



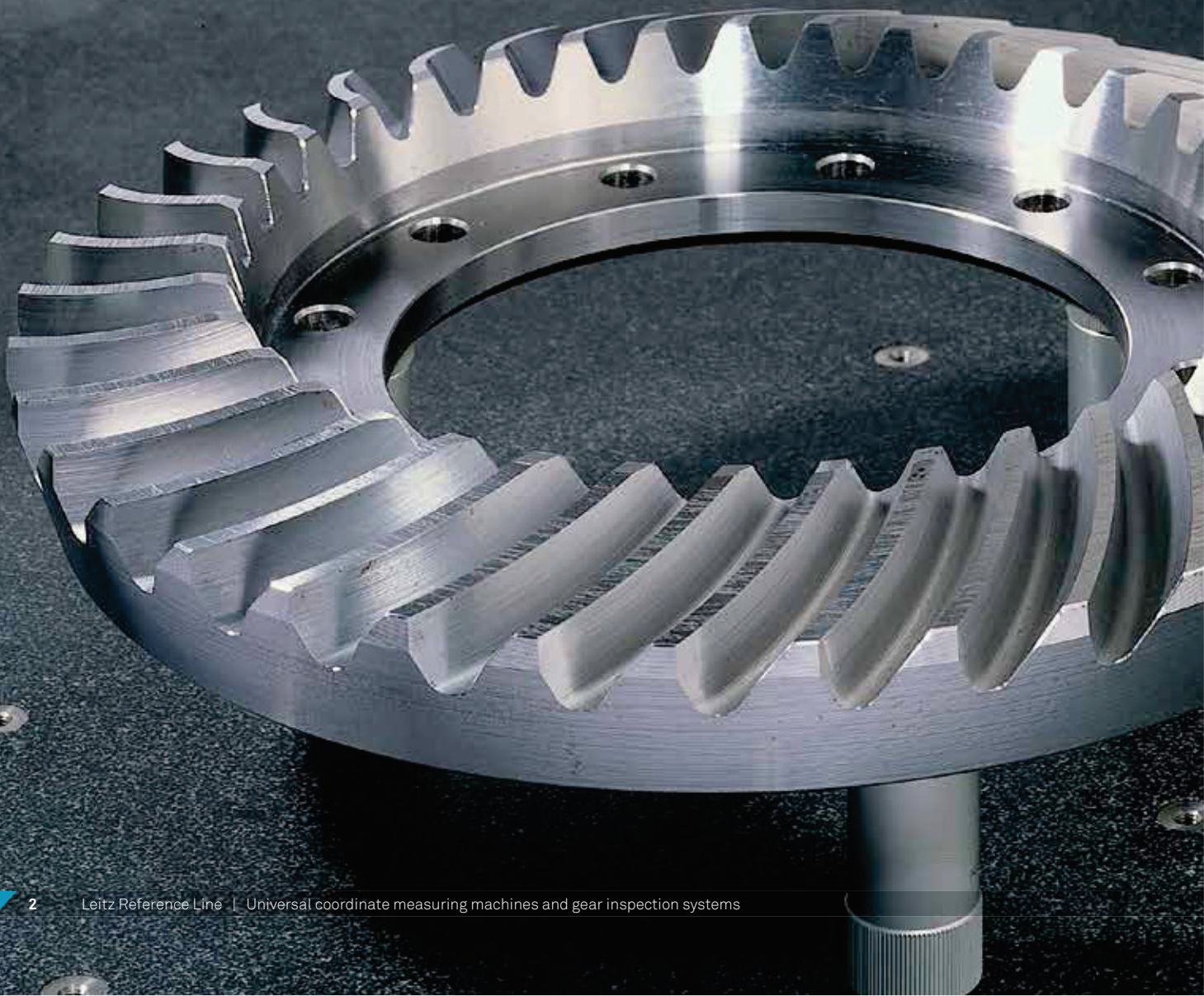
LEITZ REFERENCE LINE

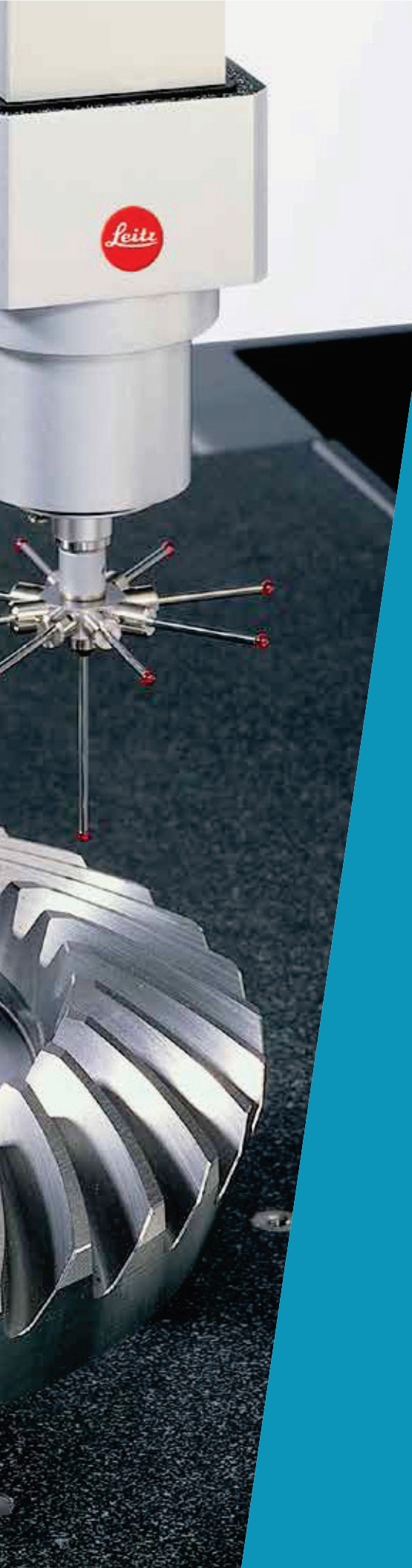
Universal coordinate measuring machines
and gear inspection systems



DECISIONS CAN BE SO SIMPLE

It is good to know that even in a complicated world, things can be simple. Irrespective of whether you are aiming for accuracy, efficiency or suitability for production – all roads lead to Leitz Reference coordinate measuring machines. These all-rounders offer maximum accuracy and throughput in the measuring room as well as in a production environment. They are perfect for small budgets too.





Leitz Reference HP

Complex applications depend on achieving very low levels of measurement uncertainty. Leitz Reference HP coordinate measuring machines combine high accuracy with optimum measuring throughput. This is substantially influenced by the LSP-S2 probe head. This high-tech probe head offers all variations of measurement methods: single-point probing, 3D self-centering scanning as well as Variable High-Speed-Scanning.



Leitz Reference Xi

This series appeals because of its large selection of different probe head systems: from LSP-X1h and LSPX1s in combination with the TESASTA R-m indexable head to the fixed LSP-X3c measurement head, through to the LSP-X5, which can also support extreme probe extensions and heavy styli configurations.



Option XT

The option XT facilitates accurate and reliable measurement in extended temperature ranges: for the Leitz Reference HP series this range is 15 to 30° C. For the Leitz Reference Xi series it is 15 to 35° C. Indispensable for measuring in a production environment.



