# NANOINDENTATION AND SCRATCH TEST MICROMATERIALS, NANOTEST NTX

Nanoindentation is a contact based technique for assessment of mechanical properties at nano/micro scale. Hardness and elastic modulus are measured in most cases, but other phenomena like pressure-induced phase transformations, incipient plasticity or time dependent effects can be studied. The test can be considered as nondestructive or semi-nondestructive. Various modification of scratch test are used for evaluation of tribological properties of surfaces including adhesion and/or cohesion characteristics. The evaluation of the test is based on complex analysis of depth-load record, high-resolution microscopic observation of the wear track and acoustic emissions record.

#### **ACQUIRED INFORMATION**

- > Hardness
- > Elastic modulus
- > Creep
- > Toughness
- > Adhesion
- > Wear and scratch resistance

### SAMPLE TYPES

- > Thin films and coatings
- Microscopic objects (microcrystals, grains, etc.)
- > Composite materials
- > Bulk
- > Biomaterials

## **MODES, CONDITIONS AND PRECISION**

- Indenters: Berkovich, Knoop, Rockwell (radius of 5, 10, 20 and 50 μm), Flat punch
- > Room temperature and in situ at elevated temperatures up to 500 °C
- > Nanocompression test
- > Nano-dynamic tests (impact resistance)





a) Nanoindentation, b) Scratch test, c) Impact test

#### DETAILED INFORMATION ON REQUEST



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