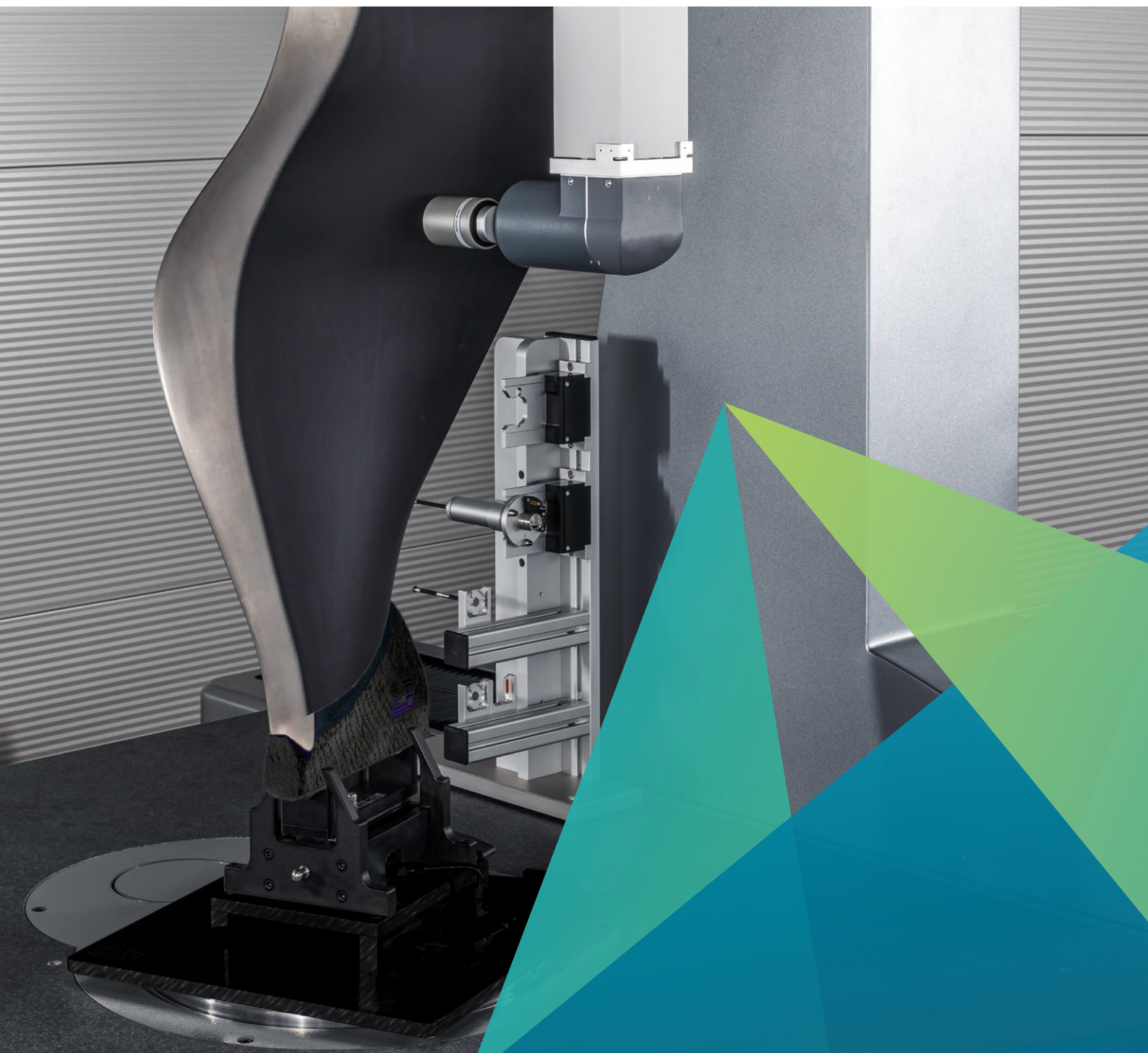


Leitz Reference BX

High accuracy blade & glass measurement solution





Leitz Reference BX

Non-contact, high speed 4-axis scanning

The Leitz Reference BX is a dedicated high speed scanning solution for specialized measurement tasks such as non-contact inspection for all kinds of turbine and fan blades or for inspection of smartphone glasses in the electronic industry. It is especially designed to measure complex shaped workpieces with maximum throughput, without compromising on accuracy. Even very demanding materials like carbon fibre, glass or ceramic components can be measured.

