



# TAKING ON A NEW DIMENSION

**Members directory  
2022**

**skywin.be**

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# Chairman's message

Let's not stop at bemoaning one crisis after another: the climate, the pandemic, Ukraine, which are harming humanity and affecting our business, our markets and our supply chains.

Let's look ahead.

Fortunately, the Belgian regional and federal authorities have helped in the short and medium term. Following on from this, the European Recovery and Resilience Plan is paving the way for the long term, thereby laying out the paths of the future. Beyond the real potential for commercial development, two more societal, albeit highly industrial, issues will impact our ecosystem: decarbonization and European sovereignty.

Each of our sectors is brimming with exciting prospects:

- Air transport where, in addition to the conventional incremental improvements, electricity, hydrogen and sustainable fuels are emerging as the tools of decarbonization. While we await new breakthroughs...

- Space, with new space, without neglecting classic space, is bound up with that desire for sovereignty.
- Drones, where we're still in the early stages.
- Defense, where a firm trend was emerging, while respecting alliances, in favour of European sovereignty. The horrors of the Ukrainian crisis are today exacerbating this imperative and urgent need.

These areas offer us great opportunities, some of which are bordering on duties. More than ever, research and innovation have a role to play, mainly in a collaborative approach between the industry and the research bodies.

Skywin, on a mission expanded and developed hand in hand with the Walloon government, is committed to supporting all players in the sector in the face of these important challenges.



Jacques Smal  
*Chairman*

# Skywin in a Nutshell

Skywin is one of the 6 competitiveness cluster in Wallonia.

End 2021 Skywin has **148 members** among which:

- 117 Companies: SMEs (101) and large companies (16) ;
- 21 Research operators ;
- 2 Training centres;
- 8 Other bodies (agency, association, ...).

Since 2007, Skywin labelled **91 projects** (61 R&D project) for a global budget 273m€

Turnover of the Walloon aerospace sector: **€2billion**

Employment figures: **7,500** direct jobs

## The 4 economic sectors covered by the cluster have their own different business models:

- The Walloon sector dedicated to Civil Aviation is a historical sector resulting from the metallurgical and mechanical skills acquired in the 20<sup>th</sup> century and is still growing in Wallonia. It brings together more than 70% of the Belgian activity and supplies alone 5% of the equipment in the Airbus range, while also being present at Boeing. The Walloon aeronautical industry employs more than 5,500 people (direct employment), with a turnover of over 1,350 million euros.
- For more than 50 years, the Walloon Space sector has been an important part of the Belgian sector, which ranks 5<sup>th</sup> in Europe in terms of investment both in research and in the space industry. The Walloon space sector includes 31 active players and nearly 40 other players

partially participating in the development of the sector. Despite the health crisis, this sector maintained a turnover in 2021 comparable to that of 2018, namely 340 million euros, while providing more than 2,000 direct jobs in Wallonia.

- The drone sector is strongly growing in Wallonia. It mainly revolves around the following activities: Machine design, on-board electronics, on-board applications and services for industry and the public sector, Autonomous flight, Pilot training, Diversified testing facilities.
- The Walloon sector devoted to Defense and Security is a historical sector resulting from the metallurgical and mechanical skills acquired in the 20<sup>th</sup> century. It is still a growing sector in Wallonia. It brings together several large companies (Belgian and international) as well as an extremely dynamic network of SMEs that are constantly developing new skills.

## **The 5 technological and strategic axes of the Skywin cluster:**

### **Structures, propulsion and flying subsystems**

This theme covers all structural elements and their integration into aircraft, drones, propulsion systems, launchers and satellites, at all stages of their life cycle. It encompasses the adaptation of existing systems and subsystems to take account of the issue of environmental transition.

In the longer term, this theme goes beyond such adaptation by gradually integrating the energies of tomorrow (H<sub>2</sub>, synthetic fuels, hybridisation, electrification, etc.) which are due to profoundly transform the flying systems and subsystems of the future.

### **Innovative materials and processes**

This theme covers various aspects applicable to flying systems and subsystems (aircraft, drones, launchers, satellites):

- Materials (metals, composites, intelligent materials), their manufacturing processes and associated special processes (e.g. additive manufacturing, advanced composite processes, process equipment, etc.) ;
- Mechanical components and their assembly ;
- Surface treatments and coatings
- The theme also covers the qualification/ certification aspects specific to the sector. It also takes account of the issue of environmental transition, in particular by integrating the principles of the circular economy.

### **Embedded and communicating systems**

This theme covers systems embedded in flying

systems and subsystems (transducers, sensors, communication systems, energy management, human/machine interfaces) to meet the main challenges of the following four pillars:

- autonomy supported by on-board artificial intelligence ;
- electrification, with the challenge of increasing power and voltage;
- continuous connectivity is a major issue on land, at sea, in the air and in space ;
- cyber security to provide safe and secure platforms.

Embedded systems contribute to the challenges of digital continuity, massive data processing, systems of systems, and miniaturisation in all areas such as drones and satellites.

### **Data economics and artificial intelligence**

This theme covers methods and tools for data processing and mining. Firstly, it covers the data economy and the specific integration of artificial intelligence. Second, it includes services related to data from earth observation (space, drones, etc.) and from test and maintenance benches. Finally, it supports the development of the industry of the future (Industry 4.0).

### **Simulation, modelling and test facilities**

This last theme brings together:

- The development of agile and secure design algorithms and software ;
- The development and operation of numerical simulation methods and numerical twinning techniques ;
- Facilities for ground tests and physical simulations (NDT, engine testbeds, autonomous systems, aerodynamics, vibration, radiation, extreme conditions, etc.).

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# Industrial Members







+8, rue de l'Avenir - 4460 Grâce-Hollogne | BE

T. + 32 (0)4 247 11 24 | F. + 32 (0)4 247 21 87

info@acte-sa.com

<http://www.acte-sa.com>



AERO



DRONE

As a company acting for waste heat recovery, ACTE designs and manufactures innovative heat exchangers dedicated to waste heat recovery from micro-gas turbines and industrial applications including energy production units and vehicles.

Thanks to its unique arrangement of modular ring-shaped components and a specific primary surface profile, ACTE heat exchanger technology is flexible and fits with a wide range of applications and processes with a specific focus on lightweight and compactness.

ACTE S.A. has more than 15 years of experience in high performance gas-gas heat exchangers, mainly used as heat recuperators on turbine engines. ACTE is therefore able to deal with primary surface heat exchangers in extreme environments: high power densities, large range of mass flows, thermal shocks, creep and thermal fatigue, combustion gases, etc.

The waste heat recovery solutions designed by ACTE are aimed at being compact and lightweight while offering all the features required to reach the target performances.

In order to respond to each customer needs, ACTE answers in several ways:

- Standardized solution supply
- Adaptation from ACTE standard products
- Full development
- Prototype to mass manufacturing

ACTE also offers service related to the whole spectrum of heat transfer.



68, Allée Centrale - Zoning de Jumet - 6040 Charleroi | BE

T. +32 (0)472 59 03 29

info@addiparts.com

<http://www.addiparts.com>



AERO



SPACE



DRONE



DEFENCE

ADDIPARTS is a service company specialized in high-end industrial applications of Additive Manufacturing.

ADDIPARTS designs and prints varieties of complex parts, per unit or in small batches, using high performance industrial thermoplastic materials such as Antero (PEKK) and ULTEM™ 9085 (PEI), used in Aerospace, Defense, Transportation applications.

New service offers CALFDM, a FEA methodology allowing stress and strain prediction within FDM built parts when structurally loaded, providing engineers insight into the behavior of PEKK or ULTEM™ 9085 printed parts in highly stressed applications, opening door to part optimization and certification. The resulting functional prototypes, parts, tools, and jigs offer unequalled mechanical, thermal and chemical performances, matching industrial requirements and constraints, allowing their use in actual conditions.

Several AM technologies and materials are available, allowing for specific solutions and materials that match customers' requirements.

Based on customers requirements, ADDIPARTS provides qualified industrial AM technologies, high performance thermoplastic materials, Design for Additive Manufacturing expertise, rapid prototyping and digital manufacturing services in order to reach technical and cost optimized solutions.

ADDIPARTS professional performances allow customers to meet their development and production deadlines, and reduce their costs and risks.

ADDIPARTS works hand in hand with customers to select the right AM technology and material for each specified application.

ADDIPARTS' CALFDM services are proposed to all companies requiring their parts design compliance to be validated by FEA calculation against specified loading requirements.



# ADVANCED COATING



Rue de l'Avouerie 7 - 4000 Liège | BE  
T. +32 (0)4 254 50 11 | F. +32 (0)4 254 50 10  
info@advco.be  
<http://www.advanced-coating.com>



AERO



SPACE

Advanced Coating is a reference in thermal spray coating technology, as well as in flat and cylindrical grinding, super finishing and balancing of technical parts of any dimensions. Advanced Coating is an optimally sized, customer-oriented company with the skills to provide its customers high added value. Quality, reliability and flexibility are the watchwords of our family company who can meet the tightest design, development and manufacturing deadlines on the market.

## Products

Advanced thermal sprayed coatings (metals, alloys, abrasables, ceramics and carbides) onto mechanical components up to Ø2000x6000 mm

## Main properties

- wear resistance (abrasion, erosion, fretting)
- abrasable
- thermal barrier
- high temperature corrosion resistance
- electric insulation
- power conductivity...

