



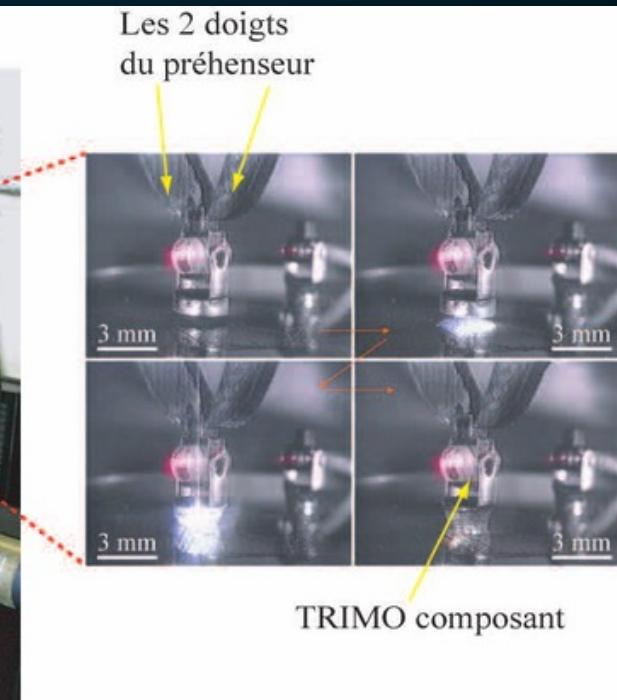
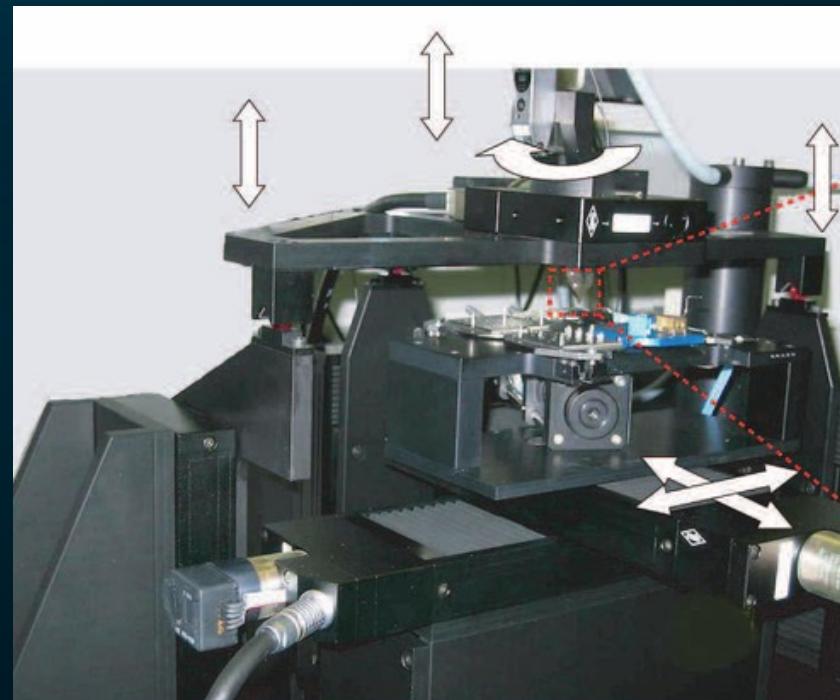
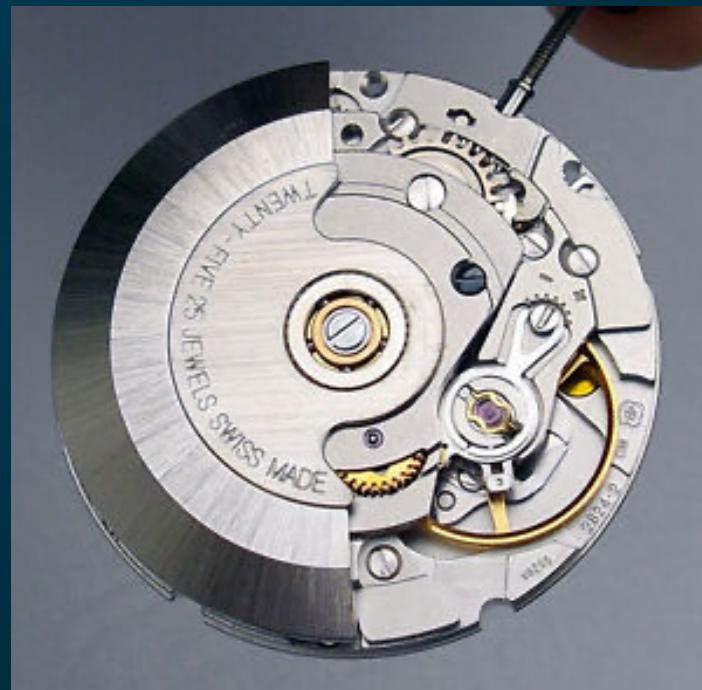
**HEXAGON**

