



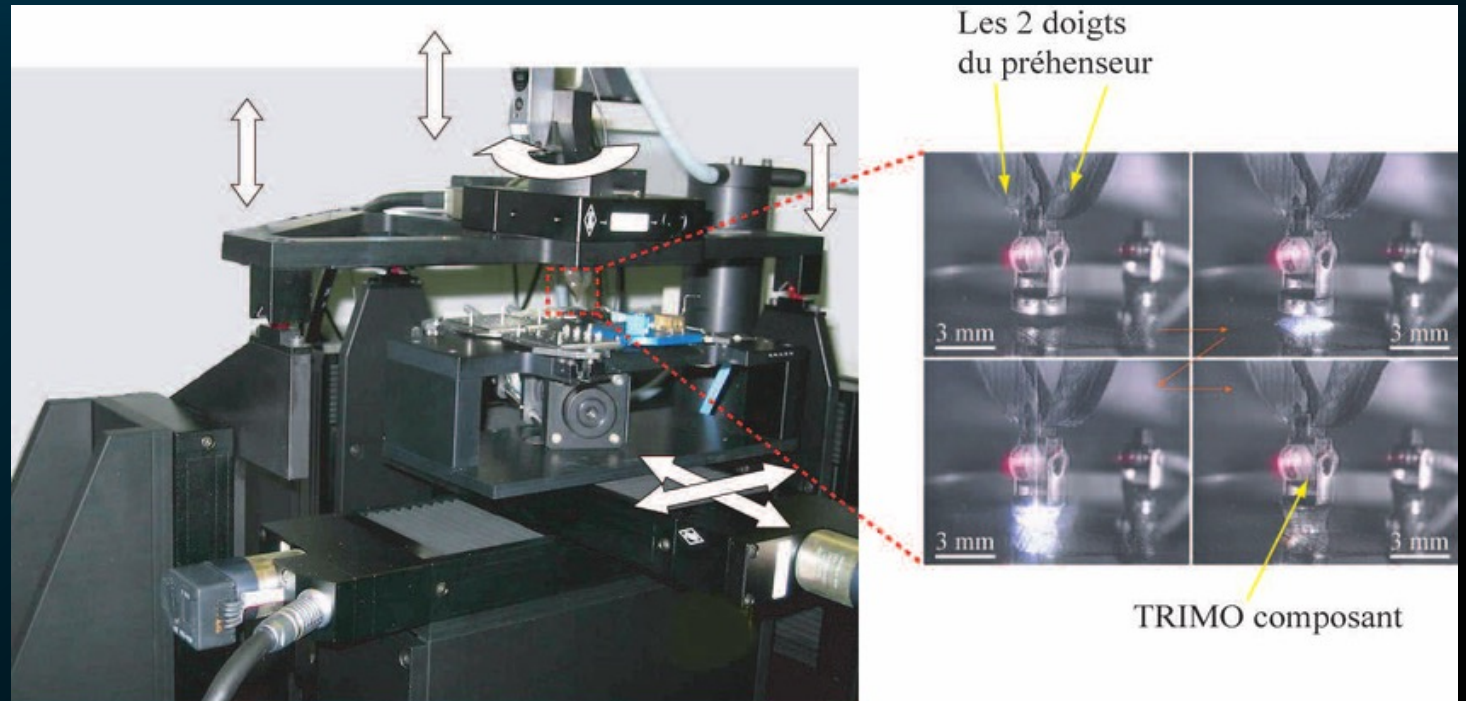
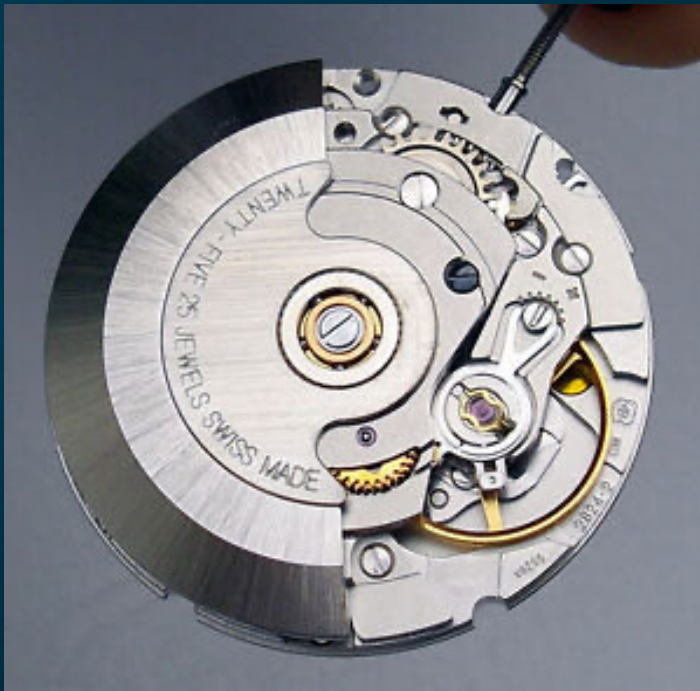
**HEXAGON**

