

Presented by



# AGENDA



Who are we?

Our expertise

Our certifications

Our packaged offers

Our customers

Our state-of-the-art  
equipment

Examples of subcontracting

# WHO ARE WE ?



- Materials Analysis, Engineering and Expertise Laboratory
- **15 years** of industrial **experience**
- Team on a human scale
- **16 Pieces of Equipment** – 43 Analysis Packs
- **Based in Normandy**
- One of the 3 entities of the Dynamic Test Center, CED managed by Normand'Innov

My Knowledge, my Experience, my Expertise...  
**To support you in operational and technical functions or projects**

**Products / Processes / Development / Innovation**  
**Sheet and Wire Forming Metals Industry**  
*Cutting, Bending, Stamping, Tooling, Forming*  
*Raw Materials, Tool Steels, Heat & Surface Treatments*

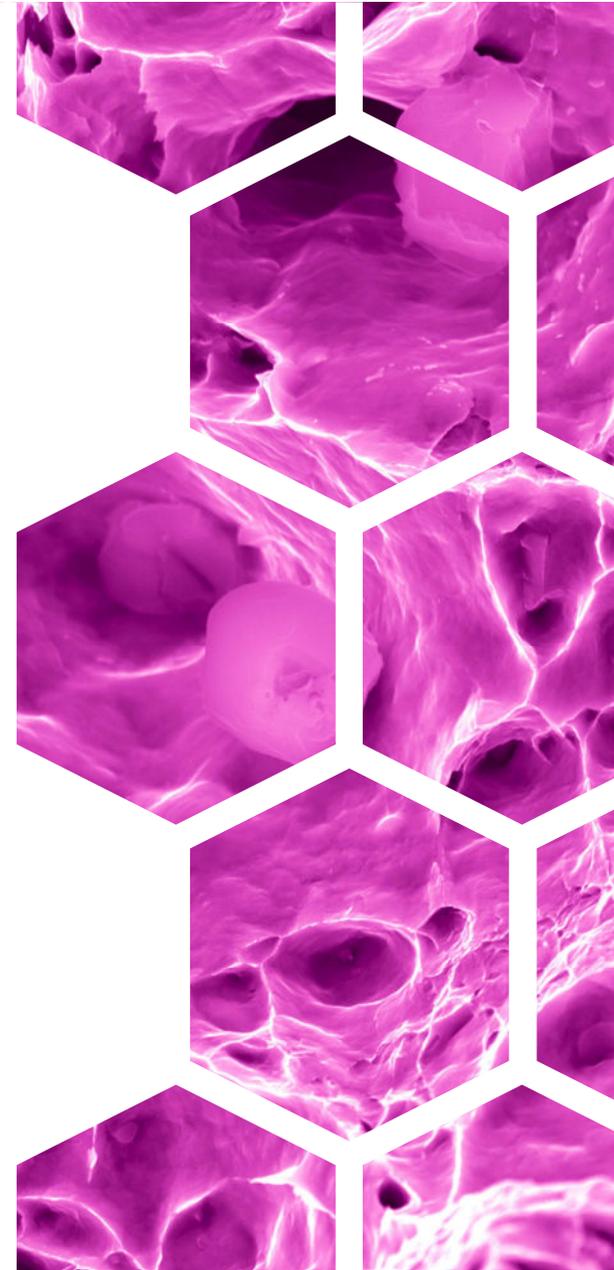
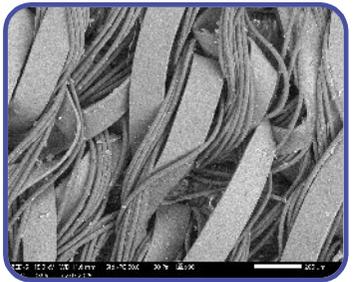
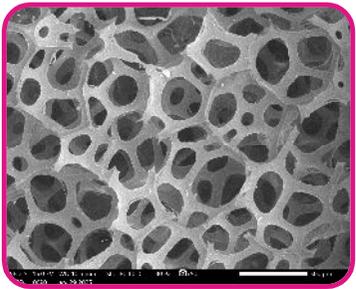
**Business Partner and key contact person for Lab**



- 1 Doctor of **Metallurgy** (Materials Specialist): Margaux Marnier
- 1 Doctor in **Tribology** (Scientific Expert): Eymard Houara Komba
- 1 Senior Expert in **Heat Treatments**: Aurélie Achille

# OUR EXPERTISE

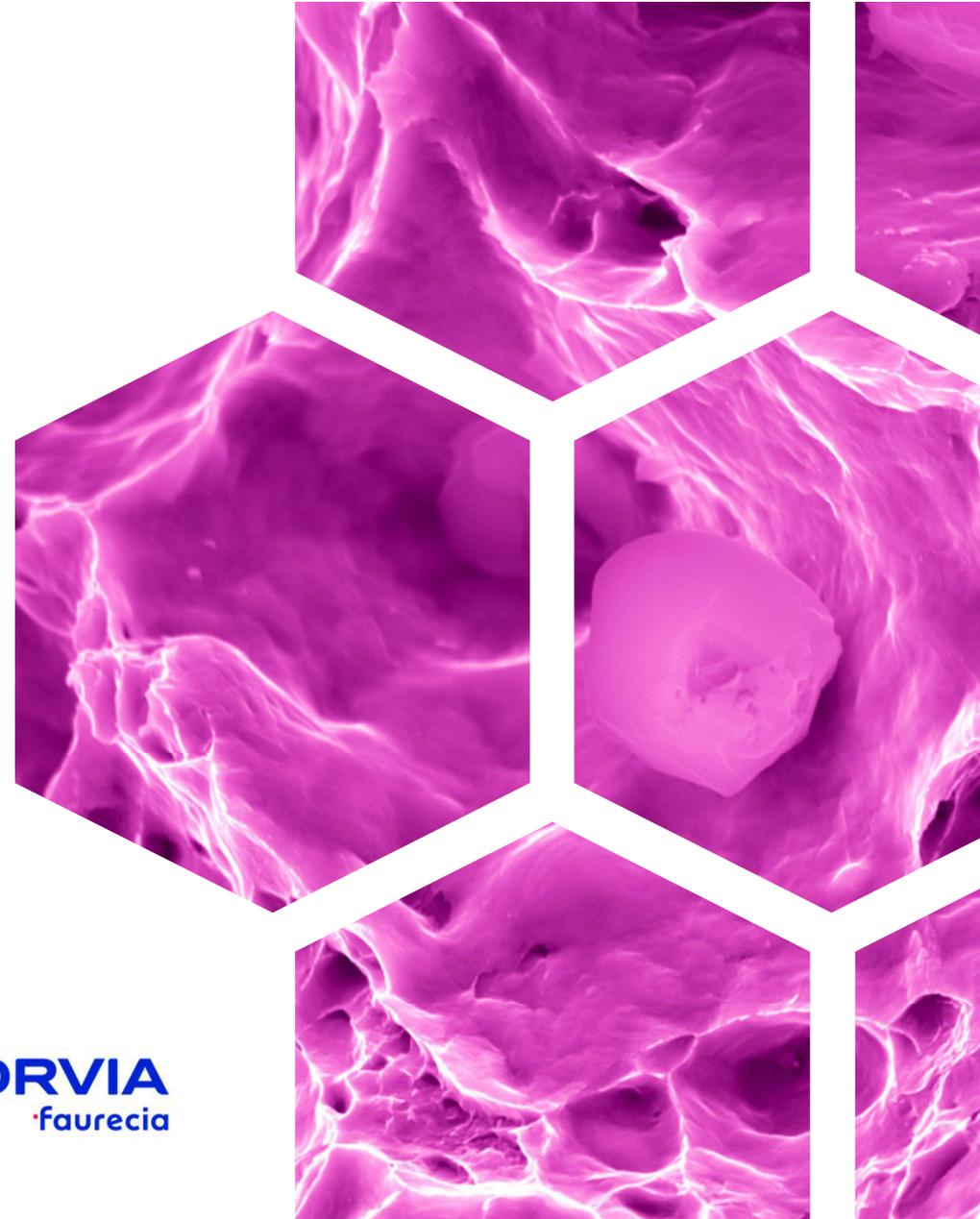
- **Compliance analyses, characterization and in-depth analyses** based on our pillars of expertise
- Technical expertise in classic **failure**, on tooling elements or after wear and tear in friction
- **Engineering solutions:** Bibliographic synthesis, tribological characterizations and optimization
- **Technical training** focused on the practical training of your teams for greater autonomy and interpretation of results
- Additional services: **consulting, R&D, change management** in collective intelligence, writing summary reports or articles for technical journals



