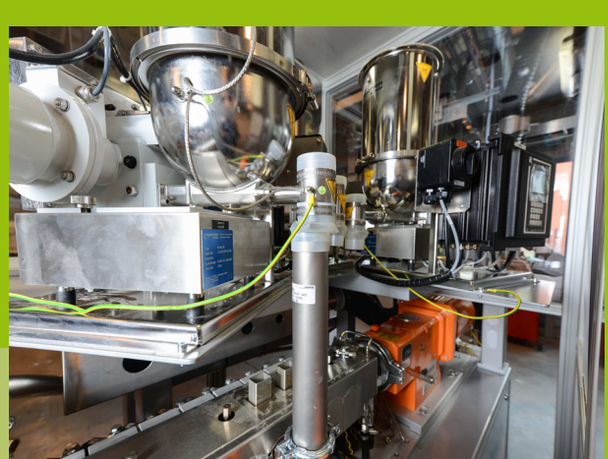
Axel'One

The french open innovation chemistry-environment platform

FACILITIES



SHARED TOOLS

SKILLS

In the field of innovative materials and clean processes

A NEW WAY TO ACCESS INNOVATION

DIDIER BONNET

Executive director

Since 2013, Axel'One offers the opportunity to develop collaborative projects through specific facilities, shared tools, expertise and industrial know-how. The platform has been specifically designed to provide the conditions required to overcome the barriers that inhibit innovation in the field of clean processes and innovative materials (polymers and composites).

Start-ups, SMEs, corporate companies, academic laboratories, join Axel'One to boost your open innovation!

FACILITIES

Axel'One offers first class facilities (offices, laboratories, technological hubs) adapted to R&D collaborative projects in the fields of chemistry and environment. Axel'One team provides a daily technical support designed for the platform flexibility requirements (HSE, supply chain, maintenance, IT…).

SHARED TOOLS AND EXPERTISE

In order to help our partners to develop, validate, scale-up and commercialize new products and processes, Axel'One provides a wide range of shared tools and specialized expertise. Our R&D services are customized to fit each projects needs. Moreover, Axel'One does not claim any intellectual properties.

3 SITES IN A UNIQUE LOCATION IN FRANCE

PARTNERSHIP WITH 3 NATIONAL CLUSTERS

AXELERA
Chemistry-environment

TECHTERA
Textiles & flexible materials

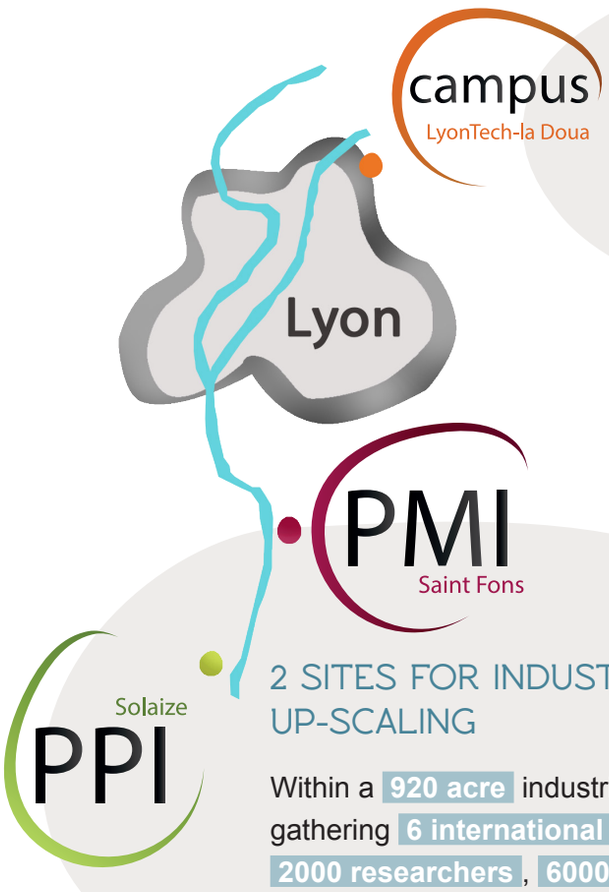
POLYMERIS
Plastics

A LEADING TERRITORY

NUMBER ONE PRODUCING AREA
of chemicals in France

SECOND LARGEST FRENCH NETWORK
of higher education and research institute

SECOND GREATEST INDUSTRIAL
metropolitan area in France



A BASIC RESEARCH SITE

Within an educational and academic hub gathering more than **2000 researchers**, **1500 PhD students** and **70 companies**.

2 SITES FOR INDUSTRIAL UP-SCALING

Within a **920 acre** industrial park gathering **6 international R&D centers**, **2000 researchers**, **6000 jobs** and **48 companies**.

AXEL'ONE FIGURES

9000 M² SQUARE FEET
of dedicated real estate

30 MILLIONS EUROS
of R&D tools

200 PEOPLE
hosted on our sites

20 HOSTED START-UPS/SMEs

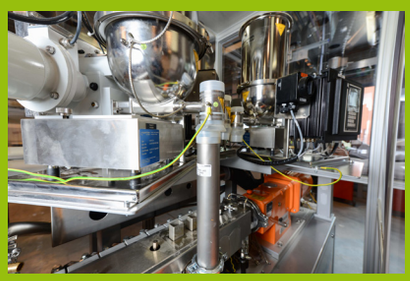
MORE THAN 50 PROJECTS
ongoing within the platform

25 EMPLOYEES

OUR TECHNOLOGICAL PLATFORMS

Splitted into three different sites, Axel'One allows to facilitate the access to several technological platforms dedicated to materials research & development and process up-scaling.

Skills and tools are built through strong partnerships with key academic and industry leaders in three major domains.