## Capabilities

- Automated sandblasting up to Ø2000x5700 mm
- Cylindrical grinding up to Ø1524x5700 mm
- Modern thermal spraying processes including Plasma, HVOF, HVOF and Cold Spraying
- CN cylindrical grinding up to Ø350x1000 mm
- Super finishing up to 0,01 µm Ra
- Flat grinding up to 4000x500 mm
- Balancing up to Ø1500x6000 mm and 5 T

## Certifications

- EN 9100
- NADCAP Coatings
- Qualified as test laboratory for Safran Group (Metallography)
- ISO 14001

## Main References

- References of intermediate and final customers: SAFRAN Group (SAFRAN AIRCRAFT ENGINES, SAFRAN AERO BOOSTERS) – GENERAL ELECTRIC - AVIO
- Working of following programs: LEAP - ARIANE 6 - GE90 - TP400





# AÉRODROME DE NAMUR



Rue du Capitaine Aviateur Jacquet 44 - 5020 Namur | BE

T. +32 (0)81 55 93 55

info@aerodromedenamur.be

<http://www.aerodromedenamur.be>



AERO



DRONE

The aerodrome of Namur is located in the heart of Belgium. With its new asphalt track of 690m by 25 it can now operate all year round. The site continues to develop by building office spaces to create an aeronautical hub. The plane, drones, gliders and helicopters coexist for 70 years at the Aérodrodrome de Namur.

The Aerodrome of Namur, with the contribution of its new owners, undergoes important modifications.

The grass track has been replaced by an asphalt track. New gas pumps have arrived and real estate is growing.

Sonaca Aircraft is based on the site of the aerodrome and has just integrated its brand new building of 2.300m<sup>2</sup> intended for the assembly of the S200 aircraft. New tenants should set up on the site in 2019 where there are still building spaces available.

Aerodrome also wants to develop corporate incentives and rehabilitate its main building by the end of 2020.



# AEROFLEET



Chaussée de Wégimont 25 - 4630 Soumagne | BE

T. +32 (0)4 377 50 50 | F. +32 (0)4 377 38 49

info@aerofleet.be

<http://www.aerofleet.be>



AERO

## Aerofleet is specialized in High-Tech composites.

Nowadays we produce all kinds of high technical quality prepreg parts under vacuum and in autoclave.

Composite materials, using prepreg materials offer technical and environmental qualities.

Among other realizations, our company has built the domes for the Very Large Telescope, developed for ESO on the site of Cerra Paranal (Chile), the nozzles and the fairings for the A380 Airbus, weapon protection for the "FN"...





Rue André Dumont, 9 - 1435 Mont-Saint-Guibert | BE

[bonjour@aerospacelab.be](mailto:bonjour@aerospacelab.be)

<http://aerospacelab.be>



SPACE



DEFENCE

## Small satellites, data & insights

### Activities and experience

Aerospacelab is a Belgium "new space" scale-up founded in 2017 by Benoît Deper. The company's vision is to enhance efficiency across markets by making geospatial intelligence both actionable and affordable. With the objective of becoming the European leader in satellite-based intelligence, Aerospacelab follows a vertically integrated approach, developing expertise both in upstream and downstream markets.

Aerospacelab, therefore, offers solutions to customers in three distinct markets:

- Satellites
- Data (satellites' imagery)
- Insights (solutions based on artificial intelligence applied to satellites' imagery)

The company currently employs more than 140 full-time employees (and targets to be 200 at end of 2022), for two offices (Mont-Saint-Guibert and Leuven), and is currently setting up a satellite assembly line close to its Mont-Saint-Guibert offices.

### Technologies and products

Aerospacelab develops cutting-edge tools to automate a broad range of tasks ranging from surveying to monitoring. It processes heterogeneous datasets composed from various sources and can also customize the tools to incorporate your own proprietary datasets.

Aerospacelab offers high-performance satellite

platforms, up to 150kg, for a pricing comparable to current 12U CubeSats. Leveraging investments already made for our own constellation's deployment, we have the capacity to design, manufacture, integrate and test 24 platforms a year with an unmatched performance-to-cost ratio. Platforms can accommodate various payload types, fulfilling demands from Institutional and Commercial actors. Our satellites are equipped with a variety of sensors collecting high-resolution optical data multiple times per day on selected target areas. Tasking and archive imagery products will be available soon, with an optional extra layer of AI and machine learning to speed up your findings.

# ALKAR TECHNOLOGY



Rue Albert 1<sup>er</sup>, 46 B 23 - 7134 Leval - Trahegnies | BE

T. +32 (0)64 65 20 82

alki@alkartechnology.com

<http://www.alkartechnology.com/>



AERO



DRONE



DEFENCE

ALKAR TECHNOLOGY srl was founded in 2002 based on a 15 year personal wide experience (by that time).

We are proud to specialized in High Performance composites, always trying to be one step ahead with a continuous improvement strategy.

Future is built on innovation. We participate in several regional and international R&D projects.

## Services available at Alkar Technology

- Engineering: parts design and Finite Element Analysis of composite laminates, optimisation.
- Training (in-house or in partnership with WAN) focused on manufacturing, engineering and repair.
- Technology transfer.

## Production

- From models, moulds and toolings to prototypes and small run production.
- CNC machining: 3 axis gantry and 6 axis robot.
- All processes: autoclaved prepregs, RTM (capacity upto 850x1500x850 WxLxH), vacuum infusion (mainly double bag Airbus process VAP).

## Our specialty

- Development and production of NDT references for delamination, porosity, foreign objects, dry patch, ply waviness (in-plane / out of plane), using any material / any process.
- Machining of samples for destructive testing, complete with quality / measurement report.

Rue de la brasserie, 8 - 4000 Liège | BE

T. +32 (0)473 52 30 20

info@alxsys.com

<http://www.alxsys.com>



DRONE



DEFENCE

ALX Systems provides mission-optimized UAV operating system, with AI enhancement.

The solution supports secure cloud control, integrated image recognition, obstacle avoidance and path finding, as well as complete integration of swarm capabilities.

To complete our offer, we provides customer based solution, like integrated security system (Sentinel), counter-UAV solution (Spartiath), and many other ones dedicated to indoor exploration, 3D mapping, search & rescue.

In a few words "ALX provides solutions to make UAV projects come true!"

ALX Systems provides mission-optimized UAV operating system, with AI enhancement.

The solution supports secure cloud control, integrated image recognition, obstacle avoidance and path finding, as well as complete integration of swarm capabilities.

To complete our offer, we provides customer based solution, like integrated security system (Sentinel), counter-UAV solution (Spartiath), and many other ones dedicated to indoor exploration, 3D mapping, search & rescue.

The solution is dedicated to be easily integrated in any kind of structure, to make the UAV an extension of business process, which means, that it's completely open to the connection with other software.

Our 3D simulation environment will allow our users and customers to test, train and validate their process in a completely secure way.

Our Vision suite will allow our customers to train themselves, without knowledge, our image recognition AI engine.



Rue des Chasseurs ardennais 2 - 4031 Angleur | BE

T. +32 (0)4 361 40 40 | F. +32 (0)4 367 20 07

info@amos.be

<http://www.amos.be>



SPACE

AMOS was created in 1983, merging from the mechanical machining expertise of "Ateliers de la Meuse" and the optical polishing know-how of the Institute of Astrophysics from the University of Liège.

Located in Belgium, AMOS has been designing and building high-precision optical and mechanical equipment for more than 35 years. Its main achievements are professional telescopes, space optical systems, test equipment for space instruments, and high-precision mechanical equipment. It employs about 100 employees highly skilled in advanced technologies and offers services to the space industry, to the professional astronomy sector, to scientific laboratories and to industry.

AMOS' added value recognized by its customers is:

- Cutting-edge expertise in optics and high-precision mechanics,
- Ability to reach the technology limits despite difficulties,
- High quality thanks to in-house manufacturing,
- Precise and reliable solutions for long-term use.

## Main area

- Professional Astronomy Systems: turn-key telescopes, telescope subsystems, telescope instruments.
- Space Systems: on-board hardware, optical and mechanical test systems (GSE), handling systems.
- Science and Industry Solutions: optical and mechanical systems.
- Services: Design, engineering, manufacturing and test services in optics, mechanics and mechatronics.

AMOS has customers in Europe (ESA, ESO, AIRBUS DEFENCE & SPACE, THALES ALENIA SPACE, OHB), in United States (AURA), in India (ISRO, PRL, ARIES), and has more recently expanded its business in countries such as China, Turkey and Russia.



Rue de Wallonie, 11 - 4460 Grâce-Hollogne | BE

T. +32 4 239 80 20

contact@ampacimon.com

<http://www.ampacimon.com>



DRONE

Founded in 2010 based on research undertaken since 2003 at University of Liège, Ampacimon developed innovative Dynamic Line Rating systems (DLR) for transmission/distribution systems operators.

This new technology belongs to the « smart grid » world of innovations to actively manage electricity grids. It is made of stand-alone sensors installed on high-voltage lines, coupled to software interfacing with dispatching centers SCADAs.