**Hexagon MI division  
Metrology BU  
Hexagon Renens**

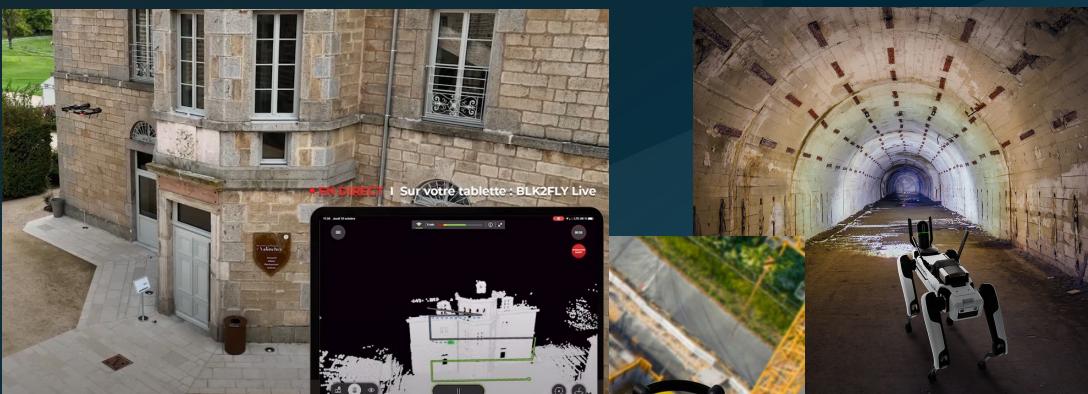
Christian de Graffenreid, 19.02.202

# Mon parcours

- EPFL, MT 93
- Assistant Prof. Clavel, Delta-linéaire, PPO EPFL-Leica, TRIMO-SMD
- 1999: Demaurex Robotic, resp. projets, resp. Dev. Mécanique
- 2003: Heraeus Materials, resp. projets, resp. Dev, automation, médical, horlogerie
- 2018: Hexagon (TESA), Team Leader R&D mécanique

