The research and transfer projects of the Surface Technologies research group are oriented to the component optimization through development of innovative tools, measurement methods and knowledge that supports reliable surface design and implementation for improving component live and performance. Towards this goal, the group has built up core competence and expertise in advanced characterization and modelling methods with both numerical and experimental approaches. All research areas are applied to a wide range of industries, including: Additive Manufacturing, Aeronautics, Automotive, Machine components and Health Industry.
RESEARCH TOPICS

TRIBOLOGY

• Broad tribology test capabilities for research and development, quality control and application engineering.
• Friction, wear, lubrication, scratch, anti-galling... test capabilities.
• Hostile enviromental testing (High temperature, tribo-corrosion).
• Tribological characterization of biomaterials intended to orthopaedic prosthesis.
• Surface texturing and coatings for process optimization.

SURFACE METROLOGY

• State-of-the-art 3D surface texture roughness and finish measurements for functional optimization in a wide range of industries: Automotive, micro-electronics, medical devices and industrial manufacture.

FRETting FATIGUE & FRETting WEAR

• Fretting wear and fretting fatigue experimental and numerical characterization at coupon and full scale level.
• Development of ad-hoc fretting tribometers.

CORROSION

• Climatic and acelerated corrosion testing.
• Potentiostat dynamic analysis.
• Intergranular corrosion analysis.
• Forensic investigation of corrosion related failures.
• Consulting services of our experienced and renowned researchers.

WEAR & CONTACT FATIGUE SIMULATION

• Wear prediction of in-service and manufacture components.
• Complex fatigue and contact fatigue life estimations of in-service components.

TISSUE ENGINEERING & REG. MEDICINE

• Fabrication and characterization of biodegradable electrospun scaffolds for chronic wounds and ulcerative processes.

Predicted wear

Experimental wear

FEA

X=381μm
Y=154μm

Wound dressing

Drug delivery
Our main research activities are industry driven and include a vigorous programme of work primarily in tribology, metrology, and contact fatigue which build on the long track record in the fields of friction, lubrication and wear.

Signed long term research agreements with industrial partners such as Orona EIC allow the recruitment of students and providing turnkey solutions and PhDs to the near companies increasing their technological knowledge.