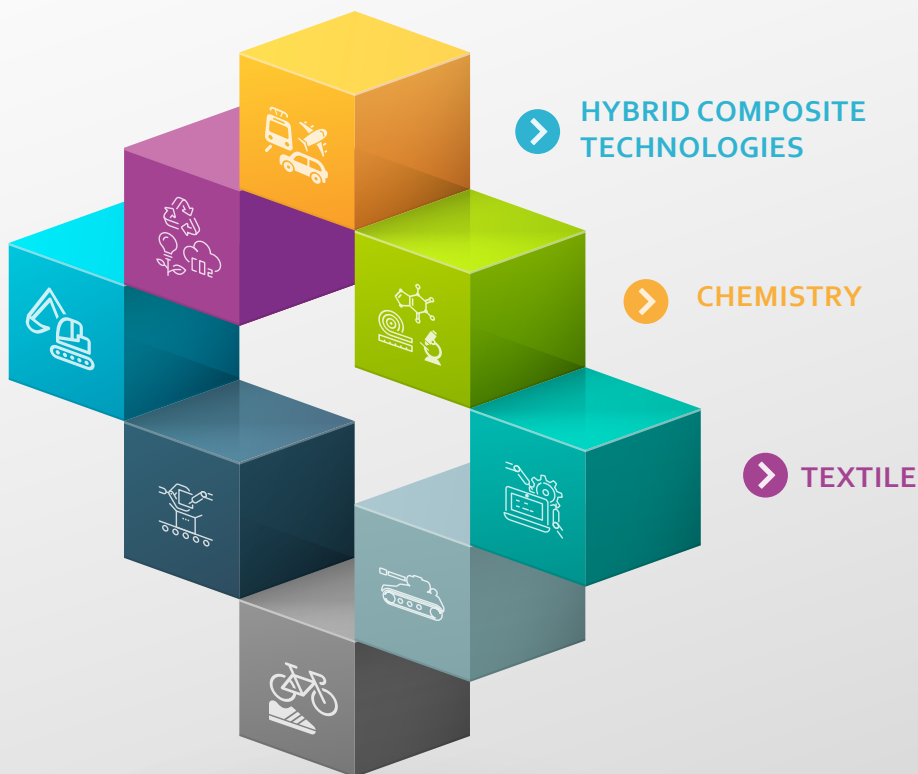




# Composites

Auvergne-Rhône-Alpes

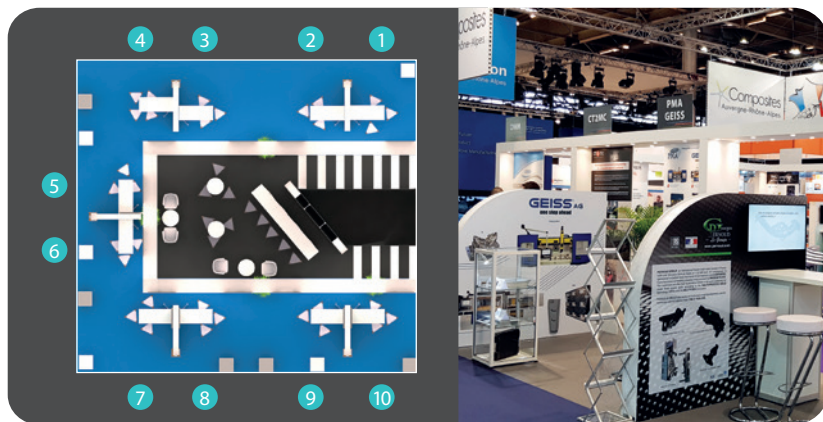


**JEC**  
**WORLD**  
The Leading International  
Composites Show



# Summary

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## Who are we?

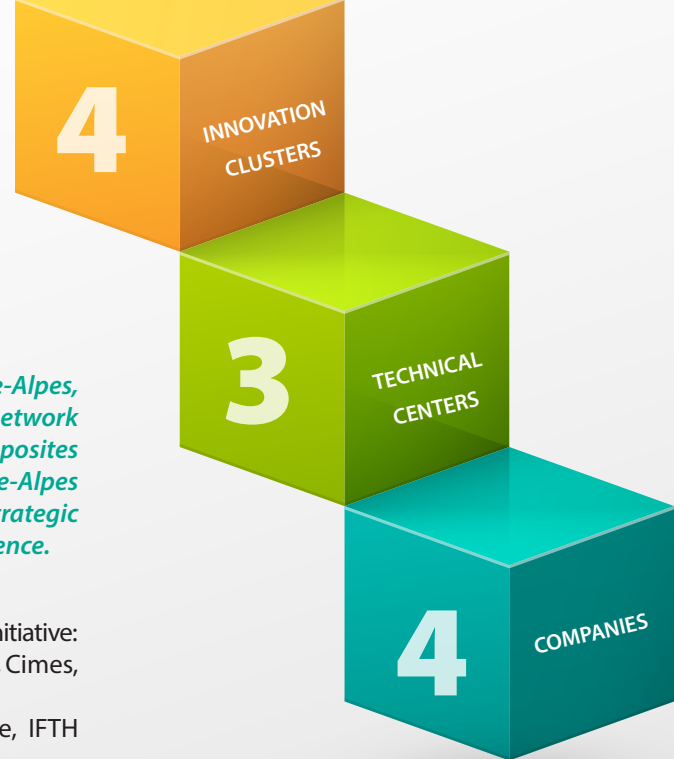
*Composites Auvergne - Rhône-Alpes, created in 2009, is a French network gathering key players of the composites industry in the Auvergne - Rhône-Alpes Region and focused on two strategic domains: innovation and excellence.*

Eleven partners are behind this initiative:

- 4 innovation clusters: Axelera, Cimes, Polymeris and Techtera,
- 3 technical centers: Axel'One, IFTH and IPC,
- 4 companies: Chomarat, Hexcel, Plastic Omnium and Solvay.