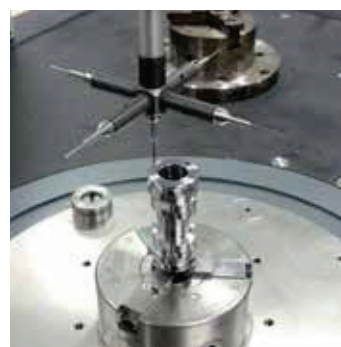
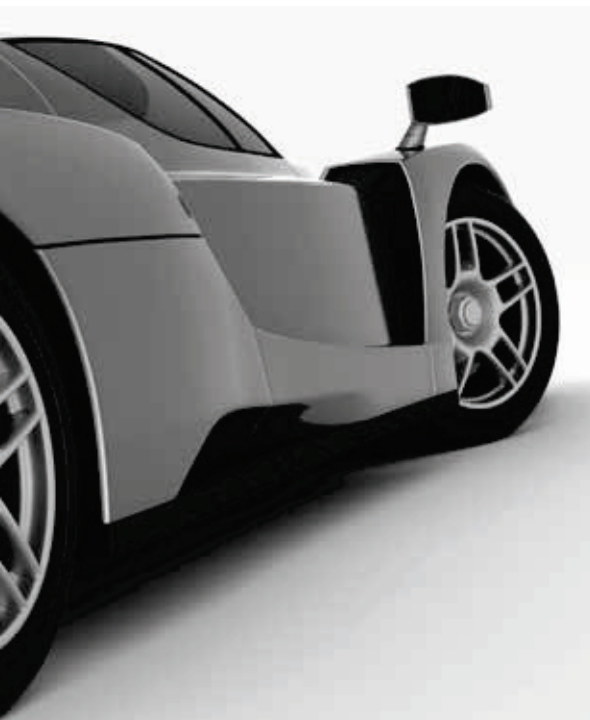
High-speed option

With the high-speed option travel speed is increased to up to 800 mm/s. In addition, laser scanners are used to establish a safety area around the machine. When the safety area is entered, the speed is automatically reduced. As soon as the area is free again, the machine increases its speed without user intervention. This option is available for machines of the Leitz Reference Xi series.



LEITZ REFERENCE IN PRACTICE





It is versatility that makes metrology so interesting and challenging. Leitz Reference has been tried-and-tested in practice for many years – in a wide range of industries and in innumerable measuring applications. It is a universal genius.

Industrial examples

- Automotive
- Aerospace
- Machinery
- Research & Development
- Precision industry

Examples of measuring applications

- Powertrain components
- Gears and spiral bevel gears
- Blisks and blades
- Engine blocks
- Cylinder heads
- Camshafts
- Crankshafts
- Connection rods

Our customers say:

“We decided in favour of a Leitz Reference Xi because this coordinate measuring machine offers the best price-performance ratio.”

Florian Huber, Bosch Siemens Hausgeräte (BSH)

“We have found the Leitz Reference to be a very attractive alternative and in my view the only coordinate measuring machine on the market that offers this high accuracy in such a compact format.”

Felix Zacharias, Bosch Rexroth

“We were looking for a measuring machine that makes our handling easier and gives us flexibility in our work because we have to measure many different highly complex parts to customerspecific requirements.”

Markus Grünwald, Grünwald Feinmaschinenbau, about the requirements placed on his Leitz Reference