The system consists of sensors installed on high-voltage lines that measure key parameters influencing the maximum thermal capacity of a line (vibrations, temperature, sag, wind speed). It measures the so-called « ampacity » of a line, i.e its true, real-time maximum capacity (which is usually significantly higher than its design capacity). This system also allows to reliably forecast this capacity up to two days in advance.

A first field-test was initiated in 2008 on the Elia high-voltage grid in Belgium. Through the EU-funded «Twenties » project (completed in 2013) with RTE (France), REE (Spain) and Elia (Belgium), Ampacimon was able to demonstrate that its DLR system was not only technologically proven, but also the most effective in the field.

Since then, Ampacimon started bringing to the market the ADR (Ampacimon Dynamic Rating) product line, including quantification/modelling tools, real-time monitoring systems, up to day-ahead forecasting software, integrated in T/DSOs SCADAs.

Ampacimon works alongside its customers globally, helping them to optimize their grids.



# ANY-SHAPE



Rue de la Digue 37 - 4400 Flemalle | BE

T. +32 (0)4 223 00 95

info@any-shape.com

<http://www.any-shape.com>



AERO



SPACE



DRONE



DEFENCE

Any-Shape is a leading company dedicated to Additive Manufacturing (3D Printing) for Industry with state-of-the-art equipments for the production of plastic, composites and metal functional parts. Any-Shape provides its customers with services in the whole Additive Manufacturing (AM) value chain, with a specific focus on Engineering for AM, high standard & state-of-the-art production machines and strong capabilities in control, test & quality assessment.

Any-Shape is your ISO 9001 / EN9100 and ISO 13485 accredited AM production partner (Design + Manufacture). We print, monitor, measure, test, validate and certify - all in one location.

Any-Shape competitive assets are based on three main pillars:

## **Engineering, co-conception & design for additive manufacturing**

Any-Shape provides its customers with a professional support to exploit the full possibilities of industrial 3D printing while properly accounting for manufacturing constraints from the concept to the detailed design phase.

## **Metal, plastic and composites parts serial production**

Any-Shape manufactures high value parts in both plastic & metal for highly competitive industries. Consistent state-of-the-art technologies are available: Selective Laser Melting (SLM) for metal powders, Selective Laser Sintering (SLS) for polyamide powders, Multi-Jet Printing (MJP) for high-definition ABS-like plastic production and Fused Deposition Modeling (FDM) for high performance polymers and continuous fiber reinforced composites.

## **Control, Test and Quality assessment**

Providing our customers with the best quality standards is our main concern as a way to favor the rapid introduction of 3D printed parts in highly demanding industrial applications. Any-Shape is fully equipped with metallography, mechanical testing and metrology labs aiming at qualifying the mechanical properties of the parts produced or developing the process parameters for new materials. Detailed on-line and a posteriori process control is performed in parallel to rigorous part quality assessment.





# BALTEAU NDT



Rue Voie de Liège 12 - 4681 Hermalle Sous Argenteau | BE

T. +32 (0)4 374 75 75 | F. +32 (0) 4 374 75 85

[sales@balteau-ndt.com](mailto:sales@balteau-ndt.com)

<https://www.balteau-ndt.com>



AERO



SPACE



DEFENCE

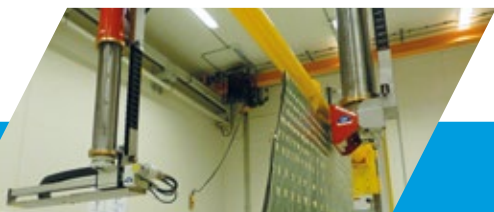
BALTEAU NDT is an NDT manufacturer specialized in X-Ray solutions designed for the quality control of industrial products since 1932. Balteau NDT is involved in various industries and has been deeply involved in the aeronautic industry for decades, with portable equipment and Real Time System.

Understanding new requirements is very important for Balteau as we are always looking to answer your needs with the best solutions. Balteau has evolved into digital applications and developed products such as software suite, calibration tools, etc. that are specifically designed for the aeronautic industry.

Highly qualified engineers, a customer orientated staff and an extensive network is one of the main reasons to the success of our brand and to your possibility of always getting service, maintenance and a qualified and professional support.

Balteau is involved in most industries by having portable units, stationary & mobile equipment, real time systems (standard and customized), NDT software, digital imaging, etc.

Balteau is one of the most experienced and complete x-ray solutions manufacturer and we are delivering high quality and highly reliable x-ray equipment since 1932. After sales service is very important and this is why we worked hard to offer one of the best service possible. Thanks to a worldwide network, we are able to be responsive, offer a fast delivery and allow every user to have fast maintenance and / or repairs in case the equipment needs it.



Bâtiment B17b, rue Grande traverse , Quartier des Urbanistes 2 - 4000 Liège | BE

T. +32 (0)472 86 26 39

jerome.dagruma@beblue-cryotech.eu

<http://www.beblue-cryotech.eu/>



AERO



SPACE



DRONE



DEFENCE

Beblue is proposing testing capabilities with cryogenic fluids, namely Hydrogen, Oxygen and Nitrogen both liquid or gaseous.

Beblue has a great expertise based on more than 3 decades in cryo tests.

We support our customer along their development from engineering support, material characterization to complex tests including test rig design.

Beblue is one of the 3 recognized ESA test centers.

## Material Characterization

- Pin-on-disk tests in gaseous and liquid environments (N<sub>2</sub>, O<sub>2</sub>, H<sub>2</sub>, He)
- Impact tests for material compatibility (LOx)
- Auto-ignition tests in Gox (120 bars , up to 500°C)
- Adiabatic compression test up to 1000 bars
- High cycling fatigue under cryogenic conditions (update for 2022)
- Cryogenic compatibility

## Components and system testing

- Fully operational benches for tests in real dynamic conditions for space engine components
- Dynamic seals
- Bearings
- Valves
- Liquid or gaseous nitrogen and oxygen.
- Gaseous hydrogen
- 700+ sensors and measurement lines

## Focus on H<sub>2</sub> based systems testing

- Fuel cells with ULiege
- H<sub>2</sub> distribution & storage (composite)

## Our expertise to support your business

- Engineering office with strong expertise in testing :
- Cryotribology
- Expertise support
- Design capabilities for specific test rigs
- Test rigs integration & design
- Project management
- Test management & reporting
- 30+ years experience in cryotechnic technologies

Route de Liers 121 - 4041 Herstal | BE

[info@becover.eu](mailto:info@becover.eu)

<https://becover.eu/en/>



AERO



DEFENCE

**Aerodynamics test center Unique in Europe.** BeCOVER will be able to test all types of compressors for the next generations of civil and military aircraft engines. The 3,000 m<sup>2</sup> facilities will be operational from 2023 and will serve as a genuine laboratory for industry and academia.

These new facilities will be used to validate breakthrough innovations in order to meet the major environmental challenges and requirements of tomorrow's aviation industry.

Covering a wide range of low and high-pressure compressor requirements, BeCOVER will have exceptional technical capabilities, including a closed air-loop system, making it possible to test turbomachine components under conditions at altitude and on the ground.

BeCOVER will offer a turbofan test capability, a multi-speed gearbox, heat resistance over 600°C as well as the possibility of co-piloting the tests remotely. These competences, initially applied to the field of aeronautics, could be used more widely by other sectors, for example, the energy sector. The 5 metres of usable space for installing the compressors will provide ample scope for diversity.

Safran Test Cells, the test cell unit of Safran Aero Boosters, will be in charge of building the test centre. The very best technologies for optimising resource consumption (energy, water, etc.) will be implemented.

Designed to serve the industrial sector, BeCOVER's facilities will also be made available to the academic and scientific world for experimental research in the field of turbomachine aerodynamics. The facilities will serve as a genuine laboratory for Belgian universities and research centres and help develop a network of common skills.



# BELGIAN DRONE FEDERATION



Rue des Pères Blancs, 4 - 1040 Bruxelles | BE

info@tbdf.be

<https://belgiandronefederation.be/fr>



DRONE

The Belgian Drone Federation forms a network for more than 350 members, including universities and colleges, companies, pilots -operators and institutions. It represents their interests in the unmanned aviation sector. The federation is active in both Belgium and abroad to promote the sector and the integration into the airspace.

The Belgian Drone Federation represents the interests of her members and the drone sector locally, regionally and federally. The lobby for a new European legislation and an accurate Belgian implementation is a priority. The sector is on the eve of a rapid evolution. It's the goal of the organization to create an ideal environment in Belgium so that no opportunities are missed and Belgium remains one of the leaders in Europe. The federation is based on the dedication of a team of board members who volunteer to share their passion for drones and look after the interests of the sector. A good mix of knowledge and expertise is deployed daily in working groups and advisory boards such as those of the Belgium Civil Aviation Authority and in contacts with foreign sister organizations. The 4 main objectives are:

- Maximum safety and true airmanship
- A pursuit of a uniform position in terms of regulations within the sector
- Fair competition and a viable sector
- A positive image for the drone sector in Belgium



# BIG BAD WOLF



Avenue des Eaux Vives, 4 - 1332 Genval | BE

T. +32 2 318 84 58

[inquiries@bigbadwolf.be](mailto:inquiries@bigbadwolf.be)

<https://www.bigbadwolf.be>

**Big Bad Wolf's mission is to support organizations in achieving their digital transformation by identifying creative technological opportunities and challenging business processes to positively impact the value chain.**

Big Bad Wolf is a brand-tech product and services company. We help innovative businesses shape the future of their brand experience through digital transformation of their services, products and communication. We see Virtual Reality, Augmented Reality, Computer Vision, Machine Learning and Natural Interfaces as new opportunities to redesign and improve business-to-consumers interactions. Our integrated startup studio helps companies by giving them access to an ecosystem of software solutions and platforms dedicated to the digital transformation of their business.



