

Reference procedure

Instrumented Indentation Testing (IIT) for determination of hardness and further mechanical properties

Proof of competence

ISO/IEC 17025 accreditation

Testing quantities and objects

Indentation hardness H_{IT} and indentation modulus E_{IT}

Sufficiently plane sample surfaces

Testing range

All materials from rubber to diamond-like materials:

Minimum/maximum test force: $F_{min}=100 \mu\text{N}$ / $F_{max}=500 \text{ mN}$

Minimum/maximum indentation depth: $h_{min}=5 \text{ nm}$ / $h_{max}=20 \mu\text{m}$

Expanded measurement uncertainty ($k = 2$)

Uncertainties: force $< 0,15\% F_{max}$ and indentation depth $< 1,5\% h_{max}$

Measurement uncertainties of H_{IT} and E_{IT} dependent on material and sample, e.g.

polished RM fused silica: $U_{HIT} = 0,3 \text{ GPa}$ (3 %) and $U_{EIT} = 1,42 \text{ GPa}$ (2 %)

Field of application

Determination of mechanical properties of solid-state surfaces, coatings and thin films

References

DIN EN ISO 14577, Part 1 to 4, Metallic materials - Instrumented indentation test for hardness and materials parameters

DIN EN ISO 14577-1:2015-11, <https://dx.doi.org/10.31030/2055269>.

DIN EN ISO 14577-2:2015-11, <https://dx.doi.org/10.31030/2055270>.

DIN EN ISO 14577-3:2015-11, <https://dx.doi.org/10.31030/2055271>.

DIN EN ISO 14577-4:2017-04, <https://dx.doi.org/10.31030/2517674>.

Contact person

Dr. Michael Griepentrog

Michael.Griepentrog@bam.de

+49 30 8104-3555