Clúster Mav
MATERIALS AVANÇATS DE CATALUNYA

Working Group

LIGHTWEIGHT MATERIALS

Coordinators:

eurecat
Technology Centre of Catalonia

Universitat de Girona
Campus Compòsits

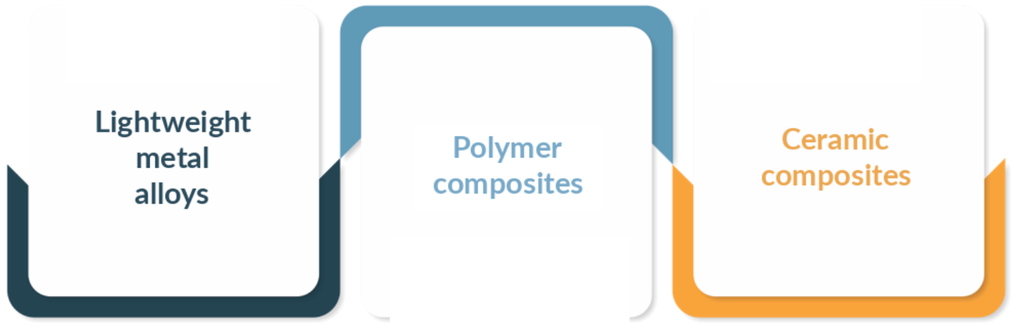


Lightweight Materials What are they?

Lightweight Materials are characterised by a relatively high strength-to-weight ratio compared with conventional materials.

There is a wide variety of them and, depending on their composition and structural characteristics, they have different properties, which means they can be used in a wide range of applications.

They can be divided into three main categories:



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Lightweight Materials
Sectors involved

The Lightweight Materials industry is well established and has great growth potential, driven by emission reduction regulations. These materials play a key role in defence and dual-use technologies, automotive, aeronautics and renewable energy, and are also used in sectors such as sport and consumer electronics.



Defence and dual-use technologies



Automotive



Aeronautics and aerospace



Railway



Marine



Construction



Health and medicine



Sport



Energy



Telecommunications



Consumer electronics

The Lightweight Materials Working Group of the MAV Cluster drives its main activities and fosters the development of projects among members. It is coordinated by Campus Compòsits of the University of Girona and the Eurecat technology centre. It currently has 22 members:

Lightweight Materials Members

Lightweight Materials Value chain

The members of the Working Group operate at different points of the value chain, which means they complement each other.

Raw material producers and suppliers

- Unprocessed metals
- Non-metallic materials
- Additives

Processors

- Semi-finished and finished parts

Applications

- Different applications
- Industries/Users

Waste recovery

- Recyclers

Research & Development (basic and applied research, technology development)

- New materials and polymers
- Design tools
- Characterisation, manufacturing and continuous reinforcement techniques
- Formulation technologies (compounding)



Lightweight Materials Value chain

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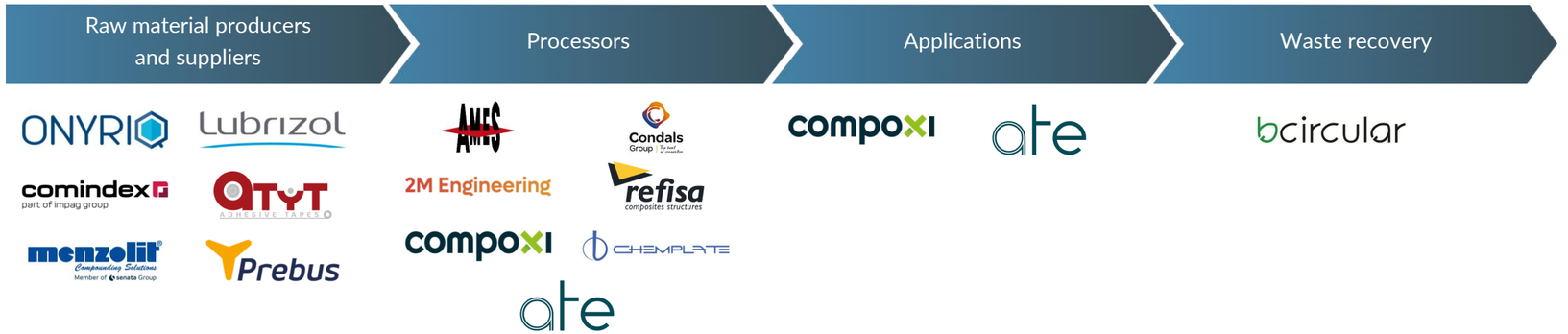
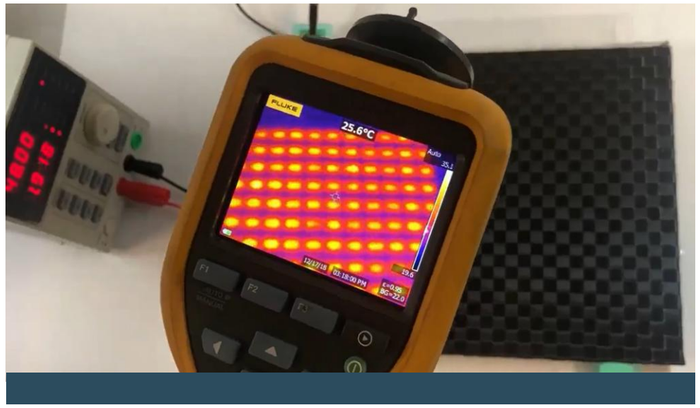