This network was created thanks to the gathering of four industries, associated to composites, having a significant position in Auvergne - Rhône-Alpes region: chemistry, textiles, plastics and the mechanical industry.

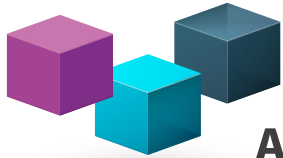
The Auvergne - Rhône-Alpes region gathers significant advantages: an integrated industry, world leaders, an active R&D policy and very dynamic clusters.



The Composites Auvergne - Rhône-Alpes technological domains offers development on growing markets in the composites industry such as:

- thermoplastic composites technologies,
- high-speed and high quality manufacturing processes,
- assembling and multi-materials joining, technologies and processes,
- finishing and painting of composite parts,
- recycling technologies.





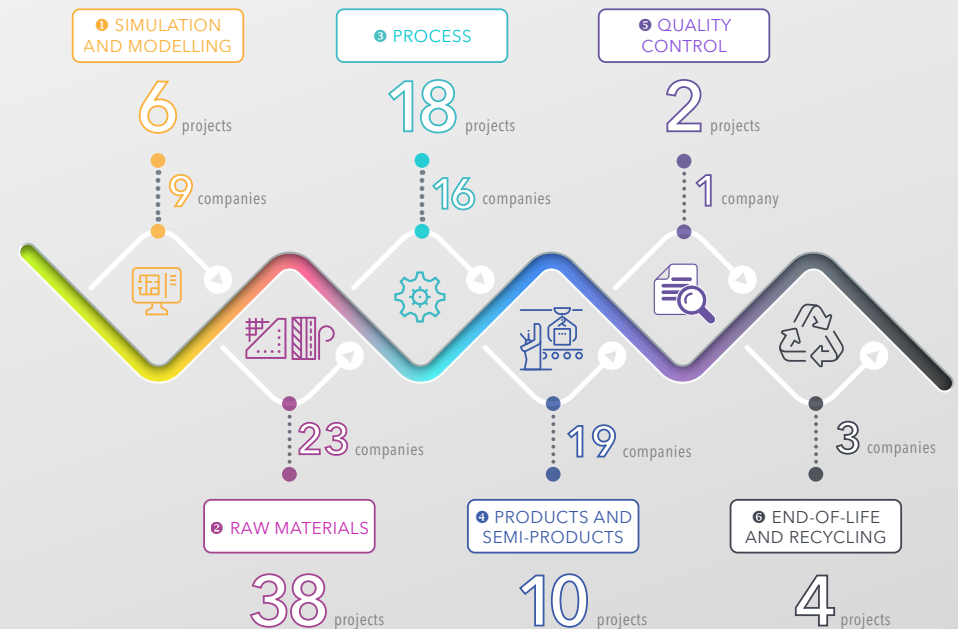
## Auvergne-Rhône-Alpes Region, the composites industry excellence area

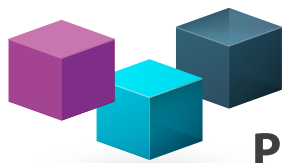
WITH MORE THAN 1000 MEMBERS, INCLUDING INDUSTRY, ACADEMIC, AND R&D PLAYERS, AMONG THE 4 CLUSTERS REPRESENTING COMPOSITE AUVERGNE-RHÔNE-ALPES NETWORK, THE REGION GATHERS A SIGNIFICANT AND ACTIVE COMMUNITY IN COMPOSITE SECTOR.

THIS INDUSTRY OFFERS YOU A HIGH LEVEL OF INNOVATION AND OF INDUSTRIAL CAPABILITY, SUPPORTING YOUR PROJECTS IN COMPOSITES, AND COVERING THE WHOLE VALUE CHAIN, FROM RAW MATERIAL UP TO FINAL PRODUCT.



## A project dynamic at each step in the value chain





## Projects showcase



### AUTOMOTIVE / AERONAUTIC



- Project coordinator: AMZ Sachsen
- Funding: Cosme Go International
- Estimated end: 2022

European Lightweight Cluster Alliance, international strategy for SMEs for lightweight solutions in 4 mobility sectors (aero, auto, rail, maritime) .



- Project coordinator: TPAC
  - Funding: Interreg North-West
  - Estimated end: 2023 • 4 < TRL < 7
- Novel advanced materials solutions for affordable lightweight to meet auto and aerospace maker's need.



- Project coordinator: Chomarat
  - Estimated end: 2022 • 4 < TRL < 7
- Develop a new generation of Non-Crimp Fabric based on carbon fiber and associated textile processes for the manufacture of thermosetting composite parts.



