GF Machining Solutions:

UNA SOLUZIONE INNOVATIVA PER LE FINITURE DI SUPERFICI

Testimonial: Microrelleus

Georg Fischer

The three divisions of GF
Key figures 2020

GF Corporation	137 companies	14’118 employees	CHF 3’184 million sales

GF Piping Systems

CHF 1’708 million sales

GF Casting Solutions

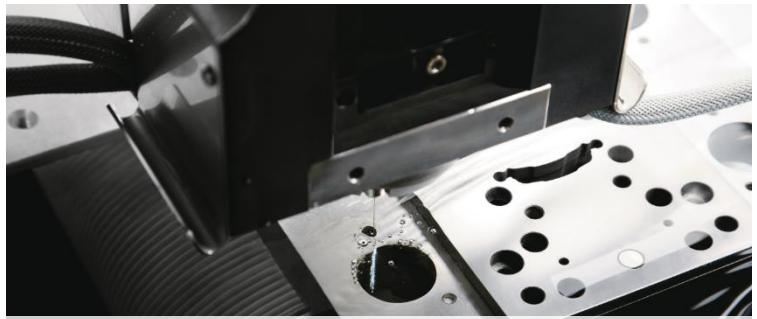
CHF 752 million sales

GF Machining Solutions

CHF 725 million sales

GF Machining Solutions

GF Machining Solutions:
Our technology brands



AgieCharmilles
Wire-cutting, die-sinking and hole-drilling EDM solutions and Laser texturing

Mikron Mill
High-speed, high-performance and high-efficiency Milling technologies

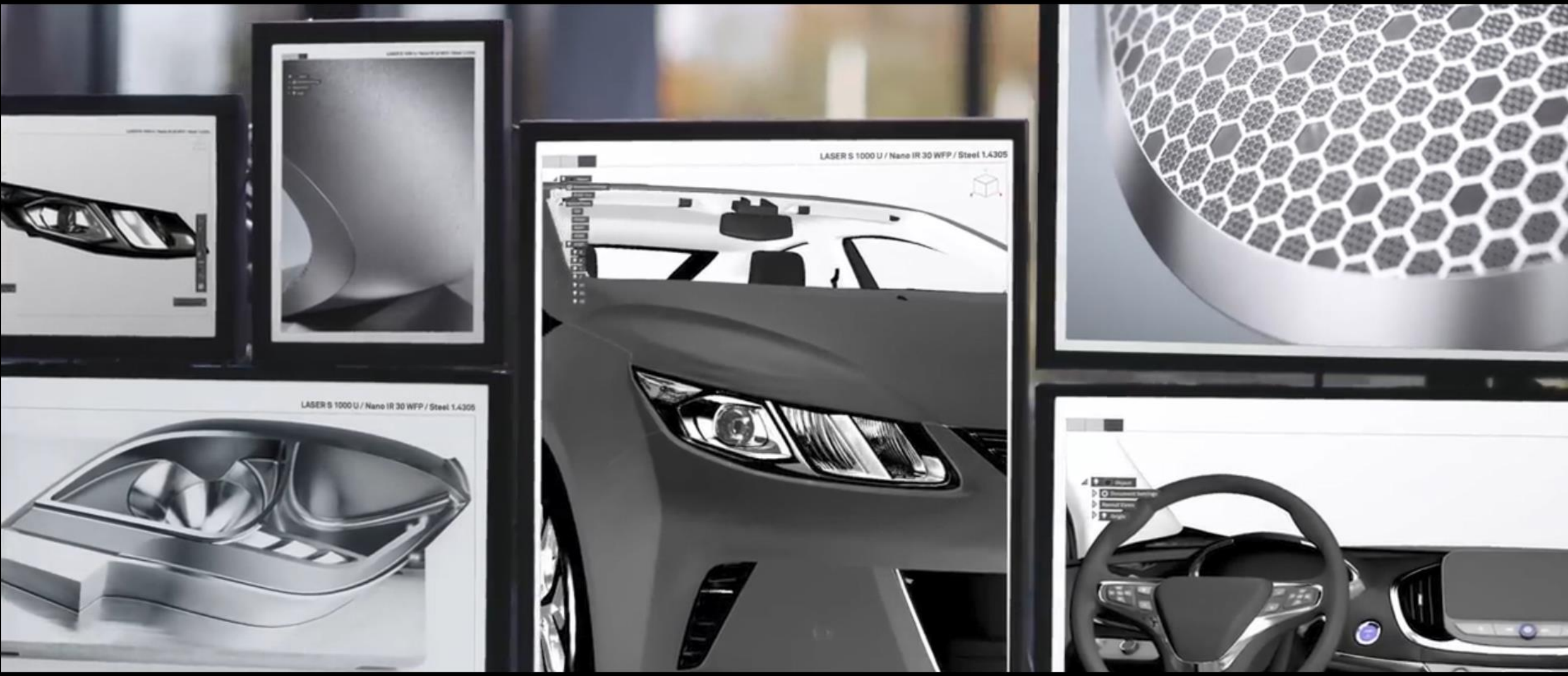
Microlution
Specialized in femtosecond Laser for hole-drilling and micro-cutting in a wide range of industries

