
CIT
UPC
TECHNOLOGY CENTER
UNIVERSITAT POLITÈCNICA
DE CATALUNYA
BARCELONATECH
MATERIALS
TECHNOLOGIES

RESEARCH, DEVELOPMENT & INNOVATION AT THE UNIVERSITAT POLITÈCNICA DE CATALUNYA (UPC)

The Universitat Politècnica de Catalunya (UPC) specializes in the areas of architecture, science and engineering, including materials technologies. In this field, the main focus areas are:

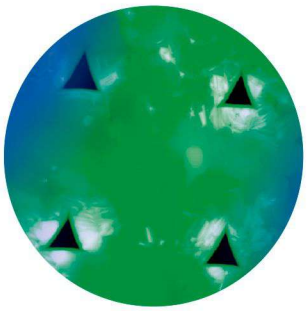
- Advanced characterization and design of materials and processes
- Biomaterials, composites and polymeric, textile, functional and advanced materials
- Processing, protection and advanced manufacturing

As a result of the UPC's recognized research track record in its areas of specialization, we can offer a wide range of services:

- R&D technology transfer projects
- Consortium for national and H2020 projects
- Patents
- Technology assessment
- Specialized facilities

The UPC is the leading university in Spain in volume of research and technology transfer to companies, and has become one of the major hubs of knowledge in Southern Europe.

ADVANCED CHARACTERIZATION AND DESIGN OF MATERIALS AND PROCESSES

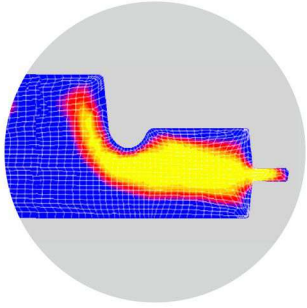


MULTISCALE TESTING OF MATERIALS AND STRUCTURES

- Analysis of faults and failure mechanisms
- Experimental testing of structures
- Multiscale analysis of mechanical properties of materials and coatings
- Static/dynamic tests at high temperatures

CHEMICAL AND FUNCTIONAL CHARACTERIZATION

- Advanced characterization of polymers, metals, ceramics and composites
- Nanoscale analysis of surfaces and reactivity
- Corrosion and fire resistance studies
- Toxicology, microbiology, biofilms and biodegradation
- In vitro and in vivo studies of implants



SIMULATION AND MODELLING

- Processing simulation and time optimization
- Product design and prototyping
- Simulation of structures and construction processes
- Finite element analysis, computational plasticity and nanomechanics

TRANSPORT

- Extreme conditions and environments
- Weight reduction and energy efficiency
- Fuel economy and emissions reduction

ENERGY PRODUCTION AND STORAGE

- Energy conversion, harvesting and storage
- Renewable energy sources and fuels
- Fission and fusion energy

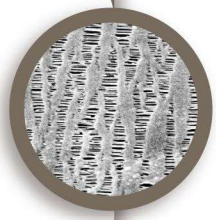
MATERIALS

BIOMATERIALS
Tissue engineering, orthopedics and implants

- Osteinductive, bioactive and antimicrobial materials
- Foams, hydrogels, nanoparticles and multifunctional coatings
- Ca/Mn phospate cements
- Ti, Cr, Co and Ni-free alloys

COMPOSITES
Performance, lightweight and multifunction

- Metal, polymer and ceramic composites
- Nanoreinforced thermosets and flame retardant composites
- Nanomaterials
- Steel, concrete and composite bridges and infrastructures



POLYMERIC MATERIALS
Lightweight, energy/thermal management and bio

- Fire-retardant and conducting composites
- Biocomposites, biodegradable polymers and recycling
- Phase change materials and thermal dissipation
- Photoselective formulations

TEXTILE MATERIALS
Biotechnology, smart textiles and advanced fabrics

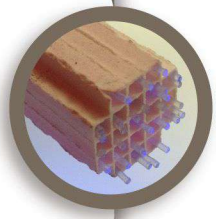
- Integral development of textile prototypes and equipment
- Addition of functional microcapsules on textiles
- Bio-textiles and lignocellulose materials

ADVANCED MATERIALS
High performance, extreme conditions and construction

- Duplex stainless steel, tool steels, and hard materials
- Light alloys, Ni-superalloys, Ti and Cr alloys
- Protective coatings (thermal, wear and corrosion)
- Fire resistance and special concrete materials and structures

FUNCTIONAL MATERIALS
Energy production, environment and detection

- Nanomaterials for catalysis and devices for fuel production
- Organic solar cells
- Environmentally friendly construction materials
- Materials for water treatment and substances detection



CONSTRUCTION

- Sustainable constructions materials
- Life-cycle analysis and recycling
- Energy efficient and environmentally-friendly buildings

CIRCULAR ECONOMY AND ENVIRONMENT

- Waste optimization, valorization and water treatment
- Reuse and recycling of used products
- Dosimetry and detection of toxic and explosive agents

PROCESSING

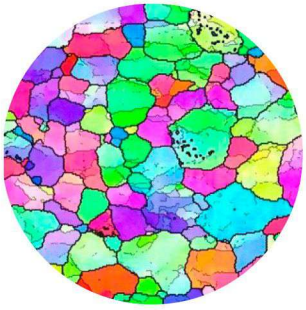
- Light alloys and metal matrix composites: powder metallurgy, casting, forging, forming, extrusion and lamination
- Polymers injection, extrusion, mixing, foaming, additives and recycling
- Metal-polymer hybrids and advanced joining techniques
- Functional coatings, textiles and composites materials

MATERIALS PROTECTION AND SURFACES

- Coatings for corrosion, wear and thermal protection
- Thermal/acoustic insulation
- Fire-retardant polymers
- Plasma modification for biocompatible/antibacterial surfaces

ADVANCED MANUFACTURING

- 3D printing, stereolithography, selective laser sintering
- Deposition of micro and nanometric layers
- Nanostructured materials and nanoparticles
- Advanced monitoring processes and quality control (spectral technologies, artificial vision)



BIOTECHNOLOGY

- Packaging and smart systems
- Biomass-based composite & processing
- Cosmetics

HEALTHCARE

- Tissue engineering and bone regeneration
- Dental, ophthalmic, orthopedic and cardiovascular implants
- Drug-delivery, surgical suture, therapeutics

CIT UPC
Ed. Til·lers (planta 1)
C/Jordi Girona 31
08034 Barcelona - Spain
Tel. +34 93 405 44 03
info.cit@upc.edu

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European Regional Development Fund
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www.cit.upc.edu