

ALPhA NOV

Centre Technologique Optique et Lasers

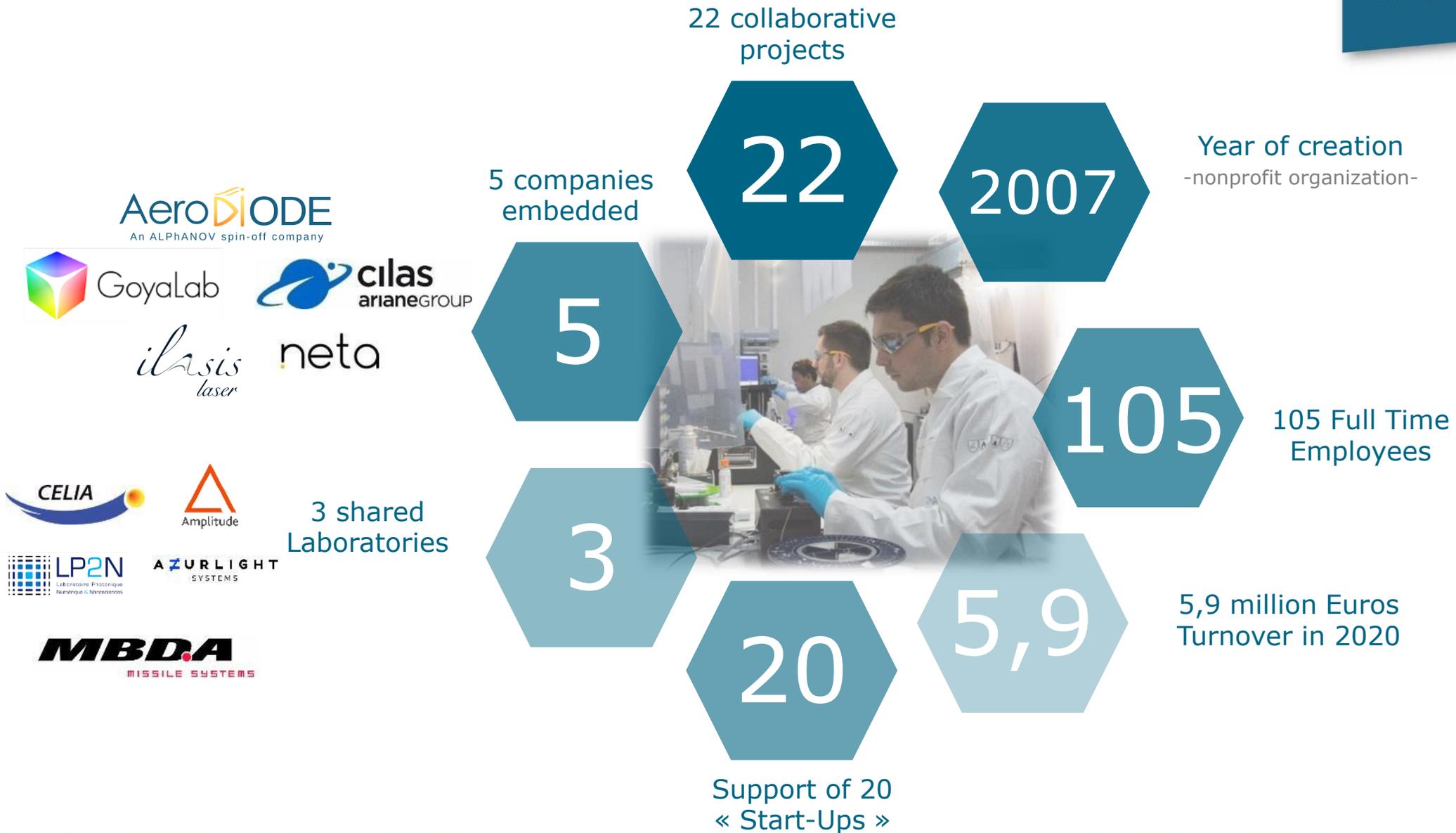


Functional surfaces
due to direct laser texturing

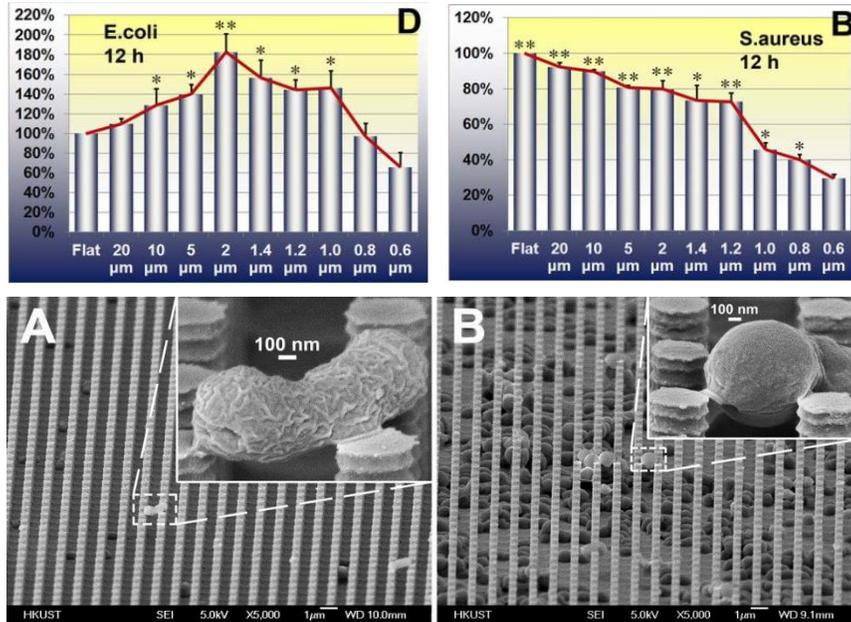
R. Kling



ALPhANOV in Numbers

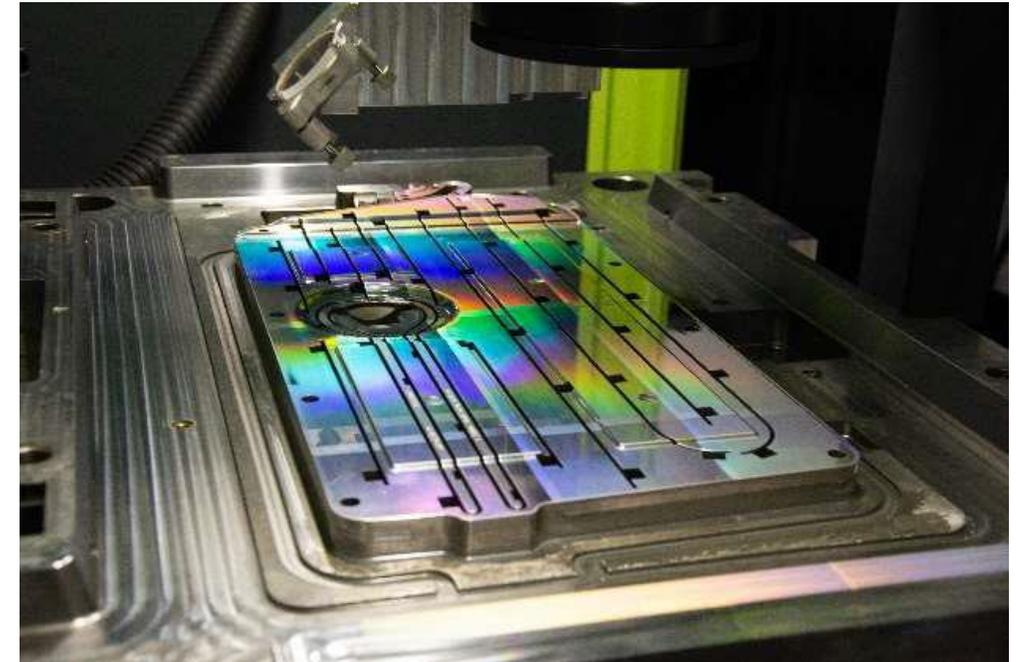


Objective : Antibacterial effect by nanotextures