Liechti
Leader in five-axis airfoil machining solutions for the turbine industry

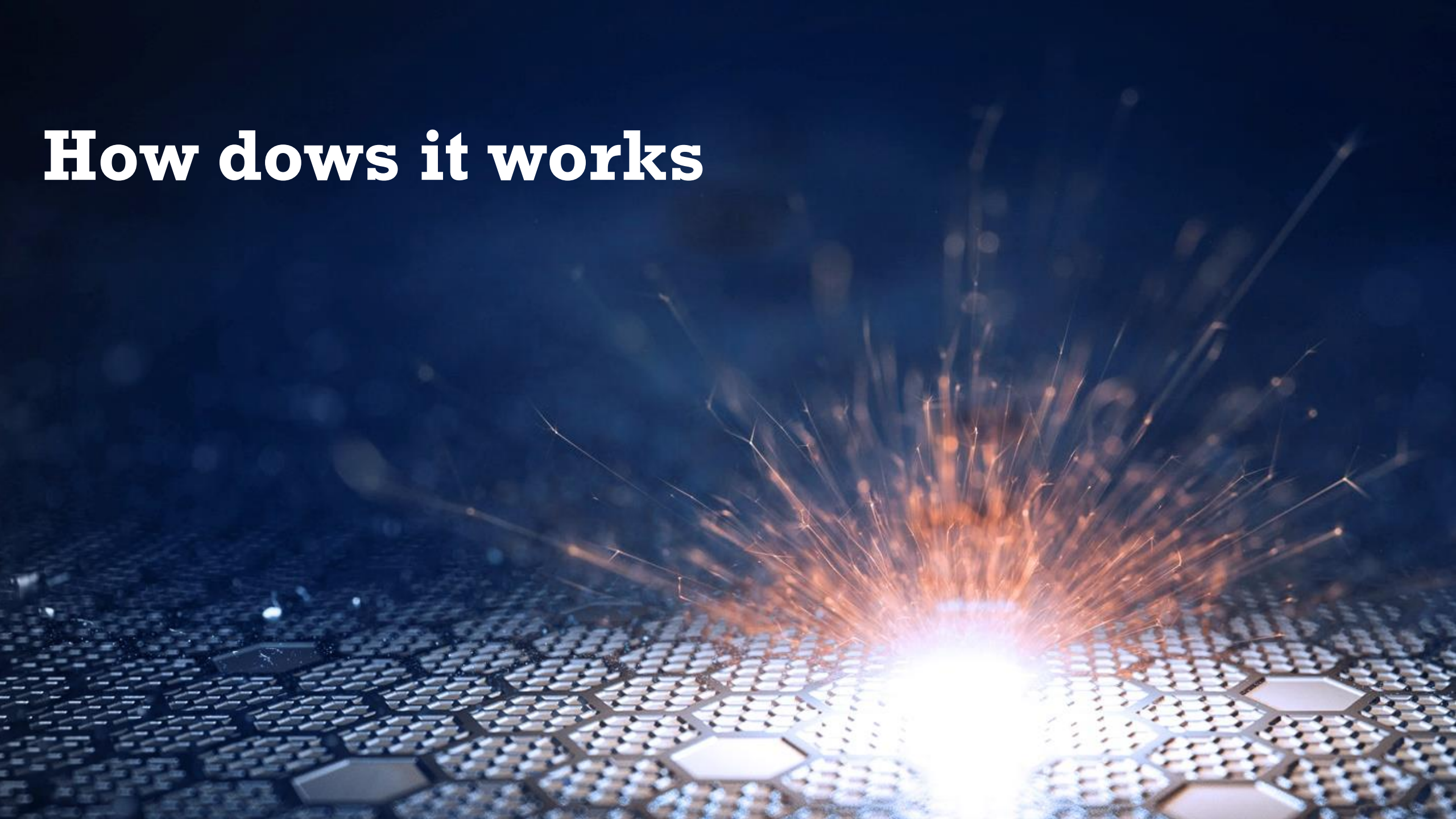
Step-Tec
High-end motor Spindles and subassemblies

System 3R
Productivity-boosting Automation, Tooling and Software systems

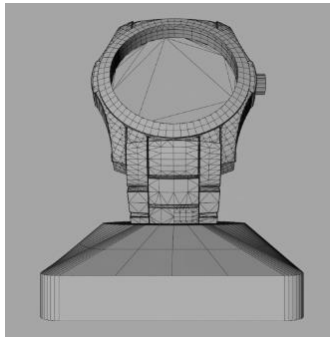
Laser Texturing


LASER S 1000 U / Nano IR 30 WFP / Steel 1.4305
LASER S 1000 U / Nano IR 30 WFP / Steel 1.4305

