asrc

à la source
de l'innovation
pour l'industrie

www.asrc.fr

contact@asrc.fr
Tel.: +33 (0)1 39 30 61 14

Partners :

oséo

Conception graphique : www.idsg.fr

Private research and technology organizations

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pour l'industrie

Energy for Innovation

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à la source
de l'innovation
pour l'industrie

The ASRC it's:

- More than **35** members
- More than **2 500** engineers
- More than **4 000** R&D agreements per year

Created in 1999, the ASRC is an association gathering French Private Research and Technology Organizations providing key R&D input to corporate innovation projects.

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de l'innovation
pour l'industrie

How does the ASRC help you to innovate?

The primary objective of the ASRC is to make it easier for companies and public organizations to gain access to innovation and technological expertise.
The ASRC groups together around thirty private R&D organizations spread across France. These are all examined and approved by OSEO, an organization providing assistance and financial support to French SMEs, for their ability to provide companies with innovative solutions in a number of different sectors, including Health, Food-processing, Energy, Materials, Transport, Logistics, ICT, Defence and Security...
Whether they are involved in designing an ergonomic control panel for a jet airliner or developing an assembly line automation process, our members perform R&D services in all fields and for companies of all sizes. They mobilize their expertise and provide tailor-made solutions with a view to enhancing their clients' efficiency, productivity and competitiveness.

What are the benefits for your company?

Making R&D investments and seeking to innovate are key strategic challenges that, if successfully met, can enhance your competitiveness and enable you to stand out in your market. Working in partnership with the RTOs provides **a flexible and effective solution** that can offer your company a number of clear benefits:

- **a tailored response** to a precise issue leading to a concrete innovation: design of new products or processes, or simply improving what already exists;
- **a clear competitive advantage** through access to new high-level competencies and technologies;
- **reliable and proven R&D project management methods** which your teams can draw upon to achieve success;
- **the guarantee of confidentiality** for your projects.

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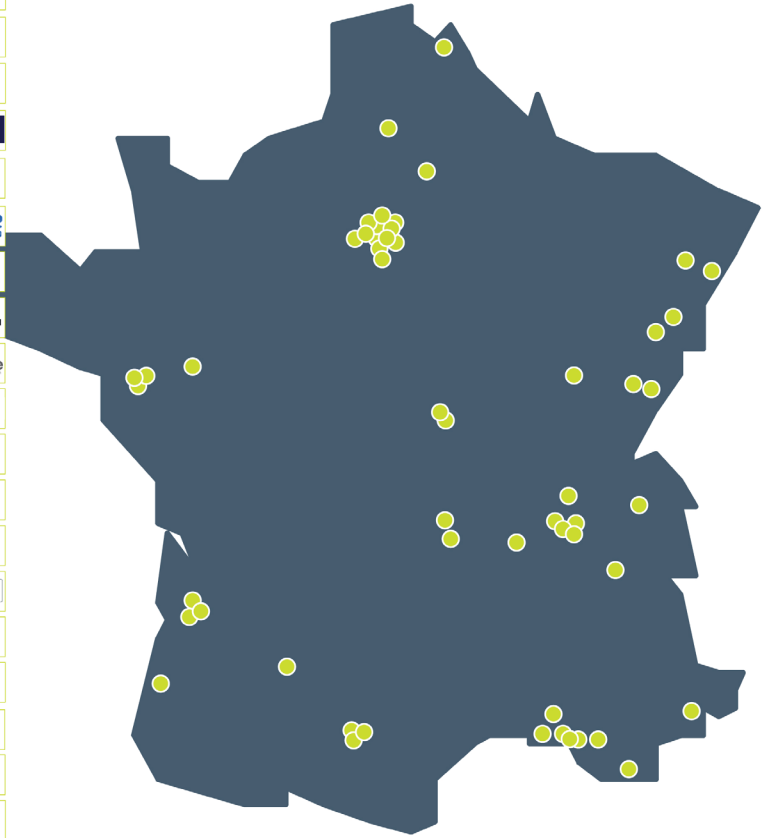
More than 35 private research and technology organizations spread across France:

The ASRC helps you surround yourself with good actors. It ensures confidentially linking with the right people among its members able to bring you the scientific and technological expertise required for your innovation projects.

To assess your needs in R&D and put you in touch with the SRC that will be able to answer your demand, contact the ASRC. This service is free.



* View profile HEF R&D

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Sectors of application:

- Aéronautique, Spatial, Défense
- Agriculture et agroalimentaire
- BTP, Construction
- Chimie
- Electronique, Télécommunications
- Energy
- Environment
- Transports

Competitiveness clusters:

- Mov'eo

Know-how:

- **Internal/external aerodynamic expertise**: Consulting, analysis and experimental characterization using digital simulation and/or wind tunnel tests. Design (CAD) and production (6-axis center, composites, etc.) of experimental tools and means (measurement test beds, scale models, etc.).
- **Thermal-Aerodynamic, Aerodynamic-Acoustic and Aerodynamic-Structure Couplings**: consulting, analysis and experimental characterization using digital simulation of thermal transfer phenomena (conduction, convection and radiation), aerodynamic noise sources and propagations and structure deformations associated with fluid flows.
- **Development of source codes and specific models of Open Source CFD software**.
- **Reverse Engineering and competitive analysis**.

Applications:

- Characterization and optimization of performances: aerodynamic (drag, lift), and/or comfort (lateral force and associated periods), and/or primary **security of aircraft and land vehicles**.
- Characterization of thermal dispersion and heat transfers in the proximity or direct environment of mechanical components to **evaluate the risks and to aid decision making for dimensioning** (simulation of convection, conduction, radiation and aerodynamic interaction).

Concrete examples of applications:

- Characterization, development and optimization of thermal transfer characteristics (air loop and fluid loop) based on the levels of power transferred, and/or flow speed (radiation, conduction and convection at low speed) on very high power thermal engine vehicles, or electric powered vehicles with range extenders.
- Reduction of land vehicle consumption based on fundamental and applied research on underbodies and wheel area.
- Reduction of energy consumption in heating/cooling systems through redeployment of sources, design of ventilation systems, etc. Qualification of pollutant/contaminant emissions and concentrations in buildings.

Services provided:

Characterization, trials, tests, control, formulation
Consulting, expertise, training
Research and development

Competency fields:

Thermal engineering - Fluid mechanics

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Sectors of application:

- Aeronautics, Spacial, Defense
- Transports
- Electronics, Telecommunications
- Energy
- Environment
- Health, Pharmaceuticals, Bio-industry, Cosmetics
- IT & ICT

Competitiveness clusters:

- Lyon Urban Truck and Bus
- Minalogic
- Mov'eo
- Pôle PEGASE
- Systematic
- TENERRDIS

Know-how:

- **Systems:** system research & development
- **Power Electronics:** research & development into power architectures and prototyping
- **Electronics:** analog & digital research & development, programmable components, prototyping
- **Software:** real-time secure software R&D, low layer embedded OS, applications
- **Burn-in:** FMECA, escalation trials, thermal simulation, accelerated maturity, up-screening
- **Operational safety:** aeronautics security design - DAL D to A, DO254, DO178, railway - EN50128, SIL4, medical, defense
- **Industrialization & production management:** research into innovative manufacturing and assembly technologies and processes, design-for-manufacturability, miniaturization.

Applications:

- Energy conversion and storage for the development of electric and low-energy land, air and sea transport
- Embedded information systems and command, control (intelligence and security)
- Signal processing in all fields of application
- Interconnection and rapid electronics for transport and defense
- Digital simulation for tests and trials…

Concrete examples of applications:

- Super-capacitor braking energy recovery system
- Real-time radiography-fluoroscopy
- Embedded aircraft computers (engine control, defense system, automatic pilot, maintenance and operation assistance, flight data concentrators)
- Embedded compact aeronautics converter
- Actuator electronics (electric brake, jack, flight control electro-actuator, seat and hatch actuators…)
- Electrical functions for automobiles, trucks and other transportation vehicles
- Neutronic flow detector
- Plant water content monitoring

Services provided:

Characterization, trials, tests, control, formulation
Consulting, expertise, training
Research and development
Prototyping, pilot lots, industrialization

Competency fields:

Electronics - Energy - ICT - Software
Acoustics - Thermal engineering

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Sectors of application:

- Aeronautics, Spatial, Defense
- Building, Public Works
- Packaging, Printing, Publishing
- Electronics,
- Telecommunications
- Energy
- Environment
- IT & ICT
- Mechanical engineering
- Health, Pharmaceuticals, Bio-industry, Cosmetics
- Textiles, Clothing, Leather, Arts,
- Luxury goods
- Transports
- Chemistry
- Materials

Competitiveness clusters:

- Aerospace Valley
- Route des Lasers
- Xylofutur

Know-how:

ADERA is the association for the Development of teaching and research in the universities, research centres and companies of the Aquitaine region. ADERA develops and multiplies links between research and industry and coordinates over thirty technology transfer units providing technological services in all fields of activity.

Applications:

Micro-analysis / Materials / Analysis / Metals / Organic compounds / Nondestructive thermal control / Speciation / Image and sound synthesis / Parallel and distributed calculation / Software engineering / IT system testing / Bio-computing / Complex fluids / Air quality / Water quality / Coastal management / Mechanical characterization / Corrosion / Biomechanics / Energy performance of buildings / Energy demand side management / Water and waste management / 3D imaging via microtomography / Nondestructive microstructural characterization / Troubleshooting and phase change studies / CEM / Radiation / Conduction, Training, Measurement / Microbiology / Wine / Molecular biology / Microbial ecology / Polyphenols / Extraction / Dosing / Pharmacology / Biotechnologies / Archeology / 3D / Reproduction / Digitization / Design & delivery of learning programs for optics and laser technology / Wood-Paper-Pulp / In-vitro selection / Health / Diagnosis / Therapy / Life Sciences / Vineyard environmental management and effluent treatment / Membrane separation processes, including nanofiltration / Component reliability and electronic systems for structural analysis / Biomolecular synthesis for use in tumor angiogenesis inhibition, medical imagery and specific substrate recognition / piezothermo and/or photostimulable materials for pigmentation of paints, varnishes, plastics and molecular electronics / Photomagnetic characterization / Real-time imagery / Thermotherapy / Focalized ultrasound.

Concrete examples of applications:

- In partnership with a consortium of leading wine houses, a series of studies aimed at reducing the use of inputs in wine production
- Development of an industrial process of nondestructive control by infrared thermography for the detection of defects in composite materials for the aeronautical industry
- Assessment of the impact of land management and wine-producing practices on vineyard biodiversity.