# OUR CERTIFICATIONS

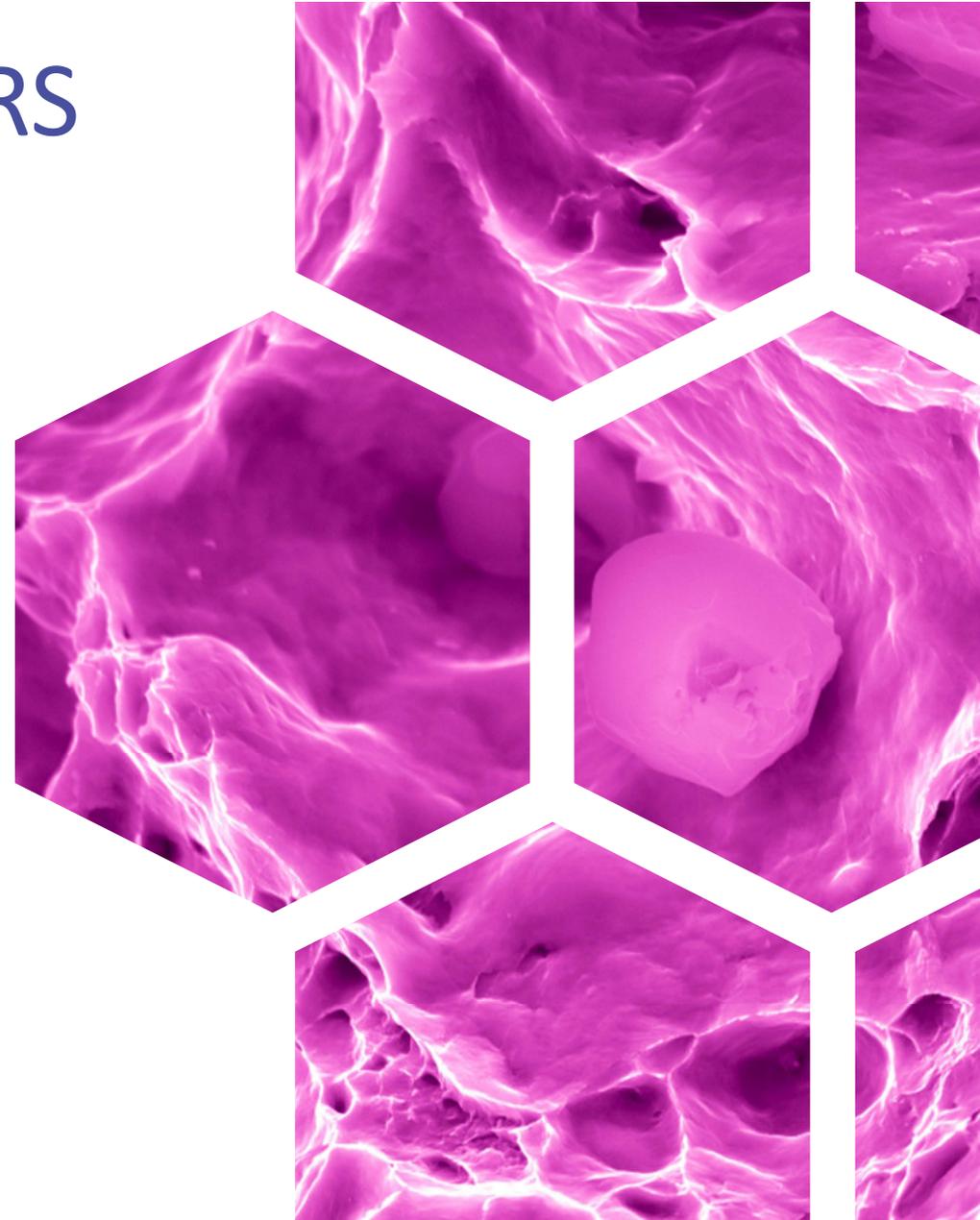


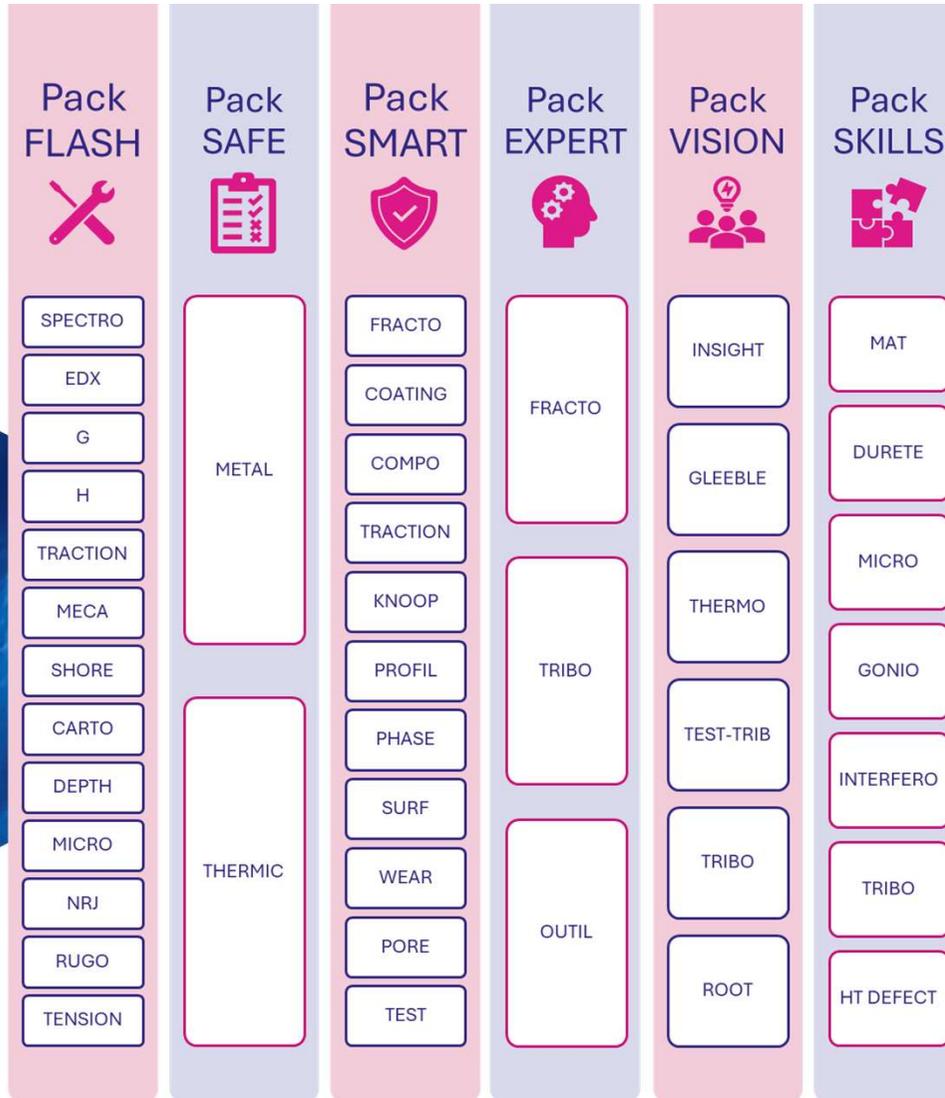
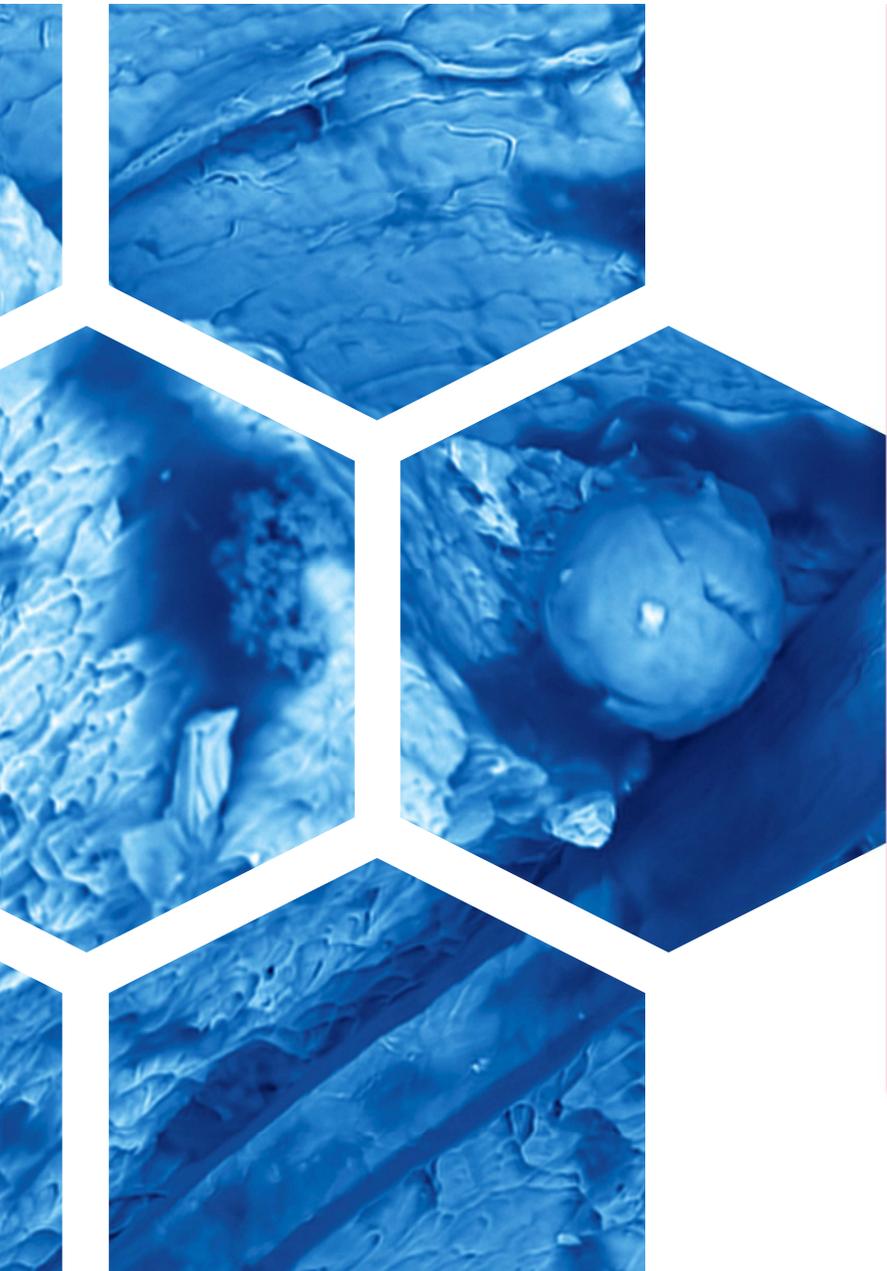
- **ISO 9001 via IATF 16949**
- **Qualiopi via the Galilee Circle**
- **ISO 14001 / 45001 OHSAS 18001 via Forvia**
- **Inter-laboratory tests via a Cofrac-certified laboratory in inter-laboratory comparisons**
  - HRC/HV macrohardness (class 1)
  - Tensile tests (class 1 on the mean of Rm and Rp0.2, class 2: A%)
  - Spectrometry (class 1: B, Cu, C, Si for steels)
  - Grain size (Class 1)



# OUR PACKAGED OFFERS

- **FLASH:** fast standard analysis
- **SAFE:** full technical validation
- **SMART:** interpreted analysis
- **EXPERT:** multi-technical study
- **VISION:** R&D support
- **FREEDOM:** flexible hour credit
- **SKILLS:** practical training





The Freedom Pack offers you a credit of hours to be used freely.

All reports are available in French or in English without extra charge.



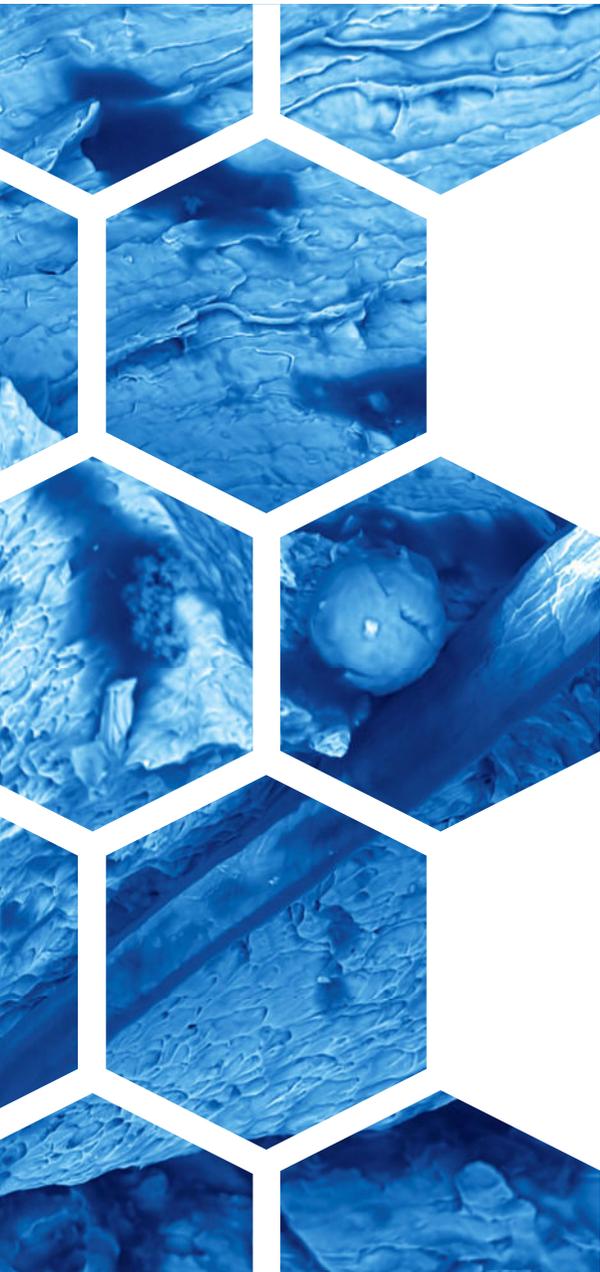
# OUR CUSTOMERS



And more.....

