Surface Characterization of **Medical Devices**

Bridging metrology and healthcare

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HOW CAN WE HELP

Polivalent equipment

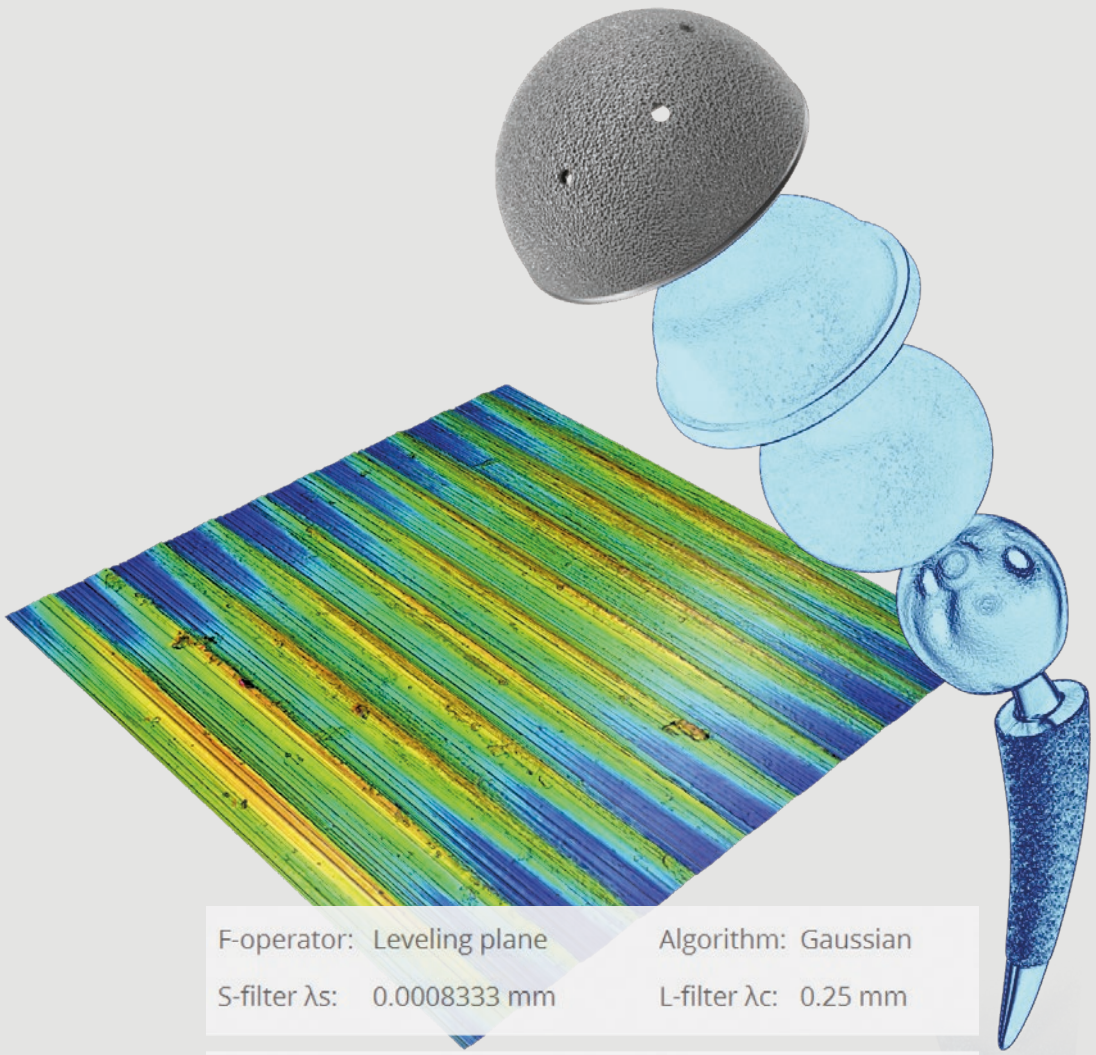
Our systems are designed with inherent versatility, adapting easily to changing measurement requirements through advanced technology and numerous automation tools. This flexibility maximizes our equipment's long-term value.

Multiple measuring techniques in one system

Most of our systems are equipped with multiple measuring technologies, providing a comprehensive characterization and enabling users to select the best technology based on their application needs.