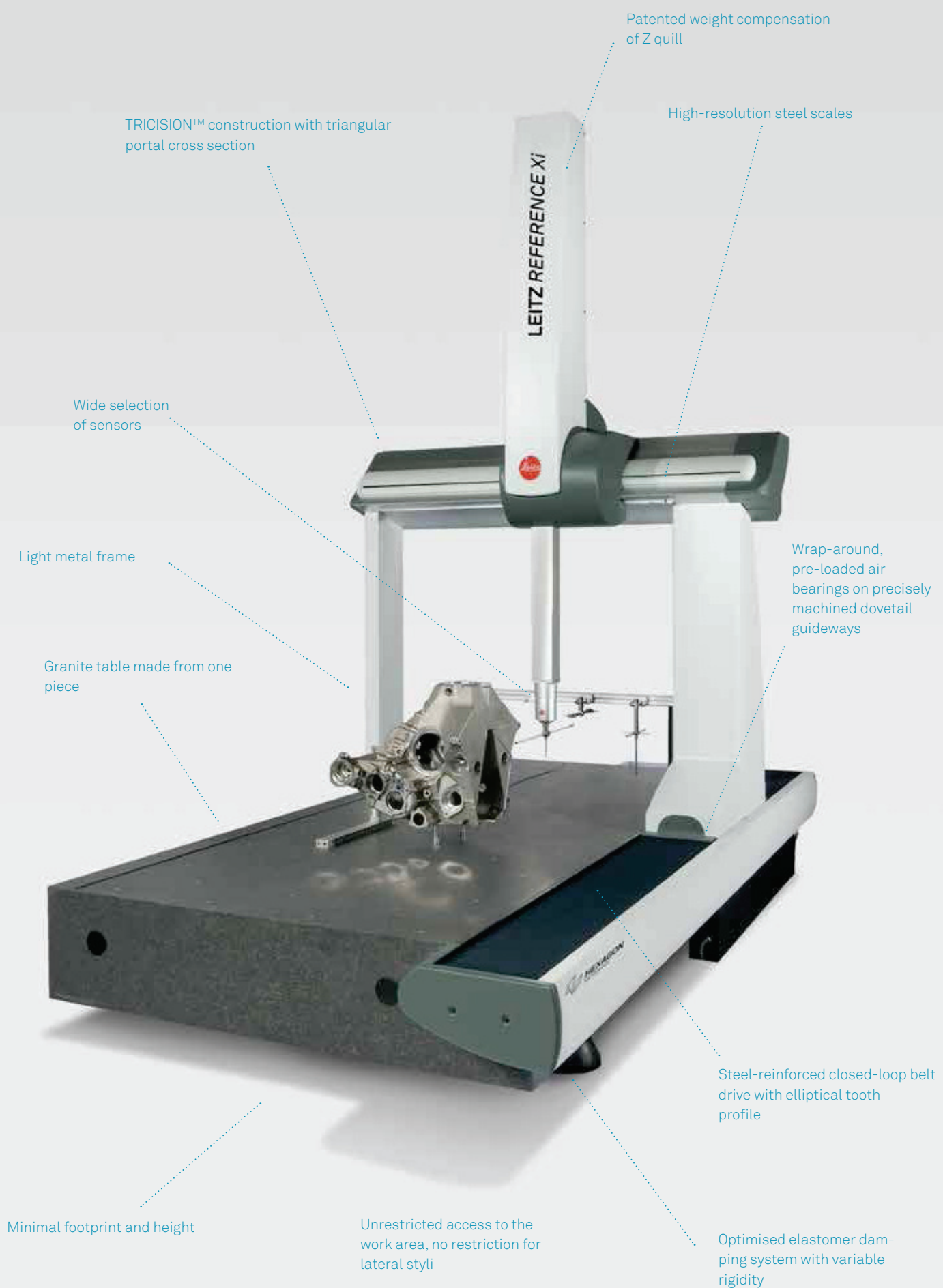
“The Leitz Reference convinced us because of its accuracy, its dynamics, its robustness and the QUINDOS measuring software, which has proven itself to us over the years.”

Kohán Zoltán, AUDI HUNGARIA MOTOR Kft

CLEVER DESIGN GREAT ADVANTAGES

The Leitz Reference family features technical characteristics which have been tried-and-tested over several generations of coordinate measuring machines.