**Hexagon MI division  
Metrology BU  
Hexagon Renens**

Christian de Graffenried, 19.02.202

# Mon parcours

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





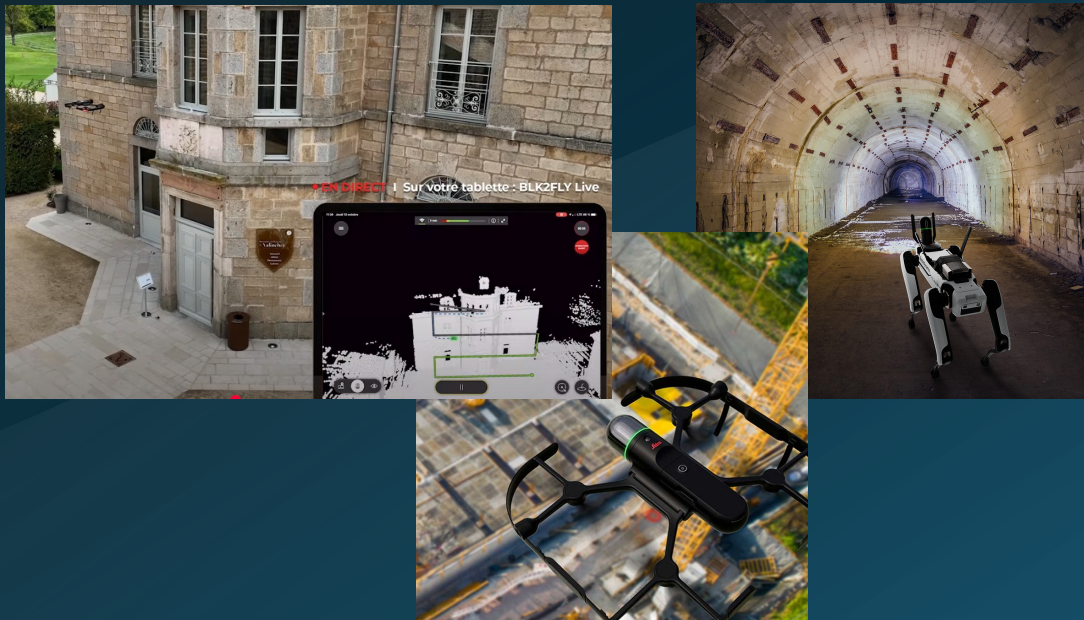
# Hexagon divisions

## Division Manufacturing Intelligence d'Hexagon

Rendre la fabrication plus intelligente Aujourd'hui, les fabricants recherchent des moyens plus intelligents d'améliorer la qualité et la productivité.

## Division Geosystems d'Hexagon

Une expertise et une innovation de pointe dans le domaine des solutions de capture de la réalité.



## Division Asset Lifecycle Intelligence d'Hexagon

Exploitez les données tout au long du cycle de vie d'un site industriel, afin de garantir des opérations efficaces, sûres et rentables, et cela de manière durable.

