic Application Solutions

Application

In the field of joining technologies, the adhesive method is gaining more importance as an alternative to welding, riveting, saddle joining and soldering. This is not only important for aerospace and automobile industries, but for other manufacturing companies as well. Therefore, the nondestructive test, introduced for bond testing, must be supplemented by an ultrasonic test method for checking adhesive bonding.



Figure 1: Inspection situation of adhesive bonding

Solution

The **through transmission method** can be used as an integral technique to detect all types of bonding defects. These are typically, lack of adhesion, missing adhesive or the cohesion quality.

A high transmission signal indicates good bonding, at bad bonding conditions the signal will disappear. The defect position and type, however, cannot be determined.

The **pulse echo method** only needs access from one side. Therefore, this method is more practical.

A damped echo sequence from the 1st plate indicates a good bonding between plate and adhesive and vice versa. Bad bonding results in a larger number of backwall echoes with higher amplitudes. Cohesive defects and a bad adhesive on the other side, however, cannot be detected.



The through transmission and pulse echo methods

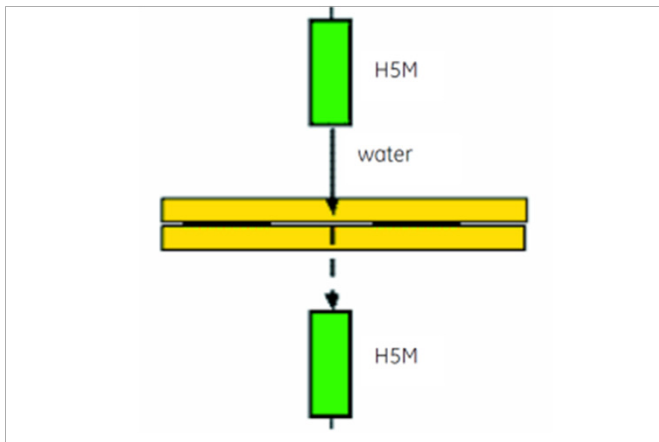
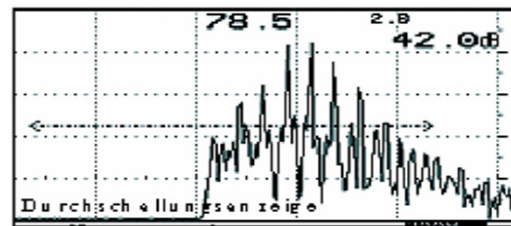
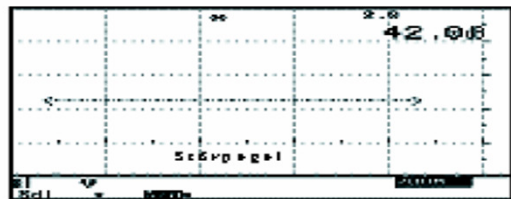


Figure 3: Through-Transmission-Method



Good



Bad

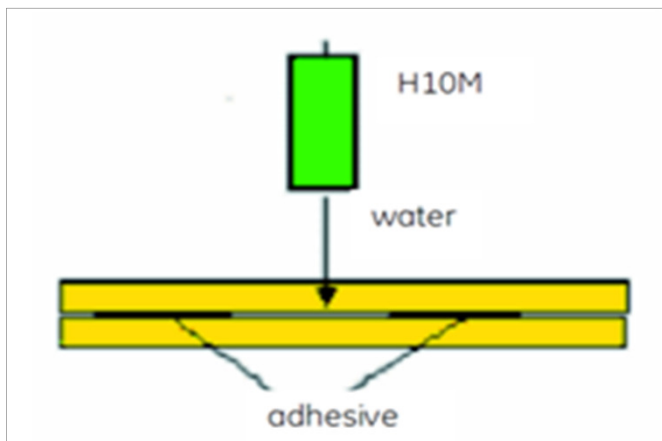
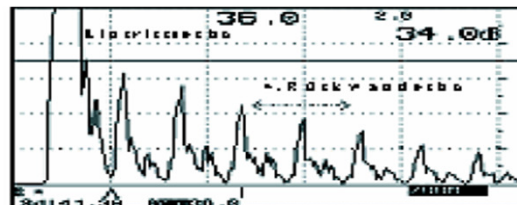
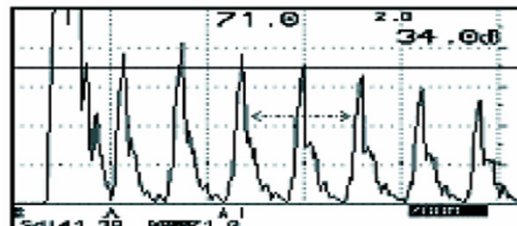


Figure 4: Pulse-Echo-Method



Good



Bad

General solution information

- Flaw Detector: USM Go / USM 36 / USIP 40
- Ultrasonic Testing Probes: G 10 MN for through-transmission, G 5 MN for pulse echo
- For immersion technique: H 5 M, H 10 M

Your benefit

- Ensure high quality
- Reduce field failures and potential liability
- Save money by eliminating destructive testing and by process improvements

Part numbers

USM Go	0109706	USM 36	0037400	USIP 40	0036535
G 5 MN	0053046	G 10MN	0053047	H 5 M	0053258
H 10 M	0053041				

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