Features	Advantages
<ul style="list-style-type: none"> Lightweight metal frame 	<ul style="list-style-type: none"> Low weight but very rigid
<ul style="list-style-type: none"> TRICISION™ construction with triangular portal cross section 	<ul style="list-style-type: none"> Reduced mass, low centre of gravity Highly dynamic
<ul style="list-style-type: none"> Wide selection of sensors 	<ul style="list-style-type: none"> The right sensor for each application
<ul style="list-style-type: none"> Wrap-around, pre-loaded air bearings on precisely machined dovetail guideways 	<ul style="list-style-type: none"> Top system stability Precise portal movement throughout the entire machine travel
<ul style="list-style-type: none"> Granite table made from one piece 	<ul style="list-style-type: none"> Stable Vibration resistant
<ul style="list-style-type: none"> Optimised elastomer damping system with variable rigidity 	<ul style="list-style-type: none"> Protection against ambient vibration
<ul style="list-style-type: none"> High-resolution steel scales 	<ul style="list-style-type: none"> Optimum reproducibility
<ul style="list-style-type: none"> Patented weight compensation of Z quill 	<ul style="list-style-type: none"> Safe position of the Z quill even in the case of air supply failure
<ul style="list-style-type: none"> Minimal footprint and height 	<ul style="list-style-type: none"> Installation also possible where space is restricted
<ul style="list-style-type: none"> Unrestricted access to the working area 	<ul style="list-style-type: none"> Perfect work ergonomics and functionality No limitation of the measuring range when using lateral styli
<ul style="list-style-type: none"> Tried-and-tested design with 20% less components compared to conventional measuring machines 	<ul style="list-style-type: none"> Greater reliability and longer service life Low maintenance requirement
<ul style="list-style-type: none"> Steel-reinforced belt drives with elliptic tooth profile 	<ul style="list-style-type: none"> Reduced machine vibration at high scanning speeds



Patented weight compensation of Z quill

High-resolution steel scales

TRICISION™ construction with triangular portal cross section

Wide selection of sensors

Light metal frame

Wrap-around, pre-loaded air bearings on precisely machined dovetail guideways

Granite table made from one piece

Steel-reinforced closed-loop belt drive with elliptical tooth profile


Minimal footprint and height

Unrestricted access to the work area, no restriction for lateral styli


Optimised elastomer damping system with variable rigidity

SENSORS FROM A TO Z LEITZ PATHFINDER TECHNOLOGY

Leitz Reference coordinate measuring machines are fitted with 3D probe systems, developed and produced by Hexagon Metrology in Wetzlar, Germany. With the help of the Leitz Pathfinder technology the probe heads offer both fast single-point probing and Variable High-Speed-Scanning (VHSS) for high-precision form and profile measurements.



LSP-S2
The extremely low Single Stylus Form Error P_{FTU} of the LSP-S2 makes it possible to measure complex geometries to very tight tolerances. The LSP-S2 probe system is suitable for High-Speed-Scanning of known and unknown contours. It can cope with very long extensions of up to 800mm and up to 1000g. Accuracy specifications are valid for the full range of styli.



LSP-X3c
This 3D scanning probe head is compact, fast and extremely accurate. It can carry up to 360mm long probes and extensions as well as a variety of styli configurations up to a total weight of 150g.



LSP-X5
This analogue probe head for demanding requirements offers accuracy also with probe extensions and heavy styli configurations of up to 500mm in length and 500g in weight. The LSP-X5 features a sophisticated anti-collision system which provides additional protection for the probe head. It is ideally suited for measuring high-precision mechanical parts and complex geometries. Accuracy specifications are valid for a full range of styli.




LSP-X1h/LSP-X1s at TESASTAR-m indexable head
In combination with the TESASTAR-m indexable head, the LSP-X1 probe heads fulfil all demands. The LSP-X1h has been designed for probes measuring 20 to 225mm in length in the axial direction. In the vertical direction, it can accommodate probes measuring up to 50mm in length.



CMS laser line sensor
The CMS 106 is a high-precision laser line sensor. Highlights:

- Different line lengths: 24, 60 or 124mm
- Automatic laser performance control

The CMS 106 is suitable for measuring almost any material, including machined, semi-machined, punched, forged, cast, paint-coated metals, sand cores, carbon fibre components, plastic parts, clay, rubber, wood and ceramics.