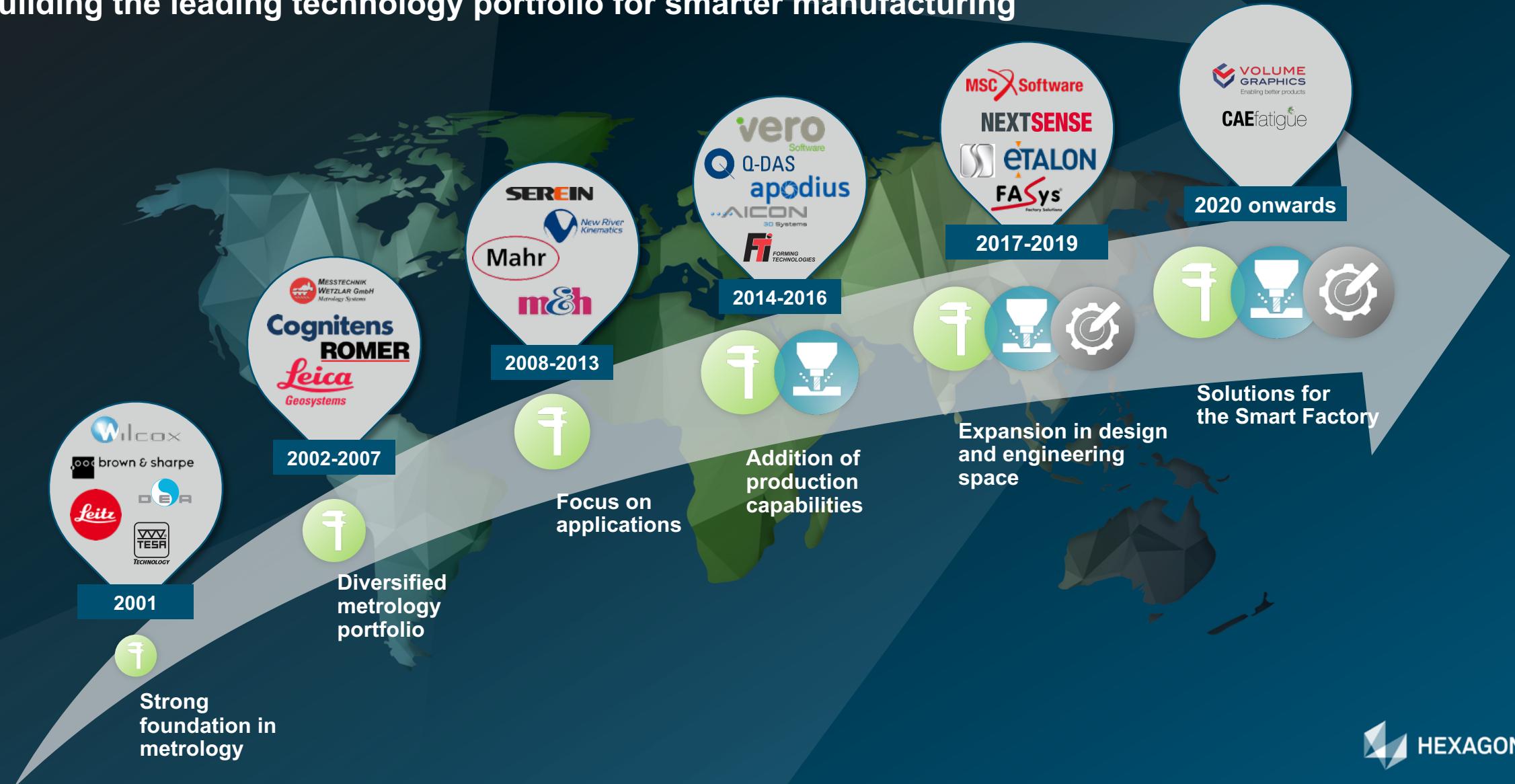


# Hexagon divisions



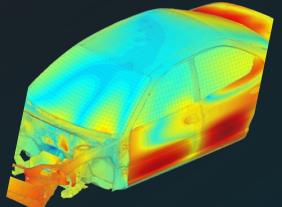
# Manufacturing Intelligence Division

## Building the leading technology portfolio for smarter manufacturing



# Business Units of Hexagon MI

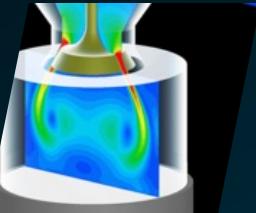
- **SIMULATION (multi-physics: MSC Software**



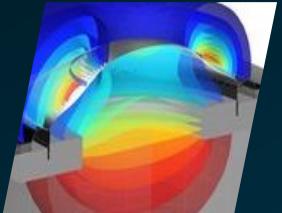
Structural analysis  
(Nastran)