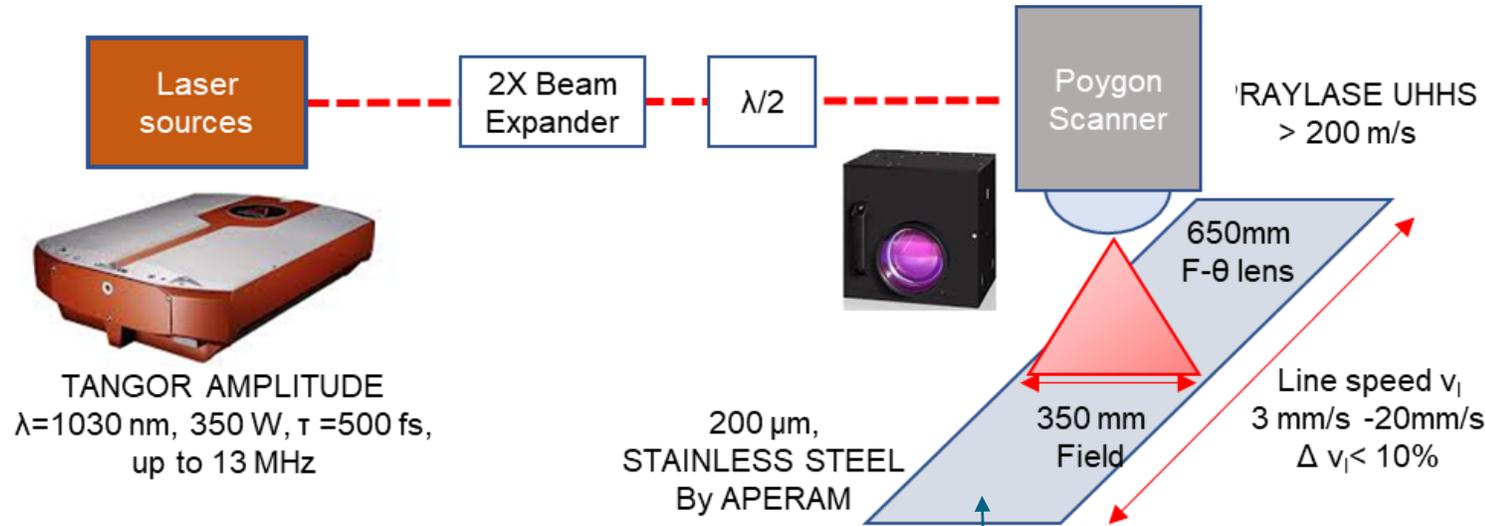
- Periods < 1μm create stress on bacteria
- Technical 3D surfaces are challenging
- Productivity still to be demonstrated

Solution : Direct laser patterning by high power fs

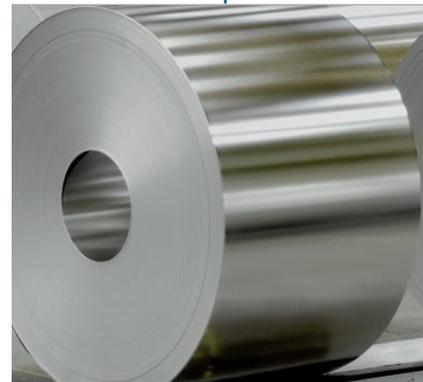
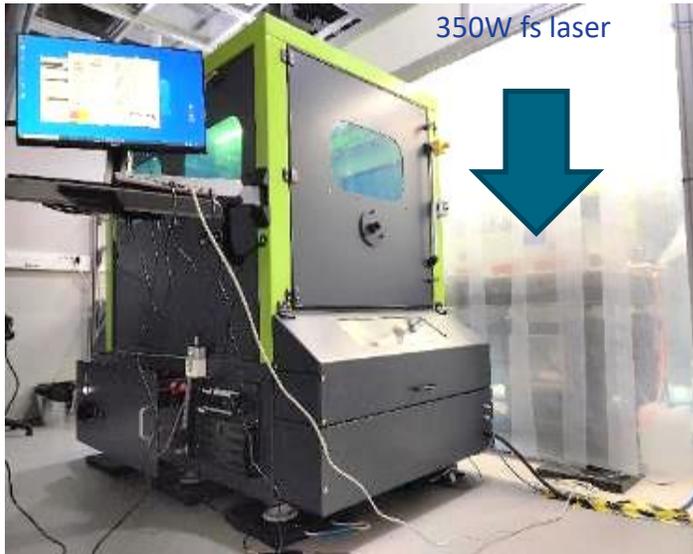