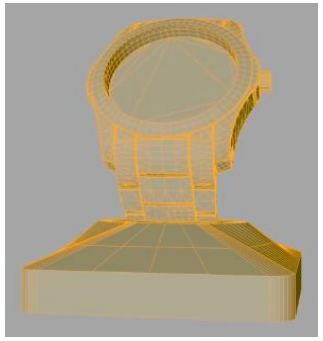
How dows it works



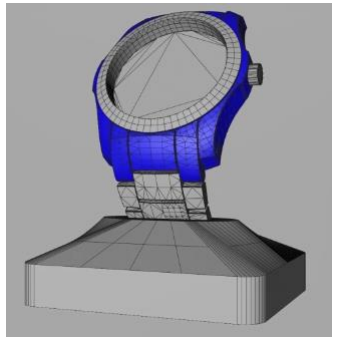
WORKING SEQUENCE
FROM DESIGN TO EXECUTION – 100 % DIGITAL



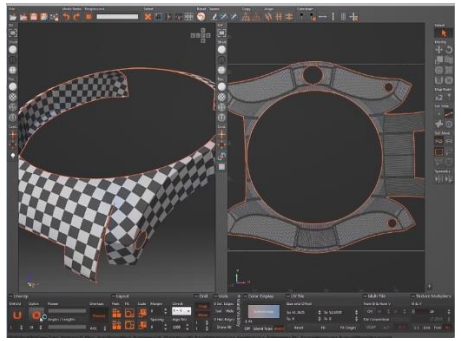
1 3D model importation



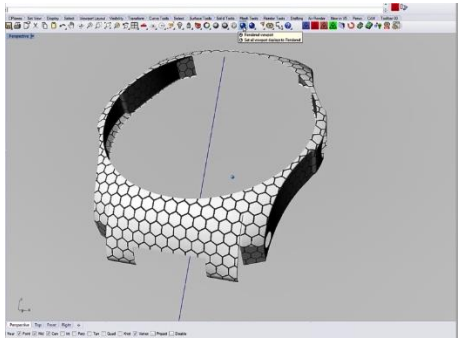
2 Meshing process



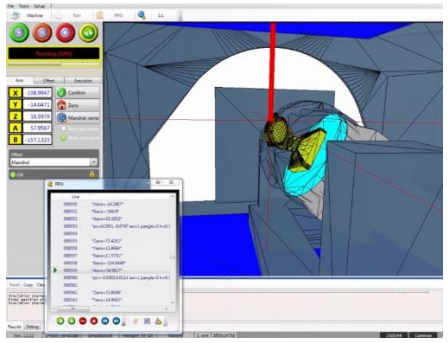
3 Selection of the volume



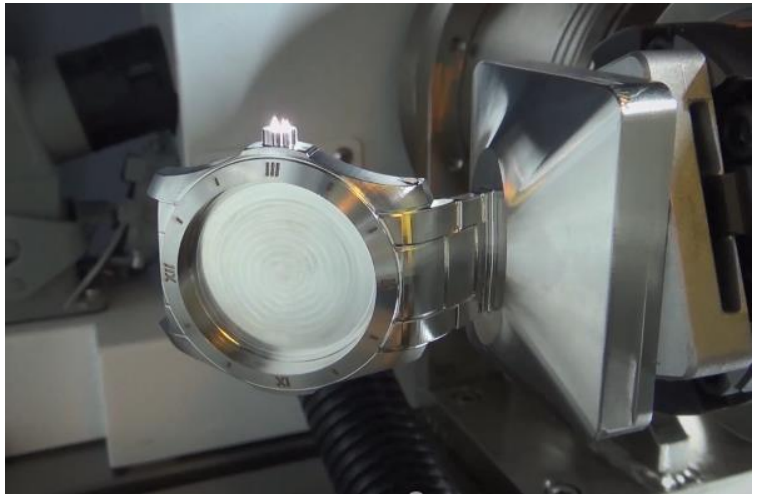
4 Mapping process



5 Texture application



6 Five axis simulation



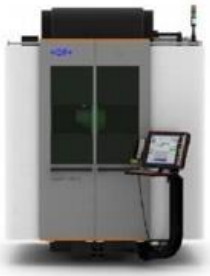
Machine portfolio

LASER S 1000 U

LASER S 1200 U

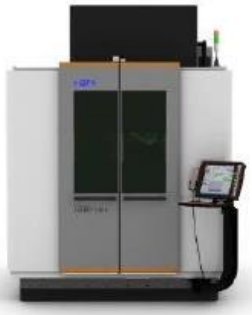
LASER S 2500 U

LASER P 400 (U)



