

The NMI is an application-oriented research institute that makes scientific knowledge available to the business world

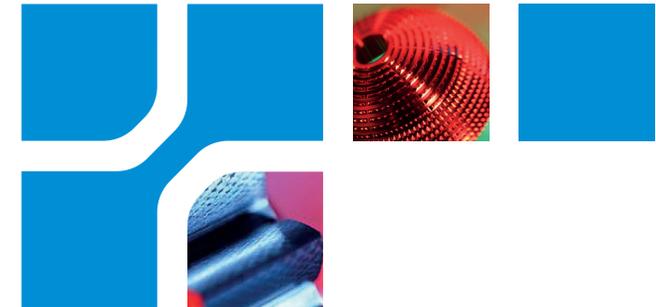
- Application-oriented research and development, consultation, measurements, testing, analysis, studies and implementation of innovative solutions.
- Wide, efficient service spectrum for SMEs and large customers.
- Flexible structures, highly qualified, interdisciplinary teams, state-of-the-art equipment and quality management for extraordinary results.
- Realisation of goal-oriented projects with a strong network of industrial partners, universities and research institutes with various specializations.
- Incubator for new companies.
- Founded in 1985 as a non-profit foundation.
- 190 employees.
- Subsidiary: NMI Technologie Transfer GmbH (NMI TT GmbH).



With our focus on solution-oriented, applied research and development, we achieve concrete results quickly and efficiently. Convince yourselves of our wide, interdisciplinary competence in meeting your demands.

NMI achieving results.

Analysis of coatings >>

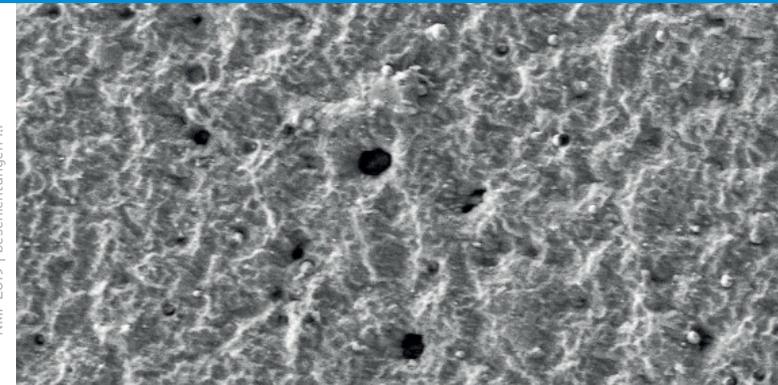


Questions about coatings?



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The entire analytics spectrum for coatings from a single source >>

How hard is the layer?

The nanohardness measurement determines the penetration hardness, Vickers hardness and the modulus of elasticity.

How scratch resistant is the layer?

The nanoscratch test and the nanohardness measurement determine the scratch resistance of a layer.

How good is the wettability of the layer?

Contact angle measurements show the wettability of the layer. Wettability is an important prerequisite for bonding agent layers, but also for the ingrowth behavior of implants.

What is the element composition of the Layers?

Depth profile

- The surface is removed by ion bombardment and the composition of the surface is determined with the photoelectron spectroscopy XPS. By means of a special argon cluster source, even sensitive organic layers can be examined with virtually no changes.
- In secondary neutral particle mass spectrometry (SNMS), the particles released from the surface by ion bombardment are analyzed mass spectrometrically down to the ppm range.

What does the surface of the coating look like?

Chemical composition

- Photoelectron spectroscopy quantitatively determines all elements (except H,He) in the near surface range (approx. 10 nm).
- Energy dispersive X-ray spectroscopy (EDX) qualitatively determines the element composition in combination with scanning electron microscopy.
- Raman and infrared spectroscopy provide information on surface chemistry (functional groups)

Topography

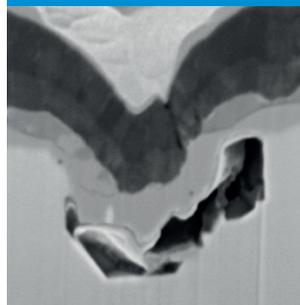
- White-light confocal microscopy provides a three-dimensional image of the surface and roughness values.
- Scanning electron microscopy shows the surface, roughness, particles at high magnification
- Atomic force microscopy (AFM) shows the surface in up to atomic resolution. Very smooth samples are a prerequisite

How thick is the layer?

- A spherical section is created on a flat sample surface and then measured.
- Determination of the layer thickness using a light or electron microscope with a classical transverse microsection
- Generation of a microsection by Focused Ion Beam (FIB) technology at a specific point in the sample, e.g. a droplet, and examination in a scanning electron microscope.
- Generation of a TEM lamella and examination in a transmission electron microscope of very thin layers, e.g. ALD layers

Are there inclusions, porosities in the layer?

The different cuts show the structure of the coating. The FIB technology is particularly suitable here.



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