800mm x 600mm mirror-polished steel mold

Targeting mass production : Experimental set-up



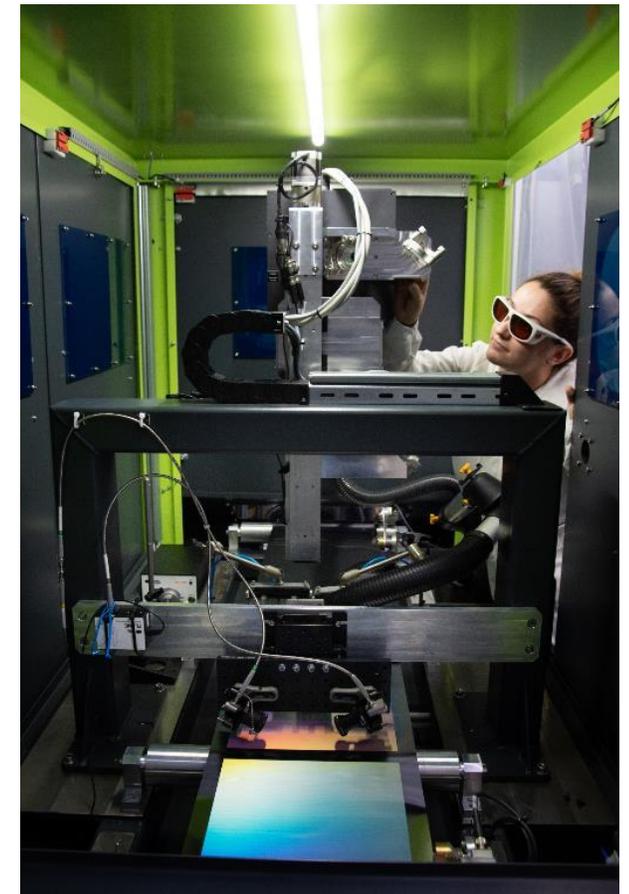
TANGOR AMPLITUDE
 $\lambda=1030 \text{ nm}$, 350 W, $\tau = 500 \text{ fs}$,
up to 13 MHz