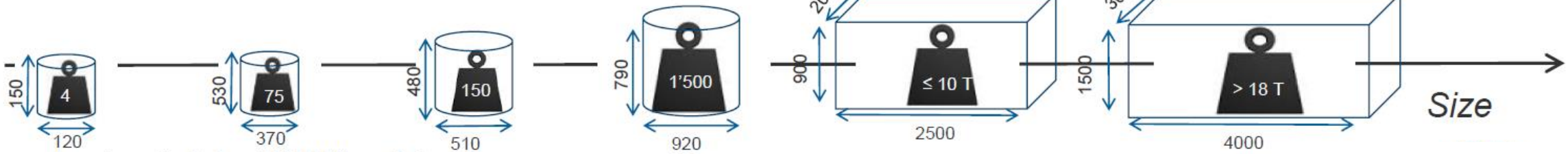
LASER P 600 U

LASER P 1000 U



LASER P 1200 U

LASER P 4000 U



Microrelleus

Who we are

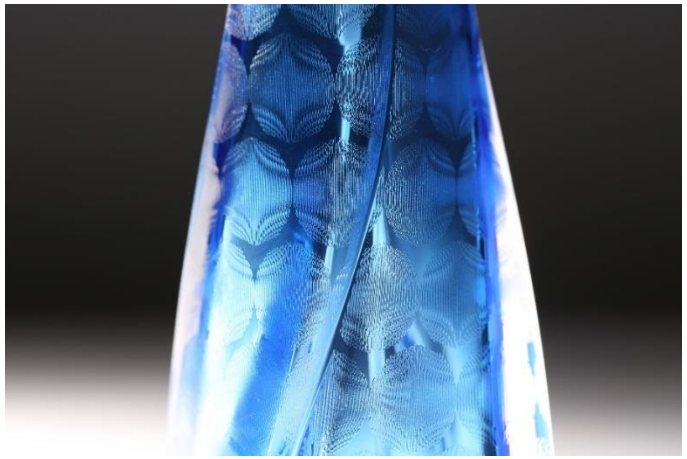
- Service provider for industry
  - Industrial engraving
  - Laser texturing
  - Laser microstructuring

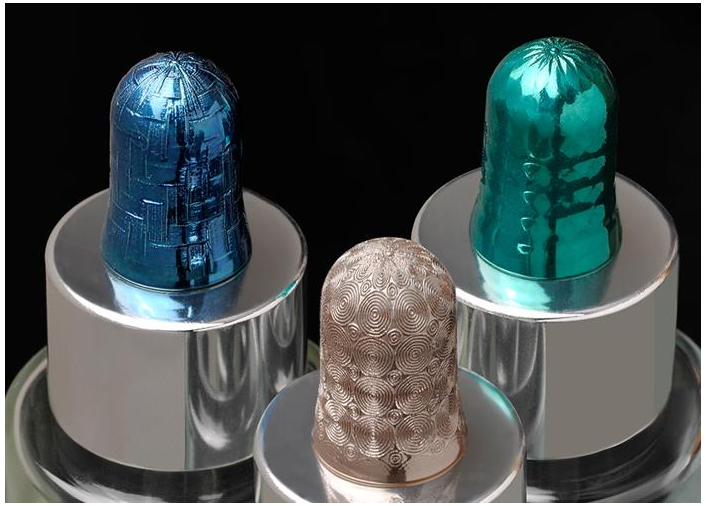
- Company creation: 1983 (Pantograph → Die-Sinking EDM → CNC Milling → Laser)
- Facilities in Barcelona – Spain
- 2013: first laser texturing service company in Spain
- 2016: pioneers at world level in femtosecond laser service in 5 axis
- 2022: pioneers in larger parts 5 axis femtosecond laser processing

microrelleus

Laser texturing → design texturing

By engraving the mould we can obtain high-end quality parts with endless design possibilities.





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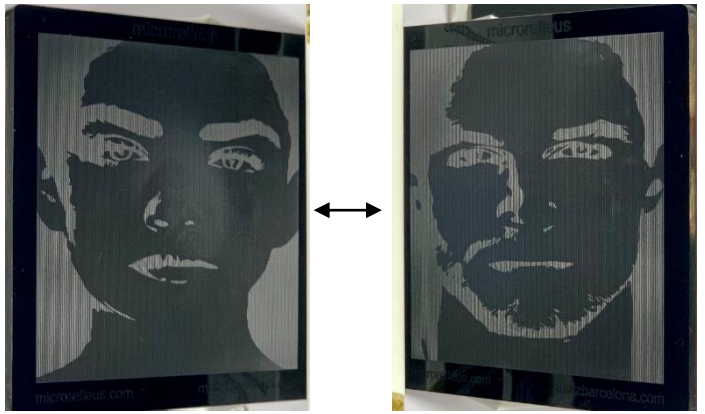
Laser texturing → design + functional texturing