Services provided:

Characterization, trials, tests, control, formulation
Consulting, expertise, training
Prototyping, pilot lots, industrialization
Research and development

Competency fields:

Chemistry / Biochemistry - Electronics - Energy ICT - Materials - Mechanical engineering / Mechatronics - Microwave technology - Neurosciences - Optics / Laser - Polymers - Supercritical fluids - Thermal engineering - Ultrasound

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Sectors of application:

- Agriculture and Food Industry
- Mechanical engineering
- Environment
- Health, Pharmaceuticals, Bio-industry, Cosmetics

Competitiveness clusters:

- AgriMip innovation
- Valorial
- Vitagora

ADIV
viande performances

Know-how:

Process engineering product and process technology (Slaughter – Cutting & Boning – Processing of fresh and cured meat): product development (formulation, process), process development / optimization / automation, technological assessment of ingredients, additives and packaging, in-company technological assistance / audits / manufacturing accident surveys, aeraulic optimization, production management support **Microbiology – Food Health & Safety:** challenge test, consumption date validation, HACCP, accreditation requests, microbiological expertise; Environmental sustainability: carbon footprint monitoring, Classified Facilities for Environmental Protection (ICPE), waste processing and energy recovery, waste water analysis, energy performance studies - **Nutrition-Health**: nutritional assessment of ingredients & additives, nutritional characterization of products, nutritional impact of processes, nutritional analysis - **Technical & Economic input:** market studies, organization, strategy, company and process performance studies - **Pre-engineering:** feasibility studies, project management assistance, project engineering, updating - **Professional in-house and cross-group training**.

Applications:

ADIV is a development tool for companies at the top end of the meat chain, (slaughter, cutting & boning, processing, distribution, retail) for meat of all origins (beef, lamb, pork and poultry). The services provided by ADIV are all linked to industrial issues encountered in this sector.

Concrete examples of applications:

Development of new procedures (new cooking technologies, ohmic cooking, Osmofood©, automated curing), Form-Fit-Function study of slaughtering equipment for small slaughterhouses) / Prototype development (e.g.: mechanical skewer, continuous washing machine for pork meals) / Processed meats: optimization of ham cooking scale / Development of automated cutting & boning systems / Development and adptation of the products (dried meat, elaborated products, uvci, precooked meat) / Salmonella behaviour during the manufacture and storage of cured sausage / Technical & Economic feasibility study for energy recovery through the on-site incineration of animal co-products / Development of a method for measuring and calculating nutritional cooking properties in order to optimize meat cooking / Measurement and analysis of energetic performance of meat processing units in France / Study of the adequation of slaughtering equipment.

Services provided:

Characterization, trials, tests, control, formulation
Consulting, expertise, training
Prototyping, pilot lots, industrialization
Research and development

Competency fields:

Health & Nutrition, Environment - Energy - Food processing - Process engineering - Biology - Chemistry / Biochemistry

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Sectors of application:

- Agriculture and Food Industry
- Building and Public Works
- Publishing, Printing, Packaging
- Electronics, Telecommunications
- Energy
- Environment
- IT & ICT
- Mechanical enginering
- Health, Pharmaceuticals, Bio-industry, Cosmetics
- Transports

ALCIOM

Know-how:

ALCIOM is specialized in **innovative applications of electronics** and a **mixed signal expert**.

Our main fields of expertise include:
- **RF and microwaves** : from 0 to 20GHz, specific or standard protocols, antennas
- **High-speed acquisition and signal processing** : up to 1Gsps, digital filtering, FPGA, DSP, etc.
- **Low-level signals** : biosensors, optoelectronic, mechanical and environmental sensors
- **Signal synthesis** : DDS, PLL synthesizers, I/Q modulation, etc.
- **Interfaces** : USB, Ethernet & Gigabit Ethernet, industrial bus, IEEE488...

Applications:

ALCIOM is involved in projects covering a wide range of applications: Industrial telemetry, Innovative communication products for the general public, High-speed instruments, Optoelectronic systems, Agronomy, health and gerontechnology, Research, Automobile industry, Robotics, etc.

Concrete examples of applications:

- **CEA**: technological brainstorming and development of an experimental prototype for the acquisition and real-time processing of gamma spectroscopy signals (constant throughput of 750Mbps)
- **LEOSPHERE**: turnkey R&D and architectural design study of ultra-rapid signal processing and acquisition boards for atmospheric LIDARs (250 Msps, 300,000 FFT/s)
- **ARTFI**: architectural design study, digital simulation and development of an experimental prototype for a system measuring microwave radiation fields (13GHz, microstrip filters)
- **DOTVISION**: architectural design study and experimental development of real-time geolocalization of over 1000 objects (specifically designed slotted-TDMA protocol)
- **CSTB**: modeling, design, development and turnkey supply of an environmental CO_2 sensor in experimental preproduction
- **ZYKEN**: architectural design study and turnkey development of four electronic boards for a sleep improvement device

Services provided:

Consulting, expertise, training
Research and development
Prototyping, pilot lots, industrialization

Competency fields:

Electronics

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Sectors of application:

- Energy
- Environment
- Health, Pharmaceuticals, Bio-industry, Cosmetics
- IT & ICT
- Transports
- Materials
- Mechanical engineering
- Aeronautics, Spacial, Defense

Competitiveness clusters:

In view of the wide range of fields covered by the joint research centers of its different partner schools and its presence throughout France, Armines plays an active role in more than 20 competitiveness clusters.

ARMINES

Know-how:

- **Help in drawing up contracts and monitoring** their progress
- **European consortia and agreements**
- **Local and regional development**
- **«Industry-focused» research** in all competency areas of all laboratories common to Armines and our partner schools
- **Research training** (PhD students, postdoctoral, etc.)
- **Intellectual property management**
- **Transfer of results of research** to the market place.

Applications:

- Support and coaching for researchers
- Help in negotiating research contracts
- Provision of qualified, private status laboratory personnel for specific needs (research engineers, technicians, administrative staff...)
- Accommodating foreign researchers, PhD students and postdoctoral fellows.

Concrete examples of applications:

Design of scientific simulation software for materials processing - Simulation of fluid transfer in porous environments - Development of deposit evaluation software - Development of a non-GPS navigation system - CO2 capture by freeze/thaw at atmospheric pressure - Application of infrared drying and heating technologies to the automobile sector - Control of the development of the legionella bacterium in an industrial water cooling tower - Development of a geochemical model for analysing water pollution - Drill pipe fatigue assessment - Image-assisted particle-size quantification of fragmented rock - Development of intelligent CCTV systems - Development of an automatic pilot drone for surveillance missions - Non-intrusive pinking detection in a controlled ignition engine - Elaboration by masterbatch of carbon nanotube polyethylene matrix nanocomposites.

Services provided:

Characterization, trials, tests, control, formulation
Consulting, expertise, training
Prototyping, pilot lots, industrialization
Research and development

Competency fields:

Energy - ICT - Geology - Thermal engineering
Materials - Mechanics / Mechatronics - Fluid mechanics - Polymers - Process engineering
Economy - Management - Society - Applied mathematics - Filtration - Supercritical fluids
Microwave technology

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Sectors of application:

- Aeronautics, Spatial, Defense
- Energy
- Environment
- Materials
- Mechanical enginerring
- Transports

Competitiveness clusters:

- Pôle ASTECH Paris Région
- Lyon Urban Truck and Bus

AVNIR Engineering

Know-how:

Avnir Engineering is mainly turned on aeronautics and energy sectors. Over 60% of its turnover is achieved through the collaboration with the R & D department of Dassault Aviation, RTE NRAC (National Centre for Study and Research), and the development of new technology department of ZODIAC Aerospace.

Applications:

- Analysis, design and calculation of aeroelastic and aerodynamic loads on aircraft
- Optimization of acoustic shock vibration via calculation and testing of embedded aeronautic structures
- Definition and performance of personalized vibration, acoustic, worst-case, EMC and thermal environmental tests
- Design, definition, construction of fuel inerting system for aeronautics
- Design and construction of a non-intrusive viscosity/density probe on a hydraulic circuit

Concrete examples of applications:

- Gauging by calculation of a turbomachine wheel turning at 120 000 rev / min
- Opening of the aerodynamics and aeroelastic flight envelope of a business jet
- Dimensioning the fuel inerting system of the Mitsubishi Regional Jet - MRJ
- Expertise of the flight incident of a C160 TRANSALL
- Seismic design of a part of the sarcophagus of the Chernobyl nuclear power plant

Services provided:

Characterization, trials, tests, control, formulation
Consulting, expertise, training
Research and development

Competency fields:

Acoustics - Energy - Process engineering - Materials - Mechanics / Mechatronics - Fluid mechanics - Polymers - Rotating Machines - Circulation of heavy and light fluids

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Sectors of application:

- Aeronautics, Spatial, Defense
- Chemistry
- Energy
- Environment
- IT & ICT
- Mechanical engineering
- Health, Pharmaceuticals, Bio-industry, Cosmetics

Competitiveness clusters:

- Capenergies
- DERBI
- Optitec
- Pégase
- Pôle Mer Bretagne
- Pôle Mer Paca
- Pôle Solutions Communicantes Sécurisées
- Pôle Risques
- SYSTEMATIC

bertin TECHNOLOGIES

Know-how:

- **Biotechnologies:** Design & development of instruments and reagents for the detection and identification of biological contamination; Laboratory equipments
- **Optics:** Design & development of optical instruments for industrial control, observation, surveillance, metrology detection of dangerous substances and waste sorting
- **Ergonomics consulting:** Ergonomic studies of IT applications, work environments, public products & services, Human Factor management
- **Information technology:** IT application security, Processing of multimedia multilingual content
- **Physical phenomena:** Advanced Simulation and Modelling of multi-physical systems
- **Operational safety:** Project risk management, operational and nuclear safety
- **Environment:** Process engineering, Combustion, Fire safety.

Applications:

Equipments design, development and delivery: Detection and observation systems for defense and security scenarios. Sensors for remote gas detection, waste sorting, biological laboratory equipments. Development and delivery of secure certified software. Automatic language processing. Physical phenomenon modelling and simulation. Human factor integration plan. Industrial risk management. Waste and effluent processing. Energy use and production.

Concrete examples of applications:

- Autonomous optical sensor for continuous surveillance and automatic alert
- Sensors: Online and contact-free control for waste sorting
- Coriolis, biological air sampler for detection of e.g. anthrax, ricin, botulinium toxin
- Provision of the human factor expertise for the design, assessment and certification of MMI of aircraft cockpits
- Supply of pre-proportioning tools for innovative space launch equipment concepts
- Development and delivery of secure certified software providing a secure, certified multilevel operating system
- Provision of language processing software sub-systems and hardware incorporating transcription, indexation and translation
- Support in producing and presenting nuclear safety reports to the relevant authorities.

Services provided:

Consulting, expertise, training
Prototyping, pilot lots, industrialization
Research and development

Competency fields:

Chemistry / Biochemistry - Electronics - Energy
Supercritical fluids - Process engineering - Thermal engineering - Fluid mechanics - ICT
Mechanics / Mechatronics - Optics / Laser

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Sectors of application:

- Materials
- Aeronautics, Spacial, Defense
- Agriculture and Food Industry
- Building, Public Works
- Chemistry
- Packaging, Publishing, Printing
- Electronics, Telecommunications
- Energy
- Environment
- Mechanical Engineering
- Paper, Cardboard
- Health, Pharmaceuticals, Bio-industry, Cosmetics
- Textiles, Clothing, Leather, Arts, Luxury goods
- Transports

Competitiveness clusters:

- Fibres Naturelles Grand Est
- Pôle Solutions Communicantes Sécurisées
- TRIMATEC

BIOPHY RESEARCH

Know-how:

Biophy Research is **specialized in the surface analysis of industrial products** with a view **to developing materials for which the physical and chemical surface and interface properties are the main added value**. Issues previously dealt with include surface cleanliness and contamination, surface treatments (plasma), chemical functionalization, thin coatings, wettability, adhesion, biocompatibility, bonding, printing, permeation, corrosion, failure analysis, powder and nano-particle analysis in the field of polymers, textiles, biomaterials, semi-conductors, metals, glass and ceramics, paper, packaging and cosmetics.