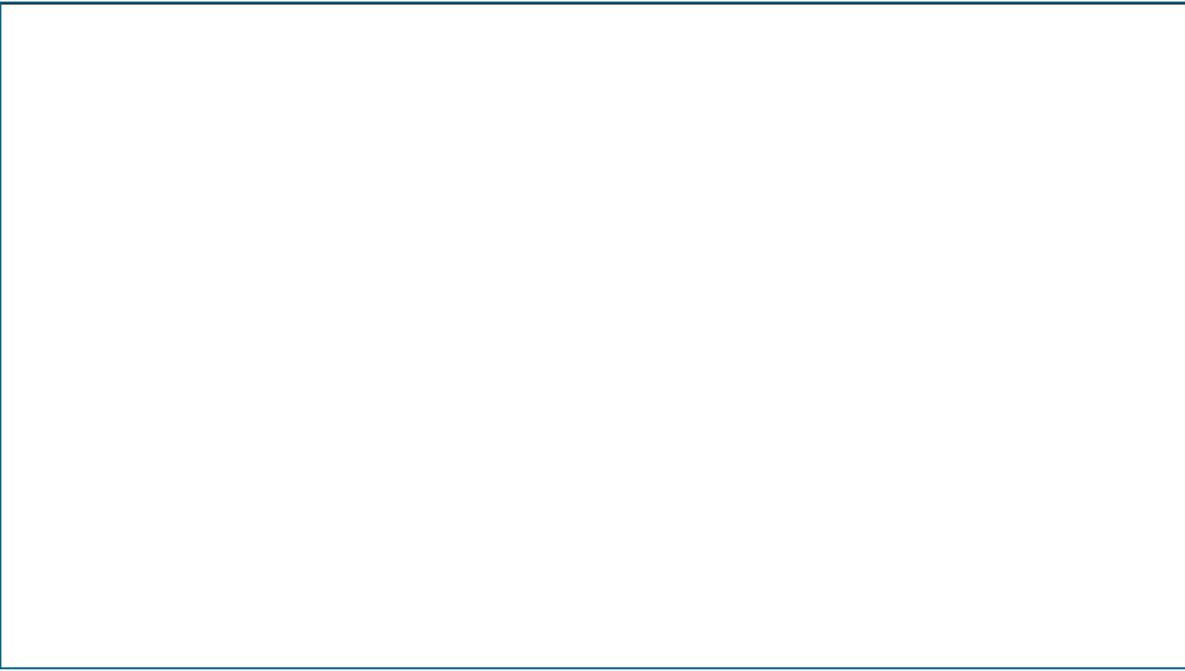
Stainless steel coil

2 Machines available

- Batch processing for molds
- R2R processing of coils



R2R Processing Results



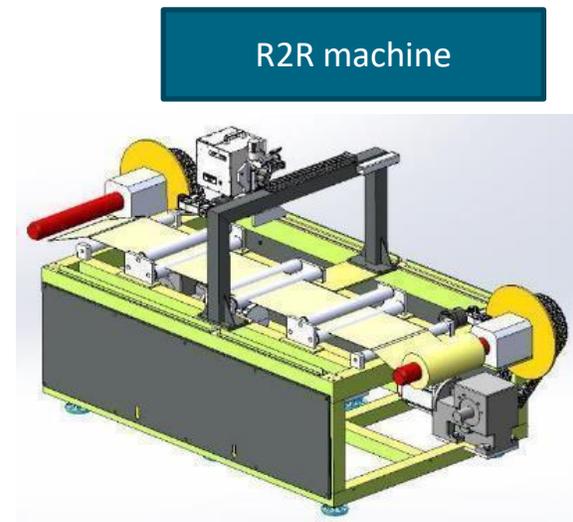
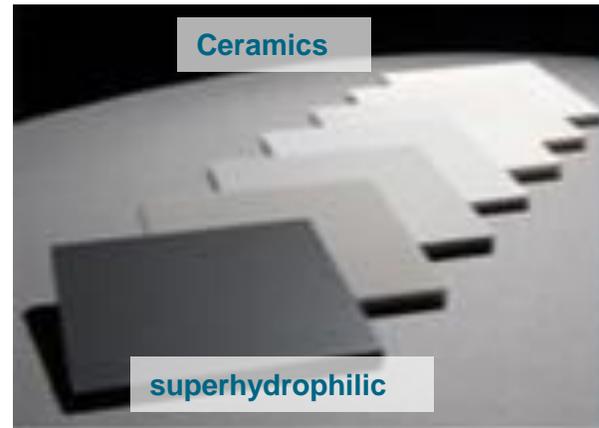
- High positioning accuracy due to fast synchronization
- No heat effects due to fast scanning