# BIT AND BYTE



Rue du Colombier, 16 - 1435 Mont-Saint-Guibert | BE

T. +32499229806

gm@bitandbyte.io

<http://www.bitandbyte.io>



AERO



SPACE



DRONE

**Bit and Byte** is an electronic system design company that offers its services to companies that build or integrate electronic products. Our **mission** is to help companies bring innovative products to the market thanks to our expertise, know-how and work force.

We do *project management, architecture and coding* of **micro-electronic** design (FPGA) and **embedded software** ( $\mu$ controller, SoC).

Our areas of expertise include image and video (sensor integration, image processing, compression and transport), cryptography and signal processing for radio communication (software defined radio). Our customers are active in the broadcast, pro AV, telecommunication, defense, transport and aerospace domains.

We are located in the Axis parc, close to Louvain-la-Neuve, Belgium.

Our **drive** is to be recognized as **tech guru** in our fields of expertise and be the **reference partner** for design of digital electronic projects.

# BOLLORE LOGISTICS BELGIUM



Bedrijvenzone Machelen Cargo 829E - 1830 Machelen | BE

T. +3227522211

[thierry.contzen@bollore.com](mailto:thierry.contzen@bollore.com)

<https://www.bollore-logistics.com/fr/pays/belgique/>



AERO

Founded in 1995 in Antwerp Bolloré Logistics Belgium currently employs over 150 members of staff at 3 locations. Belgian offices and warehouses are strategically located, offering our customers a unique link to all air and seaports, via inland waterways, rail and highways. Belgium is the perfect gateway in the heart of Europe, serving all Europe's main markets.

The company demonstrates expertise in Aerospace, Healthcare and benefits from an unrivaled network into any African destinations.

# BRIDGESTONE AIRCRAFT TIRE EUROPE



Route de Bavay 2 - 7080 Frameries | BE

T. +32 65 61 11 00 | F. +32 65 61 11 09

[sales@bridgestone-bae.com](mailto:sales@bridgestone-bae.com)

<http://www.bridgestone.aero>



AERO

Bridgestone Corporation, headquartered in Tokyo, is the world's largest tire and rubber company. With a passion for excellence and creative pioneering, Bridgestone Aircraft Tire Europe serves the commercial aviation industry with the highest quality aircraft tires and solutions, providing our customers and their worldwide passengers with superior safety and reliability. Our outstanding tires are sourced exclusively from our factories in Japan and state-of-the-art retreading facility located in Belgium, the largest aircraft tire retreading plant in the world.

Bridgestone Aircraft Tire Europe supplies solutions, new and retread tires in the EMEA Region to more than 160 airlines and wheelshops.

Aircraft tires work under extreme conditions, carrying up to 35 tons per tire and accelerating up to 380km/hour at takeoff, in addition to enduring varied environmental stress when in flight and taxiing.

With more than 80 years of experience and insistence on quality in aircraft tire manufacturing, Bridgestone ensures that its aircraft tires remain one of the most trusted brands in the aviation industry.

## References and/or Certifications

- Federal Aviation Administration (FAA)
- European Aviation Safety Agency (EASA)
- Certified EN 9110, ISO 9001, OHSAS 18001, ISO 14001

Around the world, over 2,000 aircraft equipped with Bridgestone aircraft tires land safely every hour.





# BRUSSELS SOUTH CHARLEROI AIRPORT



Rue des Frères Wright 8 - 6041 Gosselies | BE

T. +32 (0)71 25 12 11 | F. +32 (0)71 25 18 48

[bsca@charleroi-airport.com](mailto:bsca@charleroi-airport.com)

<http://www.charleroi-airport.com>



AERO

Brussels South Charleroi Airport is Belgium's second international airport, situated in Gosselies. The airport is situated at approximately 40-minutes-drive from Brussels. The operations at Charleroi Airport started in 1919 but grew significantly in the 90's. By the end of the 90's and with the arrival of the Irish low-cost carrier, Ryanair, the expansion of the airport started and keeps on going currently. Today, the airport welcomes the passengers of six airlines, i.e. Wizz Air, TUI fly, Pegasus Airlines, Ryanair, Belavia and Air Corsica.

More than 7 Mio passengers travel every year through Brussels South Charleroi Airport for its accessibility, low-fares and its stress-free environment.

3rd most punctual airport (OAG Punctuality League 2016) Brussels South Charleroi Airport is the second most punctual airport in the world (OAG Punctuality League 2014) and has been awarded several times for the quality of its infrastructure.

Brussels South Charleroi Airport offers a wide range of destinations worldwide. Passengers can choose among more than 180 destinations in Europe, North Africa and the Middle-East.

In addition to its destinations, BSCA also offers tailor-made services to make every passenger's journey more enjoyable such as: Fast-Track at the security, premium passes, All in 1 for group travels...



Allée Centrale, 52 - 6040 Charleroi | BE

[info@calyos-tm.com](mailto:info@calyos-tm.com)

<https://www.calyos-tm.com>



Experts in loop heat pipes, a form of passive liquid cooling.

We are market leaders in the design, development and manufacturing of passive loop heat pipes.

Our solutions give you the freedom to design without thermal limitations, unlocking the best performance from your components and enabling your products to be the most competitive.



AERO



DEFENCE

Capaul - High quality service - Uncompromising precision - Excellent delivery performance. Highly qualified workforce as well as the flexibility of a medium-sized company are the keys of success for Capaul.

Capaul is specialized in high precision machining of mechanical components and complex subassemblies: modules for aircraft engines (SUMP LEAP, BOOSTER LEAP, CFM56) - Subassemblies for complex medical equipment - complete installations from the procurement of raw material to the finished product. Our modern facility offers high precision multi-axis CNC-turning and milling centers as well as 3D-measuring equipment installed in a modern fully air-conditioned production hall (20°C).

#### A modern plant can offer the following capabilities

- CNC-turning on 2 to 5 axis turn-mill centers up to Ø1250mm
- 3,4&5 axis machining on vertical centers up to 1250x1000x1000mm
- 5-axis simultaneous machining up to Ø1250x1000mm in a 2000m<sup>2</sup> fully air-conditioned hall
- High-precision 3D-Measuring equipment
- Machining on horizontal centers (pallet machining) up to 500x500x500 mm
- Hard turning in an air-conditioned environment up to Ø420mm
- Dye penetrant inspection, barrel finishing, balancing, sandblasting
- Complete integration of sub-assemblies (SUMP LEAP, BOOSTER LEAP and CFM56)

#### Main References

Certified: EN 9100:2016

#### References of intermediate and final customers:

- Airbus
- Boeing
- General Electric
- Safran Group
- Snecma Motors
- Sonaca
- Technical Airborne Components
- Asco Industries

#### Working of following programs:

- CFM56
- Leap
- CF34
- A330/340
- A400M
- A380
- Embraer E2
- F7XC GE90
- GP7000
- TP400
- GE9X
- PP20
- Silvercrest



Parc Industriel Chaussée de Mons 89 - 7180 Seneffe | BE

T. +3264522000

info@castingpar.com

<http://www.castingpar.com>



AERO



SPACE



DRONE



DEFENCE

**Investment casting (lost wax process): titanium, steel and stainless steel technical parts for aerospace and defense.**

### **Civil and military aeronautics: steel, stainless steel, copper and cobalt alloys technical parts**

- For aircraft structures, engines, door locking systems, landing gears, engines...
- For embedded electronic and optics, light and heavy weapons.
- Components and complex pipes for fluid transport and control
- Seat fasteners and other level 2 and 3 parts.
- Machined and coated parts ready for the assembly on production line.

### **Other sectors**

- Besides the aeronautical and defence sector, Precimetal supplies the nuclear and petrochemical markets, general engineering, food production equipments, fluids processing, defence, building, railway and automotive...

### **Rapid prototyping**

- Fast casting of steel prototypes based on 3D files and STL models

### **Technical data**

- Investment casting process (lost wax)
- Parts from 1g to 500 kg
- All steel and stainless steel grades
- Nickel, cobalt and copper alloys
- Machining and surface treatments; ready-to-use parts
- Non destructive testing facilities

### **Certifications**

- EN 9100 / AS 9100
- ISO 9001
- NADCAP accredited (NDT including Digital X Ray)

### **References**

AIRBUS, SAFRAN, LATECOERE, RAYTHEON

### **Investment casting strengths**

- Dimensional accuracy and surface quality
- Complex shapes, thin walls, design freedom
- Lower weight
- Reduced machining, welding and assembly
- Very wide choice of alloys

Rue Santos-Dumont 3 - 6041 Charleroi | BE

T. 0032468201323

raphael.vandenbogaert@cegelec.com

<http://www.cegelec.be>



AERO



SPACE

Cegelec IMCS develops tailored solutions for multi-technical projects. We have developed advanced skills in the area of aerospace, rail and public transport infrastructures, Baggage Handling System, .... All safety critical projects are SIL2 certified.