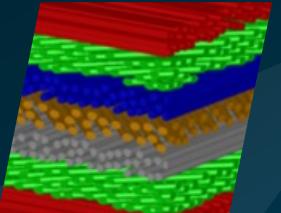
Multibody  
dynamics (Adams)



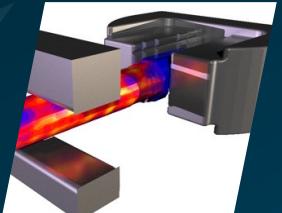
Thermal & fluidic  
dynamics



Acoustic



Materials Modelling



Process simulation  
Forming, welding,  
3D printing

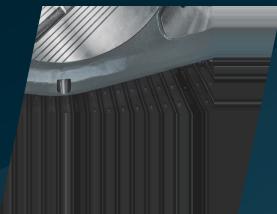
- **CFAO**



FAO (Alphacam)



3D printing



Molds & dies design



Sheet metal fabrication

And many other simulation / CFAO softwares !

- **METROLOGY**



Dimensional analysis



Metrology assisted  
manufacturing



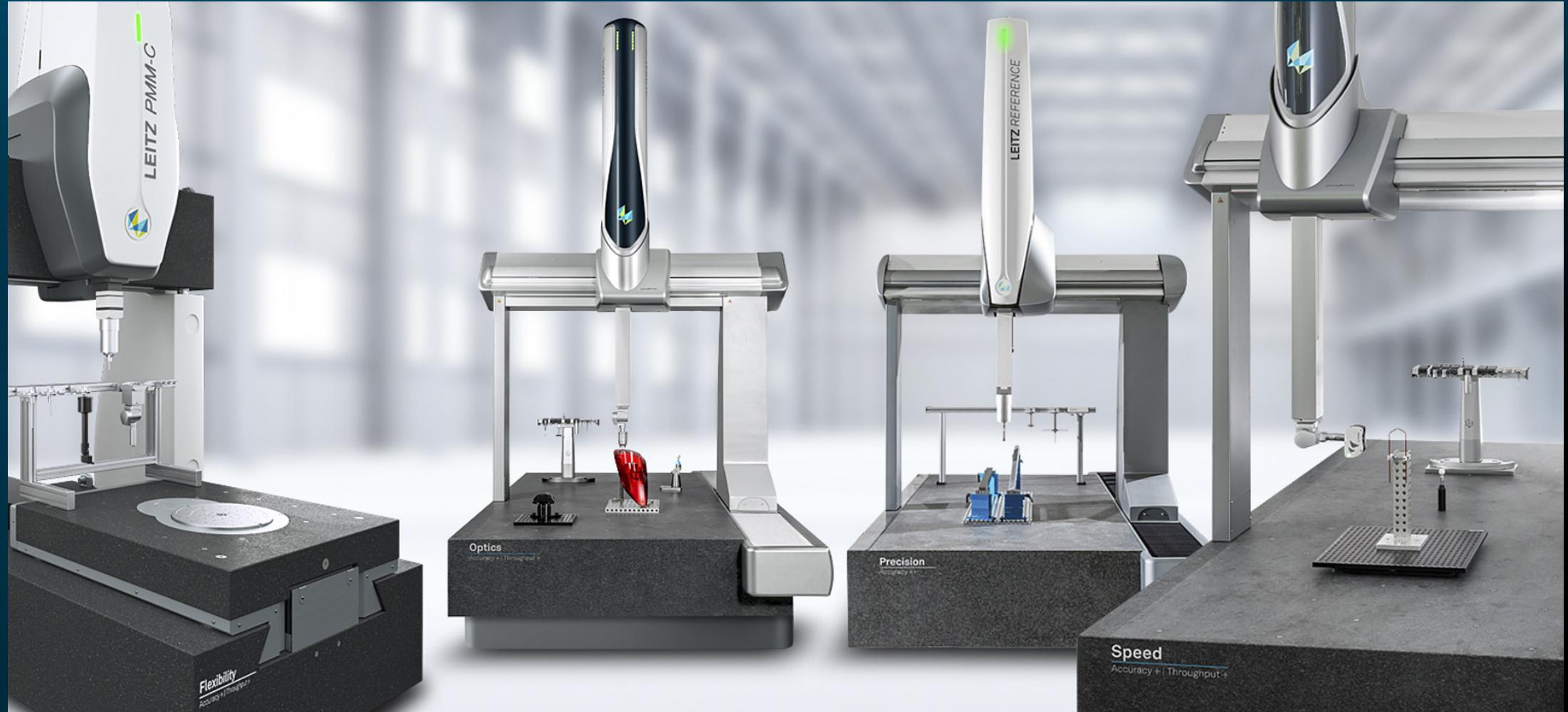
Robot and machine  
calibration



Industrial theodolite

# Hexagon Renens

Internal “supplier” of sensors & components for sCMM product units



# Hexagon CMM sensors Portfolio

INDEXABLE PROBE HEAD

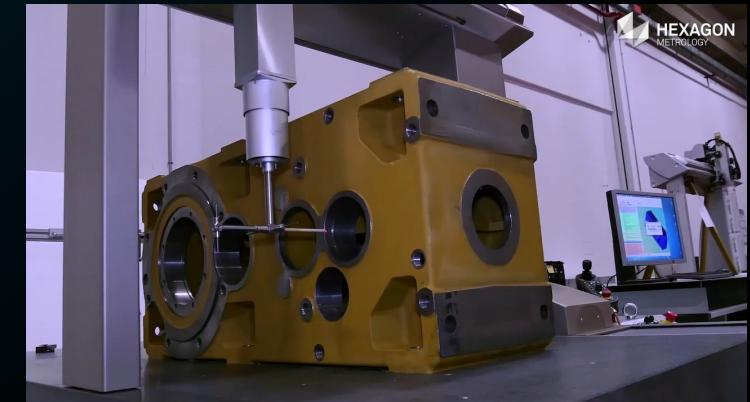


will continue as before, even with further planned investments.

TOUCH TRIGGER

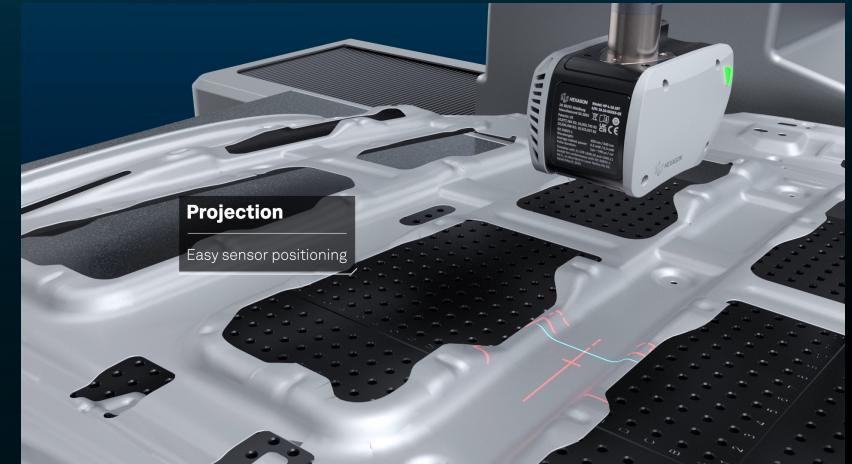
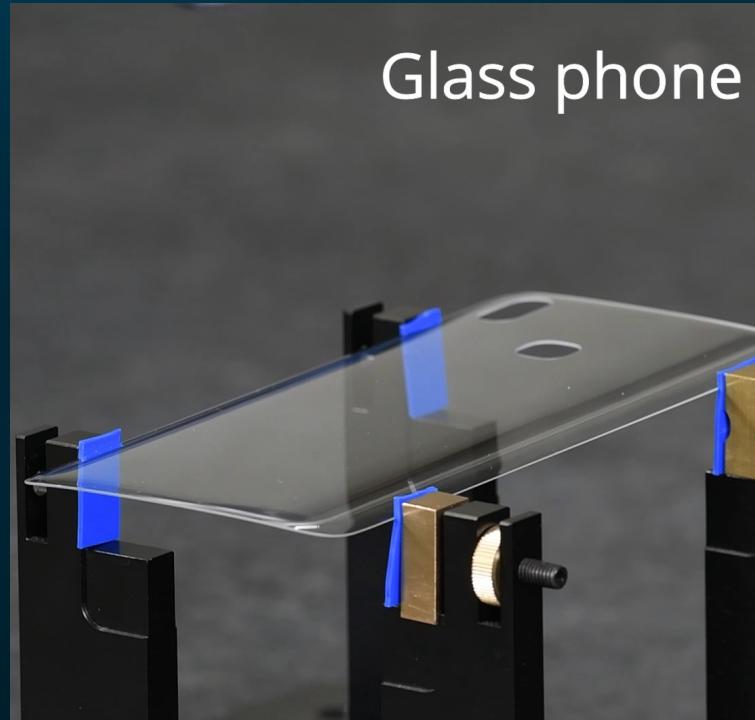