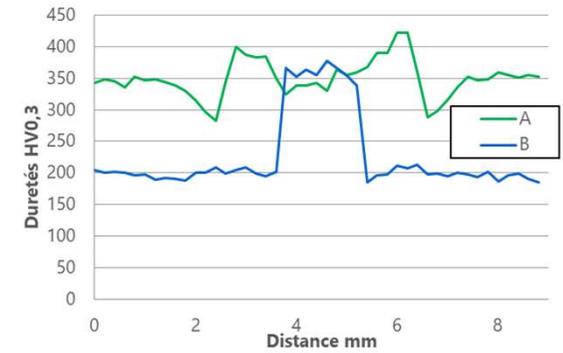
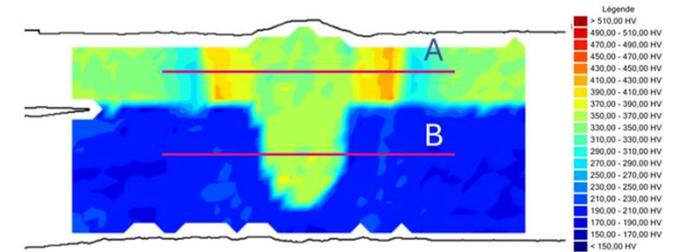
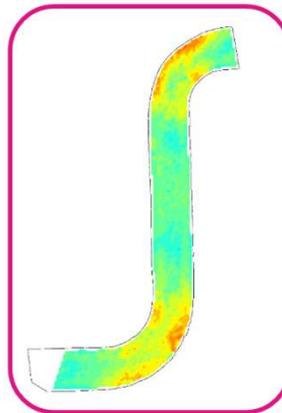
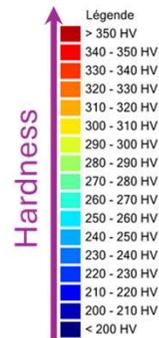
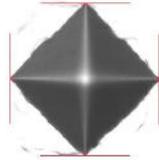
Next will be your company....!!!!





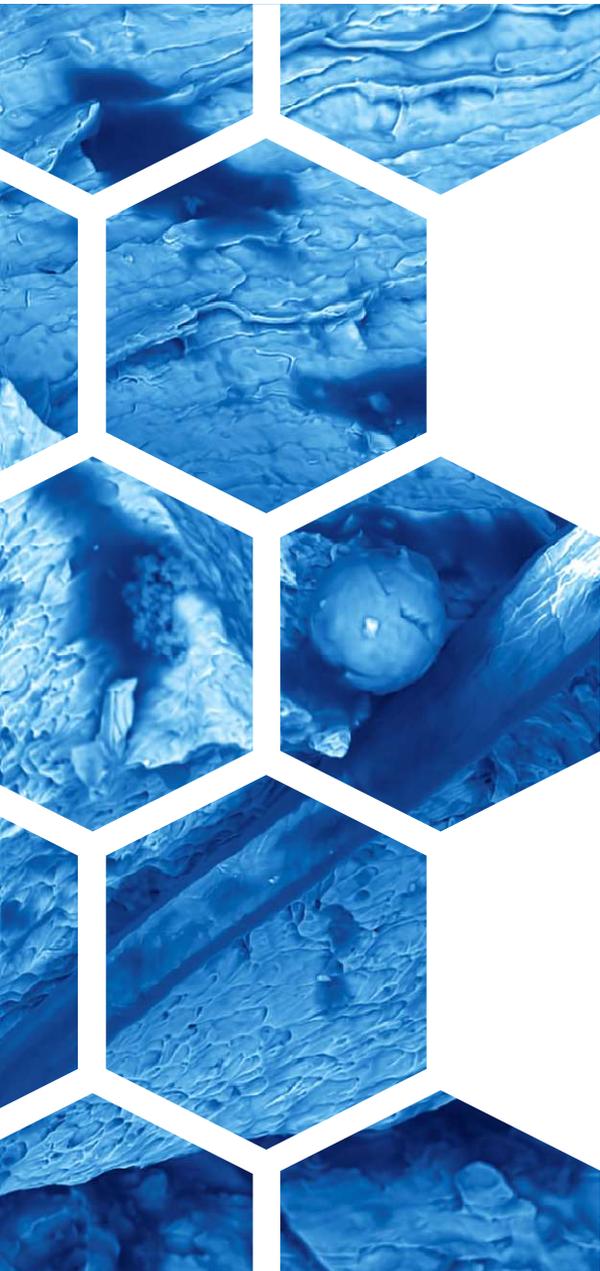
# OUR STATE-OF-THE-ART EQUIPMENT

Full-automatic microhardness testers



Hardness mappings  
after welding or  
forming

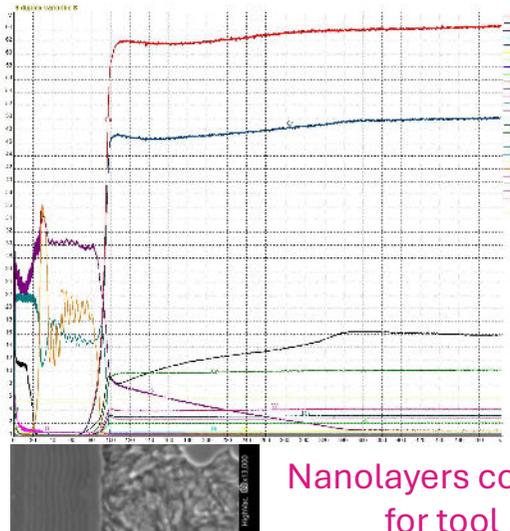




# OUR STATE-OF-THE-ART EQUIPMENT



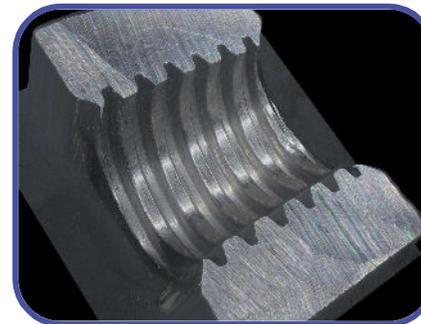
Glow Discharge Optical Emission Spectrometer