Easy transformation from R&D to QC

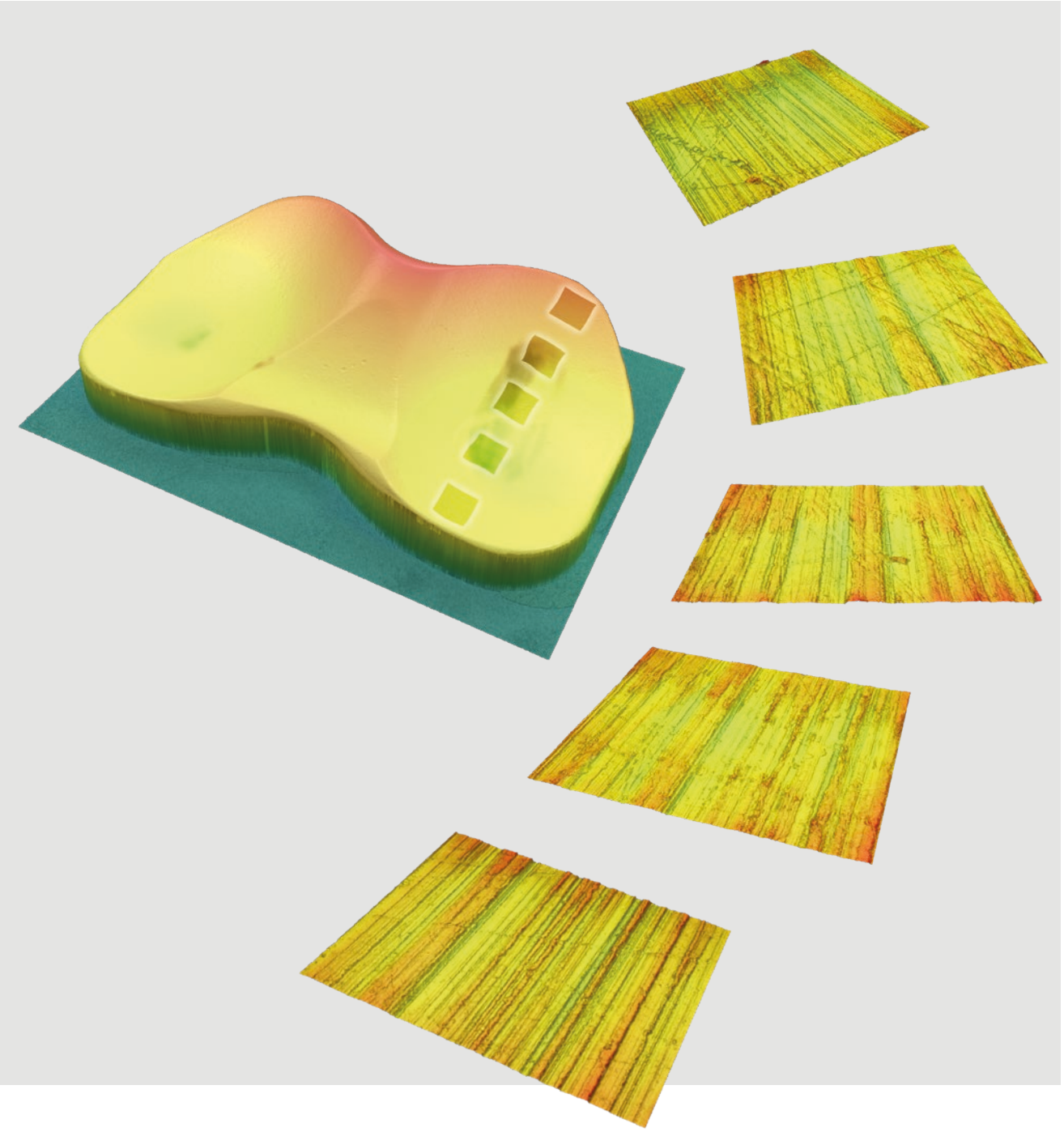
Our systems offer tremendous flexibility by easily transitioning from research and development (R&D) to quality control (QC) . By utilizing specific features, our systems can meet the needs of both R&D and QC, providing users with a versatile solution for various applications.



Roughness for durability

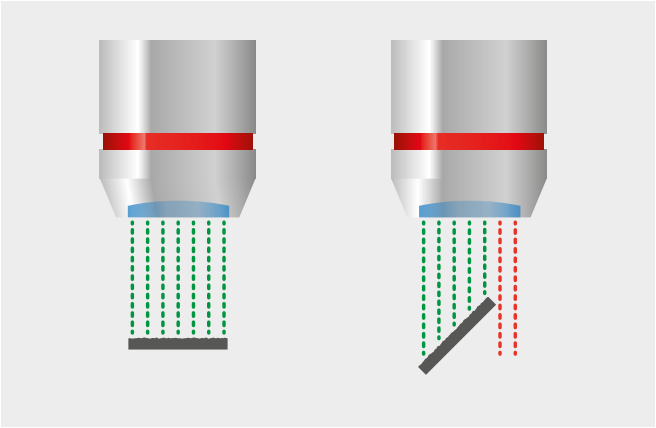
During an implant's service life, wear leads to the formation of debris that can harm patient health by causing osteolysis and inflammatory reactions. The wear behavior of hip implants, influenced by the human gait cycle, is closely linked to their surface condition. Reducing wear and debris is crucial, particularly for younger, active patients with longer life expectancies. Research[1] has shown that measuring the roughness of the top area of acetabular cups evaluates their wear characteristics and, thus, their durability.

Confocal technology, ideal for imaging local slopes and dense features, was employed at a 20X magnification. Studies identified three key roughness parameters—core roughness depth (Sk), reduced valley height (Svk), and reduced peak height (Spk)—that correlate machining parameters with wear behavior, indicating that higher values lead to greater wear volumes.