## Division Safety, Infrastructure & Geospatial d'Hexagon

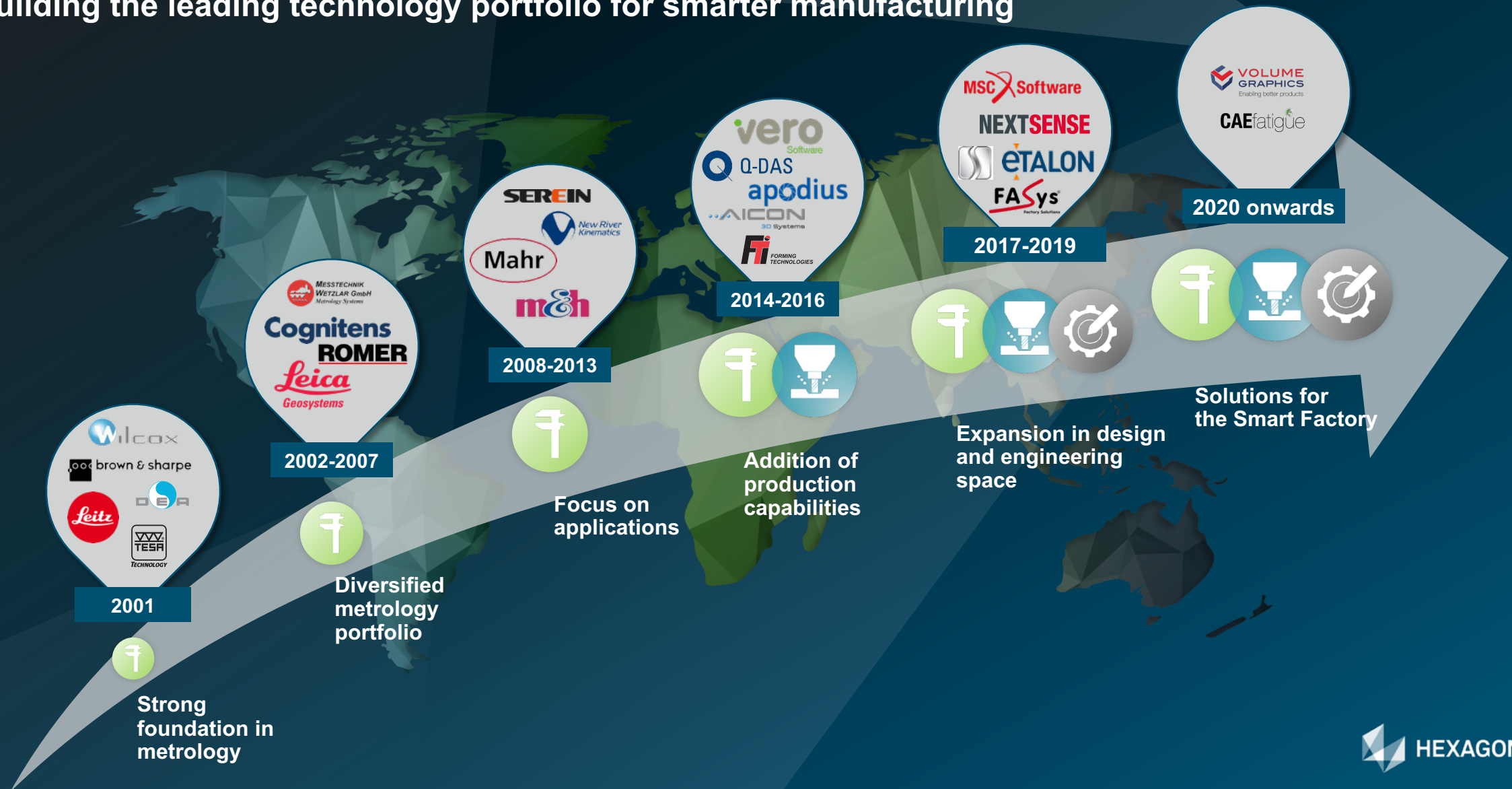
Réinventer la collaboration, briser les barrières, combler les lacunes en matière de données et acquérir une connaissance de la situation pour des villes plus sûres et plus efficaces.

## Autonomous Solutions division

Perception, positioning, vehicle autonomy and site orchestration technologies to enable the full autonomous solution for agriculture, mining, automotive and marine positioning.

# Manufacturing Intelligence Division

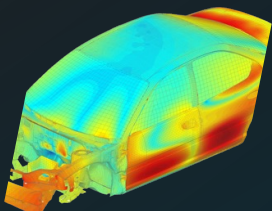
Building the leading technology portfolio for smarter manufacturing





# Business Units of Hexagon MI

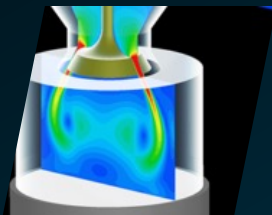
- **SIMULATION** (multi-physics: MSC Software



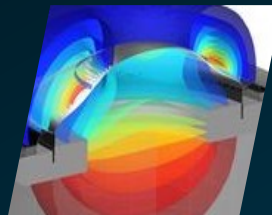
Structural analysis  
(Nastran)