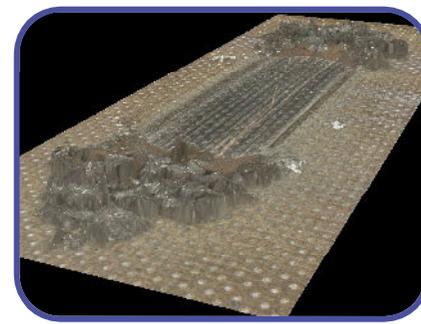
Nanolayers coating for tool



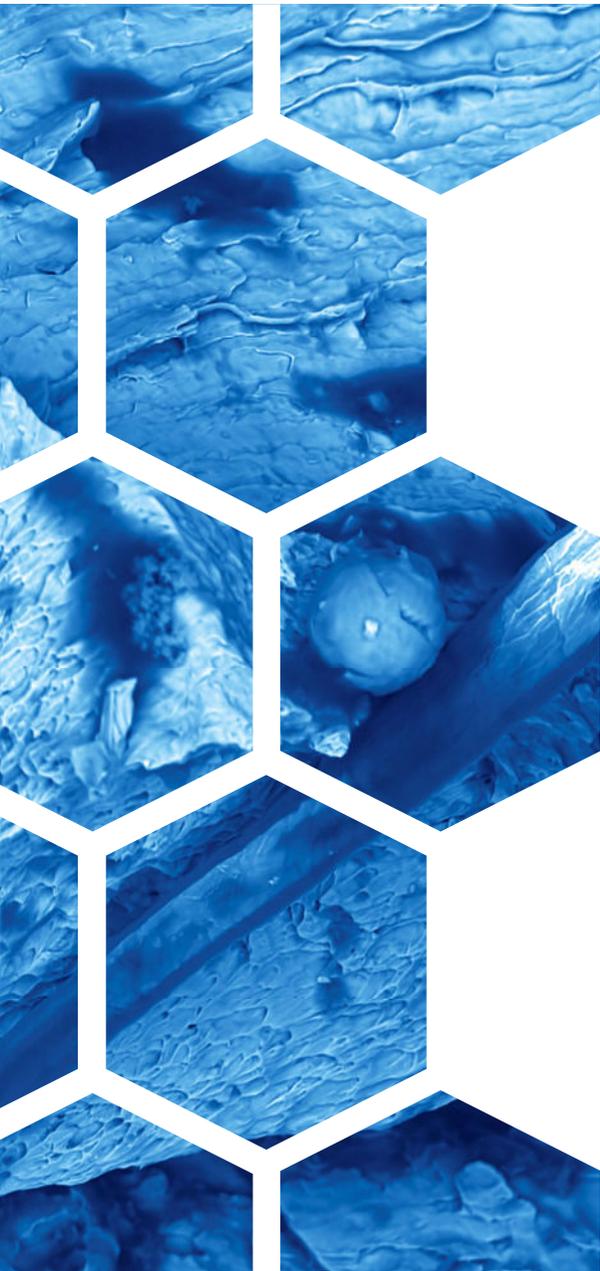
3D Microscope



Thread of nut



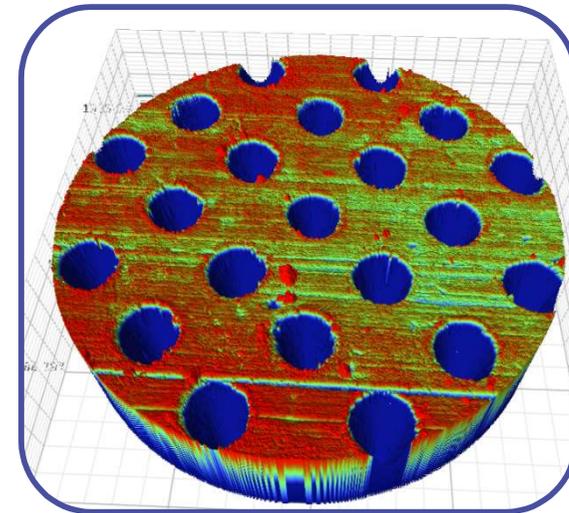
Wear marks



## OUR STATE-OF-THE-ART EQUIPMENT

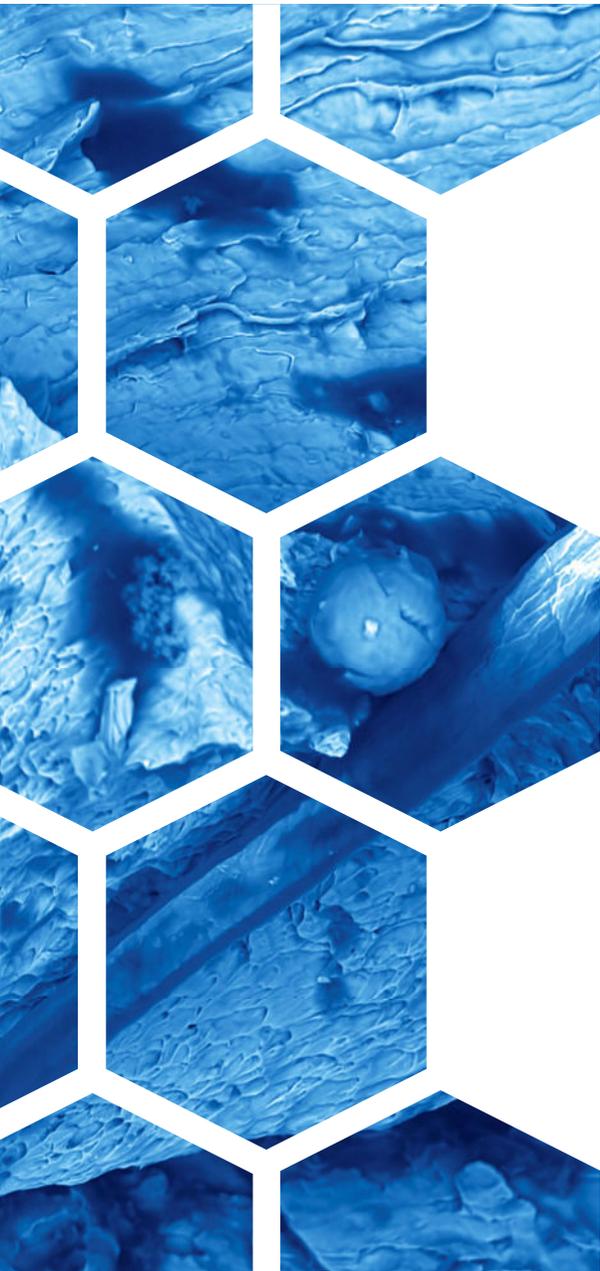


Optical Interferometer  
Micro & macro  
geometries

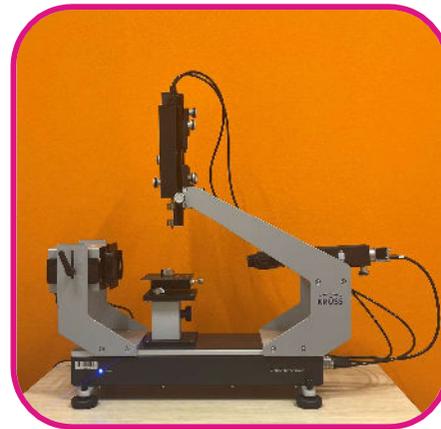


Example of surface  
texturing



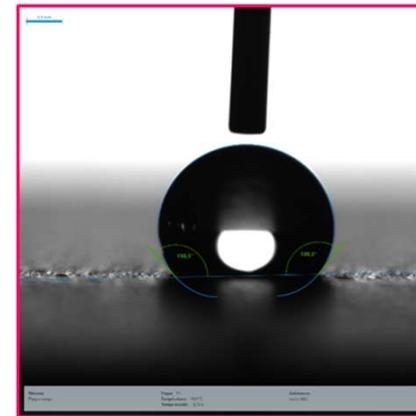


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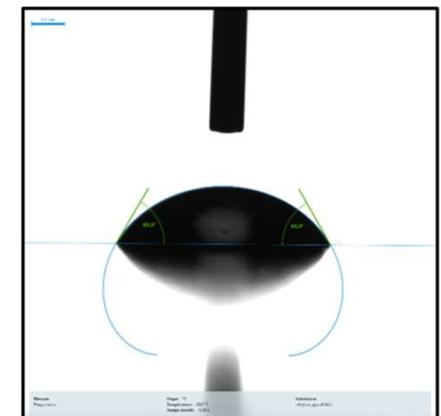


## Goniometer

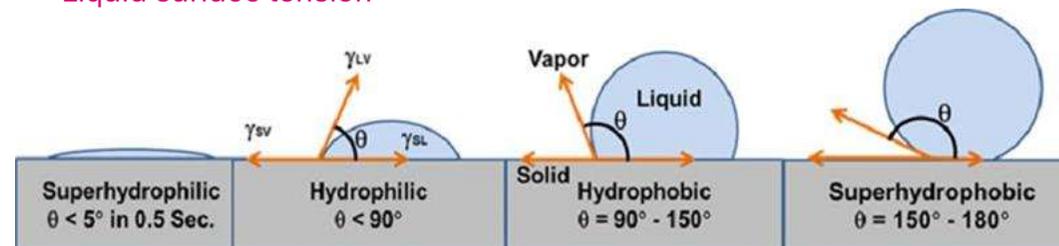
Solid surface energy  
Liquid surface tension

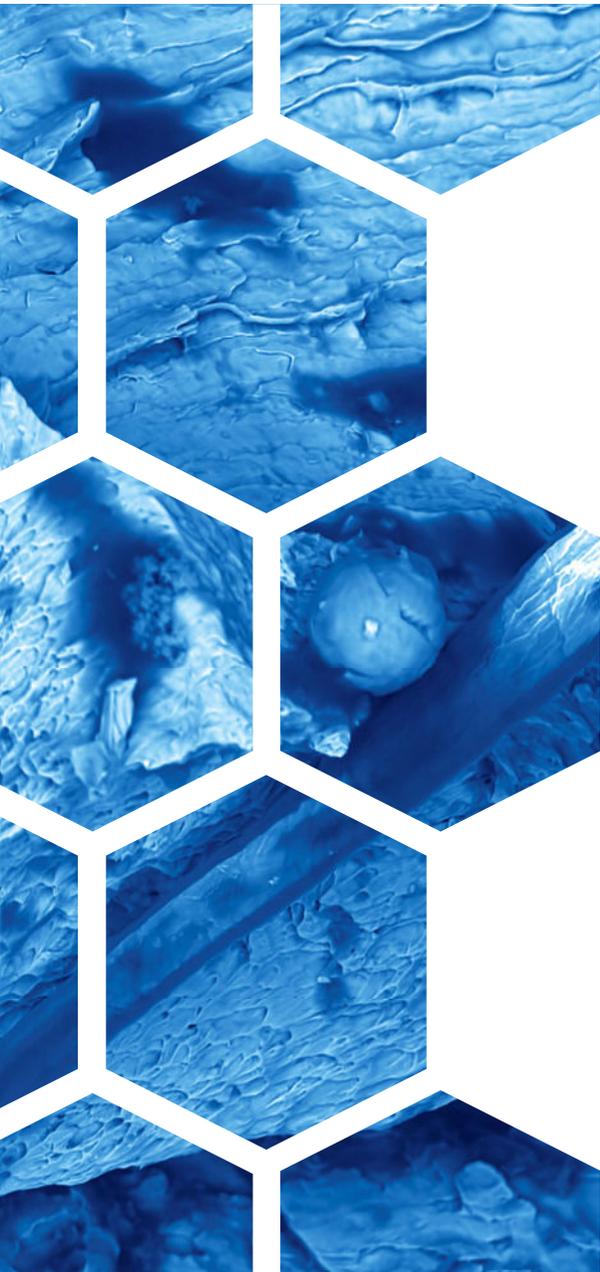


Hydrophobic surface



Hydrophilic surface

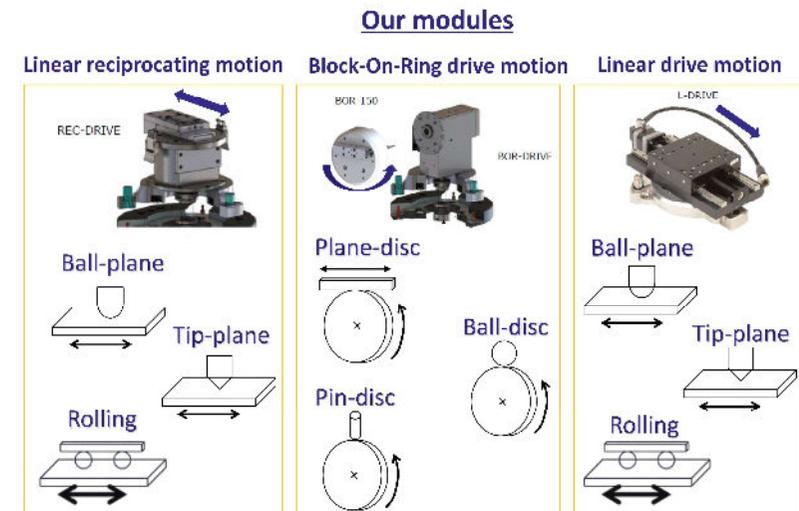
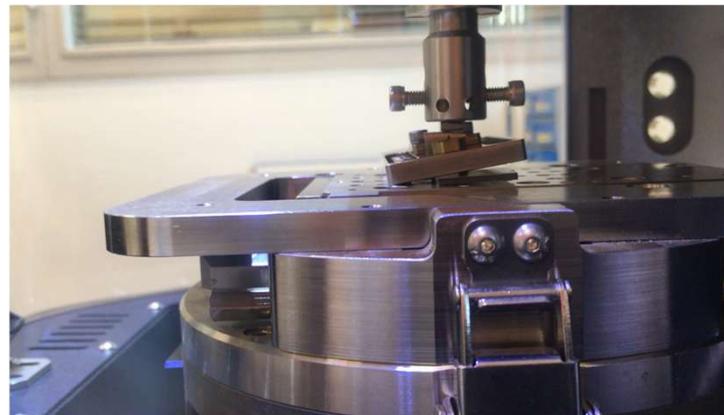