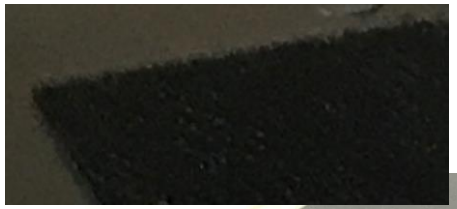
Possibility of engraving the mould for funcional + aesthetic purpose

Metal replacement → to let radar work properly

Hologram&light diffraction → anti counterfeiting

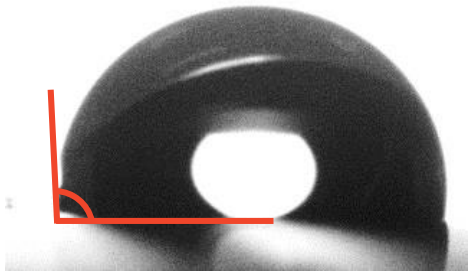


Velvet touch

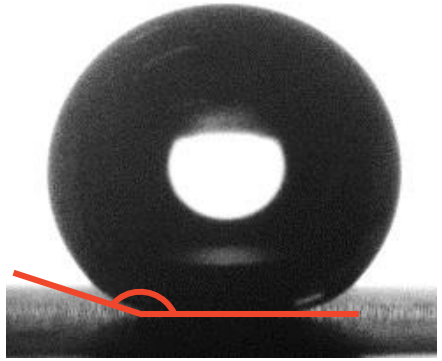


Laser texturing → functional texturing

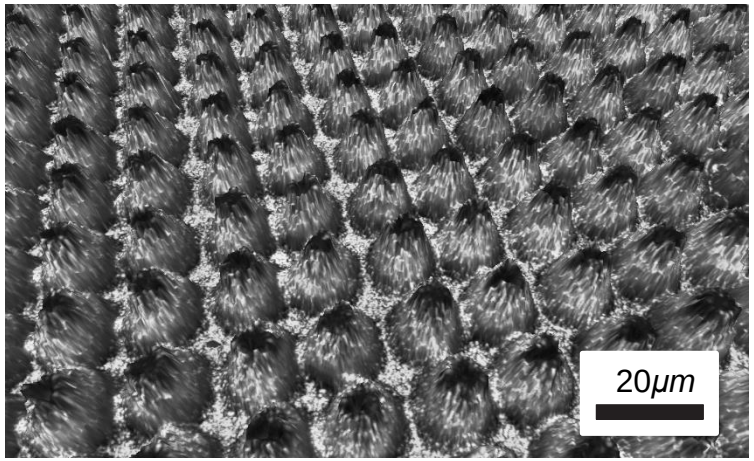
By engraving the mould we can obtain different functionalities on the final injected part, for example hydrophobicity.