We are specialized, among other things, in the design and realization of different types of real-time test benches, with hardware-in-the-loop capability. Our test system is known for its reliability and efficiency and has already been used in major projects. Our test system has been used, among others, for European space launchers for Ariane 5, 6 and Vega (to test the Vulcain engine, actuators, ...).

The success is due to a scalable Measurement and Control system that we have developed. This system can be interfaced with both laboratory test benches and large test installation systems. The software developed is based on RTX operating system. Following the concept "from measurement to knowledge", our Measurement and Control system offers a wide range of functions such as test and measurement parameter high speed acquisition (up to 1 $\mu$ s), real-time processing, storage, archiving, .... All this while ensuring the safety of the bench and equipment under test. The system can also interfaced with a broad range of standard and customized subsystems through a wide range of interface protocols.

More than a supplier of technical services, Cegelec is a partner who anticipates and thinks along with its customers. Transparency combined with a personal approach and an expertise of more than 50 years will guarantee you an excellent realization of your project. We can rely on our employees who give every day their utmost. Thanks to their expertise and knowhow we can offer innovative solutions, taking into account the life cycle cost of your installation.



# CHP CONSULT



Clos de Priesville, 40 - 4845 Jalhay | BE  
T. +32 - 471 783840 | F. +32 - 87 269781  
cpromper@chpconsult.be  
<http://www.chpconsult.be>



AERO



SPACE



DEFENCE

ChP Consult designs, prototypes, tests, develops, industrialises and produces components and actuators for aeronautic and space fluid systems.

Most R&D activity is currently focused on Shape Memory Alloy couplings for pipes which are being developed within the frame of three ESA projects and for which an aerospace compatible supply-chain is being set up.

ChP Consult is open to new partnerships within the frame of ESA, EU and other projects.

The company develops above mentioned products internally and with the help of strategic partners. Components are validated mainly in own facilities presented below, which are also available for outsourcing.

## The laboratory is equipped with

- Helium bench (up to 400 bar) with mass spectrometer leak detector, vacuum chamber ( $10^{-8}$  bar) and climatic control
- ISO5 area with laminar flow with optical cleanliness analysis equipment
- Dynamic test facilities (Shaker for resonance search, Sinus and Random tests)
- Hydraulic test facilities up to 1300 bar, liquid pressure drop bench...
- Specialised metrology (including surface scanner in nanometer range)
- Electronic diagnosis equipment
- Equipment for metallographic analysis.

## Processes (for prototyping of small components)

- High precision CNC turning
- Electroplating (Au, Ni)
- High precision polishing/lapping
- Cryogenic thermo-mechanical treatment

Within ESA projects, the company also conducts **numeric simulations** in the field of mechanics, flow dynamics and magnetic analysis with own tools/models that are validated by tests.

Currently, a process is underway for customising own space products for **non-aerospace applications**.



Liège Science Park - Rue Louis Plescia 7 - 4102 Seraing | BE

T. +32 (0)4 240 14 25

info@citius-engineering.com

<http://www.citius-engineering.com>



AERO



SPACE



DEFENCE

Citius is an engineering company specializing in design and realization of turnkey solutions for industrial facilities in production and testing. Its engineering office offers key competences in mechatronics, mechanical and electrical engineering as well as in automation.

Citius operates along three axes:

- Advanced production systems, robots and vision. Citius develops and integrates 'turnkey' production means, from defining the need to final implementation. Citius also sets up complete solutions for handling industrial processes, thanks to its skills in automation, robotics, electricity, industrial computing and instrumentation.
- Testing solutions. Citius develops specific solutions for testing equipment, provides its customers with own integrated testing facilities and proposes complete solutions of testing means based on its specialized skills in the instrumentation sector.
- Engineering and consultancy based on recognized competences in the field of mechanical design, piping and structures, energies and technical project management.

Citius ensures the development of complete systems, from the early beginning by defining concepts, to the full development of the solution, as well as the commissioning and start-up of dedicated applications. Its works cover all aspects of a project.

Founded in 2009, Citius Engineering is based on a strong team of 85 specialists representing a buoyant healthiness for this cutting-edge expertise.

Citius enjoys a growing number of customers in different sectors: aeronautic and spatial, defense and security, automotive and transport, energy, agro-food and, with Ciseo (sister company), in the sectors of pharmaceuticals and life sciences.



Rue des Entrepreneurs 10 - 5020 Namur | BE

T. +32 81 566 200

public@coexpair.com

<http://www.coexpair.com>



AERO

Coexpair is a Belgian company active in the aeronautical sector since 2006.

Our strategy is based on an original business model. It offers services to support its customers in the development of new applications in composite materials. This includes the manufacture of first part prototypes (no serial production). Once the research is complete, Coexpair extends its offer to the assembly of production equipment needed for RTM industrialization. On a general way, Coexpair is supporting its customers from the idea that sprouts in their design office up to the installation of their workshop.

Today Coexpair is a recognized partner of the largest OEM and Tier-1 suppliers in the sector. Several European companies have become regular customers, including Airbus and Safran groups. Our company is a unique place in Europe to develop and to transfer advanced composite manufacturing technologies.

## Workstation

Coexpair designs and builds RTM workstations including clamping & heating systems, injection systems and tool handling devices. Automation of High Performance RTM process for aerospace is our job. The partnership with Radius Engineering ensures our Customers the same high quality & reliable equipment worldwide.

## Mold & Tools

RTM mold quality is critical for part production success. Customers can count on a team of specialized engineers to design and to machine their molds. FEA allows study of thermal transfer, mold deformation and tool closure kinematics.

## Part & Process Development

Net-shape composites are an opportunity to improve performance: lower weight, lower cost, shorter manufacturing cycle. Coexpair supports you by engineering for optimal performance. The position of the office inside the workshop gives the designer a great opportunity to combine 3D models and hands-on trials.





# CONSOLIDATED PRECISION PRODUCTS BELGIUM



Parc Industriel des Hauts-Sarts - 4040 Herstal | BE

T. +32 (0)4 248 50 50

xavier.delandshere@cppcorp.com

<http://www.cppcorp.com>



Consolidated Precision Products Belgium is an investment casting facility using vacuum casting techniques to produce structural castings, rotating blades and nozzle guide vanes for aeronautical gas turbines.

Consolidated Precision Products Belgium is a major supplier for the aerospace market including helicopter, missile and airplane engines.

Consolidated Precision Products Belgium has a subsidiary company named CPP-Slovakia in Slovakia Republic for low cost manufacturing and is part of CPP Corporation including 14 casting facilities in the USA and in Mexico pouring Aluminium, Magnesium and Superalloys.

Consolidated Precision Products Belgium has the strength and agility to exceed customers' demanding expectations in a continuously changing business environment and is specialized in challenging products that require exotic alloys and complex geometries.

Consolidated Precision Products Belgium keeps aircraft flying by providing a wide array of critical components to the aerospace and defense industries. CPP produces the entire line of hot gas path (HGP) components including Directionally Solidified (DS), Single Crystal (SC) and Equiaxed blades, nozzles guide vanes and structural castings. CPP also provides and manages such post-cast processes as machining, grinding and stem drilling. Product quality, technical capability, customer service, delivery response and cost effectiveness are key factors when choosing a casting vendor. With state-of-the-art facilities on two continents as well as superior expertise and service CPP Corporation is a recognized and major supplier of sand casting, investment cast products and services for the aerospace.

Consolidated Precision Products Belgium is certified NADCAP for special processes and the European aeronautical standard EN 9100:2009.



Prolongement de l'Abbaye, 60 - 4040 Herstal | BE

T. +32 (0)4 295 57 00

info@dardenne-meca.com

<http://www.dardenne-meca.com>



AERO



SPACE



DEFENCE

High-precision mechanics combined with the agility of a SME.

Since 1978, DARDENNE has a recognized technical expertise for the manufacturing of mechanical parts of the highest accuracy. Active mainly in Aeronautics and Space Industries, the company is EN9100 and ISO9001 Certified.

Our workshop is equipped with up-to-date CNC equipment for Turning, Milling, Wire Cut EDM, Die Sinking EDM and Flat & Cylindrical Grinding. The combination of all these technologies with our highly qualified technicians allows us to master the manufacturing of any mechanical part from the beginning to the end. Every part produced is Quality Controlled in an air-conditioned metrology lab fitted with 3 three-dimensional measuring machine.

Dardenne is providing a complete service from single prototypes to large-sized series production and is active on most of the major engines programs: LEAP, TP400, GTF, CFM56, Passport, Silvercrest...