Lightweight Materials
Collaboration projects

The regular meetings of the Working Group create an ideal environment for fostering collaboration between members. These collaborations have led to several projects:



AEI 2022- SMART BATTERY CASE

Functional battery case for the marine sector.



"WHO'S WHO IN COMPOSITES IN CATALONIA" (2022)

Map of all the players in the value chain of the composites sector in Catalonia.

Lightweight Materials
Collaboration projects



AEI 2023- SMART BATTERY CASE 2

Functional battery case for electric unmanned aircraft systems (UAS).



AEI 2023- INHO_TOOL

Optimisation of the composite manufacturing process using hollow heated moulds.

Lightweight Materials Collaboration projects



MAT4EU EUROPEAN PROJECT
Advanced Materials for a Sustainable European Future

The project promotes collaboration between European regions in the field of advanced materials, helping SMEs to innovate, internationalise and develop sustainable solutions.

Co-funded by the European Union

- ✓ **1st funding call** (2026) · Up to €60,000 in funding
- ✓ **6 sectors:** mobility, aerospace and defence, construction, agri-food, renewable energy and health
- ✓ **4 advanced materials:** polymers, metallic materials, ceramics and composites

JOINT RESEARCH UNIT (JRU)

UdG-Eurecat unit to develop lightweight composite structures for the sustainable energy transition.

Lightweight Materials Interests and Actions

- **Contact with potential industries**
  (inter-cluster events, direct contact with other organisations):
  - Defence
  - Aeronautics
  - Construction and infrastructure

7/07/2026 · AEROS – MAV CLUSTER INTER-CLUSTER EVENT: AEROSPACE AND DEFENCE



- ✓ **Key trends and priorities** in advanced materials and technologies for the aerospace and defence sector
- ✓ **Presentation of challenges** from the aerospace and defence sector (Aeros)
- ✓ **Presentation of solutions** for the aerospace and defence sector (MAV Cluster)
- ✓ **Work in “Match and Connect” thematic groups**

The Working Group has led the move closer to the defence and dual-use technologies sector, and the contact with the AEROS Cluster, with which the relationship continues.

Lightweight Materials Interests and Actions

- **International market**
  - Joint participation in industry trade fairs

Advanced Manufacturing Madrid

4-5 November 2026 · IFEMA

Joint participation of the Cluster and its members (2025 and 2026):

- **Joint stand**
- **Opportunity to take part in the official programme (talks/round table)**
- **Exclusive networking area**
- **Contact with the national ecosystem**





Lightweight Materials Interests and Actions

- Organisation of the **1st Industrial Exhibition on Circularity of Composite Materials** (2026)

SHAPING EUROPE'S LIGHTWEIGHT FUTURE FOR SUSTAINABLE MOBILITY

Automotive · Aerospace · Railway · Dual-Use Technologies and Defense

ELN CONFERENCE SPAIN 2026

Mav Lightweight Expo

Connecting European Industry with Advanced and Circular Materials

7–8 OCTOBER 2026

PALAU MACAYA, BARCELONA

ORGANIZED BY

ELN · elca · ACCIÓ Catalonia Trade & Investment · Generalitat de Catalunya · Mav · eurecat Centre Tecnològic de Catalunya