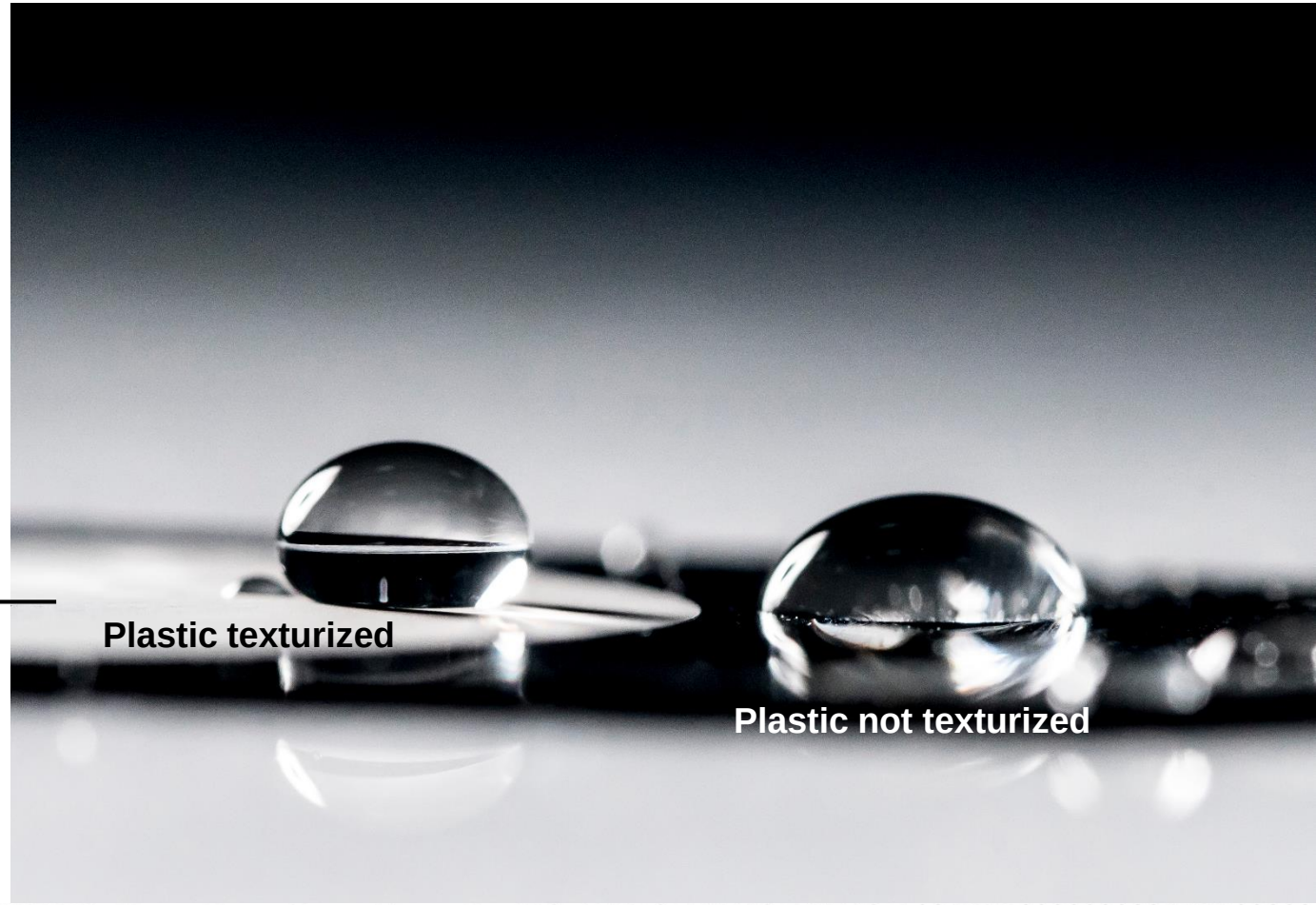
Contact angle before texturing: 102º



Contact angle after texturing: 160º



Confocal analysis of the micro/nano structure