# OUR STATE-OF-THE-ART EQUIPMENT

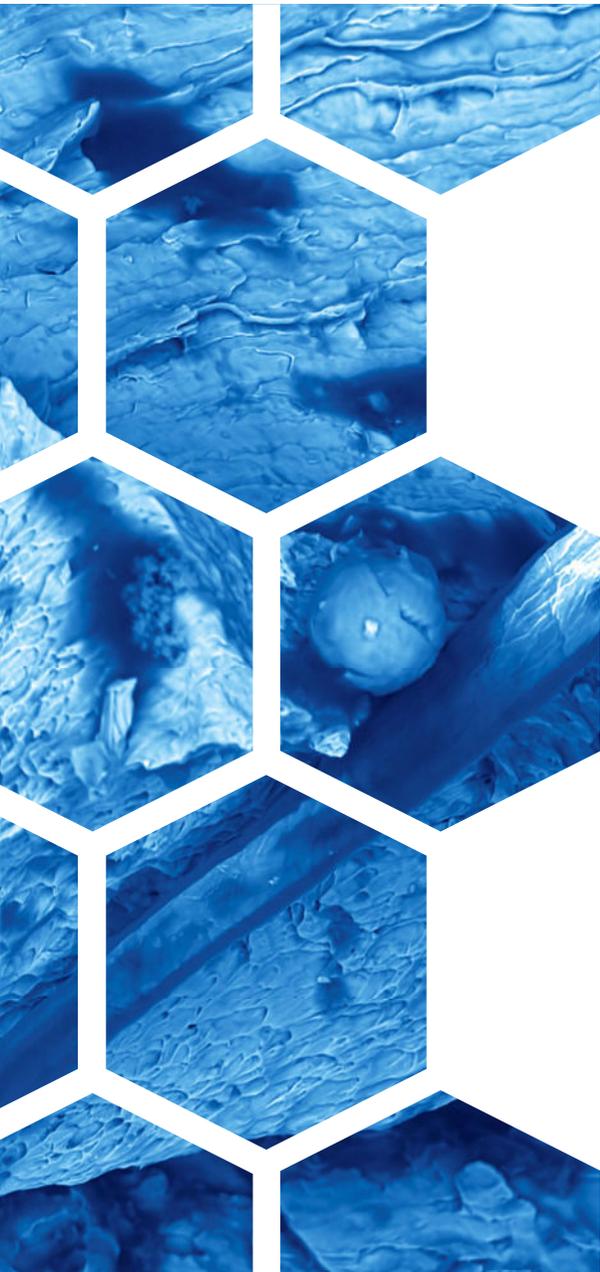


**Tribometer**  
Friction coefficient



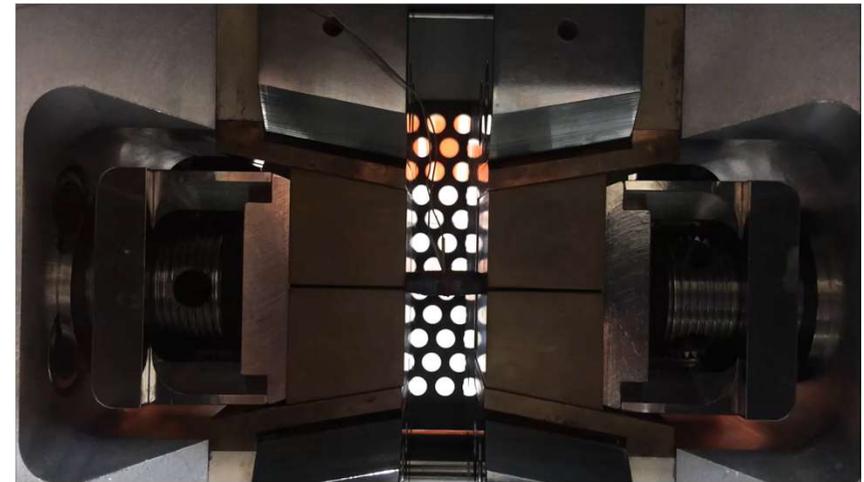
Example of a simplified representative tribological test





# OUR STATE-OF-THE-ART EQUIPMENT

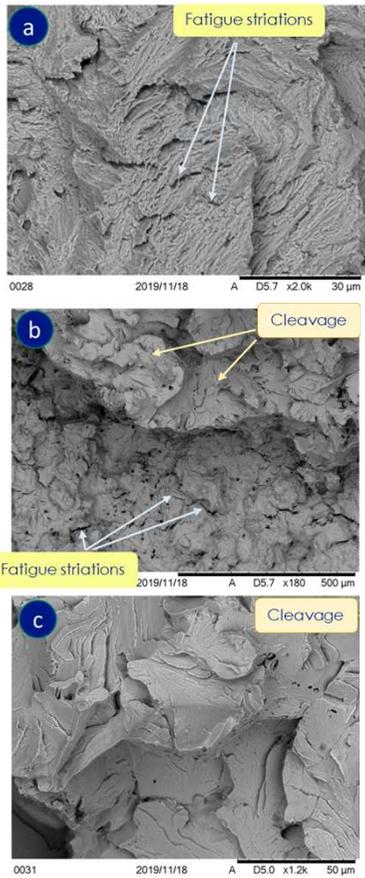
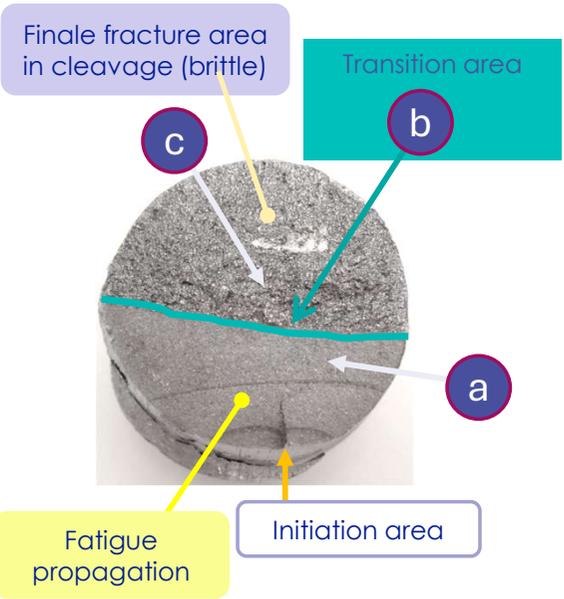
## Gleeble Thermo-Mechanical Simulator



# FOCUS ON FAILURE ANALYSIS



## Breakage of screw for tooling press

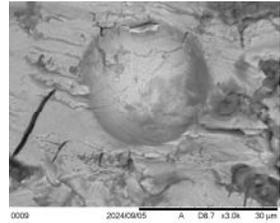
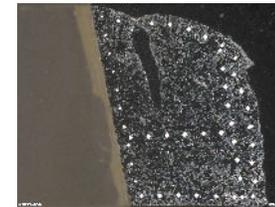
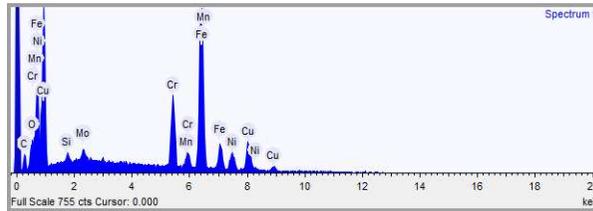
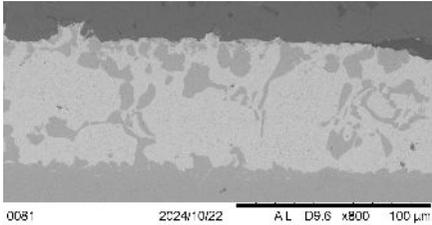
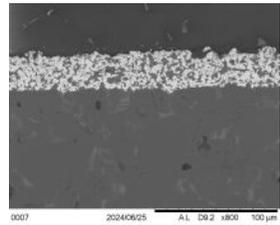


Scanning Electron Microscope + EDX

Initiation in fatigue due to noncompliance of class 8.8 + presence of machining striations



# Studies for the nuclear and aerospace fields



## Issue

- Support for R&D and innovation in the production of their thermal components

## Solution

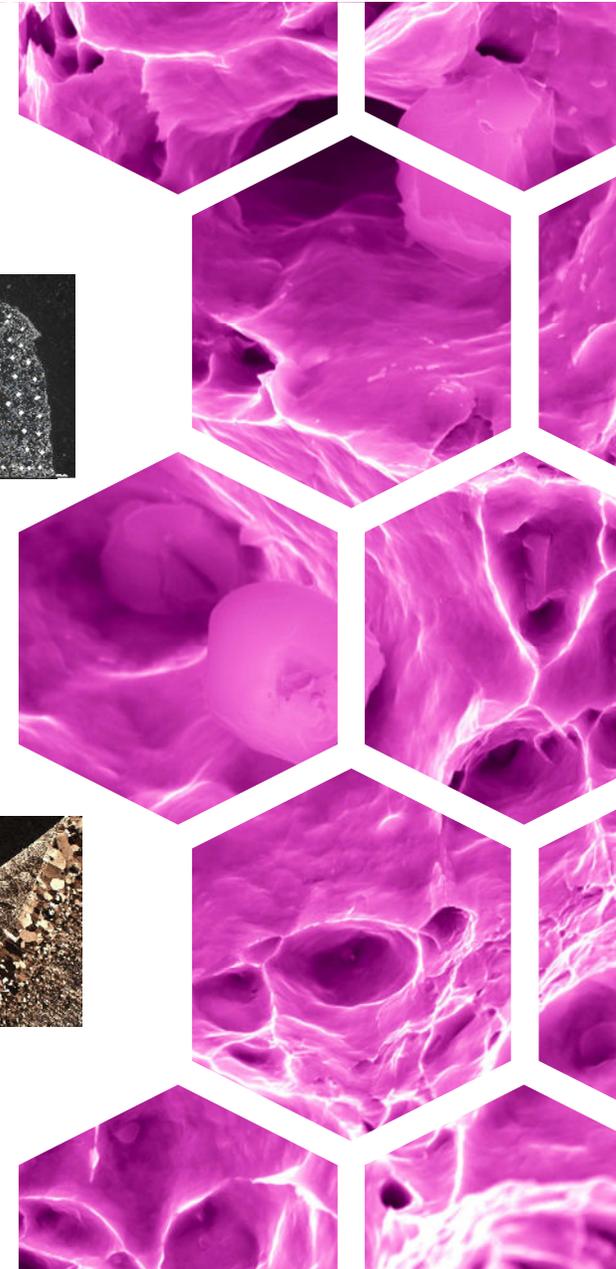
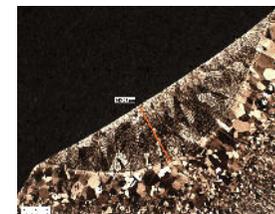
- Pack FREEDOM – 660h of analyses (tension, SEM, EDX, hardness...)

