GE
Measurement & Control

Flaws in Friction and Pressure Welded Joints of Drilling and Milling Tools

Ultrasonic Application Solutions

Application

Highly stressed, rotationally symmetrical tools for machining are composed of materials having different hardness and elasticity properties, joined by a friction or pressure weld.

The European Solutions Center presents a solution for checking the weld zone by axial scanning.

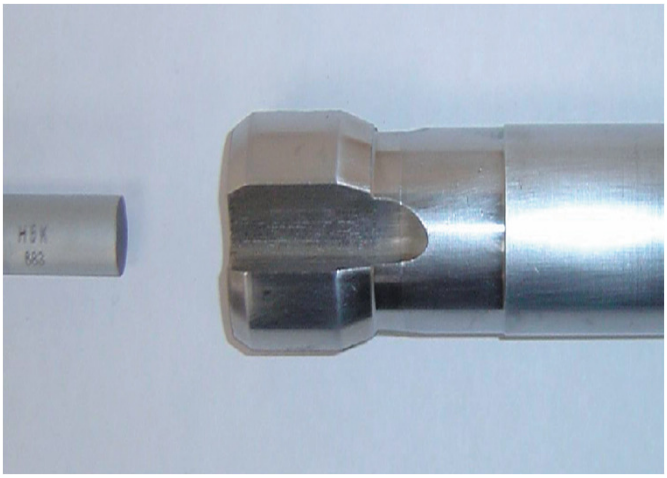

Figure 1: Drilling/Milling tool

Solution

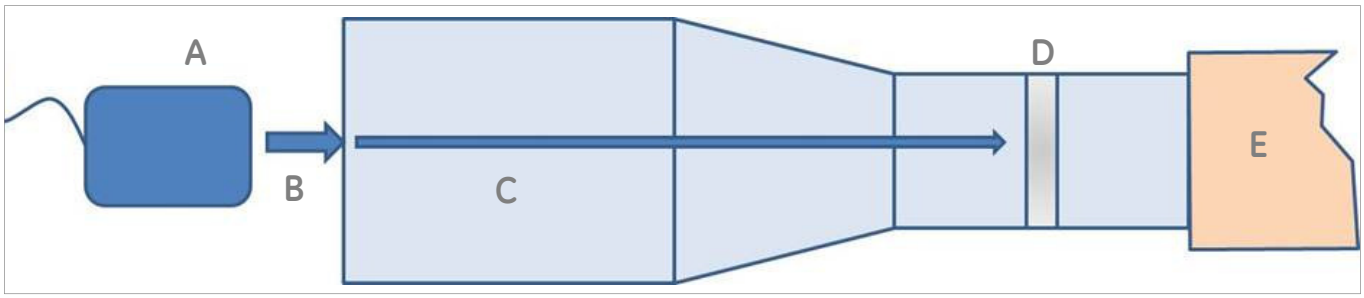

Figure 2: Recommended test arrangement

Internal interface or boundary layer echoes occur in the case of a defective friction or pressure weld. A reliable and quick test for larger component volumes (online testing) is available using the immersion technique.

A: Probe
B: Water delay line
C: Drilling/ Mining head
D: Weld
E: Shaft

GE
Measurement & Control

Immersion Probe H 5 K & Squirter Probe H 5 KF

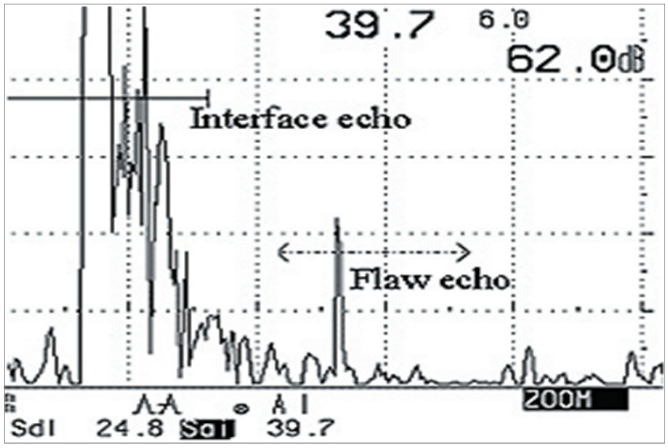

Figure 3: Recorded A-Scan

Figure 4: Immersion probe H 5 K

Figure 3 shows an example of the A-Scan from an inspected drilling tool. The interface echo can be seen, which is the result of the transition between water and steel. An echo from a detected flaw in the weld area is also visible.

Recommendations:

- To test weld diameters <12mm, the axial, centric scanning is adequate.
- With weld diameters between 12mm and 25mm, the axial, eccentric arrangement with a component rotation through 360° is recommended.
- With weld diameters >25mm, the multitrack scanning with component rotation is required.

General solution information

Flaw detectors

- Mobile instruments: USM 36, USM Go+
- Stationary instrument: USIP 40

Probes

- Immersion Probe: H 5 K
- Squirter Probe: H 5 KF

Your benefit

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

Part numbers

H 5 K	0053032	H 5 KF	0066072
USM 36	0037400	USM Go+	0113214
USIP 40	0036535		

GE imagination at work

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

GE Measurement & Control
European Solutions Center
www.utprobes.com
Portable.utsolutions@ge.com

70028062014