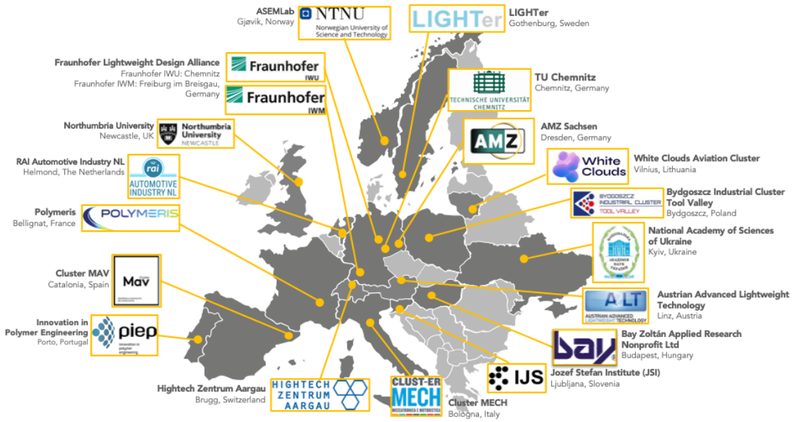




Lightweight Materials Interests and Actions

- Contact with **international platforms**

ELCA – European Lightweight Cluster Alliance



19 nodes from 16 different countries across Europe

Managed by:

- ✓ Preparation of **collaborative project proposals**
- ✓ **Tailored support: collaborative R&D projects and market access plans**
- ✓ **Dialogue** with other networks and the European Commission
- ✓ **Visibility** through the ELCA monthly newsletter and the monthly calls
- ✓ **Working groups**



- ❑ **Materials Day 2026 (25/03/2026, Red Bull Ring, Spielberg, Austria)**



Lightweight EU Project · A2LT – Austrian Advanced Lightweight Technology



Lightweight Materials How can we help you?

The Lightweight Materials Working Group covers everything from the production and supply of raw materials and equipment, through the processing of parts, to the final application and waste management. Specifically, it offers:

- **Production and supply of raw materials** (metals and polymers)
- **Production and supply of additives** to improve the properties of lightweight materials.
- **Design and manufacture** of semi-finished and finished parts and structures (composites)
- **Technical advice and services in the formulation and development** of new lightweight materials (polymers, composites, metals, recycled and bio-based materials), development of design tools, characterisation and manufacturing techniques, and continuous reinforcement.
- **Transfer** of knowledge and technology.

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Presentation of the members

Lightweight Materials Working Group

Description

The main aim of the Eurecat technology centre is to promote business competitiveness and the well-being of society through applied research and innovation.

Main capabilities

- R&D activities focused on developing high-performance material solutions to obtain lightweight / strong materials and functional surfaces able to withstand extreme mechanical and environmental requirements
- It has pilot plants with the main composite manufacturing technologies (RTM, infusion, compression, membrane thermoforming, autoclave and pultrusion); cold and hot stamping of high-strength steels and aluminium; aluminium extrusion and injection; metal atomisation; and coating application using plasma techniques.
- It has a materials characterisation laboratory and a workshop for manufacturing moulds and tooling.

Types of materials or solutions

R&D technology services for the development of lightweight structures in polymer matrix composites (thermoplastic and thermoset composites, biocomposites and recycled composites), high-strength steels and aluminium.

Highlights

- COFRARE 2020 project (CleanSky): development of lightweight composite structures for the aeronautics sector using out-of-autoclave technologies.
- Thermoforming of different families of composites (thermoplastic, thermoset) to manufacture structural components for the automotive sector. Client: Gestamp.
- FORMPLANET project: creation of Open Innovation Test Beds (OITBs) for the advanced characterisation of sheet metal.



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Universitat de Girona
Campus Compòsits

Clúster Mav
MATERIALS AVANÇATS DE CATALUNYA

Description

Campus Compòsits of the University of Girona is a relationship platform with a clearly *market-driven* approach. Its main aim is to proactively facilitate the relationship between companies and institutions in the field of composite materials and the University of Girona, based on initial contact and on building and maintaining an ongoing relationship through a single, personalised point of contact with the University of Girona.



Main capabilities

- Characterisation of the mechanical behaviour of materials and structural components.
- Non-destructive inspection of materials (ultrasound, tomography, etc.)
- Thermal analysis of materials (DSC, TG, DTA, TMA, rheometry, etc.), particularly of composite matrices.
- Simulation and design of structural components, particularly composite ones.
- Structural optimisation.
- Additive manufacturing.
- Quantification and management of uncertainty in structural design.

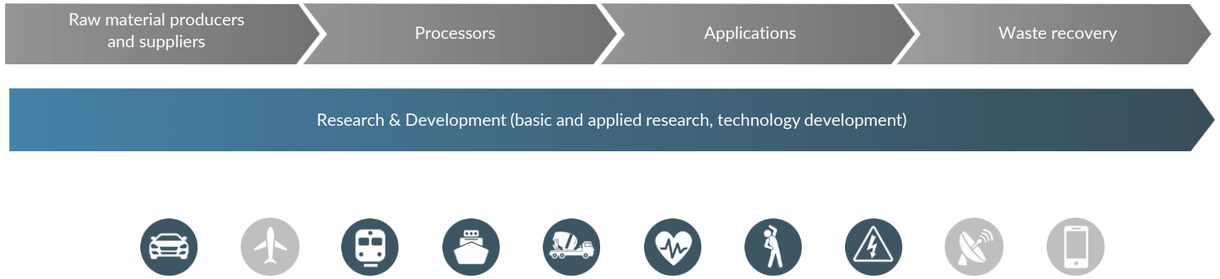
Types of materials or solutions

Composites, polymers, paper.