Quai du Pont Canal, 3 - 7110 Strépy-Bracquegnies | BE

T. +32 (0)64 46 02 60

info@decube.be

<http://www.decube.be>



DRONE

Decube, a Belgian multi-technical group : Industrial Coating, House Painting, Concrete Repair Work And Industrial Waterproofing & Surfacing Systems, Montage, Civil Engineering, Engineering And Consulting Bureaus

## INDUSTRIAL COATING

Fluid or powder coating, on sites and in the workshop, metal surface treatment, in electrical environment and in great heights, industrial waterproofing and surfacing systems, special covering for industrial floor, concrete repair work, anticorrosive treatment of pieces intended for the nuclear industry Monnaie SA, Peintures Industrielles – Belgium Coatings SA – Monnaie France

## HOUSE PAINTING

Interior and exterior, wall and floor covering, fireproof decoration, covering of concrete floor, work in nuclear environment. Monnaie SA

## CONCRETE REPAIR WORK AND INDUSTRIAL WATERPROOFING & SURFACING SYSTEMS

Concrete repair work (BENOR certifications levels A & B) and industrial waterproofing & surfacing systems (concrete, fluid, polyester and EPDM rubber). These services include a diagnosis of the problem, expertise and advice regarding treatment, preparation of the surfaces (disassembly, high pressure cleaning, sandblasting ...), application of the adapted waterproofing products and a quality guarantee. Monnaie SA

## MONTAGE

Assembly of new operating pylons and dismantlement of old ones, stringing of overhead lines, replacement and addition of supports, maintenance work on pylons. Monnaie SA

## CIVIL ENGINEERING

Civil engineering work, repair and assembly of new foundations for high voltage pylons.

## ENGINEERING AND CONSULTING BUREAUS

Energy production and transportation engineering, solar and wind energy, medium and high voltage grids, structural and geotechnical engineering. Decube Consult (energy)

Rue Gilles Magnée 92/6 - 4430 Ans | BE  
T. +32 (0)4 239 78 80 | F. +32 (0)4 239 78 89  
contact@deltatec.be  
<http://www.deltatec.be>



AERO



SPACE



DRONE



DEFENCE

With a team of more than 50 high-level designers, DELTATEC, a high-tech design company, is specialized in advanced hardware and software technologies with a strong focus on digital imaging applications, also embracing the recent Deep Learning/AI trend

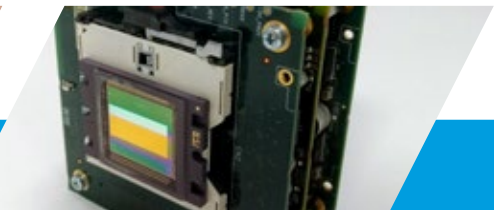
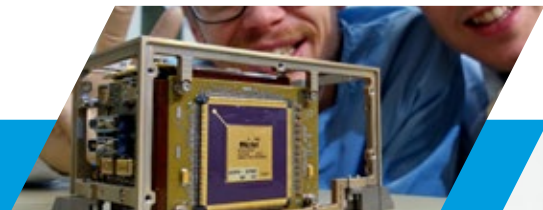
The company is active in the industry sector (embedded systems, quality control projects), in the TV broadcast market (design of boards, automation of live shows), in the Industrial Vision (development of specific cameras) and in aerospace (on-board imaging subsystems, on-board computers, EGSE...)

Space became a strategic activity in 2005 with the development of flight systems performing image acquisition and/or processing.

In the space segment, DELTATEC's role consists in designing data processing subsystems, with a focus on the electronics of cameras used in earth or sun observation satellites. Another major activity is the design of payload and on-board computers. DELTATEC is also focusing on the NewSpace, taking profit from its experience in both space and industry worlds.

In the ground segment, the activity of DELTATEC is based on the design of specific test beds and in video processing applications, which are both derived from similar activities for aeronautics and industry markets.

Based on its experience in the space sector and R&D activities in the scope of the Marshall Plan, DELTATEC also supports development of onboard equipment for aeronautics and drones sector.



# DUMOULIN AERO



Rue Al Trappe 110 - 4432 Alleur | BE  
T. +32 (0)4 228 89 60 | F. +32 (0)4 228 89 69  
gcammerrmans@dumoulin-aero.com  
<http://www.dumoulin-aero.com>



In 2003, Dumoulin Aero, specialized in the manufacturing of Fine Hunting Guns, has operated a significant diversification by launching a program to manufacture titanium and other allied steel parts for aircrafts.

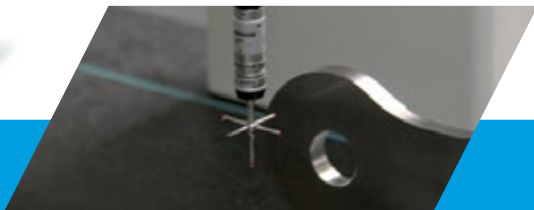
Although, the company was rather inexperienced in this particular field, the rigor and precision needed in the manufacturing of fine firearms, considerably contributed to the success of this reconversion and enabled the company to establish a performing operation and obtain the EN 9100 Certification.

In a short period, Dumoulin Aero has successfully assimilated the quality requirements, the organizational and production aspects and adopted the strict control requirements needed for the manufacturing of high precision parts sub-contracted by manufacturers such as AIRBUS, BOMBARDIER or EMBRAER.

Today, Dumoulin Aero employs 40 people specifically trained to operate modern machines and equipment and has the capacity to perform a broad range of operations from turning-milling and milling mostly for connection parts between Tracks and Flaps and Tracks and Slats as well as Carriages. We have also a strong partnership with La Nitruration Moderne (Nadcap and required qualifications against specs) which allows us to deliver complete treated parts (NDT, Passivation, Zn Ni, Cadmium Plating, Painting and Ink Identification...).

The light structure of the Company and its geographical location enables a quick and efficient response to customer needs always in accordance with strict quality criteria and allocated deadlines.

DUMOULIN AERO is positioning itself as a key partner for aeronautic companies willing to establish a close and fruitful relationship based on know-how, reliability, flexibility and cost-effectiveness.



# DYNALI HELICOPTER COMPANY



Avenue Thomas Edison, 101 - 1402 Thines | BE

T. +32 67 55 29 98

info@dynali.com

<http://www.dynali.com/>



AERO



DRONE



DEFENCE

## Ultra light helicopters

Ultralight helicopters have opened up the market to make helicopter flying accessible to many more people than the general aviation class for which both the purchase price and the operating costs are prohibitive to the general public.

The Dynali H3 Sport is an ultralight helicopter authorised in certain European countries under the ultralight helicopter category (MTOW 500 – 600 kg). The Dynali is certified for 500 kg and retains a comfortable reserve of power.

Incorporating a number of safety features generally found only on far more expensive aircraft in the general aviation class, the Dynali H3 Sport has been designed to meet the latest standards in the light aviation industry while retaining the simplicity of the airframe design and structural components.



# E-XSTREAM ENGINEERING



Rue Emile Francqui 9 - 1435 Mont-Saint-Guibert | BE

T. +32 10 68 07 52 | F. +32 10 84 07 67

info@e-xstream.com

<http://www.e-xstream.com>



AERO



SPACE



DEFENCE

e-Xstream engineering, part of Hexagon's Manufacturing Intelligence division, is a material & engineering services company 100% focused on materials.

e-Xstream engineering offers the industry the most complete and integrated solution portfolio to leverage the full potential of ICME\*. The solutions are built on an integrated stack of state-of-the-art software, hardware and engineering expertise to model materials, manufacturing process and final part performance and the connectivity in the virtual world, the physical world and between the virtual and real worlds.

\*ICME: Integrated Computational Material Engineering. It offers engineers across industries the ability to use the optimal combination of materials and manufacturing processes to innovate, maximize performance while reducing cost and lead time. ICME enables new design paradigms by modeling the strong coupling between materials, manufacturing and product performance.

e-Xstream's ICME Solution is centered around its leading nonlinear multi-scale modeling technology, Digimat and the leading data management system, MaterialCenter. 10X is setting the standard for ICME with the strongest solution ecosystem in the world. Its unique methodology blends academic research, cutting edge software and physics to enable manufacturers to tackle challenges and create new opportunities. Read more about 10x ICME Solution.

Avenue des Artisans 36 - 7822 Ghislenghien | BE

T. +32 (0)68 84 24 59

frederic.groulard@esix.be

<http://www.esix.be>



AERO



DEFENCE

## Smart coating solutions

**COATIX** is a portfolio of smart coating solutions offering easy-to-clean, anti-fouling, hydrophobic, super hydrophobic and anti-corrosion properties as well as coloration from transparent to gold while keeping the look and feel of the substrate.

**COATIX** is produced by **ESIX Surface Technologies**, a company with assets from Technochim SA, a world leader in surface treatment for the pharmaceutical industry and Materia Nova, a world-class research and development center entirely focused on future materials supporting the industry.



Aérodrome de Namur - Rue du Capitaine Aviateur Jacquet 44 - 5020 Namur | BE

T. +32494863817

info@esnah.com

<http://www.esnah.com>



AERO

## Connect anything, anywhere, anytime

Aviation | Airports and GSE | Maritime

From Earth to space, stay connected and notified no matter your operations.

ESNAH has focused its expertise on using data and communication to support decision makers with advanced business intelligence.

Our mission is therefore to break information silos, owned by each stakeholder, down and make data available efficiently, reliably and in real time

We have an end-to-end solution meant to connect pilots, crew/operators and data.

The benefits of our solution are broad, ranging from improved safety and simpler daily operations to preventing risks and maintaining contact all over the world. Ultimately, we help individuals and organisations to gain peace of mind.

The solution is made up of three components: a hardware: the Link, a dashboard: Ops and a mobile app: Pilot. They constantly interact together to offer autonomous smart tracking including notifications, messaging and reporting based on your operational needs, rules and KPI.

