

Laboratory of Engineering Metrology

Principal goals and activities

The LSM laboratory provides comprehensive measurement of machinery components in lengths and angles in 3D, 2D and 1D. LSM is equipped for high-precision measurement of surface roughness parameters using the profile method as per ČSN EN ISO 4287 and other international standards. The laboratory also offers analyses of properties of the surface layer on the components using a digital analyzer of Barkhausen noise.

General focus of laboratory

- Assessment of sets of height and length parameters of surface roughness, and material share curves.
- Non-destructive, rapid quality tests of surface and sub-surface defects in ferromagnetic machinery components.
- Length measurement using contact and contactless methods with resolution up to 0.001 mm.
- Measurement of planar and spatial angles using contact and contactless methods with resolution of 1'.

Specific instruments and outcomes

Mitutoyo Surftest SV-2000N2 profilometer

- Component surface scanning using the contact method.
- Instrument assesses 55 parameters of surface roughness as per ISO, DIN and JIS standards.
- Surfpak software for instrument control and assessment of results.

MicroScan 600-1 digital analyzer of Barkhausen noise

- Instrument analyzes changes in magnetic properties in ferromagnetic materials in magnetic fields, changes of properties in the surface layer are shown by increased amplitude of Barkhausen noise, higher intensity of signal and change in the final value of the magnetoelastic parameter.

Zeiss Prismo 5 coordinate measurement instrument

- Instrument offers comprehensive 3D metering of machinery components.
- Calypso software for instrument control and assessment of results.

Zeiss universal microscope

- Measurement of angular dimensions in machinery components with resolution of 1'.
- Digital metering offers to achieve resolution of μm in the measured values.

Profile projector

- Measurement of length in small components with resolution of 0.01 mm.
- Measurement of angular dimensions in small components with resolution of 2'.

Offer of technology and expertise

Measurement of length and angle

- Contact measurement of length and angle in components up to 800×1200×500 mm.
- Contactless measurement of length and angle in components up to 100×200×300 mm.
- Measurement of basic dimensions of outer thread and outer gears.

Measurement of surface roughness parameters

- Assessment of parameters and curves of surface roughness.
- Analyses of notch depth and similar surface damage.
- Analyses of deposit film thickness if there is direct contact with substrate without film.

Analyses of properties in the surface layer of machinery components

- Detection of defects and cracks.
- Assessment of influence of material, machining technology and cutting conditions.
- Assessment of anomalies caused by changes in residual stress, hardness and microstructure.