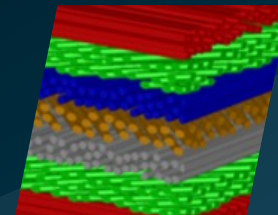
Multibody  
dynamics (Adams)



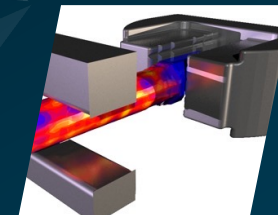
Thermal & fluidic  
dynamics



Acoustic



Materials Modelling

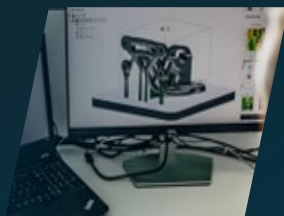


Process simulation  
Forming, welding,  
3D printing

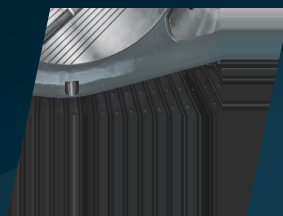
- **CFAO**



FAO (Alphacam)



3D printing



Molds & dies design



Sheet metal fabrication

And many other simulation / CFAO softwares !

- **METROLOGY**



Dimensional analysis



Metrology assisted  
manufacturing



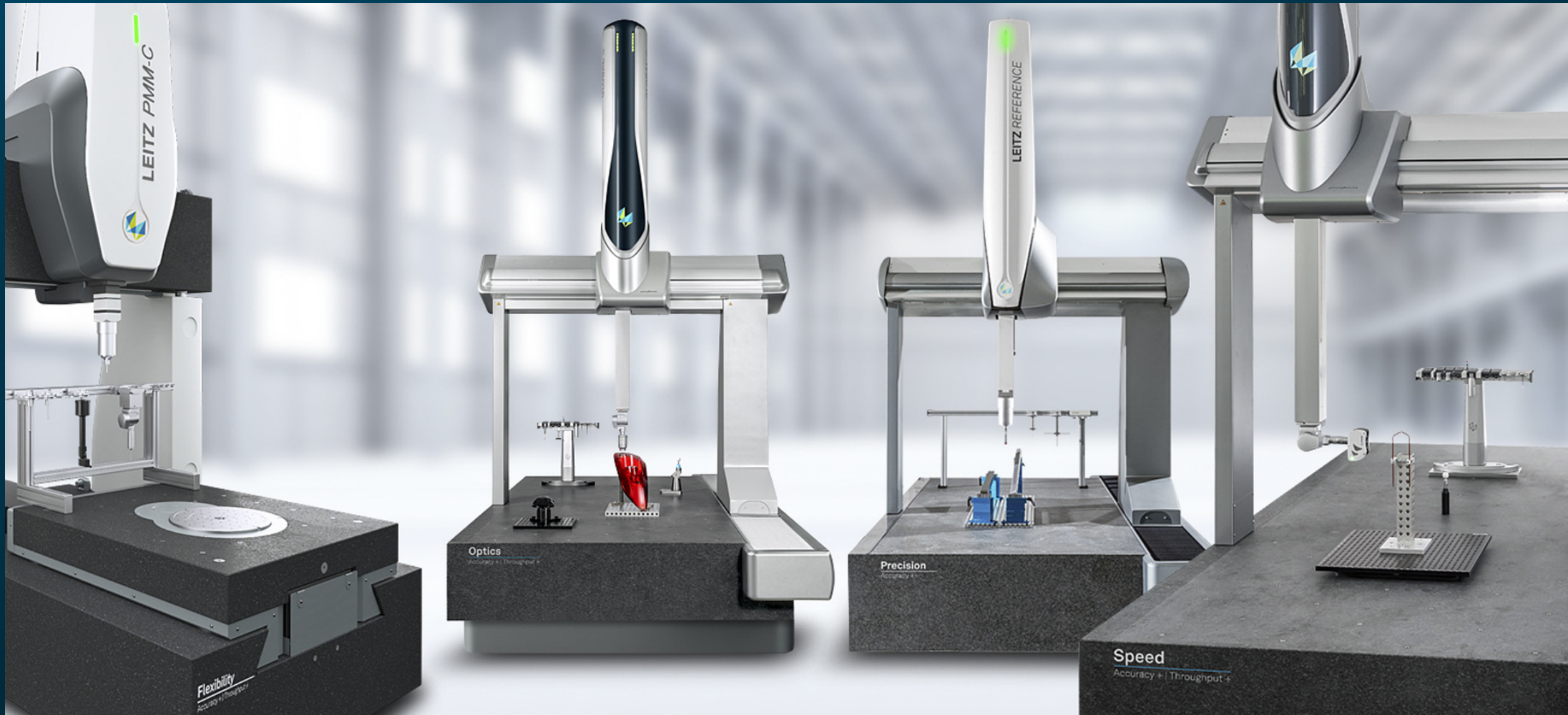
Robot and machine  
calibration



Industrial theodolite

# Hexagon Renens

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





# Hexagon CMM sensors Portfolio

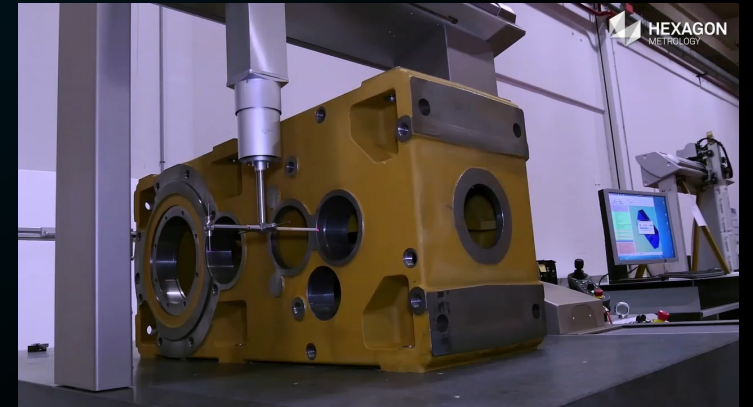
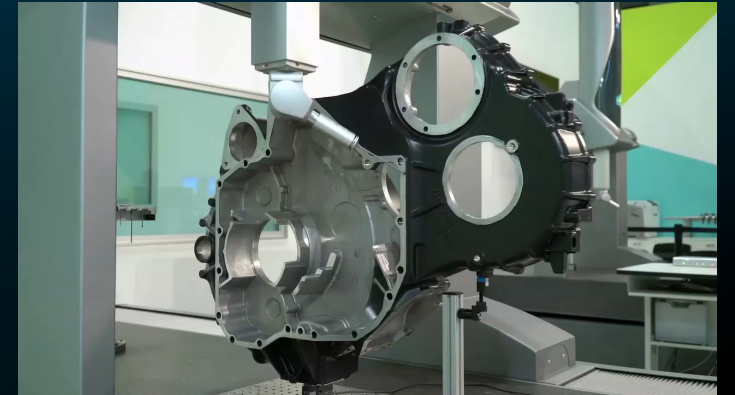
## INDEXABLE PROBE HEAD