We are proud to say that ESNAH is a long-standing partner of the European Space Agency (ESA) and is involved in several projects, whether for company-specific development or in collaboration with other companies. Besides our contract 4000115099/15/UK/ND.

- ESA BIC
- SkyLiberty CCN#1
- Profumo
- GIP4 Smart Airports

The real-time monitoring DragonFly solution provides you a real-time monitoring solution for your most critical transport of pharmaceutical products everywhere in the world.

DragonFly is a stand-alone certified solution (hardware, firmware and software) for Covid Vaccine monitoring, tracking and geolocation by air, marine and land. The device is fully autonomous, with machine learning and offer a real time warning/alert notification service.

DragonFly is expected to improve safety, coordination and information exchange of the pharmaceutical lot, through all the players of the supply chain. DragonFly will avoid counterfeit, and provide a lifecycle management during the shipping of the Covid vaccine.

# ETIENNE BONNE FORTUNE



Rue de l'informatique 8 - 4460 Grâce-Hollogne | BE

T. +32 (0)4 263 34 28

contact@ebf-meca.be



AERO



DEFENCE

Etienne Bonne Fortune is located in Grâce-Hollogne (Liège), is active in subcontracting in the fields of general mechanics. We also master the machining (milling, turning and grinding), sheet metal (bending and press), welding (TIG, MIG, ...), complex assembly (bolting and riveting).

Active in industrial subcontracting in general mechanics, Etienne Bonne Fortune S.A., located in the industrial zone of Grâce-Hollogne, serves primarily Belgium and Europe.

Based on a mechanical experience of almost 50 years, a dynamic team of about thirty professionals and diversified production means (machining, fine sheet metal, welding, assembly), our company guarantees the satisfaction of his customers through Mastery of the quality of our products and of our mechanical production processes in small and medium series.

Your requests are directly taken care of by different specialized departments (technical and launching office, production and quality control) in order to guarantee fast implementation and compliance of your requirements.

We also have a technical office that, on the basis of your plans, orientations or projects, carries out the mechanical study up to the realization of a prototype before the production phase series or integration in your industrial equipment or products.

# EURO HEAT PIPES



Rue de l'Industrie 24 - 1400 Nivelles | BE  
T. +32 (0)67 88 94 84 | F. +32 (0)67 88 94 99  
info@ehp.be  
<http://www.ehp.be>



AERO



SPACE

Euro Heat Pipes (EHP) develops, produces and sells Two-Phase Heat Transfer Systems (Heat pipes, Loop heat pipes and Thermal Bus including deployment systems) that, thanks to their exceptional thermal performances, are enabling the development of more powerful, more reliable equipment / instruments.

## From Space to Earth

Created in 2001, EHP know-how is based on more than 35 years of Space heritage. Developed for Space, now available on Earth, this 100% European technology is leading the European cooling market for Space applications and is strongly developing on Aeronautical, Defense and Terrestrial markets. EHP proposes its two-phase cooling devices that will enable equipment manufacturers to increase their equipment reliability with the management of high power densities, low temperature excursion, compact / miniaturized packaging and remote cold sources.

## Full in-house capabilities

Based on a highly qualified staff of 75 people, Euro Heat Pipes, an EN9100:2016 certified Company offers full in-house capabilities (5,000+ m<sup>2</sup> of facilities) including ISO 8 to ISO 5 clean rooms, small to large vacuum chambers and mechanical / vibrations tests rigs to be used for small to large production projects focused on: Design and simulation capabilities, Industrial manufacturing, Quality control and Qualification and acceptance tests.

## Main customers (Telecom or Institutional markets)

Main customers are ESA, CNES, AIRBUS DS, RUAG, Thales Alenia Space, Tesat, IAI, OHB... for Space markets.



# EUROPEAN METROLOGY SYSTEMS



Rue de l'Eperonnerie 2 - 4041 Milmort | BE  
T. +32 (0)4 228 04 07 | F. +32 (0)4 228 07 05  
info@ems.be  
<http://www.ems-benelux.be>



AERO



DEFENCE

Active in the metrology for more than 20 years, the company EMS proposes the maintenance/ calibration, and reparation of measure machines, the parts scanning, the implementation of measures, training on the different softwares and systems, moving and retrofit of the machines.

Constituted of executives, sales managers, technicians, engineers, makes from us, one of the largest in innovative metrology solutions in the Benelux. EMS can contribute to your projects by supplying you a wide range of solutions. EMS is at the service of the customer. Our expertise does not stop selling metrology solution, but we want to profile ourselves as true experts in Metrology. Our group has built up an exceptional sales program made up of brands and first-class solutions over the years and acquired experience. The combination of our many years of experience & our knowhow means that for each of your applications we are able to offer you a tailor-made solution. Our services can accompany you throughout the life of your investment. Through this & our approach centered on your needs, we want to make a difference! We offer you: Calibration of your measuring instruments, via our accredited laboratory, maintenance & repair, & the possibility to let us realize your measurements/controls or to carry out your parts scan, the dispensation of training for all the systems and softwares, we also have the expertise to move your machines to measure safely or realize the retrofit of your old machine or other measuring device.



Rue Montoyer, 1 - 1000 Bruxelles | BE  
jmfobe@eutralex.com



AERO



SPACE

Legal, administrative and other consulting services for air transport and space applications (including ground segment).

Boulevard Industriel 101 - 7700 Mouscron | BE

T. +32 (0)56 85 75 30 | F. +32 (0)56 85 75 38

[feronyl@feronyl.com](mailto:feronyl@feronyl.com)

<http://www.feronyl.com>



AERO



SPACE



DRONE



DEFENCE

Feronyl S.A., established since 1950, is specialized into the development, prototyping and manufacturing of technical components produced through high precision molding processes of polymers, composites and metals.

Development is dedicated to lightweight structures, advanced properties and decrease of cost. High Quality production with own tool development and manufacturing

## Scope of activities

- Injection Moulding of technical parts in polymers, metal and composites.
- Research and design of lightweight structures/advanced properties.
- Assembly of sub-systems.

### Certifications

- ISO 9001
- EN 9100

We dispose of a wide variety of injection machines between 10 tons and 1300 tons of closing force, which allows us to inject volumes till 6 kg.

Transformed technical materials: PEEK, PEI, PPS, PPSU, PSU, Carbon Fibre, PA... eventually charged with glass, carbon or metallic fibers.

## Highlights

- In-house engineering.
- More than 60 years of experience in the injection moulding of technical plastics and in the manufacturing of injection tools.
- Dynamic, flexible and reactive team which enables a mastery of complete projects from A to Z.
- Partnership with research centers or organisations specialised in complementary services(material choice, tests, design, rapid prototyping, painting, surface treatment...).



Rue du Passage d'Eau 1a - 4680 Oupeye | BE

T. +32 (0)4 227 31 03

info@flying-cam.com

<http://www.flying-cam.com>



DRONE

Flying-Cam has been the world leader in providing 25 Kg-150 Kg UAS VTOL system for the civil industry since 1988. We are now expanding to several markets: Industry, Military, Academic, Government, Entertainment. The vertical competence are the best asset for developing and selling breakthrough unmanned helicopter solutions.

Founded in 1988 by Emmanuel Previnaire in Liege, the company Flying-Cam SA is an Award-Winning company and world leader in developing high fidelity Unmanned Airborne Solutions with proprietary Flying-Cam Airborne Robotic Engineering Technologies.

Well-known firstly in the niche film industry, Flying-Cam had worked for blockbusters such as James Bond, Mission Impossible, Harry Potter, Oblivion, Prisoners, Da Vinci Code, Transformer, Game of Thrones ... etc.

Strictly adhering to aviation standards, embracing with 30 years field experience for over 1000 projects in more than 75 countries, FLYING-CAM is now offering its "Super Drones", named SARAH and DISCOVERY, fully integrated with the state-of-arts sensors carefully chosen to match the supreme platform quality for a variety of applications ranging from Entertainment Industry, Homeland Security, Earth Monitoring to High Precision Remote Sensing.

Flying-Cam is dedicated to develop, manufacture and sell the high-end "SARAH" system, Special Aerial Response Automatic Helicopter. This is an unrivaled cutting-edge "Unmanned Aerial Intelligence" solution and only possible by mastering all the technologies and skills involved: helicopter platform, centimeter precision guidance, navigation and proprietary control system (autopilot), payload integration, human-machine interface design, training, maintenance and field operations.



Voie de Liège 33 - 4040 Herstal | BE  
T. +32 (0)4 240 81 11 | F. +32 (0)4 240 81 34  
info@fnherstal.com  
<http://www.fnherstal.com>



AERO



DRONE



DEFENCE

FN Herstal provides high added value defense solutions for multi-role military helicopters and subsonic aircraft based on combat-proven small caliber firearms. These solutions cover design, development, manufacture, and full integration of airborne weapon systems that combine unprecedented and unequalled firing capabilities, ease of use and crew safety. The company is ISO 9001 and AS /EN 9100 certified.