## Result

- Process and product validation

## Relationship

- Support over 3 years, regular exchanges with the R&D manager



# Study for the tableware and kitchen sector

## Issue

- Post-stamping compliance

## Solution

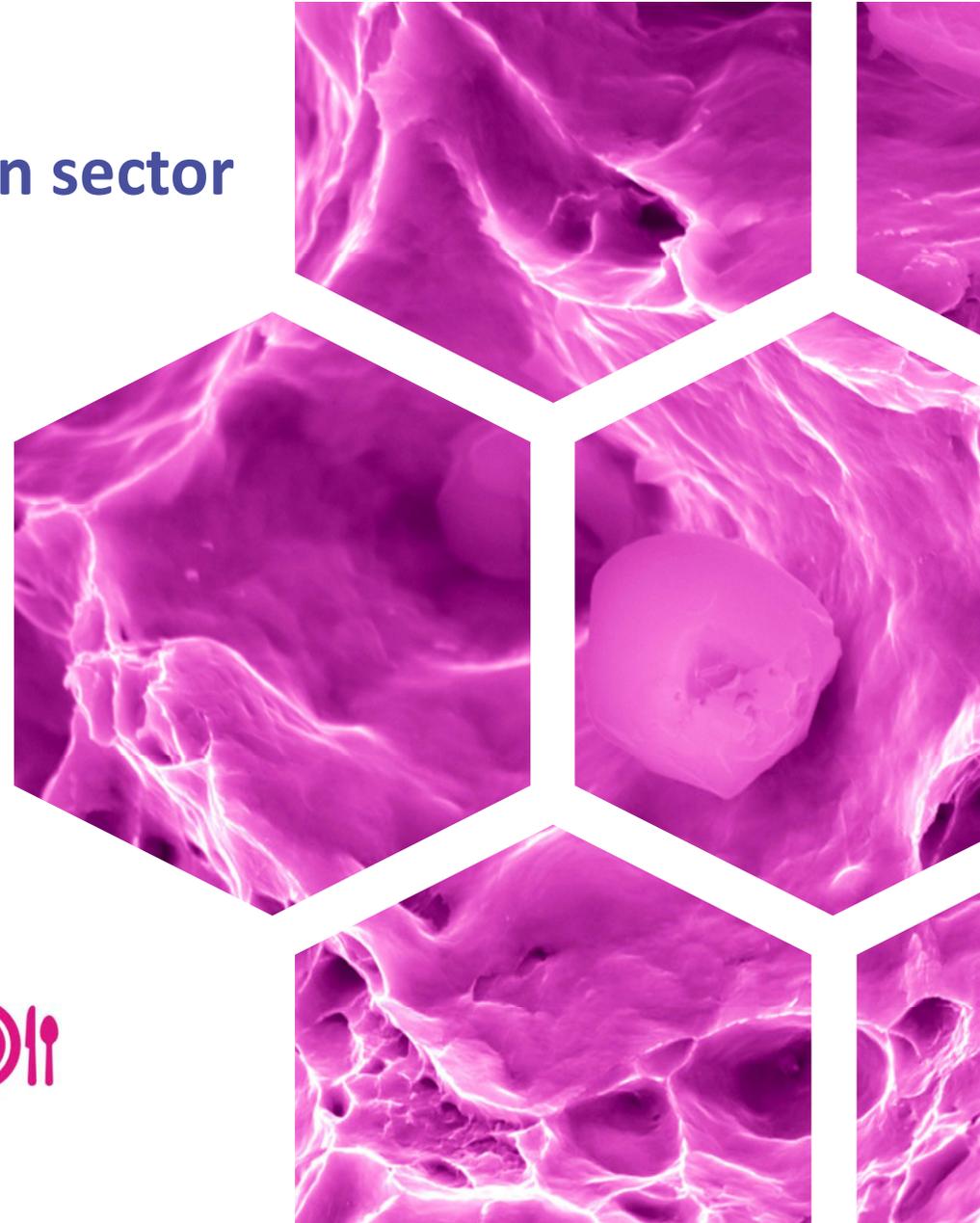
- FLASH H and G packages with short reports

## Results

- Product compliance

## Relationship

- Recurring collaboration, 10+ analyses carried out, quality people involved



# Study for an Industrial laboratory

## Issue

- Understanding a pipe failure

## Solution

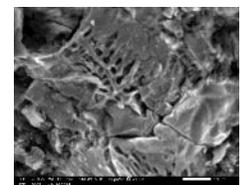
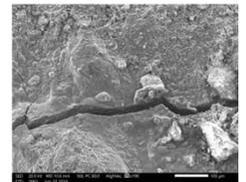
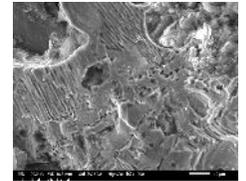
- EXPERT PACK, EXPERT FRACTO – failure analysis

## Result

- Identification of the root causes of the rupture and understanding of the phenomena