Applications:

- Development of atmospheric pressure plasma treatment for the surface functionalization of polymer films - PolyPropylene, PolyEster, PolyAmide - for improved wettability, adhesion, printing and bonding
- Development of surface analytical methods and instrumentation
- Development of a Tof SIMS data processing software (MULTI-ION SIMS®).

Concrete examples of applications:

- Optimization of atmospheric pressure plasma treatment of PolyPropylene: correlation between surface grafted nitrogen and amine functions, surface energy and ageing studies by XPS, AFM, ToF SIMS, contact angle and adhesion tests
- Development of a micro tensile stage coupled with an atomic force microscope for modelling and studying the behaviour of thin coating/polymer interface : appearance and development of cracks in barrier coatings (e.g. aluminium, SiOx) on polymers
- Production of MULTI-ION SIMS®, a Tof SIMS data interpretation software (quantitative analysis, profiles, imaging) using multivariable chemometrics methods: PCA, PCR, PLS).

Services provided:

Characterization, trials, tests, control, formulation
Research and development
Consulting, expertise, training

Competency fields:

Surface Analysis - Materials - Polymers - Chemistry / Biochemistry - Surface Treatment - Electronics - Energy

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Sectors of application:

- Agriculture and Food Industry
- Building, Public Works
- Chemistry
- Packaging, Printing, Publishing
- Environment
- Materials
- Health, Pharmaceuticals, Bio-industry, Cosmetics
- Textiles, Clothing, Leather, Arts, Luxury goods

Competitiveness clusters:

- Valorial

Capsulae
Innovative microencapsulation

Know-how:

- **Microencapsulation :** Development of customized solutions facilitating and optimizing the implementation and performance of ingredients and active compounds via microencapsulation; Cross-disciplinary support in the development of products or processes based on microencapsulation, from proof of concept through to the industrialization stage: Design innovative solutions and feasibility studies, Solve encapsulation issues, Conduct scaling-up studies and pilot-scale evaluations, Provide support for industrialization.
- **Wide range of technological expertise**: Technologies based on dripping, emulsion, and coating (fluidized air bed)
- **Bioencapsulation**: Use of biopolymers; Absence of organic solvents and toxic cross-linking agents in the processes developed; «Biocompatible» and «Green» processes

Applications:

- **Food and nutrition**: Stabilization of sensitive ingredients during the food incorporation process and subsequent storage; taste and odor masking; controlled/delayed release
- **Animal Feed and Health**: Appetite improvement; Thermal protection during pelletizing; Veterinary formulas; Vaccines; Artificial insemination
- **Agriculture and Environment**: Improvement of crop protection products by optimizing the biological profile of the active compounds, decreasing product dose, and improving applicability
- **Home and Personal Care**: Trapping volatile compounds; Stabilization and sustained release of active substances; Association of incompatible ingredients; marketing differentiation
- **Fine and Specialty Chemicals**: Implementation of self-healing materials, phase-change materials; Formulation of adhesives, paints, additives for construction materials.

Concrete examples of applications:

- Formulation of nitrogen-fixing bacteria used in association with nitrogen-based fertilizers in agriculture.
- Development of a setting agent with delayed onset in the field of additives for concrete.
- Development of new composite materials, for safety helmets and boat hulls, which enable visual detection of impacts and have self-healing properties.
- Development of a technique for encapsulating fish oil to be incorporated in consumer food products.
- Development of a technique for encapsulating semen to perform artificial insemination more easily in livestock.

Services provided:

Characterization, trials, tests, control, formulation
Consulting, expertise, training
Prototyping, pilot lots, industrialization
Research and development

Competency fields:

Food processing - Biology - Chimistry/ Biochimistry - Process engineering - Materials - Polymers

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Sectors of application:

- Transports
- Energy
- Mechanical engineering
- Environment
- Aeronautics, Spacial, Defense

Competitiveness cluster:

- Mov'eo

CAR&D

Know-how:

- **Vehicles:** Design / Study / Development / Production of innovative prototypes and components
- **Software simulation development**
- **Expertise in vehicle dynamics**

Applications:

- Concept of innovative carbon-free vehicles: creativity, feasibility analysis
- Carbon-free demonstrators and vehicles: study and development
- Prototype construction, trials and adjustment.

Concrete examples of applications:

- Feasibility study through simulation of articulated, multi-carriage buses
- High-performance suspension study for an all-terrain military vehicle
- Research programme using a high-yield tracer vehicle to assess road-holding and driving performance, risk assessment under different atmospheric conditions
- Design, study & development of a leaning electric Quadricycle for urban use (French environment agency - ADEME - research fund for low GG emission vehicles)
- Design and production of an award-winning hybrid electric urban vehicle: winner of the Lépine innovation competition and 1st prize awarded by Chamber of Commerce & Industry
- Vehicle automation.

Services provided:

Consulting, expertise, training
Prototyping, pilot lots, industrialization
Research and development

Competency fields:

Mechanics / Mechatronics
Software: mobility, dynamics, energy

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Sectors of application:

- Transports
- Health, Pharmaceuticals, Bio-industry, Cosmetics
- Materials
- Mechanical engineering
- Electronics, Telecommunications
- Energy
- Aeronautics, Spacial, Defense

Competitiveness clusters:

- Arve Industries
- Minalogic
- Mov'eo
- PopSud
- Viameca

GROUPE CEDRAT

Know-how:

Mechatronics, Piezoelectric actuators, Ultrasonic transducers, Design of specific actuators, Active vibration control systems, Vibration generators, Magnetic actuators, Voice coil actuators, Electromagnets, Torque sensors, Speed sensors, Mechanical power sensors, Eddy current sensors, Magnetic positioning, Piezoelectric actuator amplifiers, Amplified piezoelectric actuators (APA®).

Applications:

Design of mechatronic systems (eg: active vibration control, vibration generation, micro-positioning) and detection systems using magnetic technologies or active materials such as magnetostrictive alloy piezoelectric ceramics or MRF fluids. Main fields of application include aerospace, medicine, scientific instrumentation (eg: telescope, synchotron…) and industrial mechanical engineering.

Concrete examples of applications:

- Measurement system for magnetic characteristics of steel on exit from rolling mill
- Active optic actuators for the ELT
- XY microscanning plate for infrared camera
- Active vibration control
- X-ray shutter for synchrotron radiation
- Semi-active shock absorber for sport & leisure industry
- MRI-compatible piezoelectric micromotor for implanted medical use
- XYZ plate for Rosetta space probe
- Ultrasonic transducers for the iron and steel industry
- Active vibration control for turning

Services provided:

Consulting, expertise, training
Research and development
Prototyping, pilot lots, industrialization
Characterization, trials, tests, control, formulation

Competency fields:

Acoustics - Electronics - Energy - Mechanical engineering / Mechatronics - Electrical engineering - Ultrasound

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Sectors of application:

- Chemistry
- Energy
- Environment
- IT & ICT
- Materials
- Mechanical engineering
- Transports

Competitiveness clusters:

- Advancity
- ASTech
- Cap Digital Paris Région
- Finance Innovation
- Industries & Agro-Ressources
- Medicen
- Mov'eo
- Systematic Paris Région

CENTRALE RECHERCHE S.A.

Know-how:

- **Mechanical engineering:** structural calculation, dynamic behaviour, soil mechanics, tribocorrosion
- **Combustion**
- **Process engineering:** elaboration, liquid extraction and emulsions, membranes
- **Materials:** mechanical and functional behaviour
- **ICT:** data and image analysis, high-performance calculation
- **Industrial engineering:** logistics, product and service design, knowledge management.

Applications:

- Mechanical engineering and materials for energy
- Automobile engine combustion and aerospace propulsion
- Plasma-assisted combustion
- Piezoelectric materials for probes and sensors (scanning equipment)
- Large-scale database analysis
- Structural resistance and seismic behaviour
- Effluent treatment
- Design of homecare services (HAH).

Concrete examples of applications:

- Reduction of the combustion noise in industrial gas furnace
- Plasma-assisted combustion
- New routes for ceramic nano-powder production
- Simulation of US propagation for NDT
- Emulsions for detoxication
- 3D reconstruction for medical images
- Modelling of plant growth for water and nutriment optimization
- Impact of RFID technologies on stocks and supply chain management.

Services provided:

Consulting, expertise, training
Research and development

Competency fields:

Chemistry / Biochemistry - Energy - Process engineering - Thermal engineering - Materials - Industrial engineering - Fluid mechanics - Optics / Laser - ICT - Mechanics / Mechatronics

CONTACT : Tel.: +33 (0)1 39 30 61 14 contact@asrc.fr www.asrc.fr

Sectors of application:

- Agriculture and Food Industry
- Aeronautics, Spatial, Defense
- Building, Public Works
- Chemistry
- Packaging, Printing, Publishing
- Electronics, Telecommunications
- Energy
- Transports
- Environment
- Mechanical engineering
- Health, Pharmaceuticals, Bio-industry, Cosmetics

Competitiveness clusters:

- Axelera

CFD Numerics
Fluid Flow Optimisation

Know-how:

- 3D-numerical simulations in combustion, thermal and fluid mechanics (CFD);
- Mono- and multi-phase flows;
- Stationary or transient regimes;
- Heat transfer by convection, conduction and radiation;
- Tracking of thermal effects in solids;
- Integration of specific models (fluid behavior laws, coupling between 1D/3D simulations, etc.);
- Development of calculation chains (from CAD to result) with validation of simulation methods; Set-up of optimization methodology;
- Development of methods for quantifying uncertainty in CFD.

Applications:

Simulation of products in operation (Installation studies of AdBlue injector on exhaust line, impact of wave on offshore structure, automobile and aerospace combustion engines, etc.) and modeling manufacturing processes (heat and maintain component at temperature in furnace, dimension rinsing tank, etc.); understand, analyze and make proposals for enhancement and optimization of products and processes.

Concrete examples of applications:

Installation of AdBlue injector on exhaust line - CFD simulation of wave efforts on offshore structure - Simulation of comfort in 400-person modular room - Creation of parametric CAO/CFD model of rinsing tank; Estimation and optimization of ductwork ventilation - Simulations of laboratory electrolyzer to validate numerical model - Simulation of U-tube exchanger with insert plates - Simulations of shaping process for tank; Simulation of aeronautical combustion chamber - Simulation of flows in pumps - Simulation of flows in levitation furnace - Modeling of interdisc cavities of aircraft engine compressors - Ventilation in a furnace.

Services provided:

Consulting, expertise, training
Research and development

Competency fields:

Fluid mechanics

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Sectors of application:

- Transports
- Energy
- Environment
- Electronics, Telecommunications
- Aeronautics, Spacial, Defense

Competitiveness cluster:

- Aerospace Valley

CIRTEM

Know-how:

CIRTEM **is specialized in power electronics - creating and validating innovative energy** conversion technologies using high frequency light-cutting for a variety of applications.

Themes dealt with range from **power components** (IGBT, MOSFET, SiC, Gan) **to energy conversion system architecture** and **also energy conversion structures** (hard commutation, soft commutation).

