

## //// Laboratory Testing Services



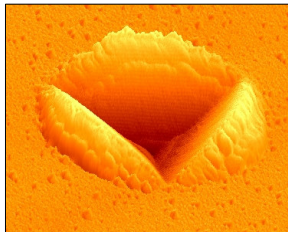
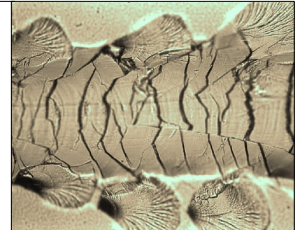
**CSM Instruments S.A.** have been developing, for over 25 years, high quality test instruments for surface mechanical properties characterization of thin films, coatings and bulk materials. Based on such experience we have evolved our analysis laboratory into a measurement center able to fulfill the requirements of our customers regarding tribology, hardness and scratch studies.

### Services description

#### //// Scratch resistance and coating adhesion

*Quantitative evaluation of scratch resistance, adhesion and coating delamination at the macro, micro and nano-scales.*

*Standard tests to ISO 1071, ASTM G171*



#### //// Hardness and elastic modulus

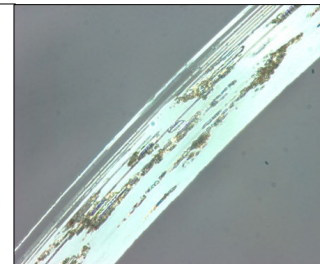
*Quantitative evaluation of hardness and modulus at the macro, micro and nano-scales using instrumented indentation.*

*Standard tests to ISO 14577, ISO 6507-2, DIN 50359  
DIN 4516, ASTM C1326, ASTM C1327, ASTM E384*

#### //// Friction and wear measurement

*Measurement of friction coefficient and wear with our standardized pin-on-disk test. Evaluation of oils and lubricants can be performed at high temperatures or in controlled environments (humidity, gaseous, high vacuum, etc).*

*Standard tests to ASTM G-99, G-133, DIN 50324*



### Applications

- > **Metals** : aluminum, copper, tungsten, steel, lead, brass, gold, silver, platinum, ...
- > **Polymers** : paints, varnishes, polystyrene, PVC, contact lenses, decorative coatings, ...
- > **Ceramics** : ruby, corundum, tiles, abrasive paper, ...
- > **Glasses** : watch lenses, spectacles, windows, windscreens, monitor screens, ...
- > **Automotive** : brake pads, bearings, coatings, paints, lubricants, ...
- > **Coatings** : PVD, CVD, ion implantation, sputtering, ...
- > **Electronics** : magnetic coatings, hard disks, integrated circuits, wafers, ...

**Contact us for all your surface testing needs!**