Highlights

Horizon-EU OVERLEAF project, in which the UdG characterises composite materials for hydrogen tanks in aeronautics at cryogenic temperatures.

JEC Innovation Awards 2023 winner – Horizon-EU HAIRMATE project: design and manufacture of moulds to produce the next generation of aircraft seats.





LIGHTWEIGHT MATERIALS

CAMPUS COMPÒSITS UdG

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Description

CHEMPLATE MATERIALS' main activity is the distribution and manufacture of semi-finished chemical products for the surface treatment and coating industry, for both metallic materials and engineering plastics. Founded in the late 1980s, over the years it has created different business lines and its own products, such as industrial machinery for the electronics sector. It currently offers a wide range of chemical products, both from international suppliers that it distributes exclusively in Spain and Portugal and from its own technology, developed through its participation in national and European collaborative R&D projects.

Main capabilities

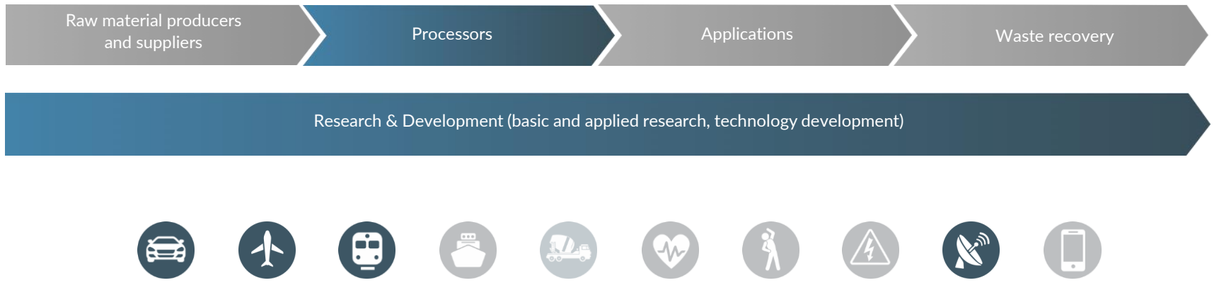
- In-depth knowledge of industrial processes related to electroplating and coatings.
- In-house laboratory for analysing electroplating baths, and specialised instruments to determine liquid- and solid-phase compositions of metals, organic compounds and impurities.
- Production area for complex chemical mixtures of up to 1,000 litres, and capacity to store and distribute packaged chemical products.
- Process piloting area and pilot plant to test chemical products on reference surfaces and substrates.

Types of materials or solutions

- Metal substrates such as aluminium, steel, titanium, zamak or brass, among others, and plastic and thermoplastic substrates in tests for third parties.
- Nickel, copper, precious metal, zinc and zinc-nickel coatings, among others.
- Organic-based coatings to achieve technical textures.

Highlights

Patented liquid-phase chemical formulation for pickling the surfaces of aluminium alloys with a high copper and magnesium content, impurities that are hard to remove without damaging the base material or the technical part. It removes the impurities selectively thanks to a specific formulation and specific temperature and treatment time conditions.



CHEMPLATE MATERIALS, S.L.

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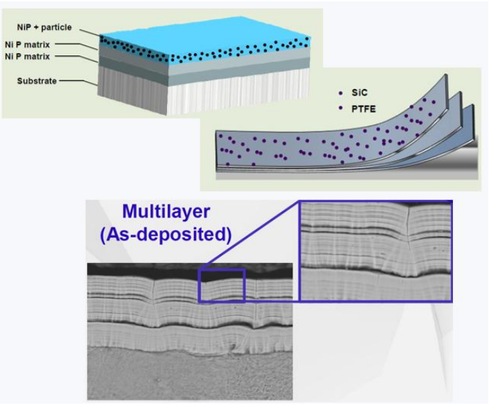


Result of successive nickel-phosphorus coatings with added nanoparticles



Pilot plant equipment for testing immersion and surface treatment processes

Description

COMINDEX S.A., present in the industry since 1933, distributes speciality chemicals that provide innovative, reliable and efficient solutions, offering the logistics service, technical advice and specialised training needed to boost its customers' activity.