CIRTEM offers high competency levels in:

- **electrical engineering**
- **analog electronics**
- **digital electronics**
- **electromagnetic compatibility**
- **thermics.**

Applications:

CIRTEM works with power ranging from 1 KW to 1 MW in the following fields of application:

- electric motorization for the transport of goods and people
- onboard energy converters for the transport sector
- power converters for energy infrastructures (renewable transport and energy).

Concrete examples of applications:

- Synchronous electric motors for electric urban vehicles
- Power supply of superconducting coils for the European Organization for Nuclear Research (CERN)
- Power supply of SONAR generators for Thales Underwater Systems
- New energy conversion architecture (120KW) for «more electric» aircraft (Airbus)
- SiC inverter for onboard electric motors supplied for the Defence sector.

Services provided:

Characterization, trials, tests, control, formulation
Research and development
Prototyping, pilot lots, industrialization
Consulting, expertise, training

Competency fields:

Energy
Electronics

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asrc

Sectors of application:

- Mechanical engineering
- Energy
- Transports
- Textiles, Clothing, Leather, Arts, Luxury goods
- Wood, Furniture
- Paper, Cardboard
- Aeronautics, Spacial, Defense
- Publishing, Printing, Packaging

Competitiveness clusters:

- Fibres Naturelles Grand Est
- MATERALIA

CIRTES
research & development

Know-how:

- **R&D for Rapid Prototyping and Rapid Tooling:** works on new innovative processes and their associated calculation algorithms using its proprietary rapid prototyping process Stratoconception® and its associated software Stratoconcept® III.
- **R&D for high-speed machining and cutting monitoring:** study of advanced machining processes, in particular the experimental study of cutting techniques and process monitoring. This involves the measurement and study of thermal fields at the part/tool and chip/tool interfaces by incorporated microsensors connected to the ACTARUS® system and its TWS® software.
- **Numerical Rapid Product Development:** CIRTES own a fully-equipped platform including all techniques of the numerical rapid product development chain (3D digitalization, numerical simulation, virtual reality, rapid prototyping, rapid tooling, rapid manufacturing, 5 axes machining and 3D control).

Applications:

- Study and integration of rapid tooling by Stratoconception® for sand casting and composite forming
- R&D works for rapid tooling (in steel&aluminum) by Stratoconception® for plastic injection moulding and die casting. Integration of cooling channels
- Integration of numerical rapid product development chain for SMEs
- Study of basic physical phenomena and experimental study of cutting techniques for the production of high added value components, instrumentation of manufacturing processes
- R&D works on cryogenic machining for complex materials.

Concrete examples of applications:

- Integration of rapid tooling by stratoconception for sand casting, application to short runs of medium to large mechanical parts for St Gobain - PAM
- Study and manufacturing of aluminum rapid tooling by Stratoconception for the production of lost-patterns for automobile engine cylinder heads in aluminum casting for PSA
- Integration of numerical rapid product development chain for SMEs, for the production of glass paste art objects for DAUM
- Study of basic physical phenomena and experimental study of cutting techniques for the manufacturing of high-added value parts for the civil nuclear industry for AREVA
- Study of tools and equipments for cryogenic machining for complex materials.

Services provided:

Research and development
Prototyping, pilot lots, industrialization

Competency fields:

Rapid prototyping & tooling - Machining Monitoring - Mechanics / Mechatronics - Forming process - Polymers - Energy - Optics / Laser

CONTACT : Tel.: +33 (0)1 39 30 61 14 contact@asrc.fr www.asrc.fr

Sectors of application:

- Chemistry
- Materials
- Health, Pharmaceuticals, Bio-industry, Cosmetics
- Textile, Clothing, Leather Arts, Luxury goods
- Packaging, Printing, Publishing

Competitiveness cluster:

- Pôle Solutions Communicantes Sécurisées

COATING PLASMA INDUSTRIE

Know-how:

The activities of CPI cover the **industrial development** and **marketing of cold plasma surface treatment technologies at atmospheric pressure and in vacuum conditions**: activation, chemical functionalization and thin film deposition by PECVD. CPI provides its plasma services in the form of R&D agreements, demonstrations, feasibility studies and sub-contractor agreements. Its primary field of speciality involves the **design and industrial application of customized plasma processes in line with client specifications**. The company also assembles reactors to match client's specifications.

Applications:

Modification of material surface properties: polymer films, 3D objects, powders for use in drug packaging, foods, avionics and biomaterials. Fields of application include adhesives, bonding, printing, protective / release / repositionable film, adhesive labels, anti-fogging treatments and gas / oxygen / steam barriers.

Concrete examples of applications:

- Permanent (>6 months) increase in surface energy (60 to 72 mN/m) for adhesive, bonding, metallization and printing applications by polymer film functionalization at atmospheric pressure: PP, PE, PET, PTFE, metallic films
- Deposit of organo-siliceous layers on polymer films at atmospheric pressure in order to provide slide and antifog properties
- Biocompatible treatments of intra-occular implants and slide treatment of implant injector cannula
- Treatment of polymer powders to improve cohesion and copolymer barrier effect.

Services provided:

Characterization, trials, tests, control, formulation
Prototyping, pilot lots, industrialization
Consulting, expertise, training
Research and development

Competency fields:

Chemistry / Biochemistry
Materials
Polymers
Surface treatment

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Sectors of application:

- Agriculture and Food Industry
- Chemistry
- Publishing, Printing, Packaging
- Environment
- Materials
- Health, Pharmaceuticals, Bio-industry, Cosmetics
- Textiles, clothing and Leather, Arts, Luxury goods

Competitiveness clusters:

- Véhicule du futur
- Vitagora
- Cosmetic Valley

creathes
Create the Solution OnDemand

Know-how:

- **Microencapsulation**: development of microencapsulation products and processes for industrial applications
- **Formulation**: design and development of formulations with or without microencapsulated products (emulsions, suspensions, gels, print pastes, spray, coating, etc.)
- **Powder**: spray-drying and prilling on a pilot scale applicable to the industrial scale
- **Flexible materials**: modifications of polymer, paper and textile surface properties. Acquisition of new properties.

Applications:

- Development of microencapsulation processes for the cosmetics, textile, food and fine chemical industries.
- Development of controlled-release volatile products (perfume, essential oils, solvents, etc.) using "eco-friendly" microencapsulation processes without chemical reactions.
- Development of galenic powders or liquids for cosmetics and chemistry. Taste masking of active molecules.
- Development of smart textiles.

Concrete examples of applications:

- Development of a silicon sealed-cavity microencapsulation process meeting cosmetic requirements for a "long-lasting fragrance" application in luxury perfumes. Development of an "eco-friendly" microencapsulation process for printing.
- Development of raticide baits with high appetence (taste masking) and increased effectiveness (local release during rodent transit).
- Cosmetotextile study and qualification (development of analysis techniques specific to the textile/microcapsule pair).
- Development of galenic formulations with sustained biocidal action. Development of smart textiles for surface treatment.
- Assay and measurement of molecule release in products containing microcapsules (cosmetotextiles, perfume, cosmetic creams, etc.).

Services provided:

Characterization, trials, tests, control, formulation
Consulting, expertise, training
Prototyping, pilot lots, industrialization
Research and development

Competency fields:

Food processing - Chemistry / Biochemistry - Process engineering - Materials - Polymers - Chemistry of interfacies - Physicochemical analysis

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Sectors of application:

- Aeronautics, Spatial, Defense
- Building, Public works
- Electronics, Telecommunications
- Environment
- Materials
- Mechanical engineering
- Health, Pharmaceuticals, Bio-industry, Cosmectics

Competitiveness clusters:

- Axelera

CT2MC
Composite materials

Know-how:

- **Design**: optimization related to needs analysis and mechanical stress
- **Dimensioning**: optimization of mechanical resistance of a structure
- **Development of customized manufacturing processes** for composite materials
- **Product development**: integration of brand new top-notch electronic functions into composite parts

Applications:

Development of new products and parts in composite materials for applications in sports & recreation, transportation, aeronautics, industry, etc.

Concrete examples of applications:

- Development of a carbon ski pole
- Design of a railway crossing system for emergency intervention
- Dimensioning of a house of composite materials

Services provided:

Consulting, expertise, training
Prototyping, pilot lots, industrialization
Research and development

Competency fields:

Electronics
Materials
Mechanics / Mechatronics
Polymers

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Sectors of application:

- Agriculture and Food Industry
- Building, Public Works
- Chemistry
- Energy
- Environment
- Materials
- Paper, Cardboard
- Textiles, Clothing, Leather, Arts, Luxury goods
- Health, Pharmaceuticals, Bio-industry, Cosmetics

Competitiveness clusters:

- AXELERA
- Céréales Vallée
- Industries & Agro-Ressources
- Pôle Mer Bretagne
- Pôle Mer PACA

Know-how:

- **Process engineering and industrial transfer** applied to extraction, purification, mechanical, physical, enzymatic or chemical modification of plant biomass fractions
- **Green Chemistry**: separation, filtration, reactive extrusion, subcritical water, drying
- **Research and development**: analyses, process scale-up, industrial extrapolation, processing and pilot lots.

Applications:

All sectors involved in substitution of carbon fossil by-products, product & process development, feasibility and industrial transfer studies, contracted production of plant extracts and by-products.

Concrete examples of applications:

- Development and transfer of a production process of a cosmetic skin whitening agent
- Development of bio-sourced aggregates for non-structural lightweight concrete
- Development of new pre-biotic soluble fibers
- Development of new production processes for oxidized industrial polysaccharides.

Services provided:

Characterization, trials, tests, control, formulation
Consulting, expertise, training
Prototyping, pilot lots, industrialization
Research and development

Competency fields:

Energy
Polymers
Filtration
Chemistry / Biochemistry
Food processing

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Sectors of application:

- Transports
- Aeronautics, Spacial, Defense
- Mechanical Engineering
- Energy

Competitiveness cluster:

- Mov'eo

danielson Engineering

Know-how:

- **Engineering:** project management and follow-up, engine and mechanical assembly design
- **Computing department:** mechanics, aerodynamics, dynamic modelling, thermomechanical calculations, specific model development
- **Light alloy foundry:** aluminium, magnesium, rapid prototyping
- **Machining workshop:** 5-axis machining center, grinding, turning, assembly
- **Test center:** vehicle mock-up and conversion, engine tests benches and component test benches, with assembly units
- **Chassis:** vehicle transformation, show cars.

Applications:

Danielson Engineering is **specialized in the design, manufacture and development of demonstrator prototypes** for validating new engine concepts for car and automotive equipment manufacturers.
The company possesses all the expertise and latest facilities required for the study and validation of new concepts: e.g. design, computation, light-alloy foundry, manufacture of complex parts, validation tests... Its fully-integrated approach enables the company to manage technically ambitious projects within short lead times and in full compliance with individual project cost constraints.

Concrete examples of applications:

- Design, manufacture and development of a variable compression ratio engine
- Design, manufacture and development of a diesel engine for aeronautical use
- Design, manufacture and development of new engine concepts
- Provision of complex prototype parts within short time frames.