SCANNING



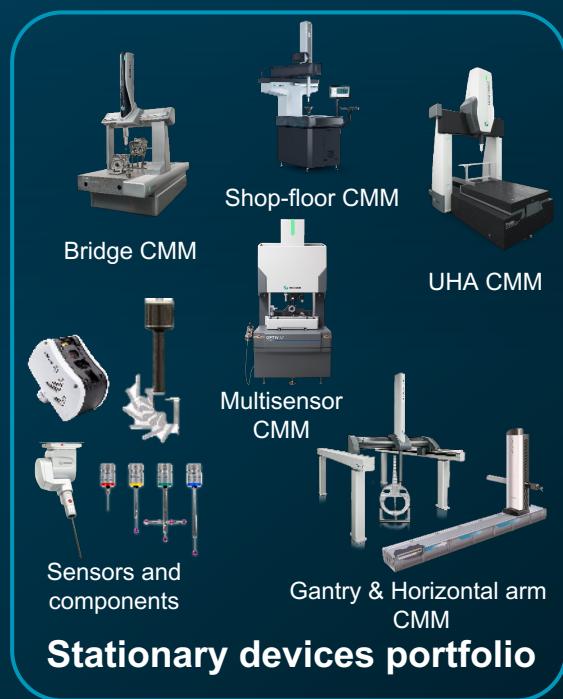
# Hexagon CMM sensors Portfolio

## NON-CONTACT



# What is metrology and inspection?

Our **metrology and inspection solutions** range, from coordinate measuring machines (CMMs), portable measuring arms, laser trackers and structured light scanners to hand tools and automated solutions – all supported by dimensional metrology software. Our products and solutions capture and process real-world data for positioning and inspection, providing actionable information that continuously improves efficiency, quality and productivity.