## Relationship

- Able to propose a broader offer to our customers

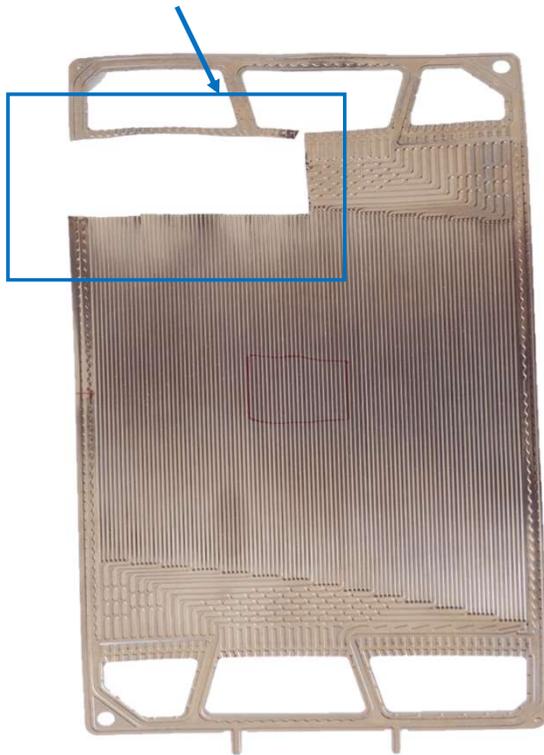


# Macroscopy for Bipolar activities or thin materials

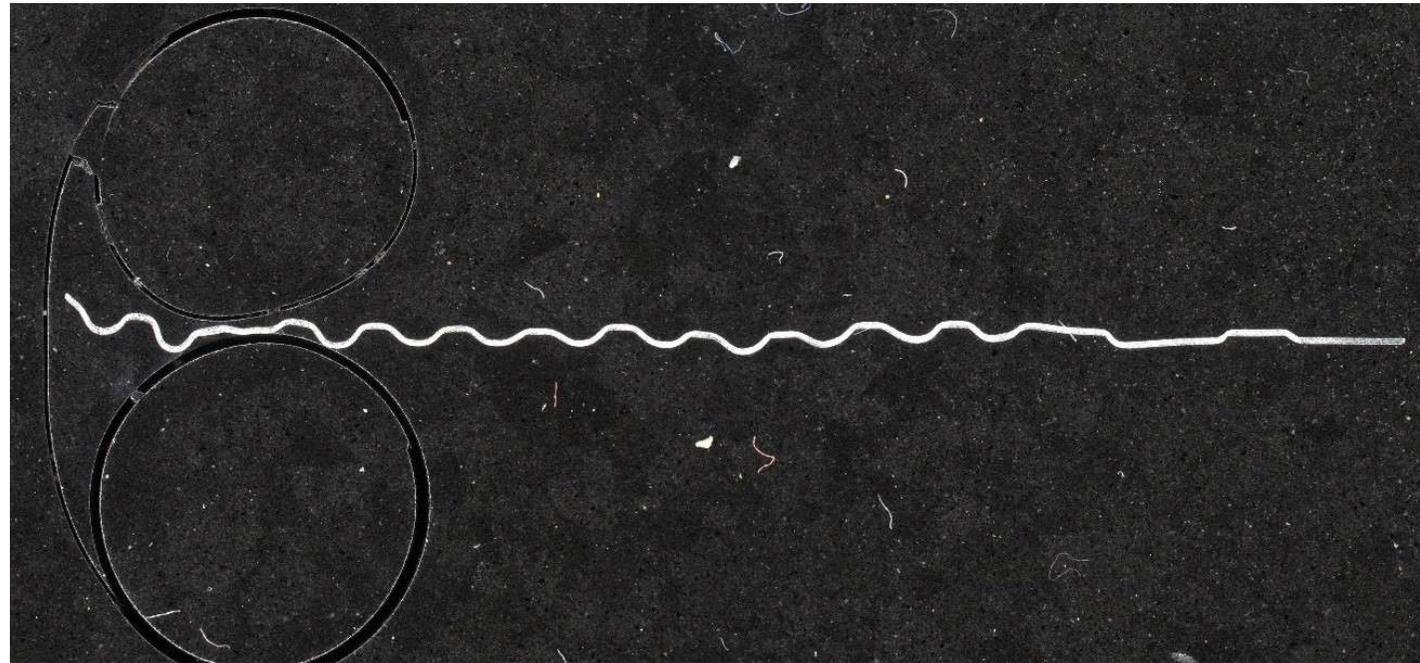


Done with **C3Technic**  
Claude Colasse Consultant

Tested area



Details of geometry Optical measurement





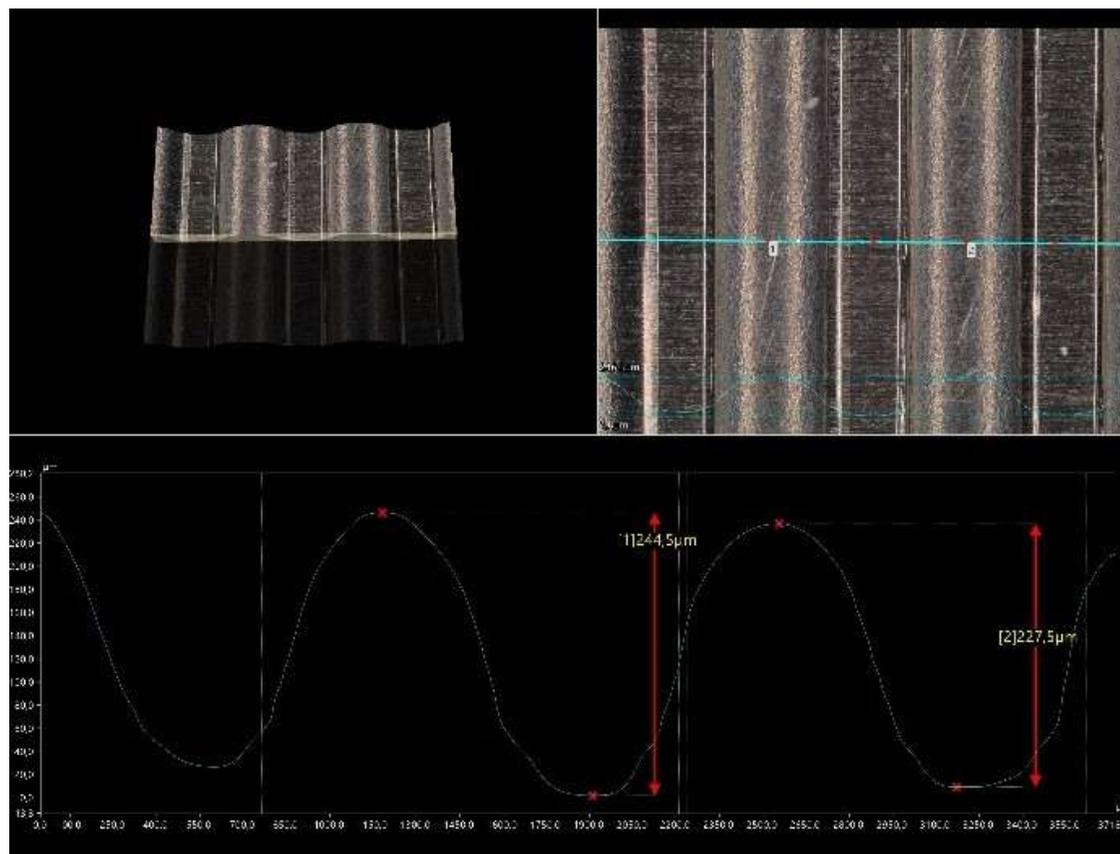
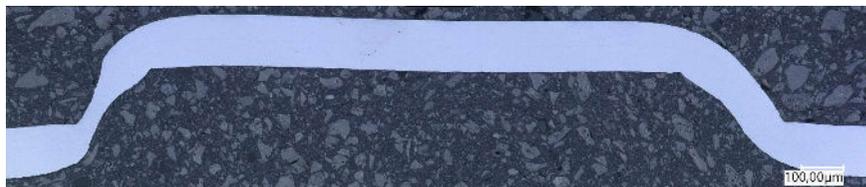
# 3D Microscope for Bipolar activities or thin materials



Done with **C3Technic**  
Claude Colasse Consultant

- Microscope observations

- cracks,...
- Dimensions
- thickness reduction,...
- depth / specific geometries





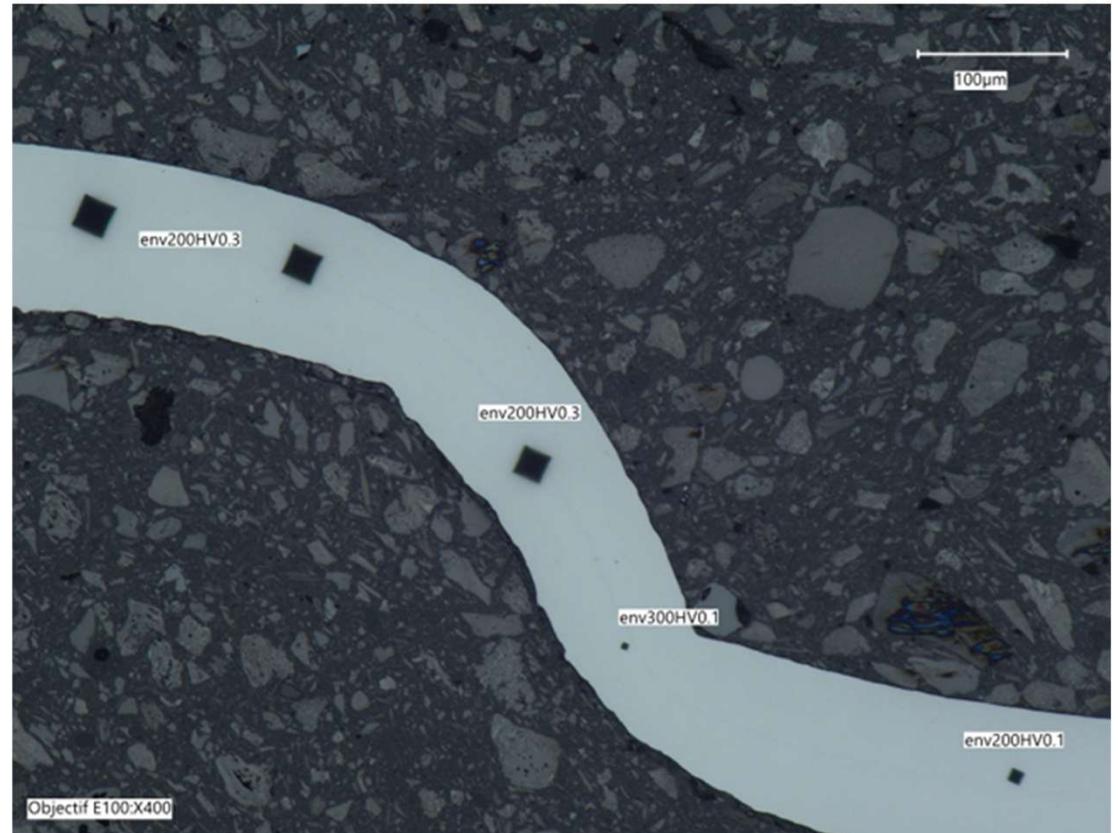
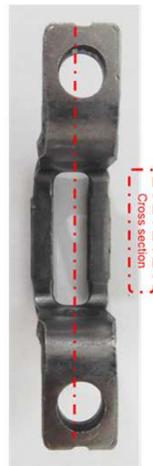
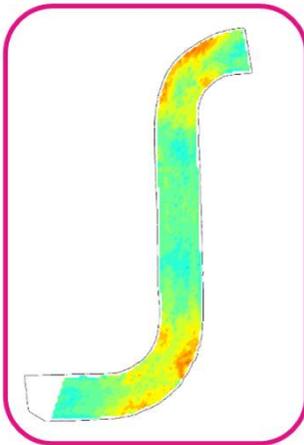
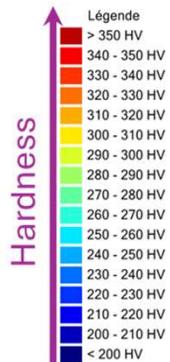
# Microhardness testers for Bipolar activities or thin materials

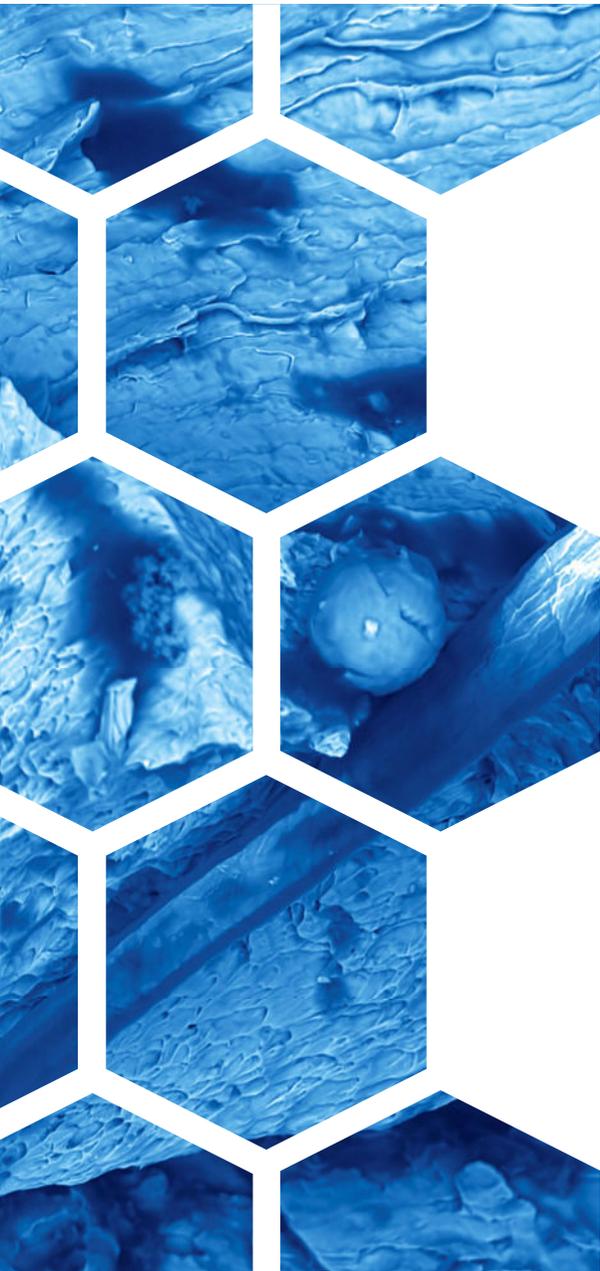


Done with

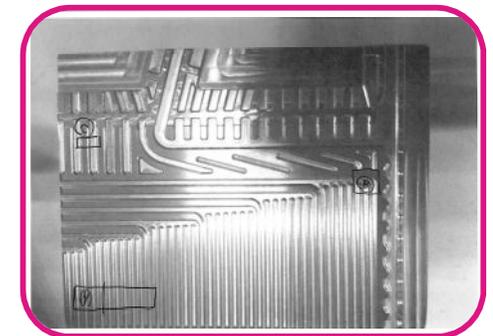
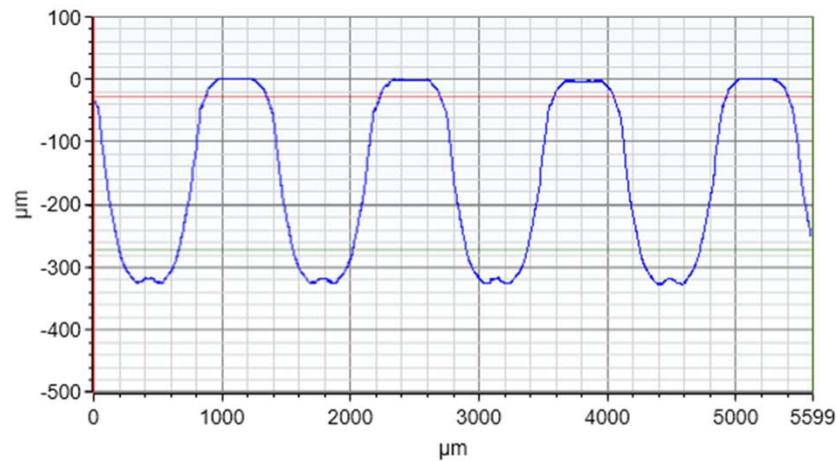
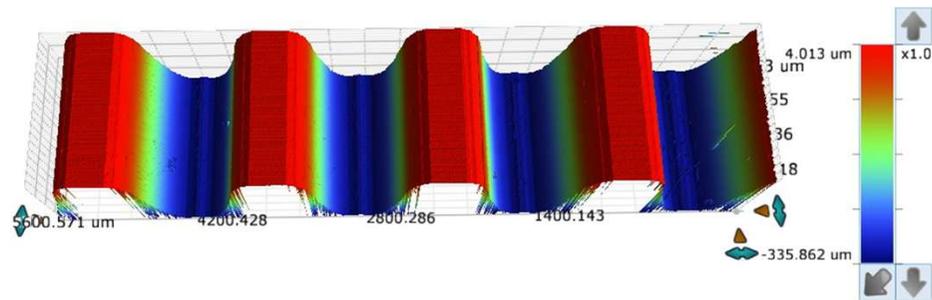