Services provided:

Characterization, trials, tests, control, formulation
Prototyping, pilot lots, industrialization
Research and development

Competency fields:

Energy
Mechanics / Mechatronics
Fluid mechanics
Thermal engineering
Technological demonstrator

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Sectors of application:

- Agriculture and Food Industry
- Energy

ERelE
Energy Research Innovation Engineering

Know-how:

- Thermodynamic systems of energy decarbonization and conversion. Operating range: from -150°C to +130°C for cooling machines and heat pumps and from +80°C to 400°C for organic Rankine cycles (ORC) systems
- Design of refrigerant fluid mixtures adapted to temperature levels and source/well differences
- Energy and exergy audits to define energy saving strategies on industrial processes

Applications:

- Design and production of pilots and demonstrators to show energy efficiency in rupture with conventional technologies.
- Biogas purification and biomethane liquefaction.
- Flue gas pollutant removal and thermal energy recovery.

Concrete examples of applications:

- Design of sterilizers integrating a heat pump with a coefficient of performance (COP) 5.
- Methane liquefaction and biogas purification demonstrator: BIOGNVAL project with avec Degrémont, supported by "Investissements d'Avenir".
- Organic Rankine System on a synthesis gas flux: SYNGAS ORC project with Air Liquide, supported by "Investissements d'Avenir".

Services provided:

Consulting, expertise, training
Prototyping, pilot lots, industrialization
Research and development

Competency fields:

Energy
Process engineering
Thermal engineering

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asrc

Sectors of application:

- Aeronautics, Spatial, Defense
- Building and Public Works
- Energy
- Environment
- Transports

Competitiveness clusters:

- Systematic

FLUIDIAN

Know-how:

FLUIDIAN is specialized in **digital simulation for fluid mechanics**. The company covers the whole spectrum of the R&D process from modeling of physical phenomena through to the development of software and computational solutions in dedicated interfaces.

Applications:

- **Security improvement of public sites**: modeling of biological and chemical dispersions (attacks) in critical infrastructures (railway stations, airports, subway stations, etc.) and open environments (urban areas, open fields).
- **Improvement of industrial processes**: reduce energy consumption and pollution, increase quality.
- **Housing improvements**: thermal comfort, air quality.

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Concrete examples of applications:

- Development of a physical and digital fusion model of raw materials for the glass-making industry.
- Development of an aerosol dispersion simulation tool in subway stations.
- Development of an aerosol dispersion simulation tool in urban areas.

Services provided:

Consulting, expertise, training
Research and development

Competency fields:

Fluid mechanics - Digital simulation

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Sectors of application:

- Agriculture and Food Industry

Competitiveness clusters:

- Valorial
- VEGEPOLYS

Food Development

Know-how:

- **Products:** awareness and understanding of the development of organoleptic properties, formulation, creation, nutritional audits
- **Processes:** design of innovative processes, process optimization, yield/productivity studies, eco-conception
- **Packaging:** design, optimization, reduction, environmental impact assessment.

Applications:

- Research program leadership; technology transfer
- Product/recipe development
- Process optimization
- Packaging research & design
- Comprehensive nutrition and eco-conception services: from audit through to R&D support
- Creativity workshops.

Concrete examples of applications:

- Awareness and understanding of the change in texture of meat-based products, and the appearance of exudation in processed vegetables
- Set up of a research program in the field of snacks and ready meals
- Exclusive exploitation of one of the National Research Institute's patents
- Development of a range of lamb-based products
- Formulation of a meal substitute and a range of healthy soups
- Beneficiation study of sub-products from a meat processing plant
- Set up of a fruit & vegetable processing workshop
- Research into ecological packaging solutions for organic products
- Nutritional audits of a biscuit plant, ready-cooked meals, sandwichs…
- Design of a complete menu for buffets.

Services provided:

Characterization, trials, tests, control, formulation
Research and development
Prototyping, pilot lots, industrialization
Consulting, expertise, training

Competency field:

Food processing

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Sectors of application:

- Chemistry
- Energy
- Environment
- Mechanical engineering
- Health, Pharmaceuticals, Bio-industry, Cosmetics
- Materials
- Transports
- Aeronautics, Spacial, Defense

Competitiveness cluster:

- VIAMECA

Know-how:

Surface engineering: functionalization of surface properties via the addition of new functions, development of industrial solutions around 3 key competencies:

- **Tribology, providing high-level expertise and training**, **the development of specific test benches and the development of new technologies** to limit wear and friction such as in surface microtexturing.
- **Thin coatings & plasma sources**, focusing on the development of innovative processes and coatings through the use of PVD and PECVD technologies, the development of industrial and laboratory equipment and the development of plasma sources.
- **Diffusion coatings and ionic liquid media**, focusing on diffusion coating technologies (sulfiding, nitriding) and innovative ionic liquid applications.

Applications:

- Expertise in dealing with all types of problems in the field of tribology (friction, wear…), design of solutions for wearing parts subject to friction (guiding units, bearings, axles, ball & socket joints…).
- Surface treatments and coatings for tribological applications, hard coatings and functional coatings (electromagnetic field shielding, antibacterial treatments, barrier coats, optical uses, scenery…)
- Equipment and vacuum deposition sources (industrial, laboratory), Salt bath equipment.

Concrete examples of applications:

- HEF R&D is currently helping the CARMAT company in the development of an artificial implantable and autonomic heart. HEF R&D's objective is to optimize the tribologic behavior of this system to guarantee its reliability.
- HEF R&D is developing new technologies for reducing wear and friction. Micro-texturing is one of the most recent example of this – by using a micro-textured DLC coating, it is possible to reduce the friction of a valve tappet by 60% and reduce CO2 engine emissions by 2 g/km.
- The ExoMars mission is planning to send a probe to explore the surface of Mars. HEF R&D developed a coating for the seismic antenna. This antenna is coated with a metal alloy of which the thickness increases along its 30-metre length to obtain the desired gradient of electrical resistance.

Services provided:

Prototyping, pilot lots, industrialization
Consulting, expertise, training
Research and development

Competency fields:

Energy - Chemistry / Biochemistry - Surface treatment - Mechanics / Mechatronics
Microwave technology - Process engineering
Polymers - Materials - Optics / Laser

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Sectors of application:

- Agriculture and Food Industry
- Building, Public Works
- Transports
- Packaging, Printing, Publishing
- Electronics, Telecommunications
- Energy
- Environment
- Materials
- Mechanical engineering
- Paper, Cardboard
- Health, Pharmaceuticals, Bio-industry, Cosmetics
- Textiles, Clothing, Leather, Arts, Luxury goods
- Chemistry
- Aeronautics, Spacial, Defense

Competitiveness clusters:

- Aerospace Valley
- Avenia
- Axelera
- Eau
- Trimatec

ifts
Institut de la Filtration et des Techniques Séparatives

Know-how:

Characterization of particles in powder form, in suspension and on surfaces; **Characterization of suspensions and porous media**; **Chemical conditioning** of pulp and suspensions; **Solid Liquid Separation** (SLS) processes and techniques using decanting, filtering, membrane separation, centrifuging, floatation, cycloning and centrifuging. Certification COFRAC and AFDA approved.

Applications:

- **Processing of all liquids in order to reduce their solid particle content** (clarification) whether for use in material transformation processes (beverages, chemical products, pharmaceuticals, medical, mineral, mechanical…), in machines for transmitting or extracting energy (engine fuel & lubricants, hydraulic power fluids…) or after physical-chemical purification of industrial effluents and institutional waste.
- **Processing of all liquid phase solids for concentration, washing, dehydration or drying purposes** (sludge, pulp, minerals, chemical and pharmaceutical products…).

Concrete examples of applications:

- Qualification trials of filters for Ariane 5 and the Airbus A380
- Feasibility study for a new virus extraction process
- Optimization study for a potable water sludge treatment station
- R&D for a new hydrosoluble paint clarification process
- Measurement of particle contamination of automobile fluid circuit components
- Contribution to the development of new automobile fuel filters
- R&D for a new characterization method for swimming pool filters
- R&D for an apparatus for the chemical processing of sewage sludge
- Development of a new software application for sizing thick filter cakes
- Study of the use of microwaves in a centrifugal hydro-extractor
- Study of a system for protecting oysters in the Arcachon Basin
- Research and Development for an industrial water treatment process
- Design and Development of an automobile filter trial system.

Services provided:

Characterization, trials, tests, control, formulation
Prototyping, pilot lots, industrialization
Research and development
Consulting, expertise, training

Competency fields:

Filtration - Fluid mechanics - Surface treatments - Environment - Energy - Mechanics / Mechatronics Polymers - Food processing - Process engineering

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Sectors of application:

- Energy
- Mechanical engineering
- Materials
- Aeronautics, Spacial, Defense
- Transports
- Agriculture and Food Industry
- Packaging, Printing, Publishing
- Health, Pharmaceuticals, Bio-industry, Cosmetics
- Textiles, Clothing, Leather, Arts, Luxury goods

Competitiveness clusters:

- Biovalley
- Fibres
- Véhicule du futur

IRÉPALASER
CONCEPTEUR DE SOLUTIONS LASER

Know-how:

Laser material processing for industrial applications.

Applications:

Metallic and plastic welding, direct manufacturing, marking, surface treatments (cladding, cleaning and surface preparation).

Concrete examples of applications:

- **Aerospace**: welding of structural aluminium elements, repair of engine elements, development programme for direct manufacture of working parts using CLAD® technology (French acronym for 'Construction Laser Additive Directe' - direct additive manufacturing by laser).
- **Structural lightening**: manufacture of polymer honeycombs using laser welding
- **Rail**: hybrid welding of carriage elements
- **AgriFood**: manufacture of laser-welded heating plates
- **Glass**: mould cleaning and repairing.

Services provided:

Characterization, trials, tests, control, formulation
Prototyping, pilot lots, industrialization
Consulting, expertise, training
Research and development

Competency fields:

Process engineering
Metallic materials
Optics / Laser
Polymers
Surface treatment

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Sectors of application:

- Mechanical engineering
- Aeronautics, Spacial, Defense
- Energy
- Transports
- Environment

Know-how:

Electrical engineering, Mechanical engineering and industrial processes, Innovation, Design, Modelling, Prototyping, Expertise.

Applications:

Dedicated and Specific design in the field of Electrical machines, Electromechanical actuators and electrical transformers. Our fields of application:

- **Automotive**: on-board functions and motorized traction chain
- **Energy**: wind turbines, production of electric energy, heating system
- **Mobility**: handling and transport of persons with reduced mobility
- **Robotics**: servomotor and micro engine.

Concrete examples of applications:

- Proportioning of a 24-pole, 450 kVA - 750 A - 140 rpm permanent magnet Alternator
- Proportioning, design and development of a Brushless 7.5 kW - 300 VDC - 1100 rpm PM wheel motor
- Proportioning of a Brushless 450 W - 1.45 N.m - 3000 rpm PM motor for a Hybrid motor car
- Proportioning and design of a coil for a 3kW - 220 VAC - 20 kHz induction heater
- Proportioning, design and development of a radial magnetization system for PlastoNdFeB magnets
- Noise phenomena study of a 50 kW - 175.5 rpm rotating diode exciter
- Proportioning of a Discoid Alternator for a 1MW - 800VAC, 22 rpm wind turbine (Patent applied for)
- Optimization of a Brushed DC Motor for a 400W - 12 VDC-3000 rpm GMV
- Proportioning and design of a 500 W - 20 VDC - 500 rpm permanent magnet wheel motor.