Main capabilities

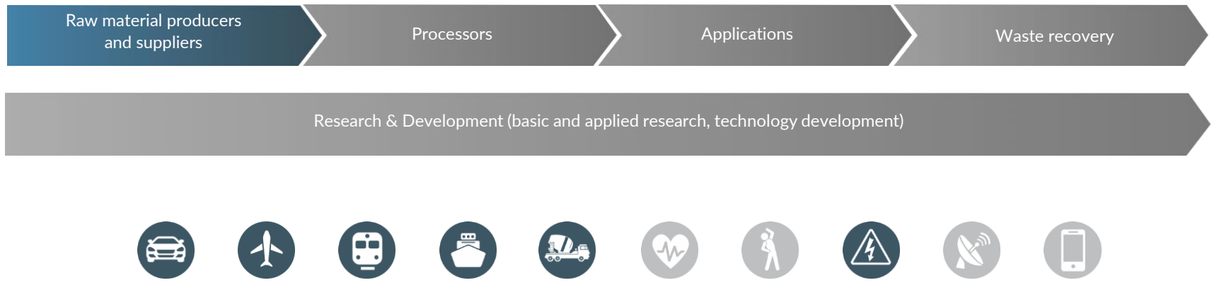
Advice on and sale of additives and speciality chemicals for the formulation, development, quality and property improvement, and production of lightweight materials.

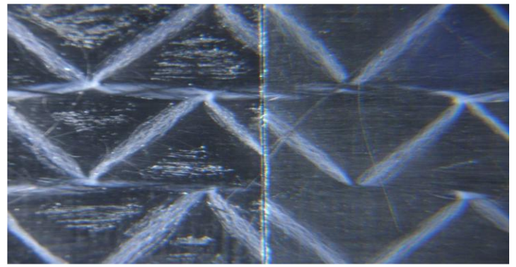
Types of materials or solutions

- Additives and speciality chemicals.
- Compatibilisers for fillers and fibres with thermoplastic and thermoset matrices, coupling agents, process-improving additives (for example, to improve fibre wetting), glass microspheres, epoxy resins.

Highlights

Applications to improve the properties of wind turbine blades.

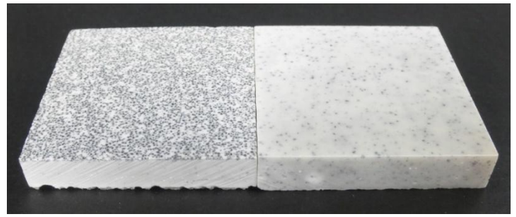




Epoxy + GF
Without additive

Epoxy + GF
+ BYK-P 9920 additive

Improved fibre wetting with BYK-P 9920



Without additive
Agglomeration and sedimentation of solids

With BYK-P 105
Homogenisation of solids
No sedimentation

COMINDEX S.A.
Part of IMPAG Group

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Description

Compoxi is a company committed to the development of composite products. It contributes to every project with its experience and know-how, gained over more than a decade of involvement in the development, design and production of composite structures and components in the space, aeronautics and industrial sectors.

Main capabilities

- Conceptual design of composite and hybrid (composite / metal) material products
- Calculation, testing and qualification of composite and hybrid (composite / metal) components
- Production resources
  - ISO 8 clean room
  - Autoclaves (up to 2.6 m diameter x 4 m)
  - Machining equipment (up to 1.3 m x 2.5 m)
  - RTM and infusion equipment
  - 80 t hot-plate press
- Production types
  - Prototypes
  - Short runs / one-off products
  - Series production
- Integration, assembly and testing

Types of materials or solutions

- Design and production of components with the following materials
- Carbon, glass, quartz and Kevlar fibres with polymer matrices (epoxy, cyanate ester, bismaleimide)
- Sandwich structures with Kevlar and aluminium cores
- Hybrid parts with composite materials and metal elements and inserts (steel, aluminium, titanium)

Highlights

Chassis of the Rashid lunar rover. Smart Battery Case 2 project (AEI 2023).





Structural engine components for aircraft able to withstand high temperatures.



DIFGI device for breast cancer treatment, patented together with the Catalan Institute of Oncology and in service at the Josep Trueta Hospital in Girona, where it has already treated more than 400 patients.

COMPOXI SL

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Description

CONDALS GROUP is a leading multinational company that has been offering advanced technical solutions for the automotive, railway and construction sectors since 1976.