## TOUCH TRIGGER

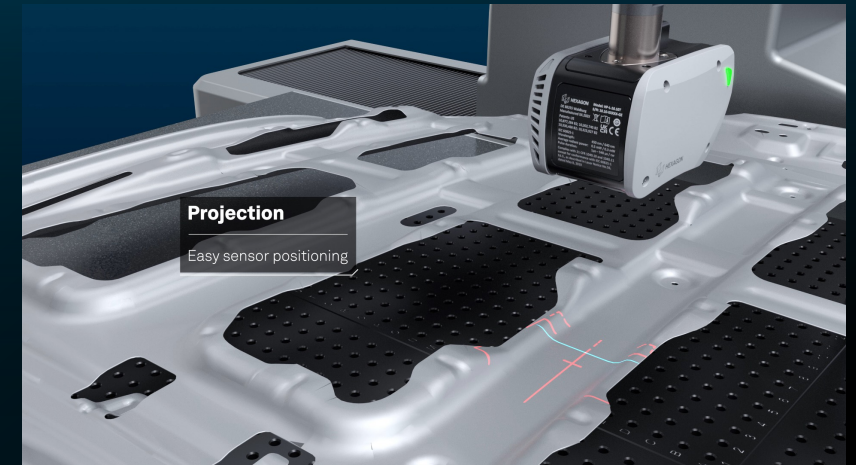
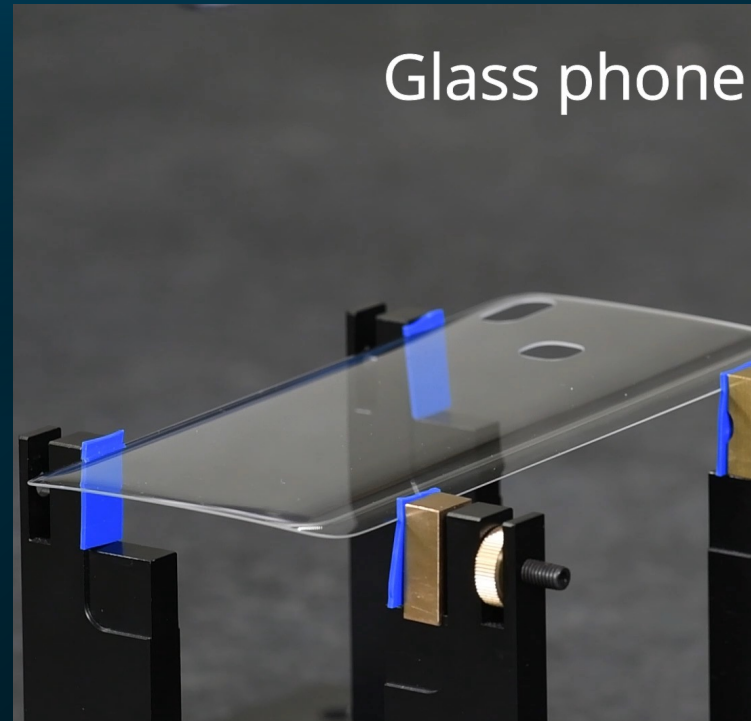
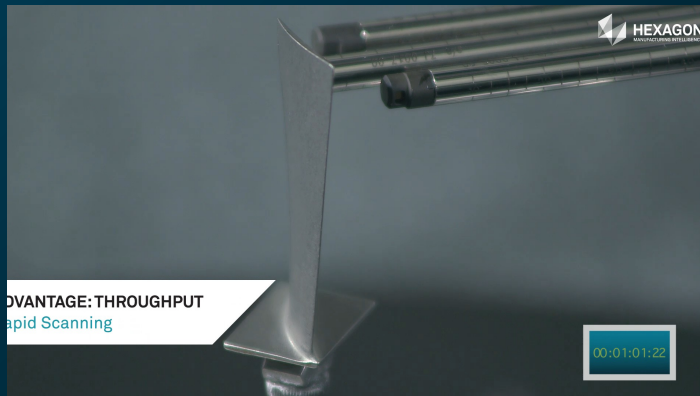


## SCANNING



# Hexagon CMM sensors Portfolio

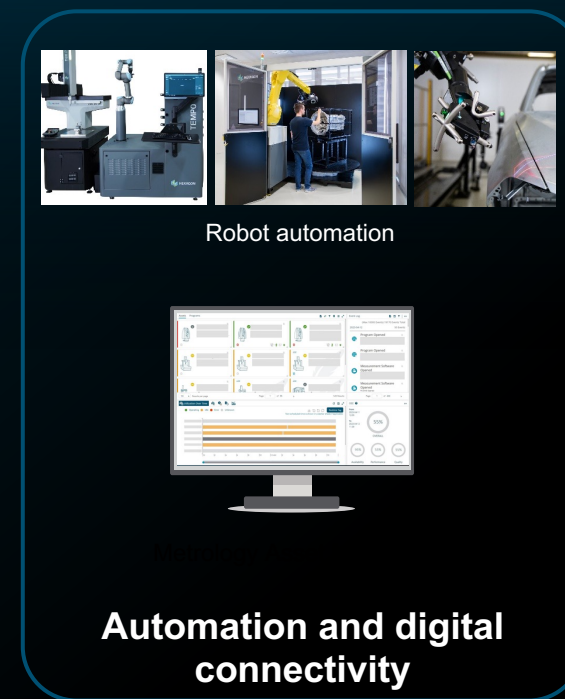
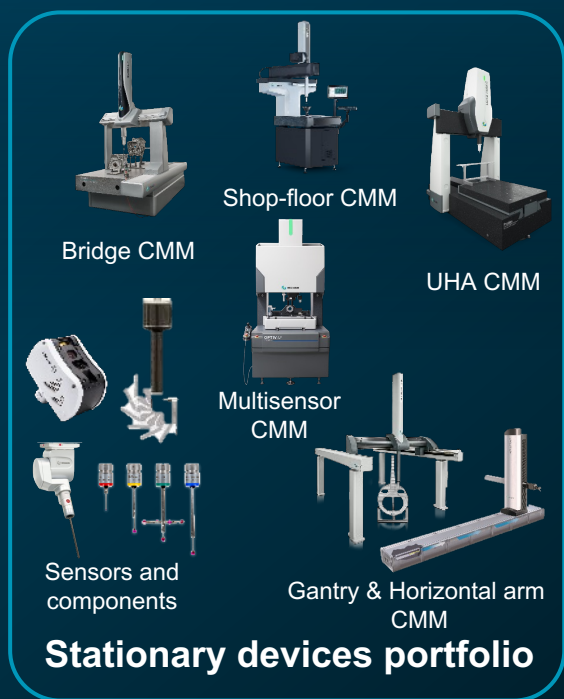
## NON-CONTACT