# Stationary devices



Bridge CMM



Shop-floor CMM



Gantry CMM



Multi-sensors CMM



Horizontal arm CMM

# Portable devices



Structured light scanner



Portable measuring arm



Portable measuring arm



Portable measuring arm



Laser tracker



Laser tracker

# Portable devices



Photogrammetry

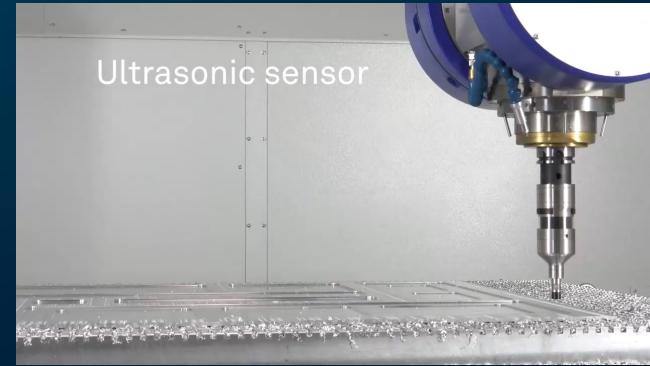


2D laser profiler

# Machine tool measurement



Probing system



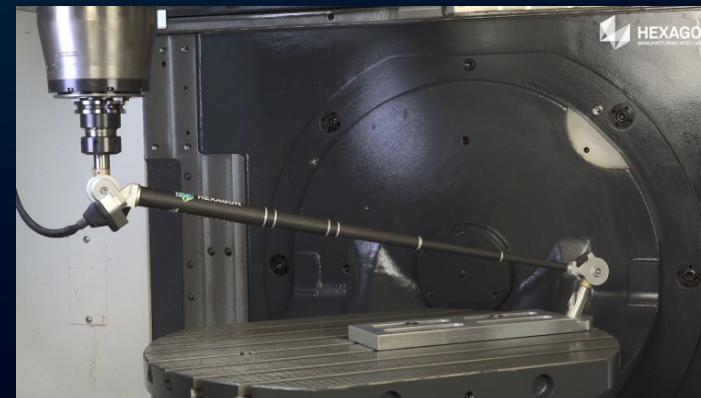
Ultrasonic probes



Laser scanner probes



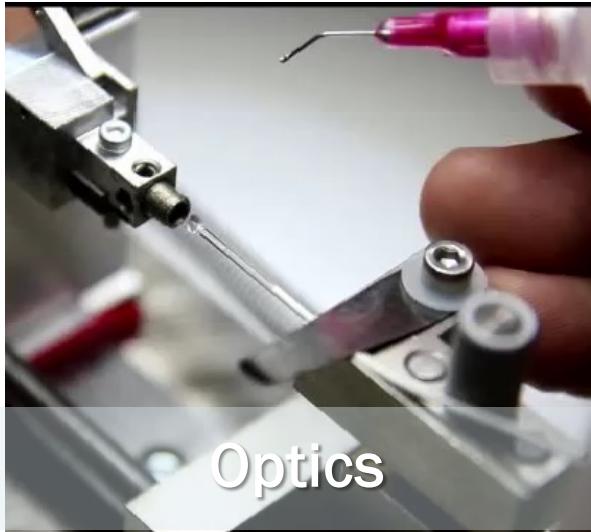
Machine calibration (Lasertracer)



Machine calibration (Laserbar)

# Manufacturing & Quality

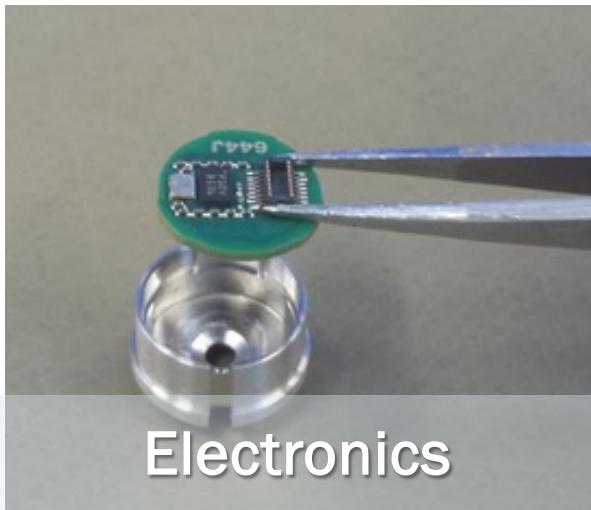
## Micro-Assembly



Optics



Mechatronics



Electronics



Small assembly



**HEXAGON**  
MANUFACTURING INTELLIGENCE



**TESA**  
TECHNOLOGY