TravelRack
A styli changer with a completely new concept: the TravelRack travels with the portal. Compared to conventional styli changers, the distances are reduced because the TravelRack is always exactly where it is needed. In addition, the TravelRack increases the available measurement volume. It is available for all Leitz Reference models with LSP-X1 sensor, from a Z-range of 600mm.

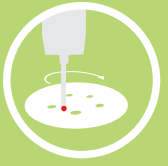
Leitz Pathfinder Technology



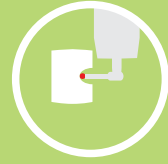
Variable
High-Speed-Scanning



4-Axis
Scan



Tag
Scan



3D Self-
Centering



Optical
Scan



Scan
Catch



COMPREHENSIVE SOFTWARE

Irrespective of how complex the application is, you want to evaluate your measured data quickly, simply and reliably. The two software solutions offered by Hexagon Metrology – PC-DMIS and QUINDOS – ensure efficient programming and evaluation.

PC-DMIS

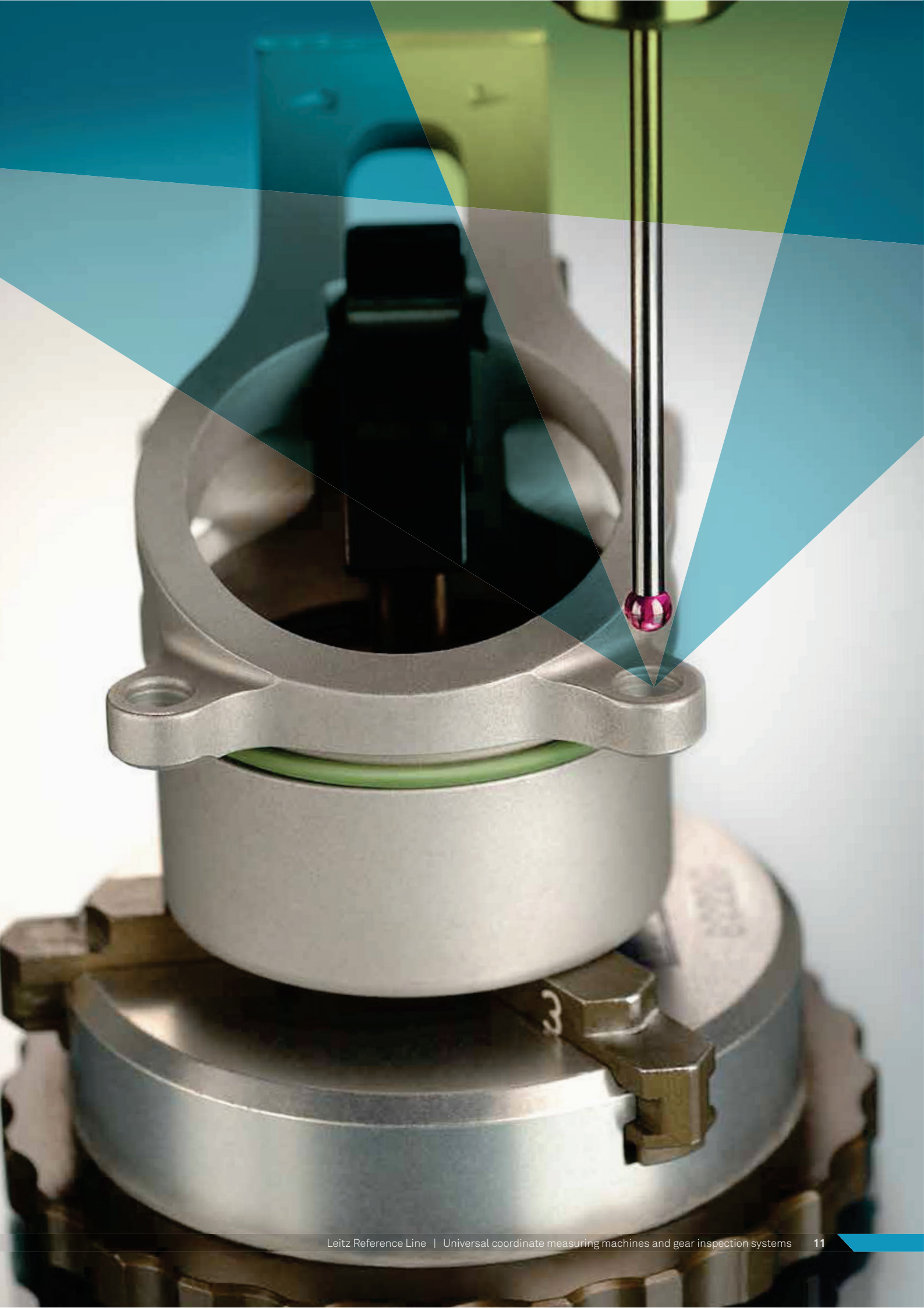
- Software for easy CAD-based, computer-simulated programming
- Graphics-focused, operator-friendly user interface
- Efficient tools to display the results
- Measurement of regular shapes and free-form surfaces