Services provided:

Characterization, trials, tests, control, formulation
Consulting, expertise, training
Prototyping, pilot lots, industrialization
Research and development

Competency fields:

Energy - Electromagnism - Electric machine encircling - Thermal engineering - Electric machine engineering - Fluid mechanics - Mechanics / Mechatronics

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Sectors of application:

- Transports
- Energy
- Aeronautics, Spacial, Defense

Competitiveness cluster:

- Mov'eo

LMM
MEMBER OF
THE AVL GROUP

Know-how:

LMM is a company specialized in **the design, development and testing of vehicle powertrains** (engine + transmission). In terms of design, its activities include CAD and digital dimensioning through the use of structure or fluid codes. LMM has a strong expertise in the field of engine performance simulation also. As far as experimentation is concerned, LMM regularly performs tests aimed at designing or improving complete engine (e.g. combustion and cooling systems …) as well as components (post-treatment elements). LMM tests engines, as well as gear-boxes and complete vehicles. Given this range of complementary competencies, LMM is able to design an engine system from the blank sheet phase through to an initial pilot lot, taking in all of the different prototyping phases required. LMM is also specialized **in complete vehicle calibration, taking charge of all engine calibration items, pollution, driveability, behaviour in extreme conditions, performance, after treatment component management, actuator calibration, cold start…**

Applications:

- Design of vehicles compliant with new standards (e.g. EUROV, VI…)
- Design & development of new engine types (conventional or hybrid)
- Experimental and numeric validation of new components, new engines or new powertrains.

Concrete examples of applications:

- Development of Diesel vehicles compliant with the new EURO5 standard
- Development of small cylinder engines (125 cc to 500 cc) for motorbikes and quad bikes
- Characterization of oil dilution in Diesel engines
- Determination of loss by engine or gear-box friction
- Characterization of pollutant emissions and post-treatment organ behaviour (DeNox, Noxtrap…)
- 15 years' experience in engine performance simulation.
- System simulation and validation on HIL test bench
- Development of vehicle demonstrators – high-drivability vehicles.

Services provided:

Characterization, trials, tests, control, formulation
Consulting, expertise, training
Prototyping, pilot lots, industrialization
Research and development

Competency fields:

Fluidmechanics - Energy - Thermal engineering
Mechanics / Mechatronics - Electronics

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Sectors of application:

- Energy
- Transports

Competitiveness cluster:

- Pôle des Microtechniques

MMT

Know-how:

- MMT provides **innovative solutions in the field of electromagnetic position sensors**, electric motors and actuators. MMT's expertise in electromagnetism engineering can be applied to a range of services including simulation, calculation and sizing studies to complete mechanical design, prototyping and testing of electromagnetic systems based on its patents but also on public domain structures or on customer specific solutions.

Key competencies include:

- **Electromagnetism engineering**
- **Development of technologies for sensors, motors and electromagnetic actuators**
- **Granting of patent licenses, knowledge transfer.**

Applications:

- Licenses granted to tier 1 or 2 suppliers makers for engine control, transmission, electronic power steering, comfort and instrumentation
- Engineering services for clients ranging from SMEs to major contractors in many sectors of activity including automobile engineering, medicine, textiles, aerospace.

Concrete examples of applications:

- 75 licenses granted – Portfolio of more than 200 patents

Examples of patent licenses granted:

- Stepper motors for dashboard gauges
- Brushless motors for electric water pumps
- Accelerator pedal position sensors
- Torque sensors for electronic power-assisted steering
- Vibrating actuators for electric razors...

Services provided:

Prototyping, pilot lots, industrialization
Research and development

Competency fields:

Electronics
Mechanics / Mechatronics

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Sectors of application:

- Transports
- Building, Public Works
- Electronics, Telecommunications
- Energy
- Environment
- Health, Pharmaceuticals, Bio-industry, Cosmetics
- Aeronautics, Spacial, Defense
- Clothing, Leather, Arts, Luxury goods

Competitiveness clusters:

- Optitec
- Pégase
- Pôle Mer PACA

OPTIS

Know-how:

OPTIS is **specialized in optical simulation**. OPTIS **develops light simulation software (SPEOS®) and provides consulting services in the fields of optics, optronics, lighting, visual ergonomics, virtual reality and real-time simulation.** The realism of the computer generated images, created using physics-based algorithms, makes it possible to make informed decisions about the lighting, appearance and quality of a future product using realistic digital models. OPTIS develops visual perception and sensory perception models which make it possible to display on a screen, or in a virtual reality center, a realistic representation of what an observer or sensor perceives during a specific event and in specific conditions (environment, artificial lighting and natural light).

Applications:

SPEOS® software has been adopted by companies of all sizes, from SMEs to major industrial groups such as Airbus, Audi, CEA, DCNS, EADS, Koito, Matsushita, NIKON, PSA, SONY, Thales... for the design of lighting systems, light guides, low consumption LED systems, cockpit design, electronic equipment and optical sensors, etc… The OPTIC process can incorporate measurements taken in a photometric laboratory and the creation of digital models.

Concrete examples of applications:

- Design of LED lighting systems, UV insulation systems for electronic cards, UV insolation systems for decontamination purposes, optical control system for glass product packaging, colour control, LED cockpit lighting, LED headlamps and tail lights. Enhanced man-machine interfaces through the choice of display technologies and ambient lighting, with accurate consideration of issues such as reflection in confined or strongly-lit environments
- Design of simulation equipment for vehicle driveability, aircraft landing and maritime navigation taking into account light conditions and effects (lighthouses, cockpit environment) and driver/pilot/navigator perception
- Measurement of BRDF (Bidirectional Reflectance Distribution Function), intensity and luminance. Simulation of the lighting impact of a building on its environment: shadow, reflection, visibility and appearance of solar panels. Development of simulation software for mega joule ghost images and reflections and optronic radiation exchange.

Services provided:

Consulting, expertise, training
Research and development

Competency fields:

ICT - Optics / Laser - Light engineering - Virtual reality - Visual ergonomics - Optimisation of perceived quality

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Sectors of application:

- Building, Public Works
- Energy
- IT & ICT
- Mechanical engineering
- Materials
- Aeronautics, Spacial, Defense

Competitiveness clusters:

- Pôle Mer PACA
- Pôle Risques
- Systematic
- VIAMECA

PHIMECA

Know-how:

- **Systems engineering:** design and gauging of mechanical systems, operational safety, nuclear safety, integrated software support
- **Mechanical engineering:** mechanical and thermal modelling, digital simulation (finite elements with Abaqus, Ansys, Code Aster, Nastran)
- **Uncertainty engineering:** application of probabilistic and statistical methods in association with mechanical modelling for robust design, performance calculation (reliability), sensitivity analysis
- **Provision of training** in this field
- **Development and sale** of PhimecaSoft software
- **Creation of scientific models and software** (Matlab, R, python, C++) and interfaces (QT), third party application maintenance of scientific codes.

Applications:

- **Nuclear:** mechanical analysis of nuclear plant components (tanks, cooling towers, piping, etc.); analysis software maintenance
- **Automobile:** reliability analysis of engine components
- **Petroleum:** mechanical analysis of flexible risers
- **Arms:** mechanical analysis of submarine hulls; design of weapon components
- **IT:** corrective and evolutive maintenance of scientific calculation codes
- **Capital goods**: design of specific test benches and special machinery.

Concrete examples of applications:

- **Biomedical**: analysis of failure modes of an artificial heart, reliability analysis, attrition rate modelling
- **Nuclear**: reliability of reactor tanks, cooling tower maintenance, piping stress, etc.
- **Petroleum**: reliability of undersea risers under stress; analytical model and software for porous environments confronted with sand encroachment
- **Arms**: mechanical analysis of submarine hulls (buckling), operational saftey and nuclear safety analysis
- **Civil engineering & Geomechanics**: digital simulation models for bridges and foundations, resetting of model measurements
- **IT**: corrective and evolutive maintenance of code Cuve1D , from code to finite elements of Code_Aster.

Services provided:

Research and development
Consulting, expertise, training

Competency fields:

Energy - Mechanics / Mechatronics - Fluid mechanics - Uncertainty engineering

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Sectors of application:

- Aeronautics, Spatial, Defense
- Chimistry
- Electronics,
- Telecommunications
- Energy
- Materials
- Health, Pharmaceuticals, Bio-industry, Cosmectics
- Transports

Competitiveness clusters:

- Aerospace Valley
- Cosmetic Valley
- Agrimip

PolymerExpert

Know-how:

- PolymerExpert specializes in the field of polymer materials: Biomaterials (implants and excipients), functional coatings, resins, composites, adhesives, etc.
- Synthesis of customized polymers and innovative polymers, formulation development, encapsulation, scale up in in-house reactors ranging from 1L to 150L
- Products resulting from our in-house R&D with the following properties: self-healing, thermogelling, shape-memory, photochromic (medical, cosmetic and industrial grades), gliding, etc.
- Analytical equipment enabling characterization of products from different syntheses, production problem-solving as well reverse engineering.

Applications:

- Development studies and services (synthesis, characterization, reverse engineering, etc.) for several SMEs and major groups
- Sectors of activity: Biomedical, Pharmaceuticals, Cosmetics, Aeronautics, Aerospace, Automobile, Industry, etc.
- Over 250 customers/partners around the world

Concrete examples of applications:

- Development of new high and low viscosity cement formulations for ortoaedic and vertebroplasty.
- Development of a polymer and formulation for pharmaceutical use (vaccines)
- Development and improvement of behavior of a new gliding system for windshield wipers (automobile)
- Development of self-healing polymers for aeronautics
- Development of new resin for aerospace industry, approved by REACH.
- Development of polymers for fragrance encapsulation
- Development of new high and low viscosity cement formulations for ortoaedic and vertebroplasty.
- Development of a polymer and formulation for pharmaceutical use (vaccines)
- Development and improvement of behavior of a new gliding system for windshield wipers (automobile)
- Development of self-healing polymers for aeronautics
- Development of new resin for aerospace industry, approved by REACH.
- Development of polymers for fragrance encapsulation

Services provided:

Research and development
Characterization, trials, tests, control, formulation
Consulting, expertise, training

Competency fields:

Chimistry / Biochimistry - Materials - Polymers - Surface treatment

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Sectors of application:

- Aeronautics, Spacial, Defense
- Energy

Competitiveness clusters:

- Pôle MER PACA
- Pôle MER BRETAGNE

PRINCIPIA

Know-how:

- PRINCIPIA conducts digital simulation studies of complex physical phenomena for major industrial groups as well as for Energy and Defense engineering.
- Those studies cover fields such as structural mechanics, fluid mechanics and multiphysics coupling. They are conducted throughout the systems lifecycle: pre-design, design, manufacture/installation, operation and dismantling and are most often associated with the industrial sector's regulatory frameworks: API, EUROCODE, RCC-M, ASME, CODETI, AISC, etc.
- PRINCIPIA also conducts engineering research on monitoring systems, basic design studies, basin tests and training.