- Project coordinator : Extractive
  - Estimated end: 2022 • TRL 6
- Offer a new and viable solution to substitute steel containing CRM and primary carbon fibres in the automotive industry through the recycling of CFRPs to obtain high quality carbon fibres. Recycled carbon fibres have lower price and carbon footprint and are ideal for applications where rigidity and lightweight are required. The project will prove the competitiveness of the thermosolvolysis proposed up to market introduction.



- Project coordinator : Hexcel / Arkema
  - Estimated end: 2022 • 4 < TRL < 6
- Optimization of the UD Tapes design and manufacturing process in view of their use in highly productive, cost competitive, composite part production. Development of a highly productive UD Tape placement technology with the ability to assemble final parts by welding and control the final part quality in line.



- Project coordinator: Solvay
  - Estimated end: 2022 • 4 < TRL < 7
- Optimization of simulation and use of composites behavior aged in a water / glycol medium.



- Project coordinator: VITO
  - Funding: LIFE Program under grant agreement N° LIFE20-ENV-BE-000671
  - Estimated end: 2025 • TRL 5
- Valorisation of lignin biomass into competitive components gradually replacing BPA in the formulation of epoxy resins.

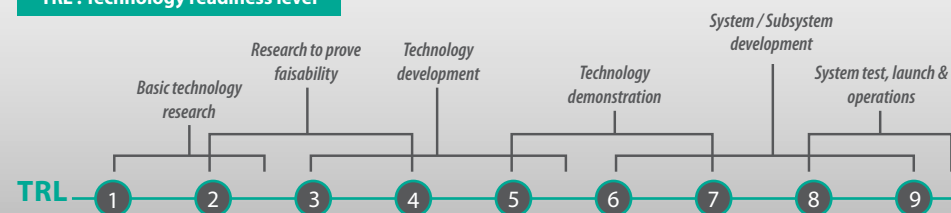


- Project coordinator: Zodiac Aerosafety Systems
  - Project completed • 4 < TRL < 7
- Improve the crash and impact performance for thermoplastic composites equipment.



- Project coordinator: IMP
  - Project completed • 4 < TRL < 7
- Non-Hydrolytic in situ synthesis of new polyolefin-based nanocomposites by reactive extrusion.

### TRL : Technology readiness level







## Projects showcase

### NHYCCO



- Project coordinator: Billion Mayor Industrie
  - Project completed • 4 < TRL < 7
- New hybrid yarns for protective clothing and composites applications with high performances.

### NICE techtera

- Project coordinator: Airbus
  - Project completed • 4 < TRL < 7
- Develop thermoplastic materials operated by automatic draping in accordance with the requirements of REACH.



## AUTOMOTIVE / AERONAUTIC / ENERGY / BUILDING

### AMULET\*



- Project coordinator: TU Chemnitz
  - Funding : European Union's Horizon 2020 research and innovation programme under grant agreement N° 101005435
  - Estimated end: 2024 • TRL 7
- Business framework with demonstration projects, training and coaching on the field of 3 type of materials (polymer-based composites, ceramic matrix composites, light metal alloys) for 4 industrial markets (automotive, aerospace & aeronautics, energy, building).



## ARCHITECTURE / INFRASTRUCTURE & CIVIL ENGINEERING

### RESOL



- Project coordinator: Polyloop
  - Estimated end: 2024 • 5 < TRL < 7
- Develop a recycling solution for PVC textile composites to produce recycled PVC that can be used in plastisol coating processes.

### RECYFE2 axelera

- Project coordinator: Tri Vallées
  - Project completed • TRL 6
- Creation of a window dismantling unit allowing optimized recovery of the different fractions. Process enabling the entrance and exit of materials from the machine.

### AC2M2 techtera

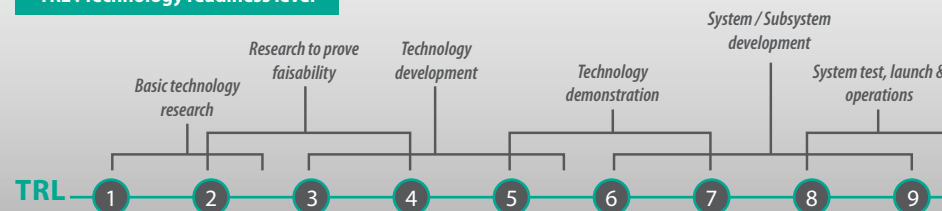
- Project coordinator: ATG Composite
  - Estimated end: 2022 • 5 < TRL < 6
- Develop a production line for composite reinforcements, with hybrid, multifunctional mineral matrix textile reinforcements for construction sector.

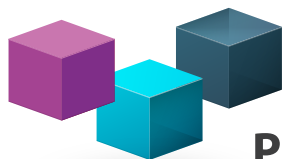
### IGNITION axelera POLYMERIS

- Project coordinator: Culture iN
  - Estimated end: 2022 • 4 < TRL < 7
- Development of fireproof eco-designed composite product with reduced environmental impact.



### TRL : Technology readiness level





## Projects showcase



- Project coordinator: IMT Mines d'Ales
  - Estimated end: 2022 • TRL < 4
- Develop a controlled release flame retardant system based on linear low density polyethylene/ethylene-vinyl acetate copolymer (LLDPE/EVA) blends dedicated to the cable industry.



- Project coordinator: Sulitec
  - Project completed • 4 < TRL < 7
- Develop composites with textile reinforcements in order to fix damaged concrete structures.