The system combines 4-axis scanning capabilities with a non-contact white light sensor and an automatic sensor exchange system that also enables the utilisation of an ultra precise tactile sensor for the measurement of tightly tolerated or hard to access features.

SENMATION SX

Automatic sensor exchange system SENMATION SX to enable instant switches between tactile probe head HP-S-X1C and optical sensor Precitec S3

Styli & Sensor Changer Rack

Vertically aligned sensor changer rack for fast change of HP-S-X1C styli as well as for sensor exchange between tactile probe head and optical sensor

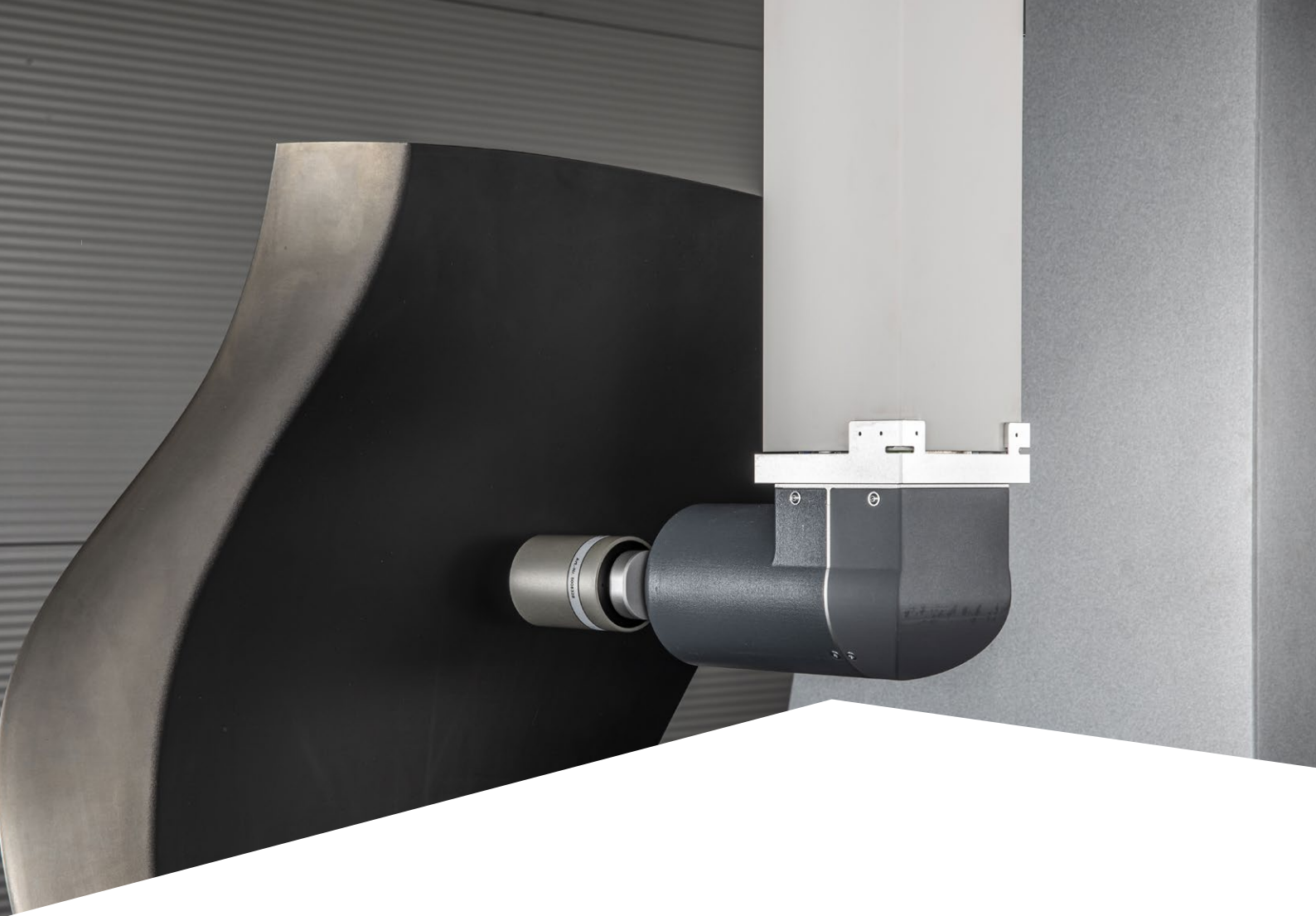
Optical Sensor Precitec S3

The white light sensor is capable of high speed digitizing of surfaces, independent of the material to be measured

Integrated Rotary Table

The integrated rotary table increases the workpiece accessibility and enables 4th axis scanning to reduce measurement cycle times in combination with the white light sensor





Optical sensor Precitec S3

The Precitec S3 is a highly-accurate optical sensor which uses focused white light to measure the most challenging surfaces with maximum speed. When tactile measuring technology reaches its limits, optical sensors take over. Operating as part of a multisensory setup on the ultra-precision Leitz Reference BX, the Precitec S3 optical sensor enables measurements of all kinds of materials.

