

## Mobile Material Analysis

On-site and in-situ analysis for accurate condition assessment of structural materials

Take advantage of economic, non-destructive methods and the quick availability of on-site results covering the entire life cycle of components and assets.

### Challenge

In a situation of global competition, availability and cost effectiveness of assets and equipment have a very high priority. Therefore it is vital to accurately assess the current condition of structural materials allowing an early detection of degradation mechanisms and finally avoiding unexpected failures. Through determination of remaining service life of important equipment, target-oriented inspection and maintenance activities can be derived and implemented. We are able to support you with mature and proven on-site and in-situ analysis methods.

### Solution

Framatome's on-site activities represent economic and non-destructive methods with a broad range of applications. The accredited (EN ISO/IEC 17025\*) material testing laboratory of Framatome's Technical Center offers a wide variety of solutions and has profound experience to perform testing in the following fields of activities:

- Metallo- and radiography
- Electron microscopy of steel and ironworks materials as well as non-iron metal materials.
- Corrosion investigations
- Mechanical-technological material tests



Mobile TIV-hardness tester



Mobile x-ray fluorescence spectroscopy for Positive Material Identification (PMI)

### Customer benefits

- Economic methods for detailed condition assessment of structural materials : non-destructive, quick, and individual
- Experienced teams with mobile equipment enable concrete, tangible statements right on-site
- Quickly deployable services of teams worldwide

**Your performance**  
is **our** everyday **commitment**

## Technical information

### Mobile hardness

The hardness level of structural materials allows a first orienting statement regarding the condition of a component. After appropriate surface preparation the hardness can be determined relatively quickly. Framatome utilizes various hardness testing methods for all relevant materials.

### Chemical analysis – positive material identification

Depending on the level of accuracy that is required, both x-ray fluorescence and spark emission spectroscopy are available as mobile analysis methods.

### Foil replicas

After appropriate surface preparation that entails local step-wise grinding, polishing and etching, foil replicas can reproduce an accurate microstructural image of a given material. The typical appearances of microstructural phenomena allow determining the reason of failure. Also the degree of thermal degradation mechanisms caused by creep can be determined accurately.

### Digital microscope

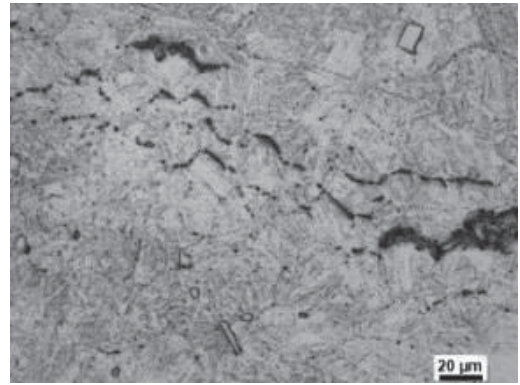
After an appropriate surface preparation that entails local step-wise grinding, polishing and etching the digital microscope allows directly visualizing and documenting the materials microstructure up to magnifications of X1000. The loss of information that can occur with foil replicas utilized on very fine-grained materials will be avoided.

### Contour and topographic replicas by silicone rubber compounds

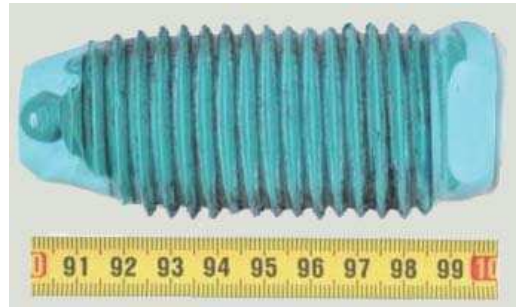
Compounds originating from the dental technology are utilized. They enable a very accurate replication of surface contours such as fracture surfaces or surface roughness up to a resolution of 1µm. Hence, fracture surfaces can be evaluated indirectly for determining the reason of failure. Measurements of already installed geometries can be realized any time.

### 3D-macroscopic

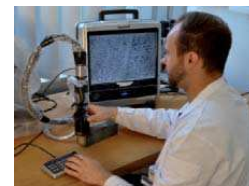
The contact-free acquisition of surface contours allows a quick visualization of geometries and topographies. At the same time exact measurements are possible. This method is often used in combination with the silicon rubber compounds but can also be utilized directly on the work piece of interest.



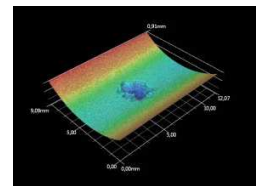
Replica disclosing creep pores as a result of long term operation at high temperatures



Replica of a large bore thread out of a ductile cast iron housing for further thread profile measurements



Direct grain structure evaluation up to X1000 with digital microscope



Exact characterization of pitting attack in heat exchanger tubing

Process and methods are accredited according to DIN EN ISO/IEC 17025 \*)



\*) the accreditation is valid only for the scope as listed in appendix of certificate D-PL-21039-03-00

see also

<https://www.dakks.de/en/content/directory-accredited-bodies-0>

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