- Project coordinator: Freyssinet
  - Project completed • 4 < TRL < 7
- Develop a robotized method able to rehabilitate underground water pipes from the inside by using a new sort of pre-impregnated textile reinforcement with a thermoplastic matrix.



### WIND ENERGY



- Project coordinator: Plastinov
  - Project completed • 4 < TRL < 7
- Develop and implement innovative composites for the making of lighter, cost-efficient and recyclable large dimension equipment used in offshore wind power (blades, nacelles).



### MARINE



- Project coordinator: SEA2-Orange marine
  - Project completed • 4 < TRL < 7
- Develop new technical textile designed to replace PVC in the making of light and eco-friendly tenders offering better mechanic properties and durability.



### RECYCLING



- Project coordinator: Next Technology Tecnotessile
- Co-financed by the COSME programme of the European Union
- Estimated end: 2024

Support the internationalisation of European SMEs whose activities are related to the manufacture of composites from recycled materials, particularly textiles. A joint internationalisation strategy will be developed and tested, targeting three countries: the USA, Japan and Singapore.



### DEFENSE



- Project coordinator: IMP, Insa Lyon
  - Estimated end: 2023 • TRL < 4
- Nano-structured composites materials for electromagnetic radiation absorption.



- Project coordinator: Techtera
- Co-financed by the COSME programme of the European Union
- Estimated end: 2023

Support the internationalisation of European SMEs in technical textiles, connectivity, advanced technologies and advanced materials. The project targets in particular the dual-use (civil and military) security and defence markets in four countries: the United States, Canada, Japan and Indonesia.

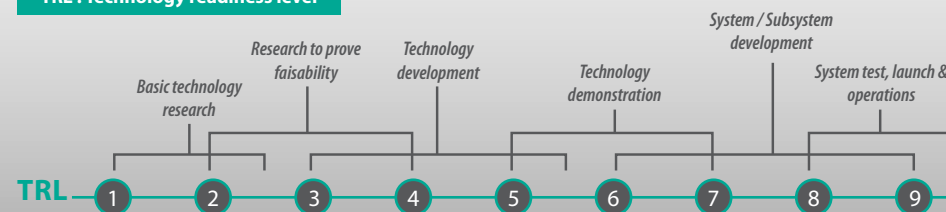


### SPORTS & LEISURE



- Project coordinator: Ateca
  - Estimated end: 2022 • 4 < TRL < 7
- Development of innovative sports equipment solutions for better vibration & shock damping to protect human tissue.

#### TRL : Technology readiness level





**Axelera cluster is a network of 400 members, connecting companies (large, medium-size and small), research laboratories as well as training organizations in the field of chemistry and environnement.**

Axelera members are extremely well-rounded, with experience and know-how in a wide array of markets and disciplines:

- production of raw materials and energy,
- production of chemicals, materials, and recycled products,
- manufacturing,
- collection, treatment, and recycling of effluents and waste,
- parts and equipment manufacturers, consumables suppliers,
- engineering services providers, assemblers, integrators,

- industrial services: process design and optimization, energy efficiency, regulatory, compliance
- environmental services: water, air, soil, waste
- chemistry, environmental technology, and biotechnology labs, technical centers, and R&D service providers,
- private-sector financing,
- training providers.

Since 2011, its Axel'One platform has brought together academic partners, VSEs and SMEs and industrial companies around shared research tools.



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**Cluster specialised in conception, production and integration for mechanical intelligent systems.**

Cimes is a competitiveness cluster devoted to design, production and integration of intelligent mechanical systems.

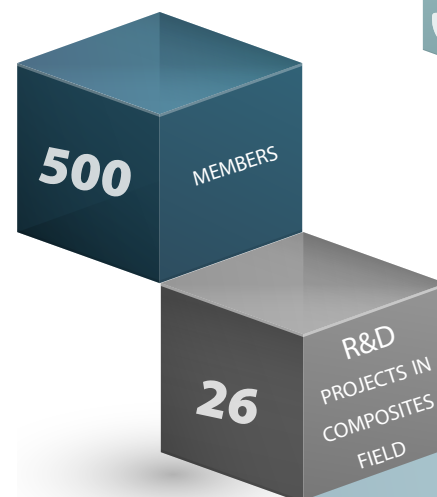
Cimes animates the communities (academic and industrial) on the topic of additive manufacturing (tools / injection molds un particulier).

Cimes collaborative projects deals with several scientific areas:

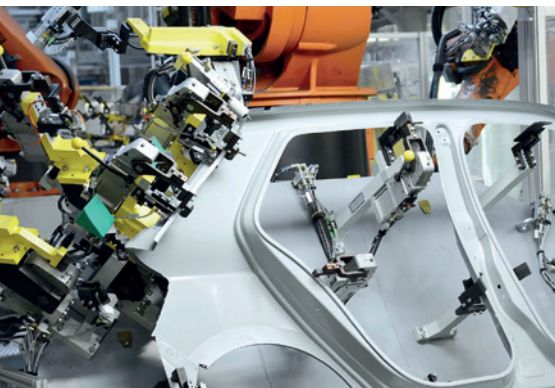
- engineering for manufacturing, materials and surfaces,
- integrated robotic and productive efficiency,
- optimised engineering for sustainable systems.