Main capabilities

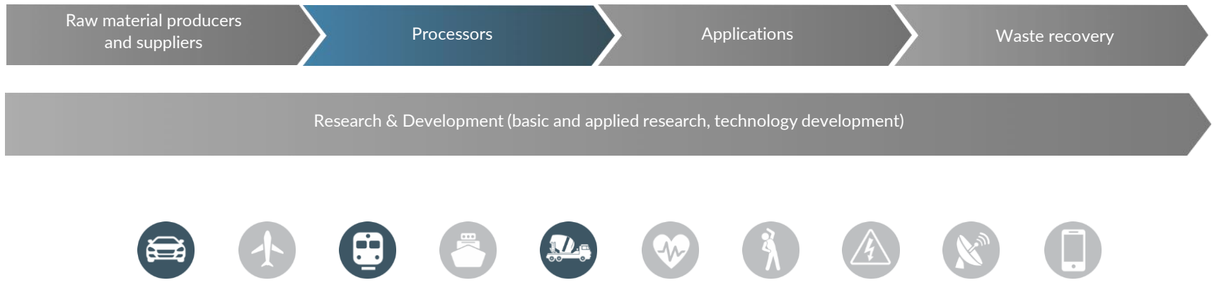
Ductile iron foundry, high-power tomography, machining, heat treatment

Types of materials or solutions

Ductile iron, specialising in safety parts.

Highlights

It holds IATF16949 automotive quality, ISO14001 environmental, ISO45001 safety and ISO50001 energy management certifications.



CONDALS GROUP

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info@condalsfoundry.com







Description

The Universitat Politècnica de Catalunya (UPC) · BarcelonaTech is a leading public university in the fields of architecture, engineering and science. The UPC is the leader in Spain in knowledge and technology transfer, and maintains a close and ongoing relationship with industry.

Main capabilities

Nanofillers to functionalise bio-composite and ultralight materials (R-LIGHTBIOCOM). Manufacture of FRCM (fabric reinforced cementitious matrix) sandwich panels with plant fibres and resins.

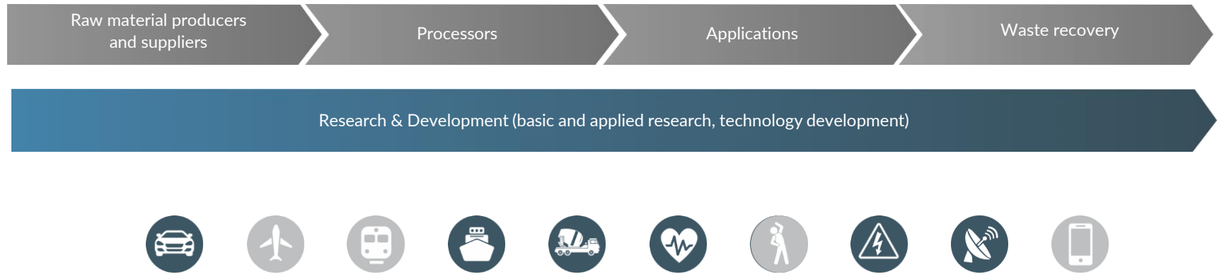
Types of materials or solutions

- Starting from standard composite materials (such as PU foams), materials with different functionalities (antibacterial or stiffer) are developed by adding nanofillers to new polymers.
- Formed material for manufacturing high-performance panels (breaking strength), made of a cement matrix with plant or synthetic fibres.
- Multifunctional polymer foams for electromagnetic shielding.

Highlights

Silver-based nanoparticles have been used in hydrogel or polymer matrices to create dressings that can heal wounds.

Patented process and installation for the production and assembly of rigid recyclable sandwich panels, with applications in various fields and especially in the manufacture of formwork panels.



CIT - UPC
Universitat Politècnica de Catalunya

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Description

Founded in 1906, Leitat is a private non-profit organisation that offers disruptive solutions to the technological needs of companies and organisations, with a clear focus on generating competitive value and a sustainable future.

Main capabilities

- Equipment: VA-RTM, compression moulding: hot-plate press (250 °C), injection moulding.
- Interests: thermoset and thermoplastic composites, bio-based composites, self-reinforced composites, use of carbon fibre and natural fibres.