Applications:

- **OIL & GAS, EMR**: Design/dimensioning/justification of anchorage
- **OIL & GAS, EMR**: Preparation of Transportation/Installation operations
- **OIL & GAS**: Qualification of operability conditions on loading/offloading operations
- **NUCLEAR**: Regulatory justification of equipment in accordance with RCC-M or ASME
- **INDUSTRY**: Qualification of structural damage following accidental or exceptional situations EARTHQUAKE, TSUNAMI, IMPACT, FALLING OBJECT, COLLISION, EXPLOSION

Concrete examples of applications:

- Hydrodynamic analysis of side-by-side offloading of cryogenic liquid gas between FLNG and LNG carrier.
- Modeling and regulatory justification of an oil platform jacket
- Mooring analyses for a container ship terminal
- Regulatory justification of equipment for the Flamnville EPR and Taishan EPR in accordance with RCC-M
- Requalification of seismic resistance of nuclear facilities
- Design of floating wind turbines
  Stability analysis of underwater cables

Services provided:

Consulting, expertise, training
Research and development

Competency fields:

Structural Analysis - Fluid mechanics - Multiphysics couplings - Basin tests - Monitoring - Software development and maintenance

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Sectors of application:

- Agriculture and Food Industry
- Health, Pharmaceuticals, Bio-industry, Cosmetics

Competitiveness clusters:

- Valorial
- Vegepolys

Protial
ALIMENTAIRE & TECHNOLOGIE
Nous inventons, vous innovez

Know-how:

PROTIAL is an **industrial R&D service provider, creating, developing and producing food products** for its clients. Our four main focuses of know-how are as follows:

- **creativity:** culinary, technical, concept
- **innovation:** territory, trends, modelling
- **R & D:** process monitoring, formulation, technology
- **industrial transfer:** production launch, training.

Thanks to the multidisciplinary input of its team members (a vast range of scientific culinary and industrial experience), PROTIAL is able to provide a comprehensive, **cross-channel solution** covering innovation marketing, culinary art processes, nutrition, bio chemicals, legislation and industrial property.

Applications:

PROTIAL's main applications **involve the creation of new food product concepts, the development (or enhancement) of recipes and processes and the industrial implementation of such concepts, recipes and processes.**

These applications concern all sectors of the food industry: meat and specialised pork products, fish and seafood, fruits and vegetables, milk and dairy products, vegetable protein and cereals, delicatessen products, bread and pastries, cheese and cheese-based products.

Concrete examples of applications:

- Development of fruit-based products with a «dairy» texture
- Development of «food» textures for use in the cosmetics industry
- Identification, conceptualization and development of new products compliant with P.N.N.S., organic and R.H.F. standards
- Research into new food applications of a specific functional ingredient
- Development of a new, hypoprotein, cheeselike product that can be kept at room temperature
- Development of specific solutions aimed at controlling «barrier» effects and reducing humidity transfer during product storage
- Development of microwaveable pasteurized vegetable pasta.

Services provided:

Characterization, trials, tests, control, formulation
Prototyping, pilot lots, industrialization
Research and development
Consulting, expertise, training

Competency fields:

Food processing

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Sectors of application:

- Chemistry
- Building, Public Works
- Wood, Furniture
- Electronics, Telecommunications
- Energy
- Environment
- Materials
- Mechanical engineering
- Paper, Cardboard
- Aeronautics, Spacial, Defense
- Textiles, Clothing, Leather, Arts, Luxury goods
- Transports
- Health, Pharmaceuticals, Bio-industry, Cosmetics

Competitiveness clusters:

- Aerospace Valley
- Plastipolis
- Pôle des Microtechniques
- Xylofutur

RESCOLL
Société de Recherche

Know-how:

- RESCOLL is a **research company specialized in the study of innovative industrial applications of polymer-based materials** (composites, resins, ink, varnish, adhesives…) and associated fields of activity such as bonded assembly, burning behaviour and preparation of environment-friendly surface coatings.
  In its field of expertise, RESCOLL performs several different types of activity:
- **Analysis, testing and characterization of materials** and products, providing key input in technical evaluation programmes for new legislation (e.g. REACH, GHS, COV, Formol, Phtalates…)
- **Innovation studies**, either working directly with companies (B2B) or within the framework of multipartner projects (European initiatives, competitiveness clusters, project bids…)
- **In-company and inter-company training**
- **Certifications** ISO 17-025 for "Tests on plastic and composite materials" by COFRAC - NADCAP for "Non Metallic Materials Tests" - EWF for DIN D-6701

Applications:

- **Studies and services** in a wide range of industrial areas: **Aerospace & Defence (> 50%), Biomaterials, Mechanical Engineering, Transport, Nuclear, Construction**...
- Over 500 clients in Europe
- Winner of several professional awards (Engineer of the Year, Young Innovative Enterprises growth prize, Potier prize for "Chemistry for the Environment"…)

Concrete examples of applications:

- INDAR process for disassembling bonded structures. Currently applied in the field of space exploration (GAIA satellite tests) with validation ongoing for the automotive sector
- PANIPLAST process: synthesis and formulation of electrically-conductive polymers. Currently undergoing tests in the construction industry for Joule effect heat applications or for electrostatic removal of paint and gel-coats.
- Several studies ongoing for French competitiveness clusters (SMILE, AEROCONF, HOBBIT, SWC…), European projects (POLYZION, NEWBONE…) and several tender programmes (H2E, COMBIPOL-2…).

Services provided:

Characterization, trials, tests, control, formulation
Consulting, expertise, training
Research and development

Competency fields:

Surface treatment
Polymers - Materials
Chemistry / Biochemistry

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Sectors of application:

- Agriculture and Food Industry
- Environment
- Materials
- Mechanical engineering
- Health, Pharmaceuticals, Bio-industry, Cosmetics
- Textiles, Clothing and Leather, Arts, Luxury goods

siléane

Know-how:

SILEANE, a SENSORY ROBOTICS specialist, designs and industrializes ADAPTIVE MACHINES for GESTURE AUTOMATION in RANDOM and real-time contexts.

Applications:

- **High-speed PICK & PLACE (food, cosmetic and glass industries)**
  Sileane builds ADAPTIVE MACHINES dedicated to INSPECTING and HANDLING products in continuous flow, whether products are flexible, fragile, natural or of undefined shape.
  Most often, the adaptive machines are for high-speed applications (several hundred products a minute) required for sorting, assembling, canning or packaging.
  Applications: Composition of homogenous retail units from heterogeneous batches, VISION inspection in continuous flow – unit compliance of products – aspect, shape, volume, etc., Characterization, classification, association, Handling by high-speed ROBOTS in continuous flow.
- **3D GESTURE – Gesture Automation and associated processes (SORTING and RECYCLING INDUSTRY)**
  3D gesture recognition is aimed at reproducing and automating hand gestures based on the visual analysis of an evolving 3D scene.
  Applications: Automation of resetting process, Real-time, trajectory guidance and resetting in space, Machine learning

Concrete examples of applications:

- Filling pies with apples at fixed weight - analysis and placement of 1200 slices/minute with real-time calculation of placement layout.
- Manufacturing boxes of dates with fixed weight (650 cpm) – grading, associating, packing
- Filling oyster baskets – Optimized filling – oysters laid flat
- Placing fragile and/or sticky sweets (such as calissons) into compartments
- Assembly lines jars: assembly of heterogeneous components with wide range of shapes – glasses, metal wires, rubber
- Guiding lasers on skew surface to reproduce marking based on the position of the part in space
- Cutting process for bananas, one by one, from a bunch - Peeling bananas, etc.

Services provided:

Consulting, expertise, training
Prototyping, pilot lots, industrialization
Research and development

Competency fields:

Acoustics - Mechanics / Mechatronics - Surface treatment

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Sectors of application:

- Mechanical engineering
- Energy
- Health, Pharmaceuticals, Bio-industry, Cosmetics
- Environment
- Agriculture and Food Industry
- Aeronautics, Spacial, Defense
- Chemistry
- Building and Public Works

Competitiveness clusters:

- Maud
- UP-tex
- Trimatec

SinapTec
ULTRASONIC TECHNOLOGY

Know-how:

- **Design and development of innovative ultrasound solutions**
- **Implementation, installation, support and optimization** of all ultrasound modules provided for client applications
- Fields of expertise: **Healthcare, Cleaning & Decontamination, Measure & Control, Manufacturing, Bioprocessing, Waste recovery**
- Tailor-made technological project approach, **taking full account of clients' needs**, for the definition of procedures or for the adaptation of known principles to a specific application. Sinaptec provide a range of ultrasound modules that can be adapted to a range of applications.

Applications:

- Development of an ultrasonic **lysis system** for the preparation of samples for molecular analysis
- Development of ultrasound technology for **reducing volumes of cleaning water** used in the Food Processing industry
- Development of tools for **reducing contamination** in the nuclear industry and confined environments
- Deployment of **ultrasound measurement techniques** for use in quality control, operational safety and environmental characterization.

Concrete examples of applications:

- Development of lipolysis equipment using low frequency ultrasounds
- Worksite equipment for the control of welding of bituminous materials; the equipment performs real-time mapping of the quality of welding at a speed of 300 meters per hour
- Development of a technique for breaking foam during machine-assisted bottle filling so as to ensure top quality sealing at high speeds
- Cleaning equipment for ophthalmic glass
- Sludge treatment equipment
- Vacuity Control of a pipe for nuclear environments.

Services provided:

Prototyping, pilot lots, industrialization
Consulting, expertise, training
Research and development

Competency fields:

Measurement system integration - Ultrasound - Acoustics - Electronics - Mechanics / Mechatronics

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Sectors of application:

- Transports
- Energy
- Health, Pharmaceuticals, Bio-industry, Cosmetics
- Agriculture and Food Industry
- Aeronautics, Spacial, Defense

Competitiveness cluster:

- Pôle des Microtechniques

STATICE
ÉTUDES ET DÉVELOPPEMENT

Know-how:

- **Micromechanics** : "watch industry" precision, precision microsurgery
- **Microelectronics**: routing, cabling, micro-coiling
- **Information technology**: automation and man-machine interface
- **Project flow management**: help in drafting specifications, feasibility study
- **In-house prototyping**: digital orders, polymer microinjection, cabling…
- **Industrialisation**
- **Full preparation for EC or UL labelling**
- **Contracted production**
- **Technology transfer**
- **Biomaterials**
- **Electrophysiological catheters**

Applications:

- **From conception to performance for Non Destructive Testing** (eddy current control) in the Nuclear, Aeronautic and Automotive sectors.
- **Process engineering**: Thermal Activity Trace control for foods and cosmetics
- **Aerospace**: Oz distribution, pilot microphone system, gamma ray space probes, distortion mirror actuators…
- **Complex and compact instrumentation for BioTech and Medical applications**.

Concrete examples of applications:

- Biomérieux diagnosis machinery, NDT of AREVA facilities
- Long-term cardiac and neurological implants.