# 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



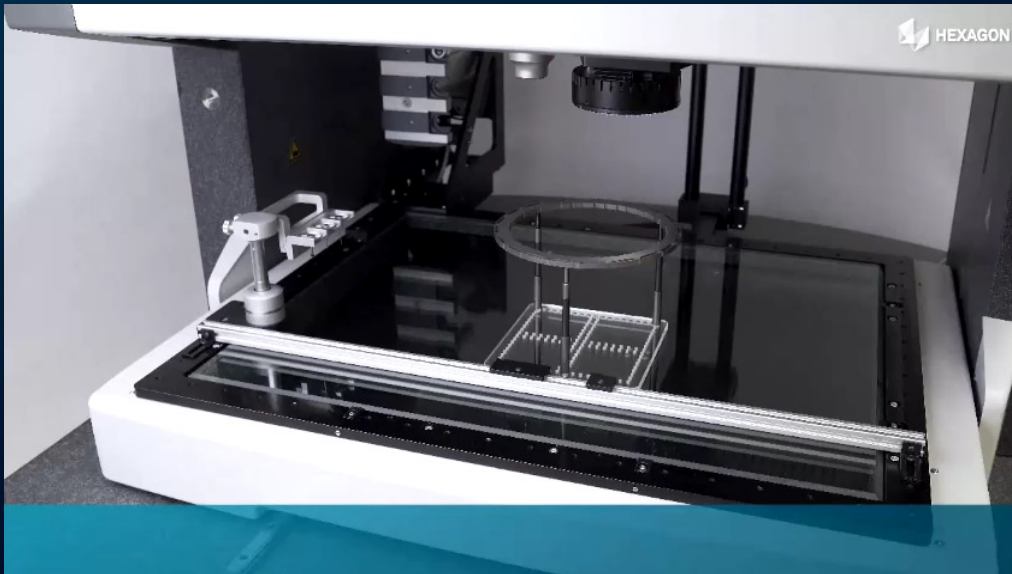
Bridge CMM



Shop-floor CMM



Gantry CMM



Multi-sensors CMM



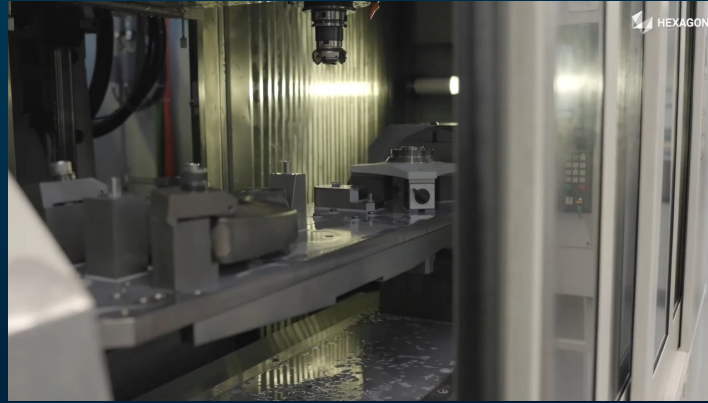
Horizontal arm CMM



# Portable devices



Structured light scanner



Portable measuring arm



Portable measuring arm



Portable measuring arm

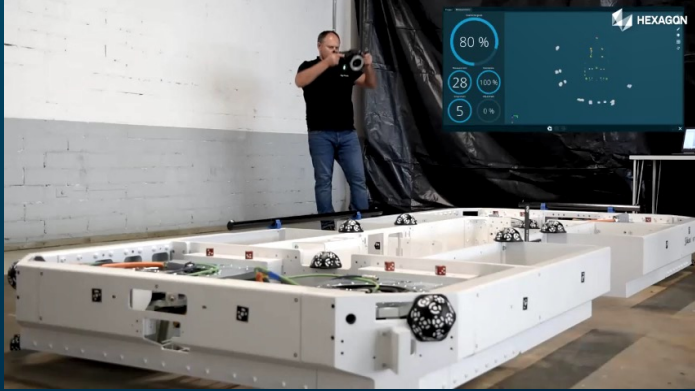


Laser tracker



Laser tracker

# Portable devices



Photogrammetry