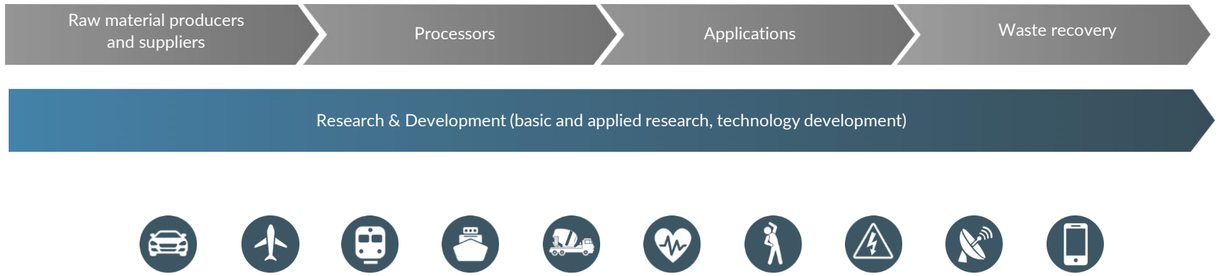
Types of materials or solutions

Carbon fibre modification, thermoplastic and thermoset composite materials.

Highlights

CUSTOMISIZE: Recycling carbon fibres for stronger composites (CleanSky 2018)

Two different sizings (PEI and PI) were specifically developed and characterised for recycled carbon fibres for PPS and PEKK thermoplastic matrices.









LEITAT
ACONDICIONAMIENTO TARRASENSE

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Description

Menzolit is the world's leading supplier of Sheet Moulding Compound (SMC) and Bulk Moulding Compound (BMC) for the automotive, E&E, construction, industrial, sanitary and railway markets in Europe, with more than 70 years of experience.

Main capabilities

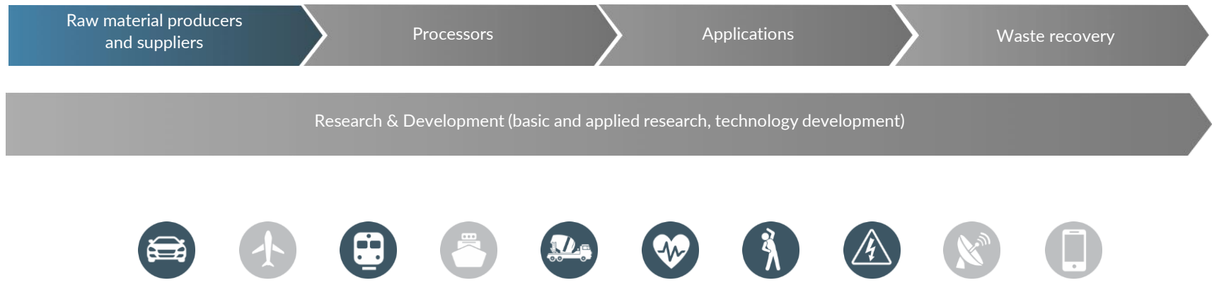
Support for customers from development through to production, supply and after-sales service, to offer the most efficient solution.

Types of materials or solutions

Thermoset composites based on unsaturated polyester or vinyl ester resins, reinforced with glass fibre. Various functional additives are used to improve the properties of the materials and provide superior mechanical properties, excellent electrical and fire protection characteristics, a "Class A" surface finish and low density.

Highlights

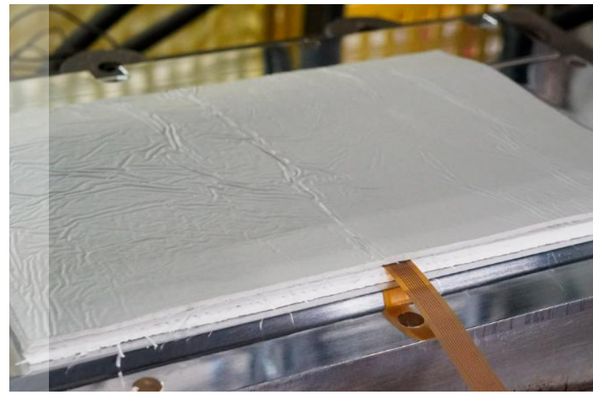
Awarded Gold in the EcoVadis Corporate Social Responsibility (CSR) rating for its Granollers plant.





SMC sheet


Glass fibre is used as reinforcement in SMC


Steel mould where the SMC is cured

MENZOLIT VITROPLAST S.L.

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Description

ONYRIQ is a customer-oriented R&D company in the field of polymer materials, with a team that has more than 15 years of experience in developing and implementing national and international research projects. Its aim is to develop and bring to market, together with its customers, new products that have a positive impact on society, through a comprehensive, tailor-made process adapted to the needs of each customer.