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**Polymeris is the only French cluster dedicated to rubbers, plastics and composites gathering more than 500 members, among them 380 companies and 65 R&D centers and universities.**

Polymeris draws on 15 years of expertise and experience in supporting businesses, with in-depth knowledge of the techniques and markets of tomorrow. Polymeris promotes and develops Innovations for rubbers, plastics and composites industries, thanks to collaborative R&D projects with around 300 funded projects and more than 35 european ones. In addition to this activity, Polymeris promotes innovation in education and opens up the companies toward different industriel sectors and international cooperation.

Its main technological added value domains are:

- advanced materials with high mechanical performance for lightweight, functional and smart properties,
- factory of the future as fast automated composite processes including additive manufacturing,
- smart products with integrated electronics for mobility, health, packaging, goods,
- circular and sustainable solutions thanks to high performance bio-based materials, eco-design and recycling loop.

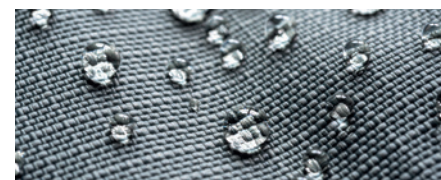


*Cécile BEDOUE, Project manager, advanced materials & composites*  
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## Techtera, innovation cluster for the French textile industry.

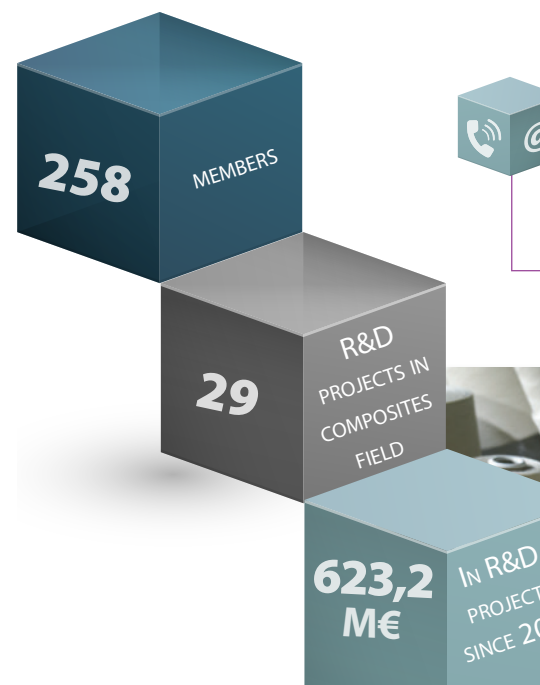
The cluster runs a network of more than 258 members (companies, research laboratories, technical centers, universities and schools) with the main objective of boosting competitiveness through collaborative innovation.

It has labelised 243 R&D projects that received funding for a budget of 623.2 million.



The cluster also supports its members through:

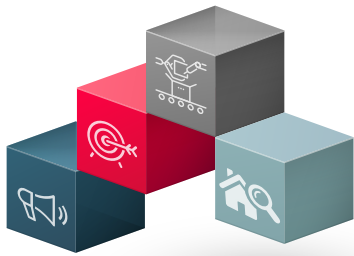
- Industry stimulation: workshops (dedicated to innovation, valorisation and competitiveness) and clubs (recycling-circular economy, 4.0 industry in textile, smart textiles).
- Collaborative innovation: projects labelling, projects support, identification of national and European fundings.
- Business development: business launching of innovative products, international support, CART'TEX database (more than 350 know-how textiles skills registered), monitoring of the latest trends in housing.



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*Project manager - Business development*  
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INVEST IN  
**ONLY LYON** 

*ADERLY/INVEST IN LYON IS THE ECONOMIC DEVELOPMENT AGENCY FOR THE LYON AREA. ITS MISSION IS TO PROMOTE THE LYON AREA AND TO IDENTIFY AND ESTABLISH NEW INVESTMENTS, CREATORS OF VALUE AND JOBS. ADERLY'S TEAMS HELP AROUND 100 COMPANIES TO SET UP IN THE LYON AREA EVERY YEAR INCLUDING MANY MAJOR CLEANTECH AND CHEMISTRY ORGANISATIONS: AIR LIQUIDE, SOLVAY, SYMBIO, ELKEM SILICONES... LYON IS AMONG EUROPE'S MOST IMPORTANT CLEAN TECHNOLOGY DEVELOPMENT REGIONS: 31 500 JOBS, 1 WORLD COMPETITIVE CLUSTER, 470 PATENTS & 2 NOBEL PRIZES IN CHEMISTRY. AND THANKS TO A STRONG POLITICAL COMMITMENT, AND ITS CLEANTECH DEVELOPMENT PLAN, LYON IS THE GREAT BUSINESS OPPORTUNITY IN FRANCE FOR TESTING INNOVATIVE ENVIRONMENTAL SOLUTIONS*

### Application areas

Industry, life sciences, cleantech, digital and services.

### Services

Aderly assists with all the stages of business set-up and development in the Lyon area. We support all types of companies, from SME's to large corporations, working in the key sectors of the Lyon region's economy. The agency offers a range of free and tailored services:

- business & partnerships,
- legal & fiscal,
- real estate solutions,
- funding & aid,
- human resources,
- staff mobility,
- communication & networks.