- Microhardness characterization
  - HV, Knoop...
  - Mappings



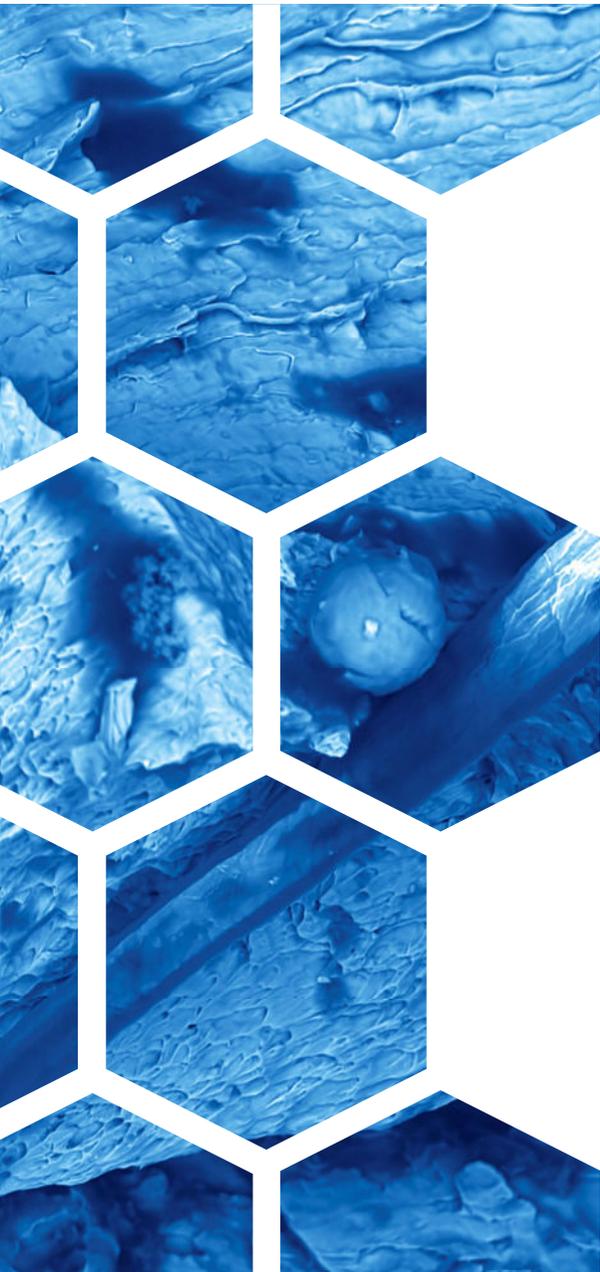


# Optical Interferometer for Bipolar activities or thin material

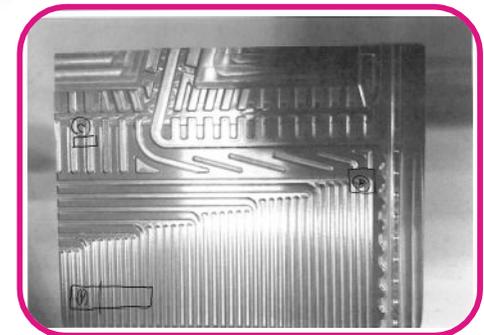
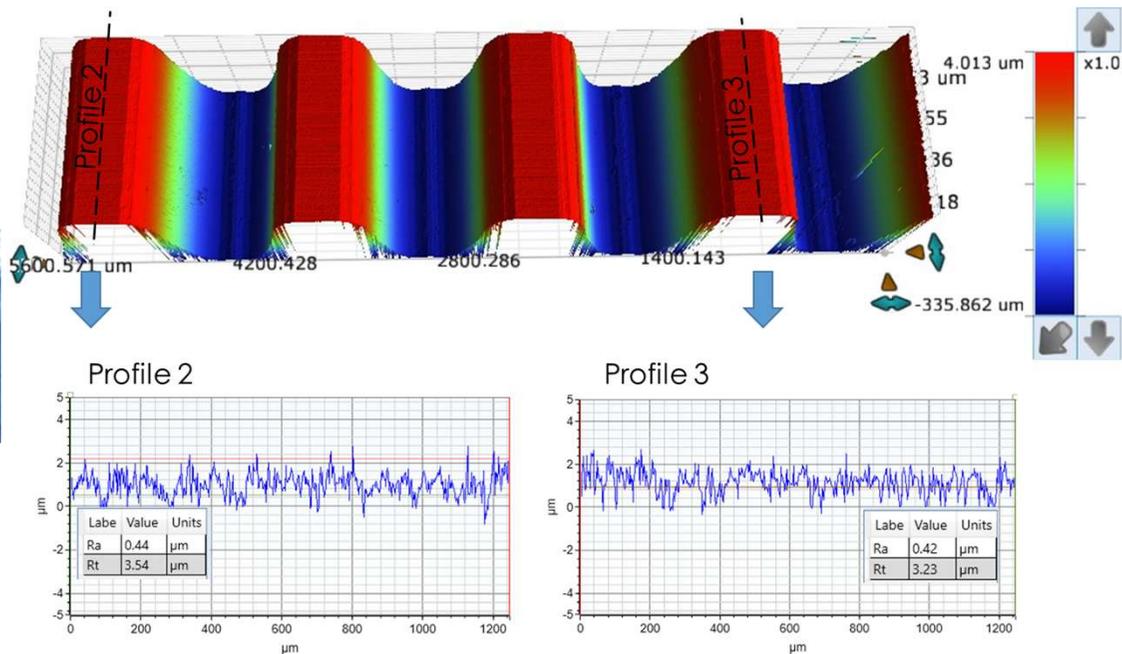


Micro & macro geometries  
characterization ( $\mu\text{m}$ )





# Optical Interferometer for Bipolar activities or thin material



Roughnesses measurements: Sa, Spk, Sz, ....

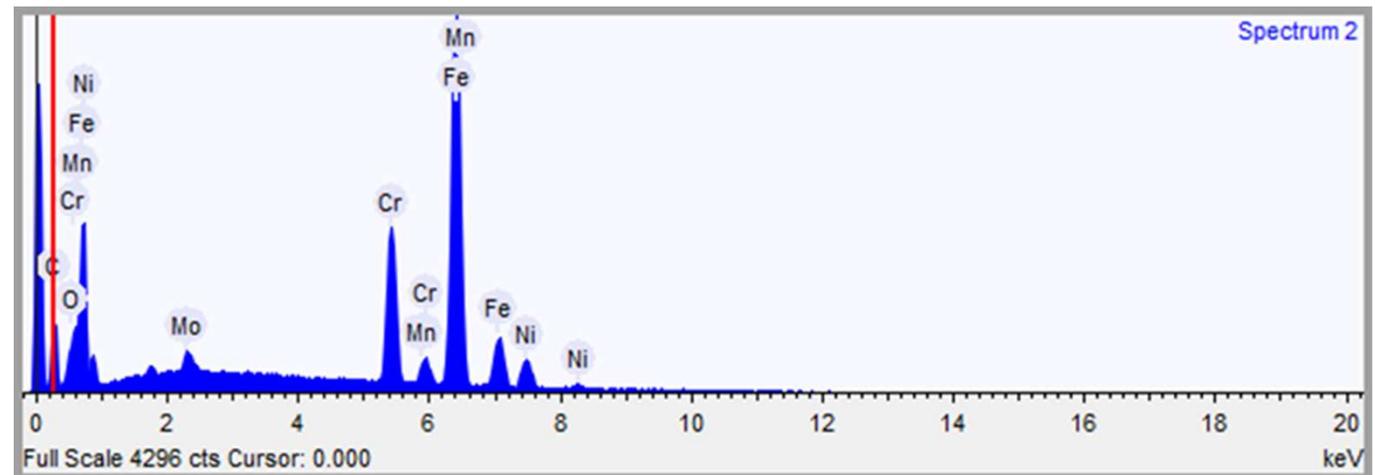
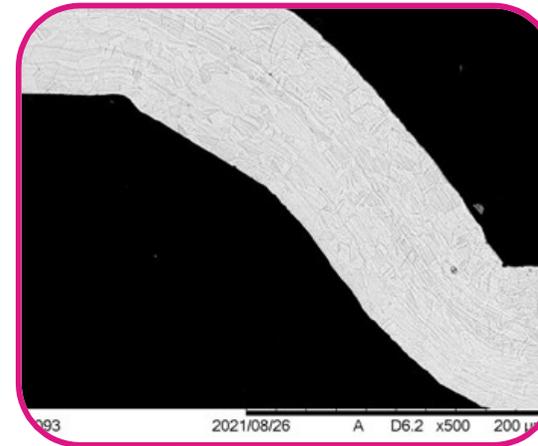


# Optical microscope and SEM for Bipolar activities or thin material

- Gain size measurement
- SEM observations (microstructure)
- EDX analysis (composition and contents)



Done with  C3 Technic  
Claude Colasse Consultant

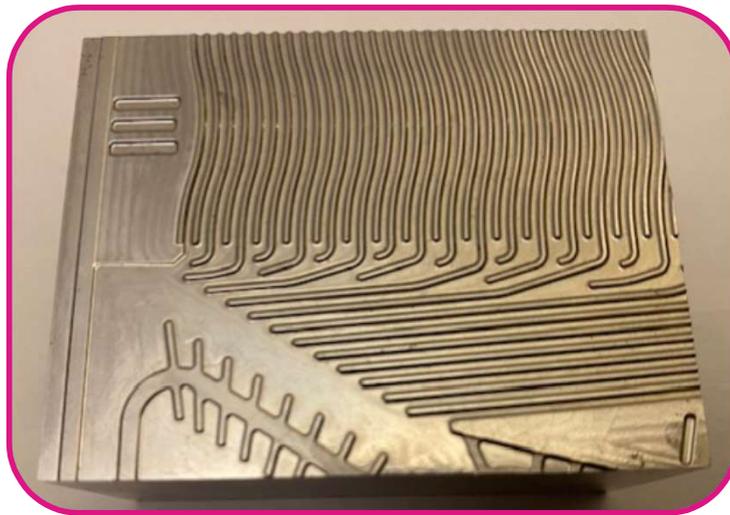


# Analyses that can be also performed on tools components for bipolar plate



Equipment can also be used for tooling  
Specimens

Done with C3Technic  
Claude Colasse Consultant



**Limited due to admissible Load on Lab equipment**

Thank you !