PROCESSES AND DIVIDED SOLIDS

Industrial scale-up of hybrid materials including MOF (Metal-Organic Framework)

Synthesis and shaping of solids and catalysts

Catalytic tests

Corrosion Loop

ADVANCED POLYMER MATERIALS

Synthesis and shaping of polymers

Advanced Chemistry

Characterization of materials

SMART PROCESS

Online industrial analysis

Liquid and gas benches in industrial conditions

Digital and data science

A wide range of shared tools in ordrer to bridge the gap between early stage concept and scalable commercial processes

Conception / Research
TRL 2 to 4

- Research infrastructure
- New start-up and collaborative spaces
- Joint laboratories
- Small pilots

Development, scale up
TRL 4 to 7

- Accommodation for SMEs
- Pole of innovation in online analysis
- Smart Process & Polymer Transformation pilot lines

Prototyping, demonstrator
TRL 6 to 8

- Solids & catalysts
- Organic Chemistry
- Polymer chemistry
- Solid chain
- Aqueous effluent

AXEL'ONE CAMPUS: THE ACADEMIC HUB

As a key pillar for academic research, Axel'One Campus platform is **the upstream structure of the research-industry-SME** complex intended to supply the other two up-scaling platforms with collaborative projects.

Axel'One Campus is an academically oriented structure for representative experimentation of industrial conditions.

campus
LyonTech-la Doua

Reaction and catalysis

High flow catalysis tests and synthesis
Process intensification
Process analysis

Polymer synthesis

Polycondensation reactors

Material processing

Materials characterization
Coating & electro-spinning
3D printing

BASIC RESEARCH

EXAMPLES OF COLLABORATIVE PROJECTS

- Chemical recycling of polymers, including silicones
- Selective rare-earth and metal recovery technologies (for EoL batteries, magnets…)
- Innovative 3D printing and dynamic moulding for health, transport, composite, textiles…
- Use of microwave technology for methane cracking and process electrification
- Natural solutions for breast reconstruction (3D bioprinting, biological ink…)

Axel'One Campus
5 avenue Gaston Berger
LyonTech-la Doua
69100 VILLEURBANNE - FRANCE

AXEL'ONE PPI:

A FACILITY SERVING NEW GENERATION CHEMISTRY

Dedicated to process development, the Innovative Processes Platform (PPI) promotes the emergence of projects aimed at **improving and developing low energy-consumption processes** with reduced environmental impact (on water, air and soil). From circular economy to eco-design, the platform's fields of action are aimed at developing concepts for the industry of tomorrow.

Solaize PPI

Powders and Process engineering

Catalysts synthesis and testing lines
Catalysts production lines (up to kg scale) and impregnation
Thermal treatment processes
Corrosion loop (online monitoring and testing)

Industrial analysis

Instrumented sampling benches
Instrumented batch reactors
Separation techniques
Spectral techniques and chemometrics
Physical and physical-chemical sensors
Digital: Acquisition, fusion and automated processing of data

Process modeling

Computational Fluid Dynamic simulation - CFD
High Performance Computer ENER110

INNOVATIVE PROCESSES

EXAMPLES OF COLLABORATIVE PROJECTS

- Novel nanoporous materials (Metal-Organic Frameworks) for hydrogen storage, water treatment, air treatment and energy applications
- Hybrid catalysts up-scaling for eco-friendly production
- Digital process optimization in batch and continuous mode integrating online analysis systems
- Development of specific sampling systems for complex environments (polymers, gel, ...)
- Evaluation and implementation of innovative technologies in the field of spectral and separation analyzes (online low-field NMR, online GPC, ...)

Axel'One PPI
Rond-point de l'échangeur
Les Levées
69360 SOLAIZE - FRANCE

AXEL'ONE PMI:

MATERIALS IN THE SPOTLIGHT

The Innovative Materials Platform (PMI) promotes the emergence of projects aimed at developing **sustainable polymers and composites biobased, or biodegradable and or/recycled**. From material characterization to material modeling, Axel'One PMI serves the automotive, textile, building and health industries.

PMI
Saint Fons

Polymer material processing

Extrusion (online analysis: viscosimetry and near-IR measurement)
Granulation (wet and dry), films forming, from 4 to 70kg/h production rates
Injection moulding

Material characterization

Mechanical characterization
Measurement of material characteristics
Material analysis
Surface analysis

Material modeling

Chemical and mechanical analysis
Surface and core characterization
Multiscale modeling for polymers and composites behavior prediction during transformation process

Industrial analysis

Physical and physical-chemical sensors
Online rheology

INNOVATIVE MATERIALS

EXAMPLES OF COLLABORATIVE PROJECTS

- New eco-designed silicone-based coatings for plastics, glass and textile
- Polymers formulation and recycled materials incorporation (packaging, textiles, paper, cosmetics)
- Eco-designed silicone-based coatings for plastics, glass and textile
- Proof of concept validation in chemistry and polymers compounding
- Advanced Chemistry Platform AdChem4, in collaboration with Solvay:
- Polycondensation, Organic synthesis, Powder production lines and Liquid Wastes treatment

Axel'One PMI
87 avenue des frères Perret
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Axel'One

FOUNDING AND PREMIUM MEMBERS

ADISSEO A Bluestar Company · cnrs · CPE LYON · Elkem A Bluestar Company · ENS DE LYON

IFP Energies nouvelles · INSA Institut National des Sciences Appliquées Lyon · SOLVAY · suez · Université Claude Bernard Lyon 1

FUNDING MEMBERS

Fonds Européen de Développement Régional · DGE Direction Générale des Entreprises · La Région Auvergne-Rhône-Alpes · Métropole Grand Lyon · bpifrance · Investissements d'Avenir

Solaize PPI

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