A large acceptance angle makes the sensor ideal for heavily inclined surfaces, while the non-contact measurement method is perfect for fragile parts. When combined with a tactile probe head, the Precitec S3 extends CMM capability by providing a complete and very fast measurement solution.

Features and benefits

- High-Speed non-contact 4-axis scanning
- Works on all surfaces
- High axial resolution for measuring complex structures
- No damage to the workpiece surface (e.g. scratching), therefore suitable for sensitive and soft materials
- Large acceptance angle of $\pm 30^\circ$, for measuring very oblique surfaces
- 3mm working range
- Small spot diameter for high lateral resolution
- Measures on dispersive, reflective, inclined, curved and aspherical surfaces
- No differences in handling compared to tactile sensors
- Simple qualification of artefacts



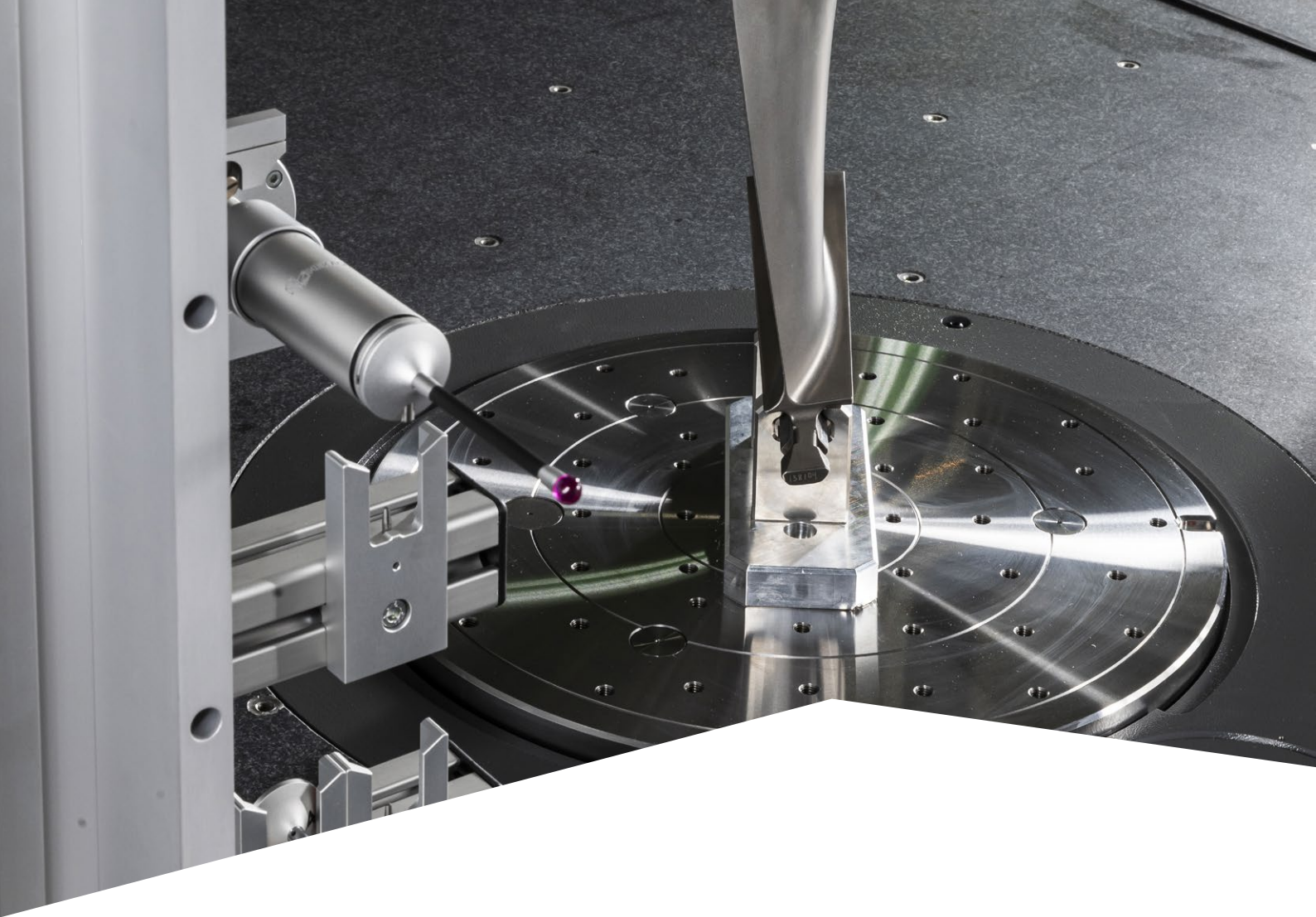
Tactile sensor HP-S-X1C

Save time and costs by reducing complex styli configurations. The HP-S-X1C is the only robust scanning probe head on the market that is optimised for a range of different styli lengths without the need to change modules.

Due to the horizontal mounting of the probe head, workpiece accessibility for vertically aligned rotational or freeform parts is increased in combination with the rotational axis. Thus complex styli configurations can be avoided.

With stylus lengths of up to 225 mm and its small external dimensions, the HP-S-X1C makes it possible to take measurements deep inside a workpiece. Flexibility can be increased further with the use of lateral stylus configurations and an automated styli changer system.





Rotary tables - Spin on measurement

- Workpiece can be accessed from all sides
- Prismatic, freeform and rotationally symmetric parts may be checked with less probe changes increasing throughput
- The rotary table can be infinitely positioned, which allows workpieces to be measured at any desired angle
- The decoupled drive does not introduce thermal energy and therefore guarantees the highest accuracy
- Four-axis scanning is supported with the rotary table, allowing continuous high-density data collection on features



SENMATION SX - Automatic sensor changes

With the fully-automatic sensor changes within a workpiece program, SENMATION SX maximises productivity. In addition to the tactile probe head HP-S-X1C the chromatic-confocal sensor Precitec S3 can be used without recalibration.

Features and benefits

- Enhancement of application range and variety of measurable features on one single CMM
