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Medical Devices

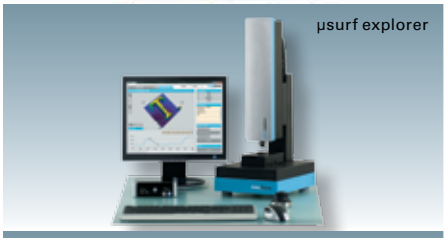
- Automated measurement and analysis
- High repeat accuracy
- Reliable roughness measuremen
- Latest 3D roughness parameters
- Layer thickness measurement
- Buffed, etched, blasted and structured materials

Quality Assurance of Medical Surfaces in Production and the Laboratory – Including Implants, Biocoatings, and Microfluidics.

In medical technology particularly, highly stringent requirements are imposed on the quality of products and components as they are used to support and analyse the functions of the human body and can even be used as implants. To ensure functional reliability and freedom from harmful medical effects, there is an increasing focus on factors such as lifetime and biocompatibility, in addition to requirements relating to material and design. In many cases, the surface quality of a product, such as its roughness, topography, microgeometry or coating thickness, are decisive factors for therapeutic effectiveness and commercial success.

For a wide spectrum of measuring tasks in medical technology, NanoFocus offers high-precision optical measuring products for use in laboratory and production environments. In addition to standard products, NanoFocus develops tailored, customer-specific or industry-specific solutions, including hardware and software. Our µsurf and µscan technologies enable non-destructive analysis of nearly all materials, from diffuse to specular, without requiring any sample preparation. Even with difficult sample properties, such as steep edges, these systems deliver exact and repeatable 3D measurements in just a few seconds.

MEDTEC Europe | emdt Innovation Awards WINNER



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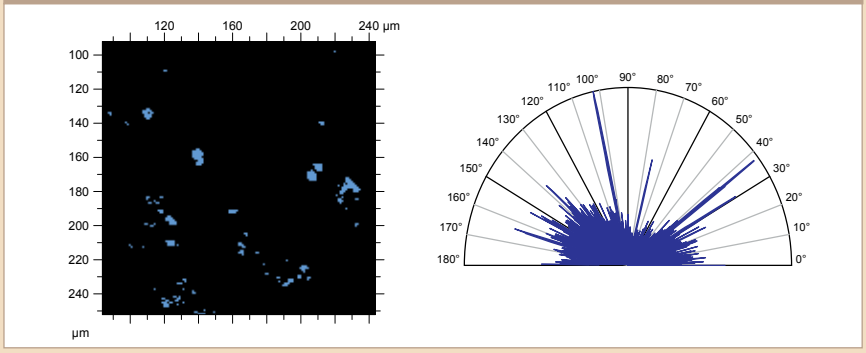
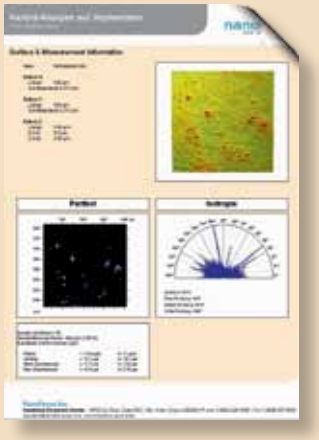
Analysis example

Measurement and analysis of carbides



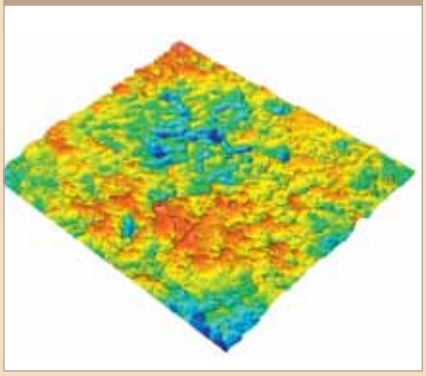
By means of carbide analysis particles on the surface of artificial hip joints can be detected and evaluated. Statistical values such as the density of grains, perimeter and area are easily determined. Further parameters like surface roughness and isotropy can be defined at the push of a button.



Measurement report for carbides.

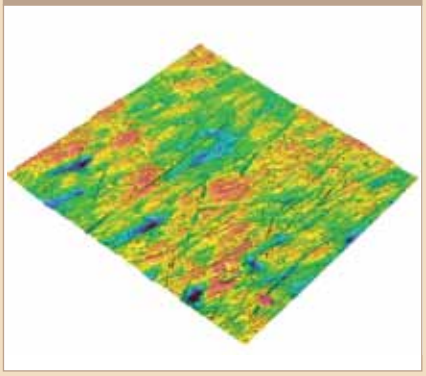
Applications

Dental prosthetics



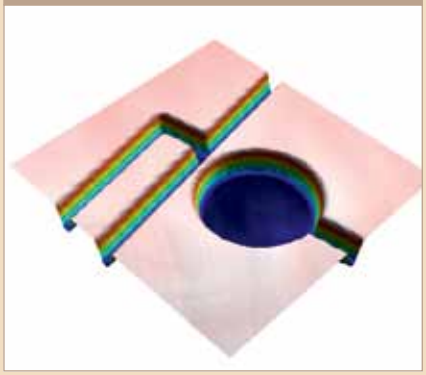
Surface quality is a major consideration with inlays, prostheses and implants. For example, dental implants must have a certain roughness in order to achieve optimal attachment to the jawbone. For this purpose, methods such as abrasive blasting and etching are used to produce textures extending to the nanometre range. The measuring systems in the µsurf product line are ideally suited to measuring roughness according to standardised parameters and determining contact areas. They provide accurate results even with steep edges, and they are also used in process control due to their speed.

Joint implants



Implants such as artificial hip joints must be polished by hand, a process in which duration and pressure are decisive factors. Weak polishing yields excessive surface roughness, while overly hard polishing causes removal of material around relatively hard particles, resulting in the formation of 'carbides'. These elevated points produce undesirable friction and cause material abrasion, which lead to reduced implant lifetime and inflammations in the user's body. With the µsurf systems, roughness can be measured down to the nanometre range. In addition, they allow the surface to be examined for defects such as carbides and scratches in order to determine reliable key figures such as number per unit area, height, and spacing.

Microfluidics



Microfluidic systems transport, mix, and separate liquids and gasses in extremely small spaces. In order to reliably judge the quality of the injection-moulded parts, the valves and channels must be inspected with regard to their cross-section area, height, width, and volume. These microgeometric parameters can easily be determined using the versatile systems in the µsurf product line. The 3D scanning profilometers in the µscan product line can also capture relatively large surfaces quickly and contact-free.

Are you interested in other NanoFocus-Technologies?
Please call us +49 (0) 208-62 000-0 or write an email to sales@nanofocus.de

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