Services provided:

Research and development
Prototyping, pilot lots, industrialization

Competency fields:

Optics / Laser - Fluid mechanics - Electronics
Materials - Micro-electromagnetics - Polymers
Process engineering - Food processing - Mechanics / Mechatronics

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Sectors of application:

- Aeronautics, Spatial, Defense
- Agriculture and Food Industry
- Building and Public Works
- Electronics, Telecommunications
- Environment
- Mechanical engineering
- Health, Pharmaceuticals, Bio-industry, Cosmetics
- Transports

Competitiveness clusters:

- Pégase
- Eurobiomed

TELEMAQ
Innovative Product Development

Know-how:

- **Innovative Design**: Feasibility studies, concept generation, rupture technology, rapid prototyping, development of innovative products integrating mechanics, electronics, plastics, etc.
- **Mechatronics**: Custom development of sensors and actuators and integration in structures.
- **Piezoelectrics and ultrasonics**: Design, simulation, production and characterization of sensors, actuators, piezoelectric motors and ultrasonic transducers. Vibration characterization of structures with piezoelectric coupling.
- **Aerosol generators**: Design and production of aerosol generators based on piezoelectric technology. Characterization of aerosols using laser granulometry.
- **Energy recovery**: Vibration energy recovery or based on effort variation via mechanical and electric conversion.

Applications:

- Development of innovative devices and products for applications in the following fields: medical, cosmetics, home automation, household appliances, automotive, avionics, defense and space.
- Design and production of piezoelectric actuators and sensors as well as ultrasound transducers for consumer and industrial applications (dynamic force, acceleration, level gauge, cleaning, sonar, etc.)
- Design and production of piezoelectric motorization for industrial applications (optics, robotics, etc.)
- Design and production of aerosol generator for medical (aerosol therapy) and industrial applications (humidification, disinfection, fluid removal, etc.).

Concrete examples of applications:

- **Medical**: « pocket-size » nebulizer for aerosol therapy, powder inhaler, standalone electronic dosage counter,
- **Disinfection**: airborne surface disinfection apparatus
- **Aeronautics**: piezoelectric defrosting device, liquid gauge using ultrasounds and air bubble detection, oxygen regulator
- **Automobile**: high-precision actuator for control motors, dynamic pressure sensors, car seat mechanism
- **Home automation**: silent shutter motorization, access control
- **Industry & Measurements**: Energy recovery system integratable in a hydraulic network, sonar transducers, ultrasonic humidifier, radio frequency torque wrench
- **Household appliances**: ultrasound spot cleaner,
- **Cosmetics**: electronic scent diffuser, active mascaras, cosmetic product dispenser

Services provided:

Characterization, trials, tests, control, formulation
Consulting, expertise, training
Prototyping, pilot lots, industrialization
Research and development

Competency fields:

Acoustics - Electronics - Mechanics/
Mechatronics - Ultrasounds - Piezoelectricity

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Sectors of application:

- Aeronautics, Spacial, Defense
- Agriculture and Food Industry
- Building, Public Works
- Chemistry
- Electronics, Telecommunications
- Energy
- Environment
- Health, Pharmaceuticals, Bio-industry, Cosmetics
- IT & ICT
- Materials
- Mechanical engineering
- Paper, Cardboard
- Textiles, Clothing, Leather, Arts, Luxury goods
- Transports
- Wood, Furniture

uteam
groupe utc

Know-how:

Smart Systems / Vehicles, Rugged, safe design, Design of electric actuators, Vibro acoustics, Transport network safety, Mechanical Engineering and Materials, Software technologies, Personalized prostheses, waste treatment, Plant-based alternatives, Nano structuring, Urban and Environmental system engineering, Organic and mineral chemistry, Innovation modelling and management, Digital analysis, optimization and probabilities.

Applications:

Transport, Aerospace, Automotive, Food processing, Biotechnologies, Biofuels and Green Chemistry, Energy, Environmental protection and Sustainable development, Services - Telecommunications, Medical instrumentation - Health, Optoelectronics - Security, Urban planning.

Concrete examples of applications:

- Electric actuators and onboard energy drive systems
- Predictive microbiology
- Biocatalysis and metabolic alternatives
- Pattern recognition
- Innovation and risks
- Artificial organs and biomaterials
- Energy optimization of buildings
- Digital simulation methods and models.

Services provided:

Characterization, trials, tests, control, formulation
Consulting, expertise, training
Research and development
Prototyping, pilot lots, industrialization

Competency fields:

Acoustics - Chemistry / Biochemistry - Energy - Filtration - Fluid mechanics - Food processing - ICT - Materials - Mechanics / Mechatronics - Polymers - Process engineering - Surface treatment - Thermal engineering - Ultrasound
Urban systems engineering

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Sectors of application:

- Electronics, Telecommunications
- Energy
- Mechanical Engineering
- Health, Pharmaceuticals, Bio-industry, Cosmetics

Competitiveness clusters:

- Systematic
- Medicen

ValoTec

Know-how:

- **Analog electronics**: small signal measurement, very low noise amplification, power, etc.
- **Digital electronics**: microcontroller, FPGA, VHDL, digital signal processing, etc.
- **Sensors**: design of sensors, calibration, corrections, etc.
- **Ultrasounds**: ultrasound-based processing system, excitation, measurement, modeling, etc.
- **Telecommunications**: Wi-Fi, Bluetooth, ISM, M2M systems (GPRS, GSM network, etc.)
- **Wireless Power**: system design, production, test and operating optimization
- **Electromagnetism**: system modeling and design, control/command and measurement
- **Fluid mechanics**: turbine design, system dimensioning and measurement, etc.
- **Thermal engineering**: thermal system dimensioning related to power electronics
- Ability to make the interface and involve external experts (laboratory scientists, doctors, lecturers, CNRS ...) on precise issues (electronics, magnetism, optics, fluid mechanics, ...).
  ValoTec is certified ISO 9001 (technical devices) and ISO 13485 (Medical devices).

Applications:

- Research and production of prototypes in the medical field (measurement systems, processing systems, etc.) using different technology (ultrasounds, electromagnetism, etc.).
- Innovative prototype research (aeronautics, M2M, smart cabinet, non-destructive testing, etc.).

Concrete examples of applications:

- **Blood diagnosis device**: research and production of an analytical device based on magnetic beads. The project included: device research, feasibility study, patent, proof of concept, prototype and test bench of a diagnostic device based on a patent of the start-up. This research required skills in the fields of magnetism, analog electronics and digital signal processing.
- **Cardiac implant** : research on an implantable device in the cardiac field, feasibility study, design of a system test bench, prototype for in vivo testing. This research required skills in the fields of fluid mechanics, electronics and the production of test methods.

Services provided:

Characterization, trials, tests, control, formulation
Consulting, expertise, training
Prototyping, pilot lots, industrialization
Research and development

Competency fields:

Electronics - Energy - Mechanics / Mechatronics - Fluid mechanics - Optics / Laser - ICT - Ultrasound - Electromagnetism - Medical field - Implants

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Sectors of application:

- Energy
- Materials
- Transports
- Mechanical engineering
- Aeronautics, Spacial, Defense

Competitiveness clusters:

- Aerospace Valley
- I-Trans
- Lyon Urban Truck and Bus
- Mov'eo
- Pôle Nucléaire Bourgogne

VibraTec

Know-how:

Vibratec's activities, focused on mechanics, and more particularly on acoustics and vibrations, revolve around a number of different disciplines:

- **structure and system dynamics**, vibroacoustics and signal processing
- **digital simulation and experimental analysis** for services ranging from design to diagnosis for a high level of reliability of calculations.
- **digital and computerized methods** enable Vibratec, and its subsidiary MicrodB, to develop experimental analysis tools for 3D acoustic imagery (complete systems – software & hardware) and identification of vibratory sources (inverse method techniques) and simulation tools, in particular for acoustic calculations.

Applications:

- Experimental analysis and digital calculation for resolving acoustic or vibratory issues, proposing and validating solutions
- Calculation and experimentation combinations for reliability, comfort and noise pollution studies. Set or customised training solutions focused on specific techniques (e.g.: signal processing) or product ranges (e.g.: automotive acoustics)
- Development of 3D acoustic imagery measurement systems and calculation software (generic or product-specific)
- Design of vibration control solutions or processes.

Concrete examples of applications:

- Vibratory diagnosis of machinery on a drilling barge. Creation and adjustment of a calculation model for assessing potential solutions. Implementation and validation of solutions
- Calculation and measurement of the vibratory behaviour of automobile bodywork. Resetting of measurements using large Finite Element models followed by application to optimize the vibro-acoustic response rate of the vehicle. Experimental and digital approach to develop a method for measuring catenary pantograph contact force on high-speed rail networks
- Acoustic imagery system for identifying source fields on incoming aircraft: this technique makes it possible to pinpoint the aerodynamic sources on the aircraft
- Development of a medium frequency acoustic calculation code for optimizing the acoustic baffle of an industrial vehicle for the comfort of other road users and for the driver and passengers
- Design and delivery of dynamic absorbers for reducing pipe vibration and stress so as to minimize the risk of cracking.

Services provided:

Research and development
Consulting, expertise, training
Characterization, trials, tests, control, formulation

Competency fields:

Acoustics - Materials - Fluid mechanics - Mechanics / Mechatronics

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Sectors of application:

- Agriculture and Food Industry
- Wood, Furniture
- Transports
- Building, Public Works
- Chemistry
- Electronics, Telecommunications
- Energy
- IT & ICT
- Materials
- Mechanical engineering
- Health, Pharmaceuticals, Bio-industry, Cosmetics
- Textiles, Clothing, Leather, Arts, Luxury goods
- Aeronautics, Spacial, Defense

Competitiveness clusters:

- Matéralia
- Pôle Nucléaire Bourgogne
- Vitagora

Welience
Innover, c'est notre métier

Know-how:

- **Materials and Technologies Department:** Materials Engineering - Metallurgy and surface treatment, characterization, study and modeling of material behavior - Analytical chemistry, and mechanical characterization vibro-acoustic structures - Molecular engineering - Nanotechnologies and Nanomaterials - Optics - Technologies including laser welding and sintering flash - Engineering vehicles…
- **Food and Biotechnologies department:** Food texturization and aromatization - Microorganisms destruction or preservation - Sensory analysis - Packaging toxicity
- **Health and Technologies department:** Tools for learning and rehabilitation Human Machine Interface optimization Orthesis and Prosthesis.

Applications:

Welience provides a response to all needs to improve industrial competitiveness and product offers. Welience M&T deals with specific industrial issues associated with materials and transformation or assembly processes.

Concrete examples of applications:

- **Materials & Technologies Department:** development of welding processes and reloading laser hybrid, heterogeneous welding steel-aluminum, aluminum-magnesium, titanium steel, titanium-tantalum, hardthick welding in all positions…
- **Food and Biotechnologies department:** tranchables sauces, continuous-made caramel, breakfast cereals with new shapes, creamy honey, new pet food, probiotics, spores, microorganisms drying, powders decontamination, enzymes production by solid state fermentation, sensory analysis of food supplements, of meat products, of cooked vegetables, development of specific products for older consumers...

Services provided:

Consulting, expertise, training
Research and development
Characterization, trials, tests, control, formulation
Prototyping, pilot lots, industrialization

Competency fields:

Acoustics - Biology - Chemistry / Biochemistry - Electronics - Energy - Fluid mechanics - Food processing - ICT - Materials - Mechanics / Mechatronics - Neurosciences - Optics / Laser - Polymers - Process engineering - Surface treatment - Ultrasound - Agroenvironnement Healthy - Social Science

CONTACT : Tel.: +33 (0)1 39 30 61 14 contact@asrc.fr www.asrc.fr