- The sensor identification system enables an automatic parameter set up without recalibration after sensor exchange
- Ensures highest throughput without compromising the accuracy
- Full CMM capacity utilisation



High-speed blade measurement

Critical aircraft engine parts like turbine and fan blades are highly complex and subject to the strictest quality assurance requirements. Every detail and every dimension must be checked and documented. To achieve this, it is crucial that the measurement solution, including the entire inspection system – coordinate measuring machine (CMM), sensors and measuring software – can be adjusted to suit individual demands.

With the Leitz Reference BX, Hexagon Manufacturing Intelligence offers the perfect solution, with each individual element of the measuring system selected according to the requirement of aeroengine manufacturers to increase measurement throughput, without compromising on accuracy. The airfoil is measured with the Precitec S3 optical sensor at high speed while the root (e.g. fir tree profile) for part alignment can not be accessed by the optical sensor and is measured with the ultra precise tactile sensor HP-S-X1C. Thanks to the sensor exchange system SENMATION SX sensor changes can be realized automatically and without recalibration in the measurement routine.

The QUINDOS options for measuring blades features a broad spectrum of measurement and evaluation options. Easy-to-operate functions are available for everything from foot measurement to profile measurement. QUINDOS offers the full spectrum, from simple evaluation to professional analysis.

Overall the Leitz Reference BX measurement solution can reduce cycle time up to 50% for all kind of blades up to 900 mm height compared to classical tactile only inspection.



Interactive, graphical evaluation of a profile section with QUINDOS Blade ultimate

QUINDOS Blade Basic Evaluation solves the entire measuring task in a single command:

- The most important profile characteristics and dimensions in a single procedure
- Execution of individual tasks, such as radius correction, best fit and deviation analyses as a full package or in separate individual mode
- Tangent line
- Leading and trailing edge
- Profile thickness

QUINDOS Blade Ultimate expands functions for the profile evaluation of blade profiles and profile segments:

- Basic and profile evaluations in 2D or 3D
- Edge radius, maximum inscribed circle of the profile
- Osculating circle
- Bow location, centre of mass
- Waviness
- Modification of the profiles
- Export functions
- PDF output of multiplots