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**DMM**  
OUR MOLD EXPERTISE  
YOUR NEEDS  
**CLM**

*SINCE 1990, DMM/CLM (ISO 9001) LOCATED IN OYONNAX DEVELOPED AND ESTABLISHED THEMSELVES AS PRIMARY SPECIALISTS IN THE DESIGN AND PRODUCTION OF MOLDS (UP TO 50T/6 METERS) FOR THE TRANSFORMATION OF PLASTICS AND COMPOSITES, AS WELL IN THE MAINTENANCE AND REPAIRS, IN FRANCE AND INTERNATIONAL.*

### Application areas

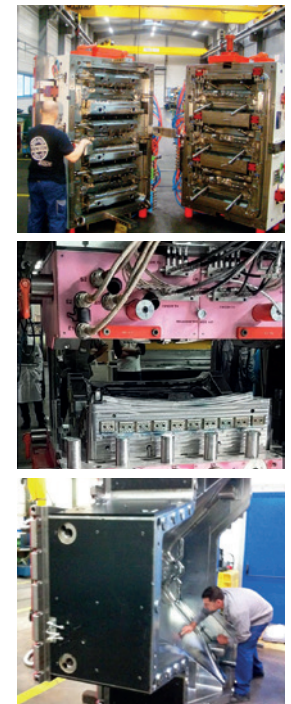
Structurals parts for lightweighting in transports as Automotive, trucks, railways, buses, aeronautics. Equipments for industry, leisure, sports, packaging, containers, transport and energy distribution.

### Products

Our molds are constructed for the transformation technology for which they are intended and designed in line with our production methods. We bring all of our added value to find solution to facilitate use and interchangeability in the lifetime based on criteria talked in the requirements. We can manage try outs & pre production of parts : injection moulding mono or 2K (50-2200T), SMC (1200-1800T).

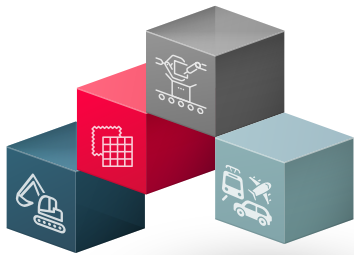
### Innovations

Based on our experience, we are involved in projects for vehicle lightweighting incorporating the following technologies: SMC for thermosets, and organo sheet overmoulded for thermoplastics (hatch back, structural parts...).



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www.dmm.fr



*FOR OVER 60 YEARS, MARDUEL HAS SPECIALIZED IN PROCESSING TECHNICAL YARNS TO STRENGTHEN INDUSTRIAL PRODUCTS SUCH AS COMPOSITE, HOSES OR MANY OTHER HIGH VALUE-ADDED APPLICATIONS. BY TWISTING, CABLING, WINDING, COATING, MARDUEL DEVELOPS AND MANUFACTURES NEW YARNS THAT FULFILL ITS CUSTOMER'S NEEDS.*

#### Application areas

Composite, aeronautics, automotive, PVC & rubber reinforcement, paper & leather industries, mechanical industry, packaging, textile, construction...

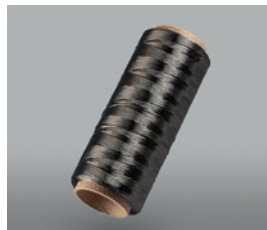
#### Products

Technical Yarns manufacturer by twisting and winding

- From 500 dtex to 100 000 dtex
- High tenacity yarns, Aramids, Carbon, Glass, basalt...
- Hybrid yarns
- Tailor-made products
- Extensive quality control check
- Traceability

#### Innovations

Marduel offers advice and technical support dedicated to innovation. This expertise allows the company to be approached for research by famous names of the aeronautics and automotive industries. A dedicated twisting carbon, glass and basalt workshop enables to meet needs of prototyping and large scale production.



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[www.marduel.fr](http://www.marduel.fr)



*MÉCANIUM IS A TESTING CENTRE IN MATERIAL STRENGTH AND CHARACTERIZATION OF STRUCTURE MECHANICAL BEHAVIOUR.*

*TESTS ARE CARRIED OUT IN ORDER TO IDENTIFY MECHANICAL BEHAVIOUR LAWS, CHARACTERIZE MATERIALS PROPERTIES AND CHECK STRENGTH OF FINISHED PRODUCTS.*

#### Application areas

Aeronautic, automotive, biomedical, energy, marine, sports and recreation industries.

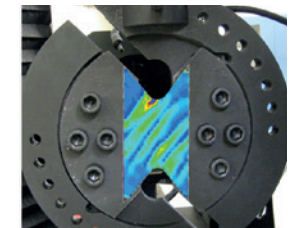
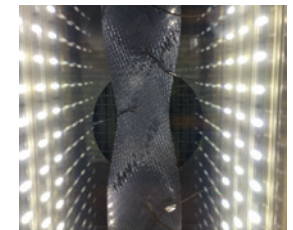
#### Services

Mecanium is able to provide services in different fields of competences related to research activities of its clients:

- characterization for technical fabrics,
- composite materials properties characterization,
- materials properties characterization for stamping and forming,
- high-low-temperature testing.