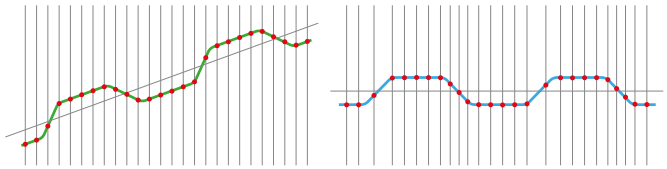


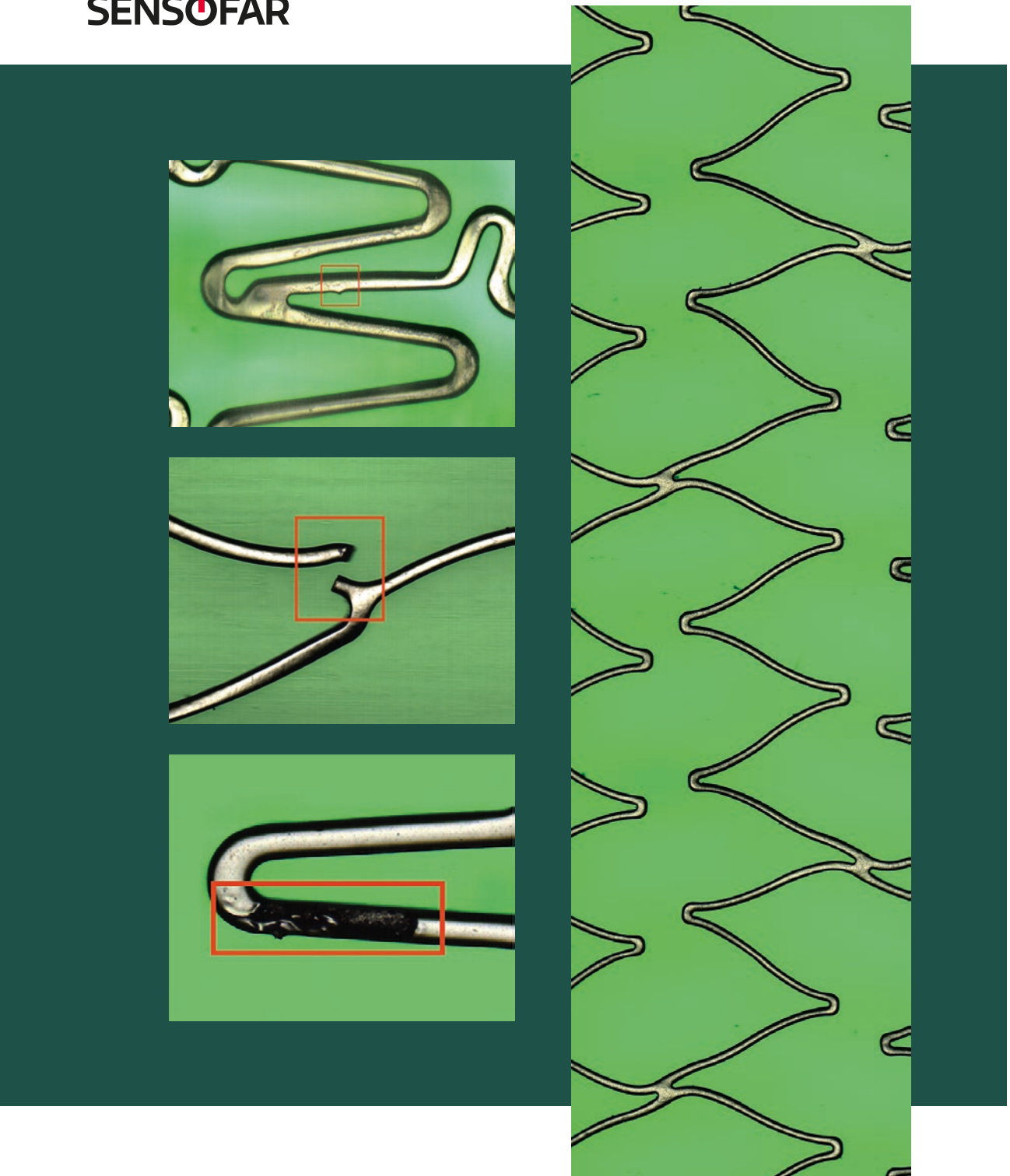
When measuring roughness on a tilted sample, the results can be useful if used qualitatively—for example, when comparing different implants measured in the same region. However, these measurements are not quantitatively accurate for the following reasons.

1 The effective measured area changes with the tilt; for example, at a 30-degree tilt, the imaged area is 13% smaller than at 0 degrees.



2 The inclination of a sample significantly affects the measured roughness, as the sampling changes with different inclinations.





Coronary stents

Visual inspection capabilities allow for detecting defects and irregularities, which could compromise the device's performance or safety.

The Q vix system autonomously gathers information for the dimensional measurements and visual inspection of stents, enhancing efficiency and precision in the production process. This advanced system captures high-resolution images to meticulously inspect both the outer and inner surfaces of each stent, promptly identifying any irregularities. By operating autonomously, the Q vix system significantly accelerates sample throughput on the production line, ensuring consistent quality control and reducing inspection time.

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