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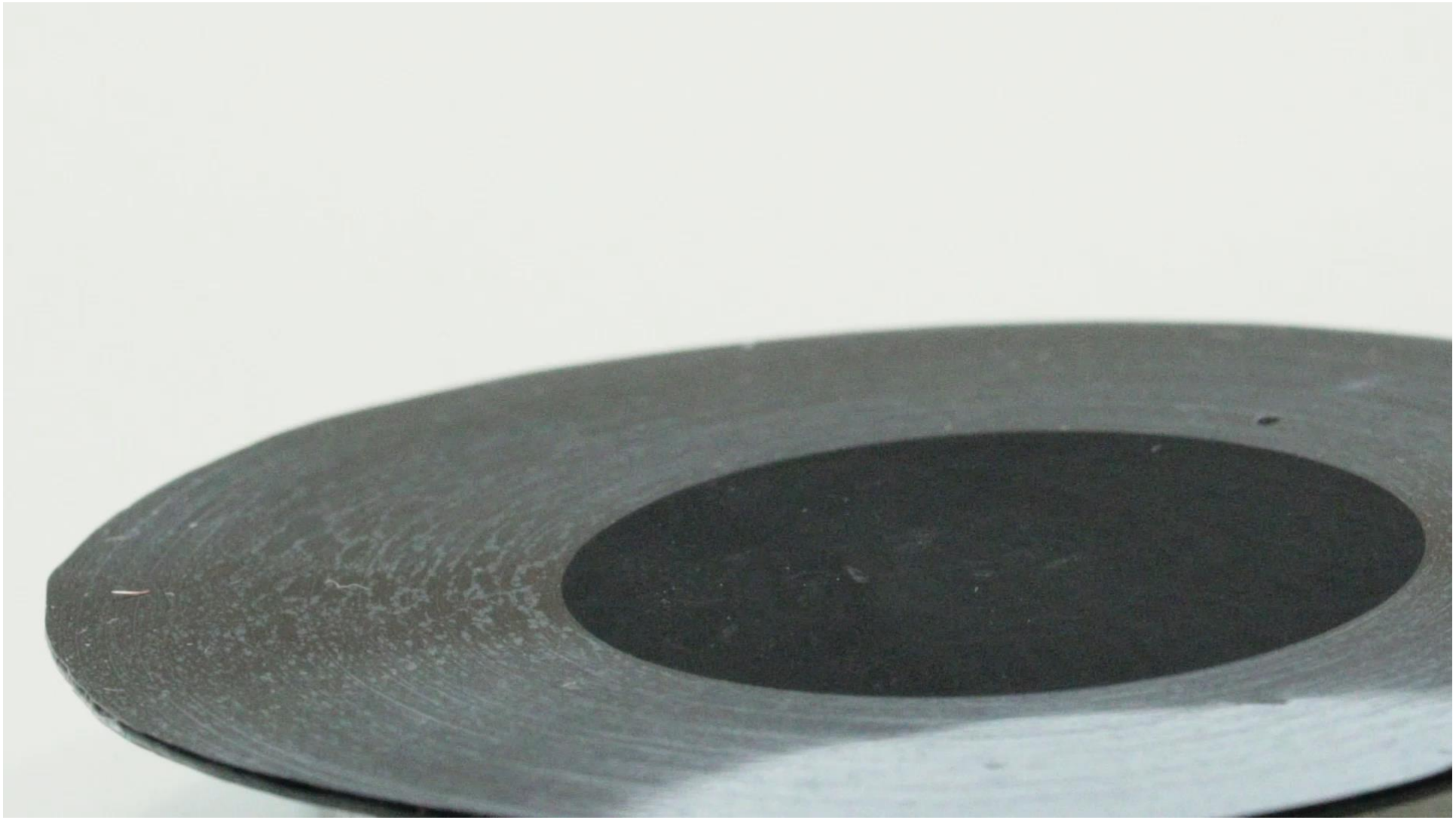
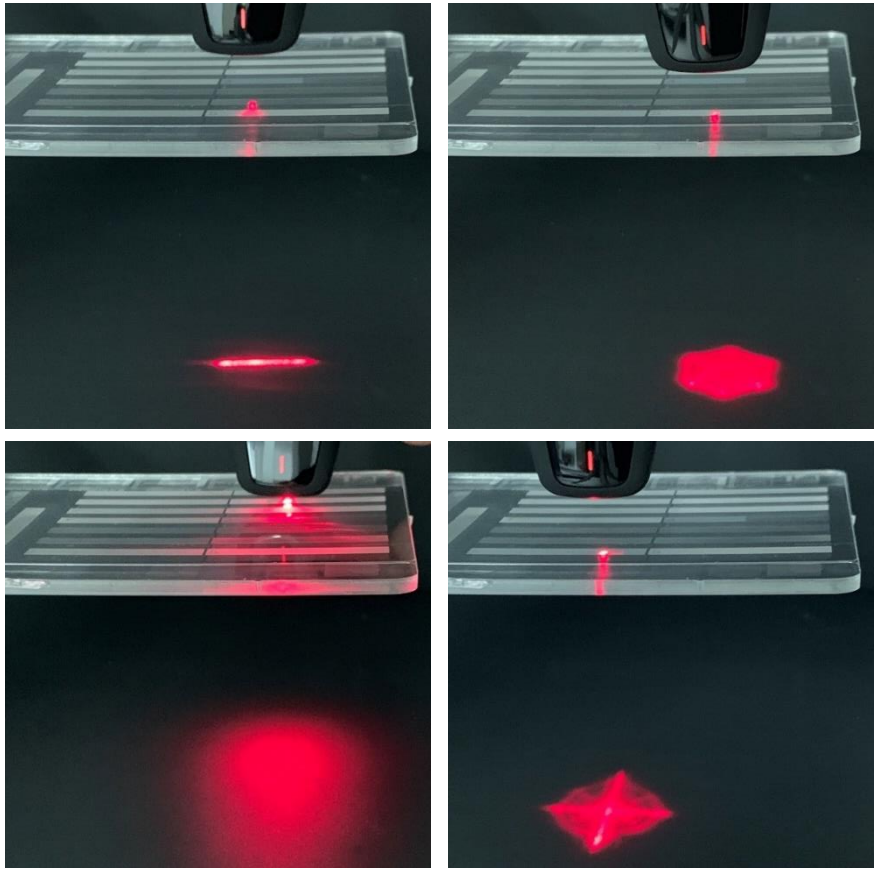
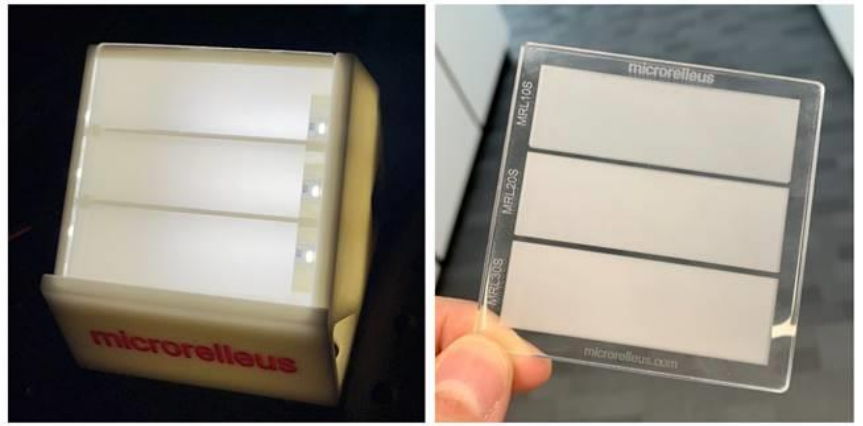
Laser texturing → functional texturing