- Variety of material can be processed (metals, flexible substrates, ceramics, dielectrics)



15 Meter coil test run

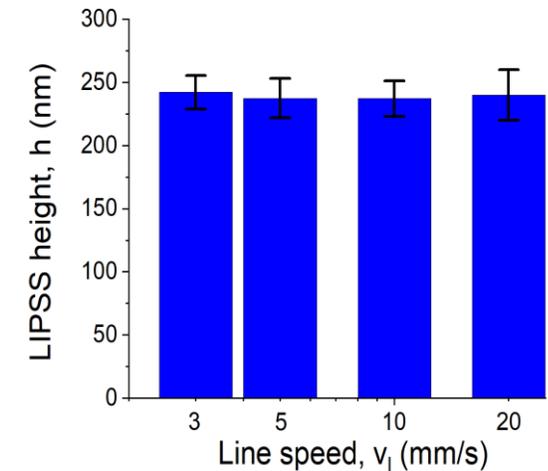
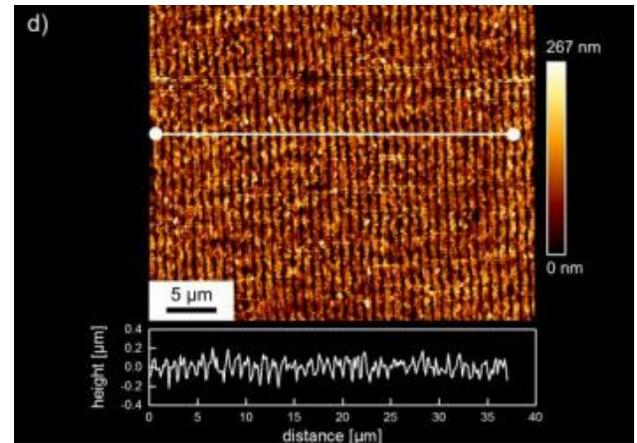
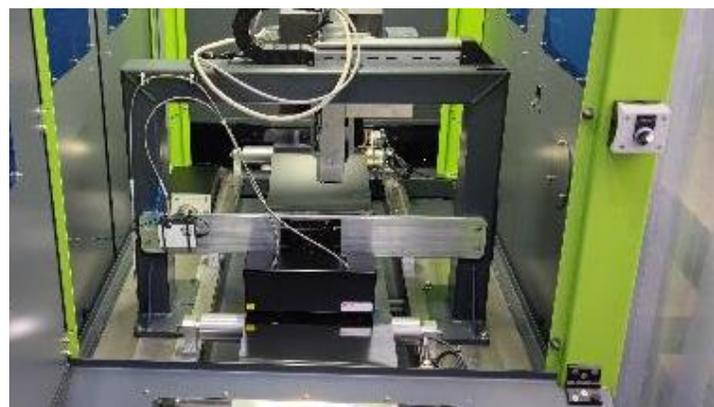
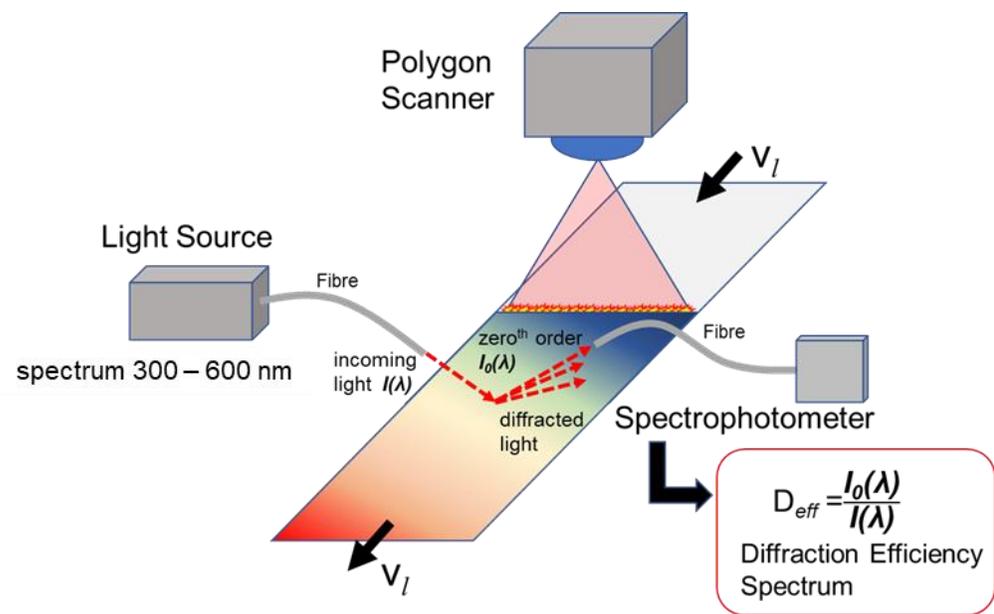
Value Proposition for Industrial Products