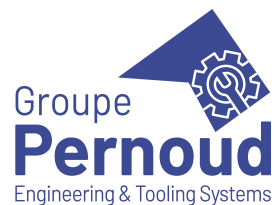
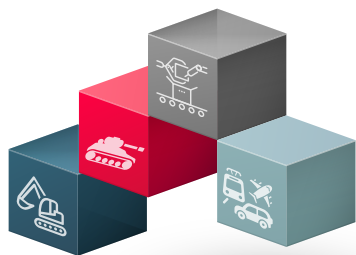
#### Innovations

For numerical simulation needs, Mecanium is able to determine material parameters used as input data for a computing code and to implement test cases in order to compare experimental / numerical results.



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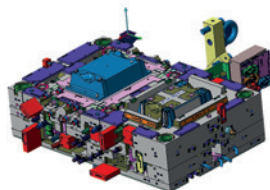
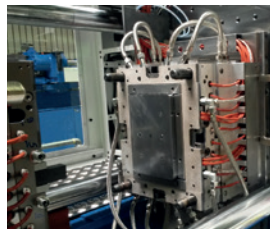
**CREATED IN 1971, THE PERNOUD GROUP IS SPECIALIZED IN INJECTION MOLDS, DIE CASTING AND COMPOSITES TOOLS. TIER 1 OF MOLD MAKING (DESIGN, MANUFACTURE, MAINTENANCE, MODIFICATION AND REPAIR). CERTIFIED ISO 9001 V2015 AND ACCREDITED RESEARCH CENTER.**

### Application areas

Automotive industry (FMS parts), building, defence and aeronautics markets.

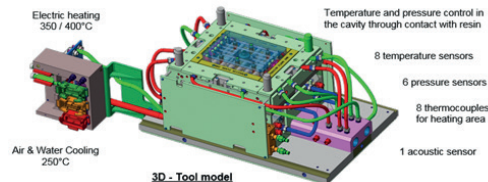
### Products

- Multitube overmolding technology to avoid welding process,
- LSR overmolding and vulcanization within the mold,
- C-RTM TP process for composite: impregnation of a dry 3D preform by a thermoplastic resin,
- E-Tooling, a smart, connected & full electric mold,
- E-Assist, a remote solution for maintenance diagnosis,
- k-E-nematic, autonomous mold and electric actuators.



### Innovations

Our R&D approach focuses on different themes such as the productivity of manufacturing processes, the vehicles lightweighting, the circular economy, the ecological transition and the industry of the future.



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[www.pernoud.com](http://www.pernoud.com)



**Plasturgy Material Advance®**



**PLASTURGY MATERIAL ADVANCE IS THE EXCLUSIVE AGENT FOR FRANCE OF EUROPEAN COMPANIES AMONG WHICH THE GERMAN COMPANY GEISS AG. GEISS AG OFFERS COMPLETE SOLUTIONS FOR PLASTICS AND COMPOSITES PROCESSING WITH THE DESIGN AND CONSTRUCTION OF PRESSURE FORMING MACHINES, CNC MACHINING CENTRES, AS WELL AS MODEL, TOOL AND MOULD MAKING FOR THESE MACHINES.**

### Application areas

Aeronautics, automotive, motorbikes, agricultural machinery, packaging, travel suitcases, furniture, advertising signs, sport (surfboard...), building, lighting, sanitary ware.

### Products

- CNC machining centres : portal milling machines, ultrasound cutting or laser cutting machines.
- Pressure vacuum forming machine T10 or Ts1 series with high dynamic servomotors by Siemens, halogen heater elements, centralized air fan system, and quick set up times allowed by fixed tool clamp system.



### Innovations

CNC portal trimming machine equipped with Sinumerik One : revised HMI Software Operate, NCU 1740 with integrated PLC S7-1500F, Safety Integrated Plus. Sinamics S120 drive technology of the latest design equipped with multi-touch wide screen monitor, new generation of permanently backlash-free ball screws, remote-controlled motor driven front doors.



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[contact@pma-onlines.com](mailto:contact@pma-onlines.com)  
[www.geiss-ttt.com](http://www.geiss-ttt.com)





*POLYLOOP FINALLY OFFERS A RECYCLING SOLUTION FOR THE WORLD'S 3RD LARGEST PLASTIC USED IN COMPOSITES: PVC. HOW? THANKS TO A PROVEN PROCESS INTEGRATED INTO A SMART FACTORY TECHNOLOGY ADAPTED TO YOUR NEEDS. RECYCLE "AT HOME" YOUR COMPOSITE PVC WASTE AND INTEGRATE YOUR RECYCLED RAW MATTER INTO YOUR PRODUCTION.*

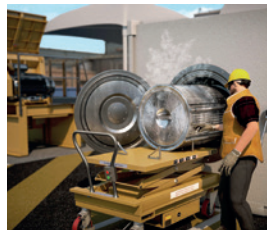
#### Application areas

Transport, outdoor, ID/Access card, building industry, medical, leather goods, packaging (non-food), recycler.

#### Innovation product

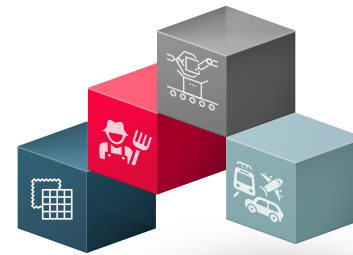
Development of compact and easy-to-use recycling units for composite based PVC material.

