

Ultra High Temperature Tribometer

Key words

Friction, wear, tribology, high temperature, extreme operational demand

Fields of application

Friction and wear characterisation at temperatures up to 1600 °C; space technology, process engineering

Methodology and instrumentation

Twin-disk tester with focussed quartz lamp heating, equipped for friction and wear measurement

Items tested

Disks with 42 mm in diameter and 7 mm to 10 mm of thickness

Quantities / characteristics tested

Coefficient of friction, friction force, wear

Uncertainty / reliability of results

Friction: $\leq 2\%$ to 5% ; wear: $\leq 10\%$ to 100%

For error and reliability considerations, it is important to keep in mind that such large variations are in the nature of the friction and wear processes of technical systems.

Qualification and quality assurance

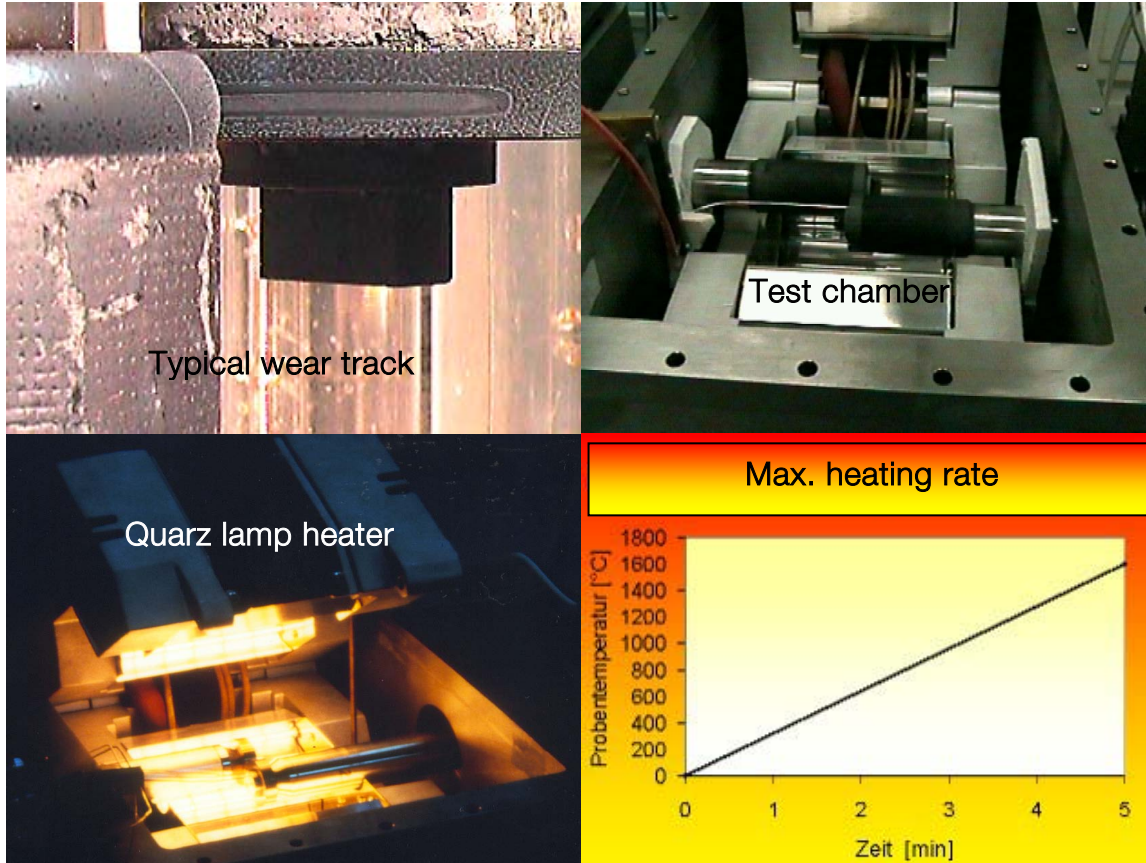
Many decades of experience in high temperature tribology.

The ultra high temperature tribometer is unique world-wide.

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| Contact: | Dr. Mathias Woydt | Phone: | +49 30 8104 1811 |
| E-mail: | mathias.woydt@bam.de | Fax: | +49 30 8104 1819 |
| Division 6.2 - Scanning Probe Microscopy, Tribology and Wear Protection | | | back to Catalogue of Unique Test Facilities |

Further information

The ultra high temperature tribometer allows the experimental verification of the utilisability of materials and coatings for frictional loads at temperatures up to 1600 °C. Via this testing facility and the respective testing procedure, combinations of material for bearings can be determined, which will not fail by adhesion at extremely high temperatures, at which for example steel will melt, and still exhibit acceptable coefficients of friction and wear.



With the ultra high temperature tribometer, friction and wear measurements can be performed under extreme ambient temperature, as they arise e.g. in plants for the pyrolisation of C-Fibres or at the re-entry of re-usable spacecrafts into the earth’s atmosphere.

For the use in the body flaps (control surfaces) of the space re-entry vehicle X38, NASA has qualified the patented concepts and materials, which have been found in tribological tests in the ultrahigh temperature testing rig.

The uniqueness is further underlined by test orders from the USA.

| Technical specifications | |
|--------------------------|----------------------------------------------------------------------------------------------------|
| motion type | sliding, rolling |
| motion sequence | continuous and reversing |
| normal load | 5 N to 50 N (to 200 MPa) |
| r.p.m. | max. 1500 min ⁻¹ at continuous motion max. 120 min ⁻¹ at reversing motion |
| temperature | 23 °C to 160 0°C |
| heating rate | 5 K/s or 1.5 MW/mm ² |
| ambient gases | air, argon, nitrogen |