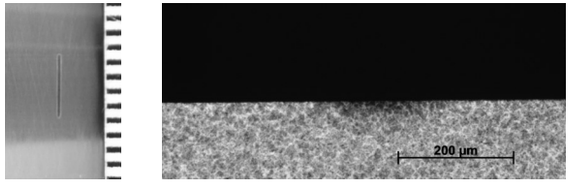
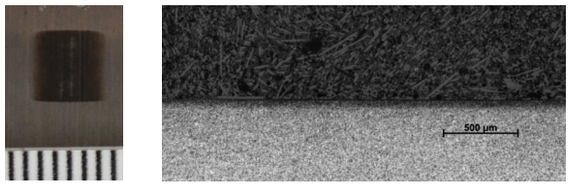
ARTIFICIAL DEFECTS - EXAMPLES

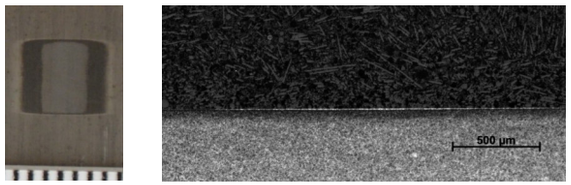
Surface after Nital Etching - Metallographic Micrograph



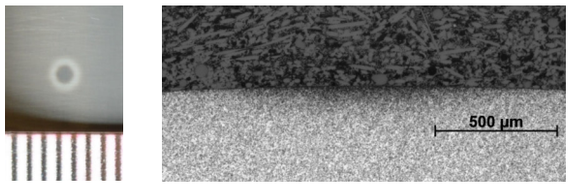
Tempered zone, line; width x depth x length: 230 µm x 25 µm x 5000 µm



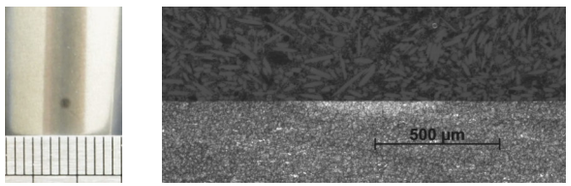
Tempered zone, large area; width x depth x length: 230 µm x 25 µm x 5000 µm



Re-hardened zone, large area; width x depth x length: 230 µm x 25 µm x 5000 µm



Tempered zone, dot; diameter x depth: 230 µm x 25 µm



Tempered zone, steel M50, dot; diameter x depth: 230 µm x 25 µm

FUNCTIONALITY AND APPLICATION

- Ensuring the necessary testing sensitivity
- Monitoring the testing process
  NDT: Equipment technology, probes, testing parameters
  STE: Verification of correct execution of Nital Etching,
  Checking the effectiveness of the etching bath
- Comparison and evaluation of the performance of different non-destructive testing methods
- Comparison of different laboratories / proficiency tests
- Supplier audits
- Application as practice pieces in training courses

We also support you with

- Nital Etching inspection service acc. ISO 14104
- Lab equipment
- Training of Etch Inspectors acc. SAE ARP 1923

independent

flexible

customer-oriented

DAkkS
Deutsche Akkreditierungsstelle
D-PL-19365-01-00

Ingenieurbetrieb für Materialprüfung, Qualitätssicherung und Schweißtechnik GmbH

REFERENCE BLOCKS FOR SURFACE TEMPER ETCHING ACCORDING DIN 4882

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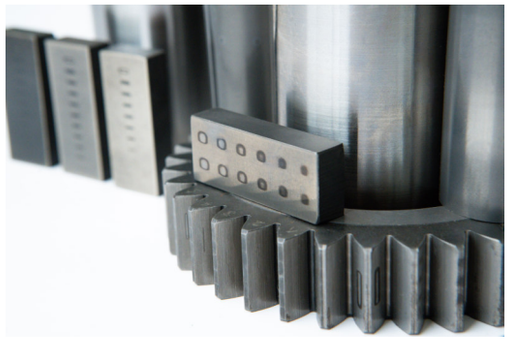
FOCUS

For non-destructive material testing methods, reference blocks are required to adjust and ensure the sensitivity of the method, see DIN EN 1330-2.

Components with real irregularities are only suitable to a limited extent, as they usually cannot be manufactured in a defined and reproducible manner. An alternative are parts with artificial inhomogeneities, so-called reference blocks.

Reference blocks with artificial inhomogeneities...

- are designed to produce similar physical effects to real defects when using NDT,
- must be defined according to the degree of damage, dimensions and position and, above all, be reproducible.

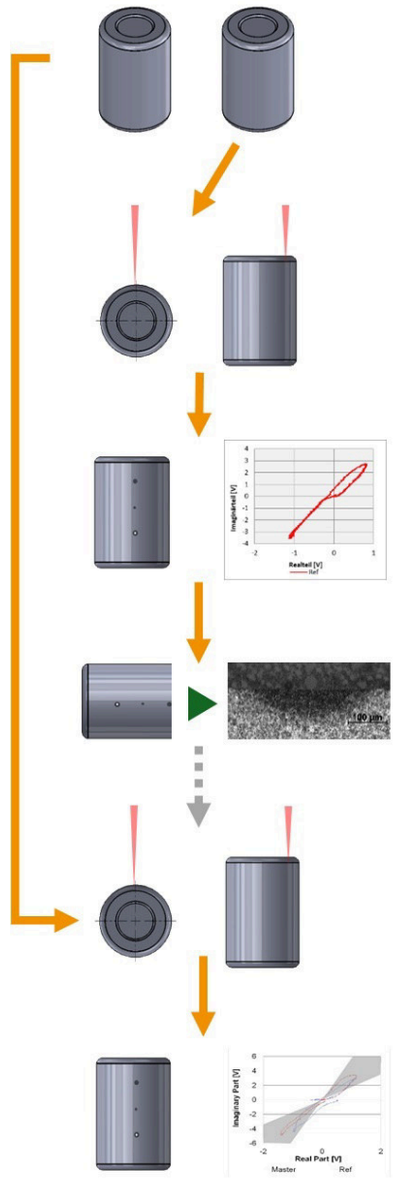


Reference blocks for the detection of grinding burn...

- are produced by laser technology developed by imq,
- can be manufactured in all levels of microstructural change from the initial tempered zones to re-hardened zones,
- show comparable changes in residual stress, microstructure and hardness to real grinding burn and
- are suitable as artificial errors for all detection methods, e.g. eddy current testing, Barkhausen noise method...

The properties of the generated artificial defects are verified and documented using accredited material testing procedures.

MANUFACTURE ACCORDING TO DIN 4882



A

Prerequisite:

at least 2 components in the same production state

B

Production of damage by varying the process parameters

C

Determination of the properties of the artificial defect

Eddy current method

Barkhausen noise

Metallography

Small load hardness testing

D

Repetition of the laser treatment with the selected parameters

E

Performance of non-destructive tests, comparison with step C

Testing signals of both parts must be within the tolerance.

REFERENCE BLOCKS FOR NDT

- Production of artificial defects on customer components
- Degree of damage adapted to the component requirements or to the testing application
- Component geometry flexible, production also possible on curved surfaces and in cavities

NE TEST SET - REFERENCE BLOCKS FOR MONITORING SURFACE TEMPER ETCHING

- Application according to standards: ISO 14104 and AMS 2649
- Available in various material variants, through-hardened and case-hardened
- Cost-savings potential by avoiding unnecessary etching bath exchanges
- Monitoring even for automated etching equipment