- **Recycling process:** selective dissolution and precipitation method (STRAP).
- **High quality r-material:** high level of component separation, ensuring the purity of the regenerated material, ready-to-use.
- **Integrated:** the equipment is integrated into your own industrial site, near the waste deposit.
- **Adapted to your needs:** on your industrial site, the equipment treats your waste by batch of 300kg in 3 hours. Maximum annual capacity of 500 tonnes.
- **Treatment** of your post-industrial, pre-consumer or end-of-life waste.



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**SOPARA**

*SOPARA IS ONE OF THE WELL-KNOWN LEADERS FOR INFRARED EQUIPMENT, ESPECIALLY DEDICATED TO NEW TECHNOLOGIES IN THE FIELDS OF COMPOSITE MATERIALS, AUTOMOTIVE AND TEXTILE AND IS ALSO VERY ACTIVE IN ALL INDUSTRIAL FIELDS. WITH ITS OWN IN-HOUSE R&D DEPARTMENT AND A TESTING LABORATORY, SOPARA DESIGNS AND MANUFACTURES CUSTOM-MADE SOLUTIONS.*

#### Application areas

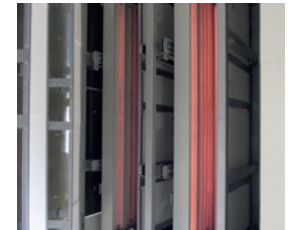
Composite materials, textile, automotive, aerospace, paint, agri-food industries.

#### Products

- Short-wave infrared heaters (for heating of materials or industrial premises),
- high performance medium-wave infrared heaters,
- curing and drying infrared ovens,
- thermoforming infrared ovens,
- non-woven textile heating infrared ovens,
- energy saving and high performance products,
- power control cabinet.

#### Innovations

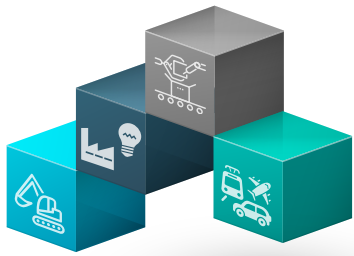
- Thermoplastic melting ovens to prepreg carbon fibers up to 450 °C.
- New infrared heaters for heating with perfect homogeneity thermoplastic composite plates for the aerospace industry.



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*LOCATED IN RHÔNE ALPES AUVERGNE AND WITH NEARLY 50 YEARS OF EXPERIENCE TISSTECH IS INVOLVED IN THE DESIGN, DEVELOPMENT AND MANUFACTURE OF TEXTILES FOR TECHNICAL PURPOSES. WE ARE CREATOR OF INDUSTRIAL TEXTILE PRODUCTS. OUR STRENGTH? OUR REACTIVITY. EXPERTISE, KNOW-HOW AND INNOVATION MADE IN FRANCE GUARANTEE OUR QUALITY.*

#### Application areas

An international presence and a great industrial reactivity in order to respond with precision to any specific request. We develop custom-made solutions for different industrial sectors : aeronautics, composite industry, electrical, rail, automotive, iron&steel, nuclear, maritime...

#### Products

- Customized and adapted support thanks to an efficient integrated production tool: R&D, warping, weaving, impregnating/coating composites, cutting, clothing industry/processing.
- Our product catalog is representative of all the developments carried out in collaboration with our customers : tapes for electrical insulation, preregs fabrics, reinforcement grid...



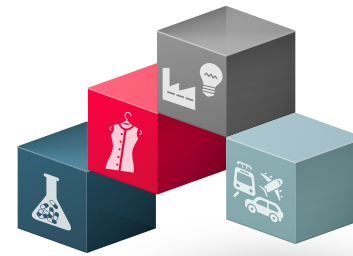
#### Innovations

We are able to develop any type of weaving. Come to our stand in order to discover our innovations!



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*3DEUS DYNAMICS AIMS TO PUSH THE LIMITS OF 3D PRINTING WITH ITS NEW FREEFORM PROCESS IN A GRANULAR ENVIRONMENT "DYNAMIC MOLDING" (DM). THIS BREAKTHROUGH INNOVATION SUPPORTS ALL THE POLYMERS AVAILABLE ON THE MARKET WITH A FIRST FOCUS ON SOFT MATERIALS (SILICONE) WITHOUT CHEMICAL REFORMULATION, WITHOUT SUPPORT STRUCTURE AND WITHOUT GEOMETRY LIMIT.*

#### Application areas

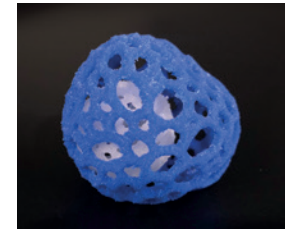
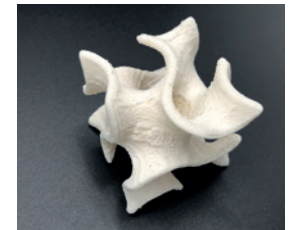
We are currently developing solutions for Silicone printing and addresses all major markets such as health for personalized medical devices, transport, energy and fashion.

#### Products

3Deus Dynamics develops custom-made products and provide technical solutions for the 3D printing of high-tech parts. Each product is unique and produced according to the specifications of our customers. We can also do co-development studies to lead to the deployment of our solution directly to the customer.

#### Innovations

The main innovation is the ability to create new composites from a unique Silicone by changing the granular environment used. DM allow to modulate the physical properties of composites (antimicrobial, conductive or multi-rigidity).



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