Main capabilities

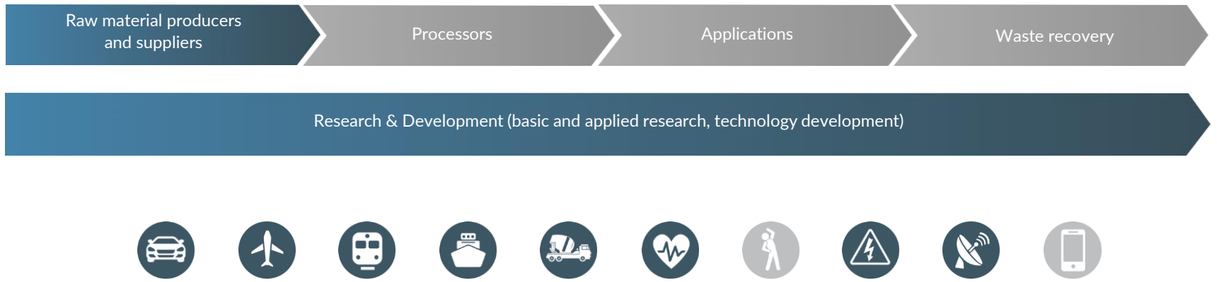
- Synthesis and modification of polymers to form matrices for composite materials.
- Development of thermoset systems with bio-based content and/or recyclability.
- Additivation and formulation of resins and other materials.
- Rheological studies of resins and composite formulations.
- Research, development and application of more sustainable, safer and less toxic alternative materials and processes.

Types of materials or solutions

- Thermoplastic polymers (polyurethanes, acrylics, polyesters, polyamides...) and thermosets (epoxies, polyurethanes, polybenzoxazines...).
- Monomers, building blocks and resins: design, synthesis and development.
- Functional additives for composite materials (flame retardants, self-healing...): synthesis, formulation and encapsulation.
- Functional coatings for composite materials (anti-corrosion, hydro/oleophobic, anti-icing, abrasion and impact resistance...).
- Sustainable alternatives: bio-based, biodegradable and low-toxicity polymers and components.

Highlights

- LOOP technology: new fully chemically recyclable epoxy systems, as an alternative to current thermoset composites, that make it possible to recover the reactive building blocks, fibres and additives.
- Participation in 3 Horizon Europe projects (ECORES WIND, FURHY and REPOXYBLE), together with the UdG, developing recyclable epoxy systems for composite materials in the automotive and aeronautics sectors.







Onyriq's laboratory facilities, where polymers with different properties are designed, synthesised and formulated

ONYRIQ LABS S.L.

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Description

Founded in 1987, REFISA focuses on the full development of composite projects for railway vehicle manufacturers and railway supply companies.
They work on a turnkey basis, providing their customers with solutions in the design, engineering, calculation and manufacture of composite parts. They also integrate all the necessary auxiliary elements into their parts: load-bearing and auxiliary structures, decorative elements, painted finishes, adhesives, etc.
The company has an Engineering and Industrialisation Department and a workforce of more than 120 people. It also has a subsidiary in Serbia, REFISA BALKAN, which gives it a key position in central Europe.

Main capabilities

Using composites in railway vehicles offers a very wide range of advantages: lightness, design adaptability, impact resistance with very low weight, and the possibility of integrating different elements or materials

Types of materials or solutions

Manufacturing systems:

- Hand Lay-Up
- Vacuum Infusion
- RTM-Light and RTM

The main materials they use are:

- All types of polyester and epoxy resins.
- All types of glass fibres, fabrics and reinforcements.

Highlights

Development of large parts (roof fairings more than 5 m long) for the high-speed trains running on the Medina – Mecca line in Saudi Arabia, with very demanding performance and requirements in terms of both weight and aerodynamic resistance. Participation in INHO_TOOL (AEI 2023).



REFISA – RECUBRIMIENTOS Y FIBRAS S.L.

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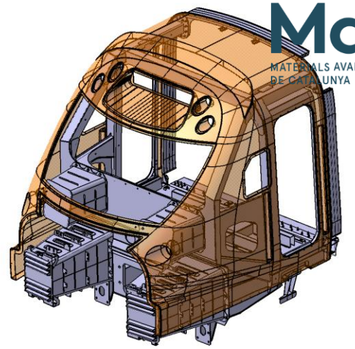

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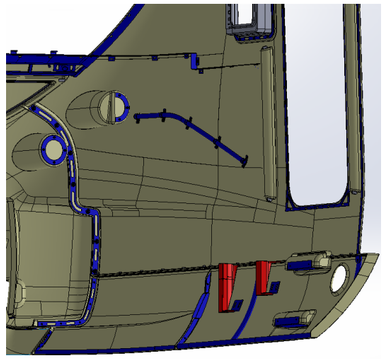

3.



Full project development. Complete front end for the Santiago de Chile metro – Rancagua Line.

1. 3D design and calculation
2. Industrialisation
3. Manufacture and delivery to the customer

Clúster Mav

MATERIALS AVANÇATS
DE CATALUNYA

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