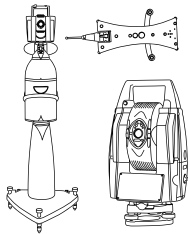


QUINDOS

- Software for virtually all industrial metrology applications – from simple parts through to complex special geometries
- Unlimited repertoire thanks to over 50 options
- With QUINDOS, Leitz coordinate measuring machines can also be used as gear inspection systems. Over 15 program packages are available for measuring gears and gear cutting tools, e.g. straight and spiral bevel gears, cylindrical worms, worm wheels for cylindrical worms, step gears, hob cutters etc.
- Integral CAD core for 3D presentation of all geometries and easy CAD-supported programming, e.g. presentation of special target points, probe points, calculated elements



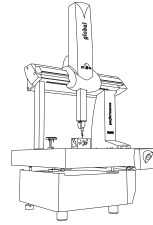




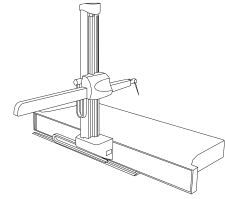
LASER TRACKERS & STATIONS



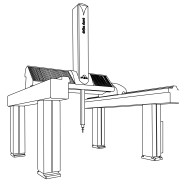
PORTABLE MEASURING ARMS



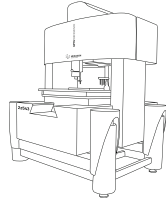
BRIDGE CMMS



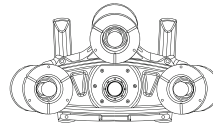
HORIZONTAL ARM CMMS



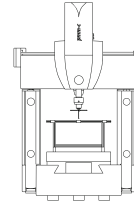
GANTRY CMMS



MULTISENSOR & OPTICAL SYSTEMS



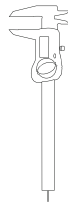
WHITE LIGHT SCANNERS



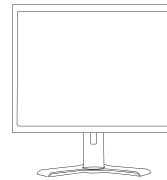
ULTRA HIGH ACCURACY CMMS



SENSORS



PRECISION MEASURING INSTRUMENTS



SOFTWARE SOLUTIONS



Hexagon Metrology offers a comprehensive range of products and services for all industrial metrology applications in sectors such as automotive, aerospace, energy and medical. We support our customers with actionable measurement information along the complete life cycle of a product – from development and design to production, assembly and final inspection.

With more than 20 production facilities and 70 Precision Centers for service and demonstrations, and a network of over 100 distribution partners on five continents, we empower our customers to fully control their manufacturing processes, enhancing the quality of products and increasing efficiency in manufacturing plants around the world.

For more information, visit www.hexagonmetrology.com

Hexagon Metrology is part of Hexagon (Nordic exchange: HEXA B). Hexagon is a leading global provider of design, measurement and visualisation technologies that enable customers to design, measure and position objects, and process and present data.

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