

## Portable hardness testing on large forged parts with SONODUR 3

### Case & solution

A special challenge of hardness measurement are large components (starting from > 1 kg). They occur in many places of hardening shops, forgeries or part machining (milling, turning). Applications can be found from incoming goods to in-process. Examples of large components are motor parts, axles of trucks, connecting rods or gear parts of wind turbines. In the process, it should be checked whether the machining or hardening has been implemented correctly.

Typical request are absolute values or tolerance range (e.g.  $\pm 10$  to 50 HV).

### Challenge

Massive components are difficult, if not impossible, to move to a conventional test apparatus. Furthermore, large test parts do not fit into static measuring tools.

As a result, sample parts have to be taken destructively. This causes costs and may not represent the complete area to be inspected. Taking samples could have an influence on results.

### Application solution

UCI allows measurements directly on site, position-independent at any number of locations (see probe variety) with precise results. SONODUR determines tolerances according to DIN 50159, i.e. approx.  $\pm 5\%$ .

The number of measured values depends on the design and geometry of the components: small parts - 5 measurements for average value; starting with a diameter larger than 50 cm different areas should be checked. In extreme cases the customer may want to check every 10 cm lengthwise of component. Safety-relevant parts should be tested at several different points.



Fig. 1: Hardness testing on large forged parts

### Benefits of the solution

- Working speed strongly improved, as measurement on site logistically favorable compared to testing in the off-site laboratory
- Cost-saving, as no destructive testing required
- Flexible, as extra measurements can easily and spontaneously be added where required
- High level of documentation despite measurement on site

### Technical setup

- SONODUR 3 Basic Package (2228025)
- Suitable probe:
  - Standard: SONO H50 (2215659)
  - Depending on part geometry: long probe to reach deep lying points (ex.: SONO H50L, 2215713), 10L with smooth surface
  - Not suitable: motorprobes
- Setting: generally material table A1
- Tripod generally not applicable