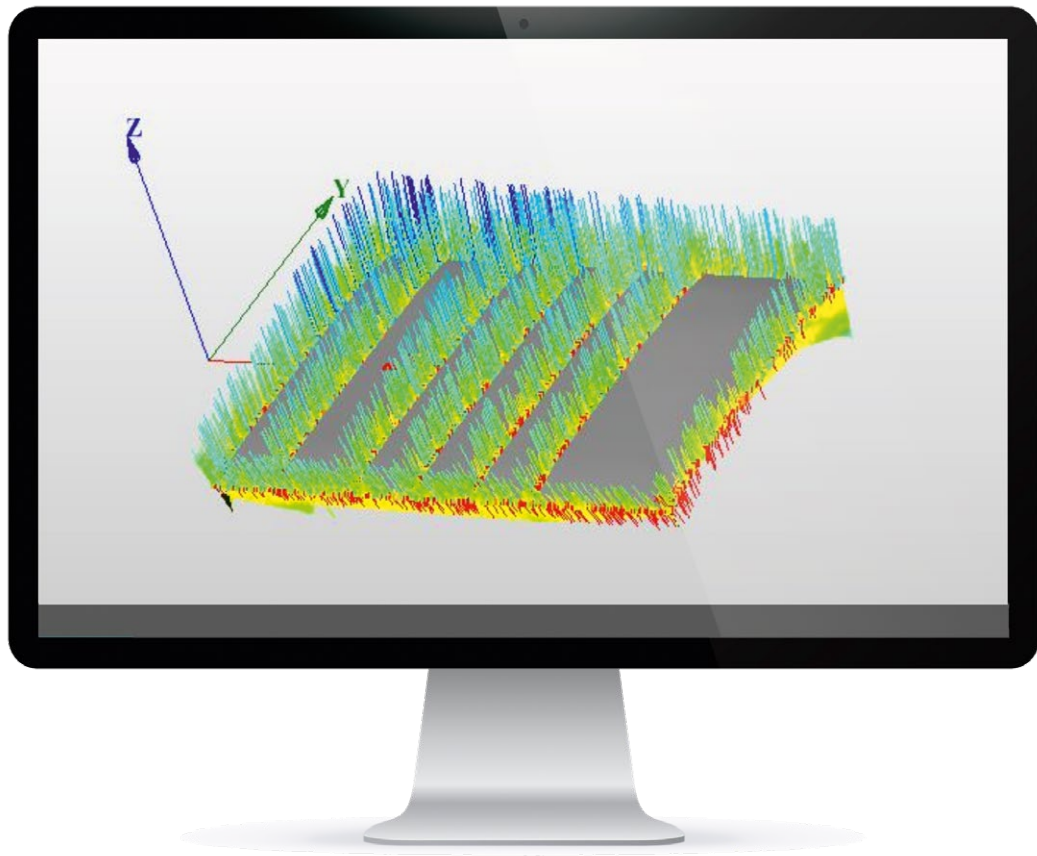
3D glass measurement

The Leitz Reference BX is an outstanding scanning and measuring solution for glass and other thin transparent or shiny materials. The Leitz Reference BX 7.7.5 is a compact model especially suited for measuring the smallest workpieces with tight tolerances, offering low levels of measurement uncertainty.

Hexagon's 3D glass measurement solution enables the non-contact scanning of strongly curved 3D surfaces of glass parts like touch screens of mobile devices. The combination of optical sensor and continuously positionable rotary table enables the complete capturing of these demanding parts which can be strongly curved at the edges.

For part fixturing a special clamping device is mounted on the integrated rotary table. The glass is clamped easily on a 3-point support by pneumatic suction cups. After part clamping and best-fit-alignment the optical measurement is carried out by scanning the curved freeform surface in several scanning lines. In order to access the vertical sides the whole part can be rotated by 90 degrees with the clamping device's automatic rotation system. The rotary table ensures that the sensor is always perpendicular to the part.

The measurement can be presented as point clouds, 2D sections or as a 3D colour coded graphic. Based on the white light technology an evaluation of material thickness on flat and on curved surfaces is also possible. There are no additional scanning lines necessary. The reflected beams correspond to two distance measurements. Based on the optical properties of the material, it is then possible to determine the physical thickness of the sample.



Graphical evaluation of a 3D glass application



Hexagon is a global leader in sensor, software and autonomous solutions. We are putting data to work to boost efficiency, productivity, and quality across industrial, manufacturing, infrastructure, safety, and mobility applications.

Our technologies are shaping urban and production ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future.

Hexagon's Manufacturing Intelligence division provides solutions that utilise data from design and engineering, production and metrology to make manufacturing smarter.



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