-from batch processing to continuous Roll2Roll-



<https://www.newskin-oitb.eu/>

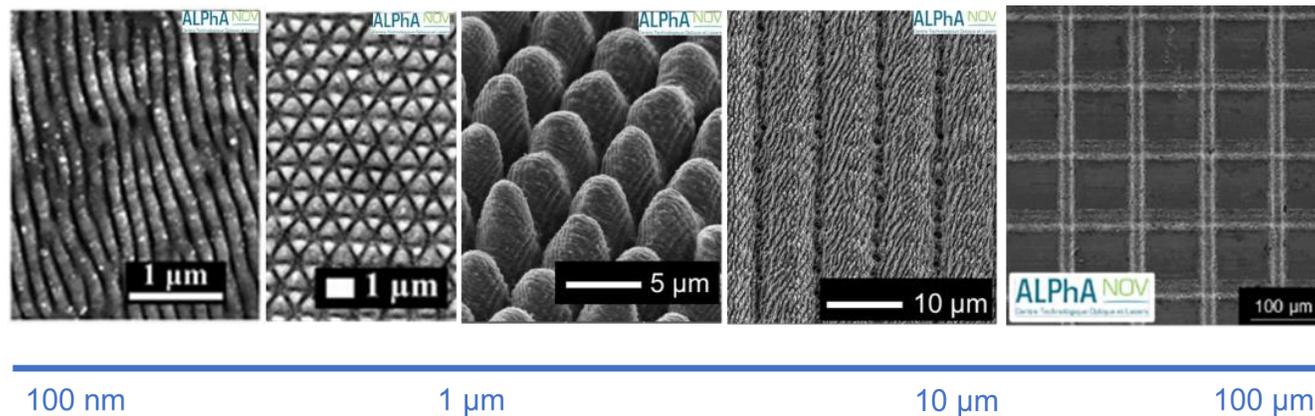
Inline QC – Scatterometry for Process Monitoring



Consistent with AFM measurements

Take home messages

- **High Power fs lasers allow for high-speed nm scale texturing**
- **Functional surfaces can be transferred to complex structures**
- **Replication of nano-scale topographies can be realized by molding**
- **Scatterometry validated as QC tool for nanoscale structures**



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TresClean

Thank you for your attention



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