Laser texturing → light diffusion

Avoid hot spot of the LED and having the diffusion just on the areas that you want injecting transparent plastic



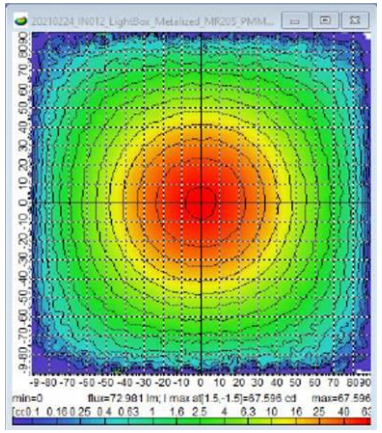


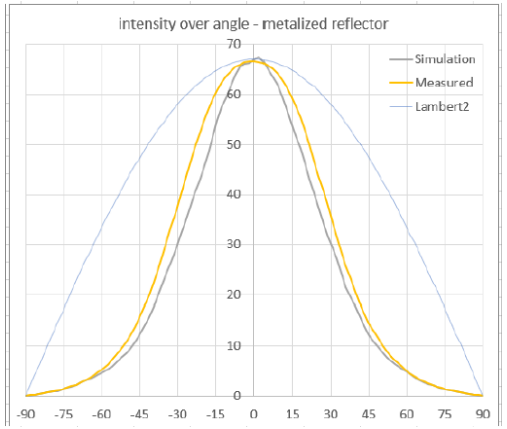
Better homogeneity

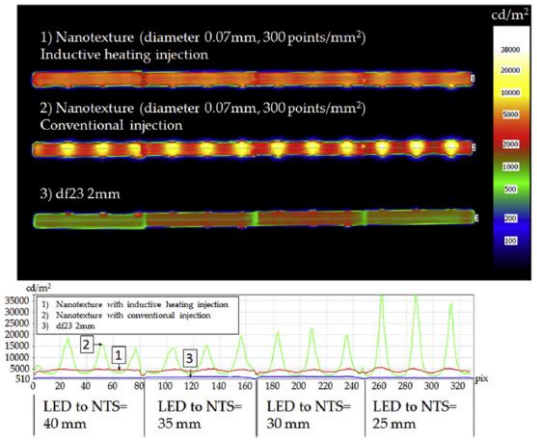
MRL10S → MRL20S → MRL30S

Better luminance

MRL10S ← MRL20S ← MRL30S







Pina-Estany, J., García-Granada, A. A., & Corull-Massana, E. (2018). Injection moulding of plastic parts with laser textured surfaces with optical applications. *Optical Materials*, *79*, 372-380.
Textures: Microrelleus

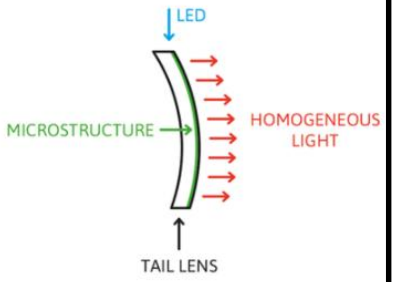
microrelleus

Laser microstructuring for lighting industry

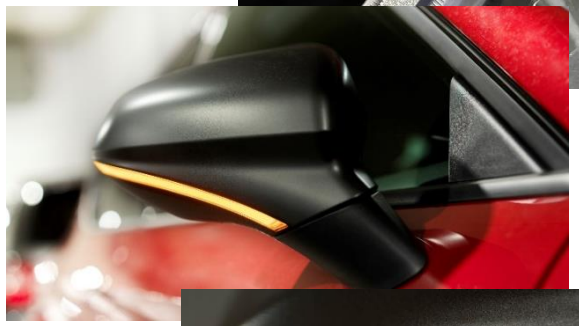
Microstructuring or texturing the mould for different applications: spreading or diffusing light, increasing light intensity, etc.

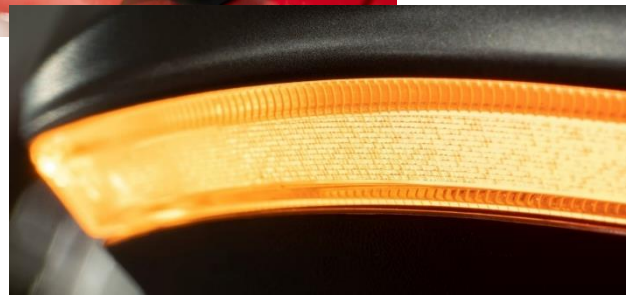
Range Rover Sport 2023 → tail lamp

Cupra Tavascan → light curtain in tail lamp



Seat León 2020 signal mirror indicator





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Thank you!
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