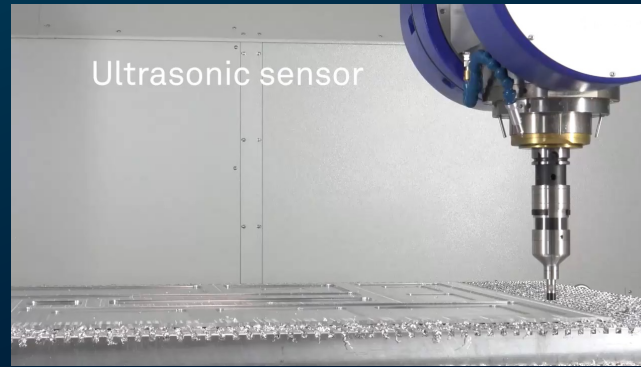
2D laser profiler



# Machine tool measurement



Probing system



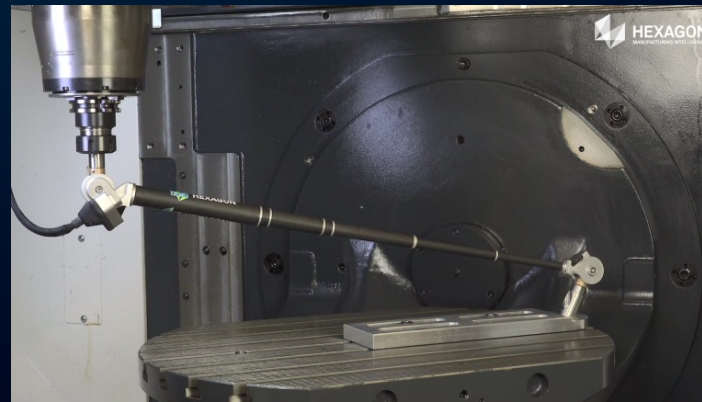
Ultrasonic probes



Laser scanner probes



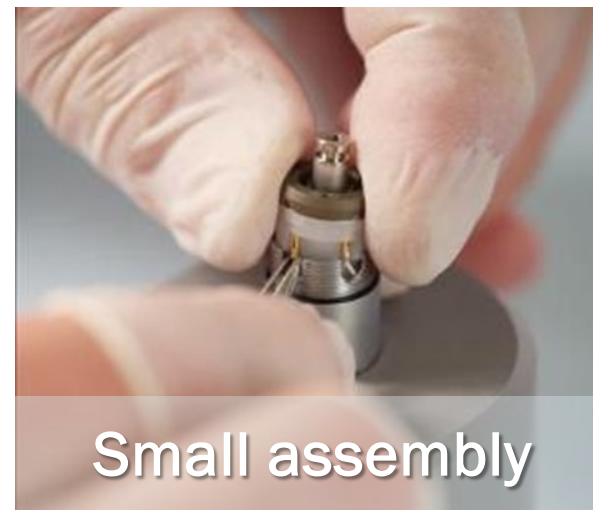
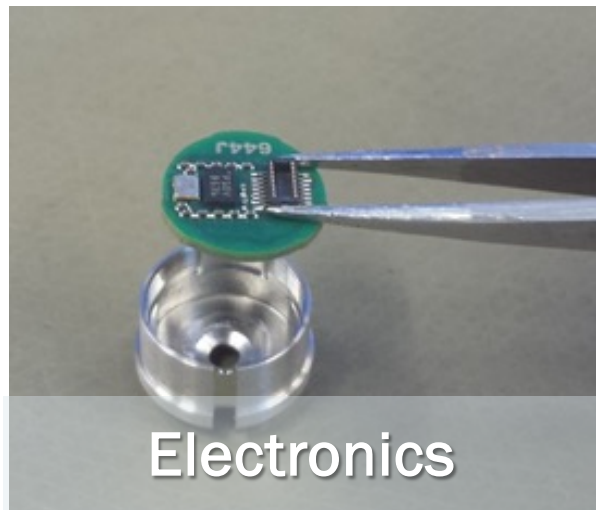
Machine calibration (Lasertracer)



Machine calibration (Laserbar)

# Manufacturing & Quality

## Micro-Assembly



**HEXAGON**  
MANUFACTURING INTELLIGENCE

