

## Hardness measurement on heat affected zones (HAZ) with SONODUR

### Case & solution

For the hardness testing of weld seams, the Vickers method is used. With this test, the strength of a weld is evaluated with special consideration of the hardness around the heat-affected zone (HAZ). The hardness in this area can be used to assess the ductility of a weld and thus determine whether it has the desired strength.

### Challenge

Certain microstructures in the heat affected zones (HAZ) of welds on pipes and boilers develop cracks due to stress relaxation caused by the heating and welding process and too rapid cooling.

Some high-alloy steels for pressure pipes and boilers in power plants develop precipitation hardening at the weld line in the HAZ with an increase in mechanical stresses in this area.

### Application solution

The SONODUR 3 is able to determine repeatable and reliable hardness values according to the specification of the customer.

The measuring process is basically the same on every weld seam. There are 5 measuring points which have to be considered:

1. Base material
2. Heat affected Zone
3. Weld material
4. Heat affected Zone (opp.)
5. Base material (opp.)



Fig. 1: Hardness measurement on HAZ

### Benefits of the solution

- UCI can be used on almost all component shapes in any direction.
- Fast measurement due to easy access to the application.
- Non destructive to the application.

### Technical setup

- SONODUR 3 Basic Package (2228025)
- Suitable probes:
  - SONO H100 (2215659)
  - SONO H50 (2215667)
- Stand PS2 (2223406)