FN Herstal's integrated airborne weapon systems include crew-served and axially mounted machine guns, rocket launchers and a complete range of ammunition. **Airborne Pintle-Mounted Systems** can be window-, door-, ramp-, or externally positioned and provide:

- Outstanding firepower (1,100 rounds per minute) through the .50 cal FN® M3M/ GAU-21 machine gun designed, developed and manufactured by FN Herstal as a worldwide exclusivity;
- Outstanding balance, hence, high firing accuracy;
- Proven reliability and safety;
- Multi-weapon/multi-caliber capability; including compatibility with the 7.62mm FN MAG® machine gun and Minigun.

**Airborne Poddet Systems** are available in various configurations depending on the ammunition box capacity, and requirement for links/cases collector and/or guided and unguided 2.75" rocket launcher tubes. Airborne podded systems offer:

- Outstanding firepower (1,100 rounds per minute) through the .50 cal FN® M3P machine gun (FN Herstal exclusivity);
- Pod weight optimization, optimal performance and reliability in all environments, including sand or dusty conditions.

FN Herstal continuously innovates to provide state-of-the-art, groundbreaking solutions for superior combat capabilities. Latest developments include:

- Digitalization of the complete axial suite, including the machine gun pods, the armament management systems (AMS) and the head up sighting system (HUDI);
- A full digital armament management system that offers improved integration with OEM's avionics computers and that controls up to 6 weapon stations (FN Herstal pods or other equipment) installed on the aircraft;
- A compact, digital and lightweight Head Up Display specifically designed for enhanced firing accuracy and reduced pilot workload.

Throughout the years, FN Herstal has built up a position as a leading provider of defense solutions to Military Agencies and Original Equipment Manufacturers, with FN integrated airborne weapon systems being qualified and fitted on over 4,500 carriers deployed around the globe. With its decision to invest in the DO-178 DO-254 standard, FN Herstal reinforces its position as a major integrator of innovative airborne defense systems embedding the latest technologies.





Avenue de l'Expansion, 7 - 4432 Alléur | BE  
T. +32 (0)4 367 87 11 | F. +32 (0)4 376 68 22  
info@gdtech.eu  
<http://www.gdtech.eu>



AERO



SPACE



DRONE



DEFENCE

Engineering company, GDTEch offers its expertise to industrial projects spanning across all necessary stages for Design, Simulation and Industrialisation :

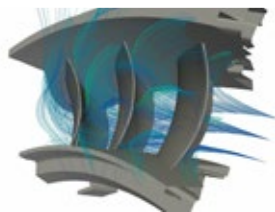
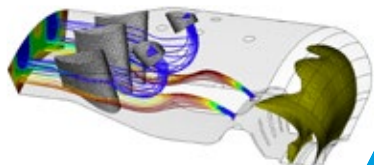
Design and stress analysis  
Tools design and manufacturing  
Technical documentation  
Project management  
Engineering consulting

At first, GDTEch was founded to provide a service in the numerical analysis sector. Its offer has significantly expanded. The GDTEch group mission is to build an integrated service offer covering the entire product development process. Our knowledge of the state-of-the-art industrial techniques and our extensive experience ensure a perfect balance between the services we offer and your project needs. Flexibility, reactivity and thorough skills are our business-enhancing opportunities.

Our consultants are: Designer (mechanics, electricity,...), Study Engineer, FEA Engineer, Modelisation Engineer, Project Manager, Hydro-mechanics Engineer, Documentation Engineer, Exploitation Engineer, Material Engineer, Tests Technician, Method Agent, Quality Management,... Enthusiasts about new technologies and permanently on the looking after real challenges, our staff will demonstrate their experience legacy and teamwork, enhanced by a never-ending quest for continuous improvement.

Thanks to our knowledge of the most advanced industrial technologies and our expertise, we provide you a customized solution.

Our assets, our expertise, our CAE complete offer and our quality commitment (EN 9100 certified).



# GENITEK ENGINEERING



Rue Edouard Belin 5 - 1435 Mont-Saint-Guibert | BE

T. +32 2 318 4053

info@genitek.be

<https://www.genitek.be/>



AERO



DEFENCE

Genitek Engineering is a consultancy company specialized in research and development for electronic design.

Since 2010, we count on our technical expertise to provide functional solutions for the medical, railway, automotive, avionics and defense sectors.

Active on cutting-edge applied technologies, our technical team counts with more than 5 years of experience in the design of embedded electronic systems, integrated solutions and high-tech electronics.

Committed and dynamic, we work with our clients to provide them with the highest quality services, through a close dialogue, respecting the technological requirements for each component, and looking forward to advance on new ways of electronic development.

## Consultancy

Focused in embedded electronics, we propose tailor-made solutions fitting our partner's needs.

## Developpement

We design technical alternatives for electronic systems based on the latest technologies, through great electronic performance, technical capacities and deep research.

## Manufacturing

We consider testing as a key for electronic success. We supply the final product at the highest quality standards, assuring their good functioning.

## Support & Integration

We provide integral solutions for new products (mechanical, packaging, etc) and offer follow-up services (support, upgrading, etc).

Avenue Georges Lemaitre 54 - 6041 Gosselies | BE

T. +32 (0)71 96 00 20

[sales@geonx.com](mailto:sales@geonx.com)

<http://www.geonx.com>



AERO



SPACE



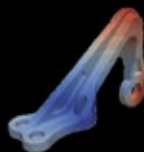
DEFENCE

GeonX S.A. started up its activities in 2012 with headquarters in Belgium and became a GE Additive company in 2017. Our customers make a daily use of our flagship Virfac® modelling software to accurately simulate various manufacturing processes such as Additive Manufacturing, Machining, Heat Treatment and Welding.

GEONX S.A. develops robust and powerful software packages to support manufacturing engineers in their daily design duties. From the design office to the factory, VIRFAC® powered by MORFEO, provides an accurate, powerful and industrial platform of virtual manufacturing. Making of virtual manufacturing a reality is the mission of GEONX. Simulation today is an essential component of the design cycle, increasing a company's profits by significantly reducing time to market. Modelling the manufacturing processes allows designers to reduce tedious manual tuning, the waste of material and to optimize the resulting manufactured part in terms of mechanical properties, residual stresses and final deformations. After 10 years of development by engineers from the Research Centre Cenaero, specialized in advanced computational methods, GEONX is integrating this approach in today's product development environment by marketing its new generation manufacturing software VIRFAC® (VIRtual FACtory), powered by MORFEO (Manufacturing ORiented Finite Element tOol).

This innovative software is the new reference in unified simulation for applications ranging from transformation and assembly processes to in-service structural response. MORFEO is built with the most modern object-oriented programming technologies and has been particularly designed to handle large and complex mechanical components for realistic industrial environments.

GEONX S.A. revolutionized in 2017 the modelling of additive manufacturing with the release of its new product Virfac iAM® optimized for high performance GPU computing.



Mont Saint-Martin 58 - 4000 Liège | BE  
T. +32 (0)4 232 95 95 | F. +32 (0)4 223 42 76  
info@gillam.be  
<http://www.gillam.be>



AERO



SPACE



DEFENCE

GILLAM SA is able to propose a wide panel of products and services in Aeronautics, Aerospace, Defence, Mission Critical Applications as well as Civilian sectors.

GILLAM SA aerospace/aeronautics activities are mainly focused in the following areas:

- Test benches and Simulators
- Avionics Systems
- Time & frequency solutions
- On-demand electronic designs

Our team of experienced engineers is at your disposal to attend your needs, throughout the project.

Study, design and supply of airborne electronic equipments for military and civilian use. On-board Human-Machine Interfaces including illuminated control panels compatible with night vision (MIL-STD-3009). Severe environmental constraints (RTCA DO-160, MIL-STD-810). Design in accordance with aeronautical standards DO-178 and DO-254. Main test benches achievements are EGSE for Main Frequency Generation Unit (Iridium Next program), EGSE for L-Band converter (Iridium Next program), RF suitcase for space dielectric & coaxial resonator oscillator (CRO / DRO), TWTA / RFDN Discrete Interface Simulators (ExoMars program), COMS ADEV STE (JUICE program), etc

Frequency and Time (F&T) Subsystem for the GALILEO Uplink Stations (ULS).

GILLAM SA experts have developed a high level of expertise necessary to design, to industrialise and to manufacture specific solutions and GILLAM SA, certified ISO9001-2015, can bring added value to partner or to customer.



Rue Camille Hubert, 13C - 5032 Gembloux | BE

T. +32 (0)81 71 34 20 | F. +32 (0)81 71 34 29

info\_w@gim.be

<http://www.gim.be>



SPACE

## From satellite images to actionable insights

GIM helps public and private customers understanding and better managing our changing environment. GIM is able to build on over 15 years' experience in integrated solutions for processing and analysing countless types of satellite, aerial and drone images, from optical to radar. We deliver solutions across the environmental, agricultural and urban sectors specializing in high and very high resolution satellite imagery, automated features extraction, customized land use land cover mapping and change detection.

## Operational services

GIM is at the forefront of developments in image processing with a particular focus on advanced processing chain automation. Time series of images are analysed in near real time to derive geoinformation supporting the business and decision making of our clients. Not only maps are produced but complex geostatistical and spatial analyses are applied to deliver specific information that can be directly integrated in the business practices of our clients. GIM delivers information services in application areas such as precision farming, urban planning, environment and natural resources management, infrastructure development or e-health. GIM is serving large international industrial and multi-lateral organizations, has a long track record in working with ESA and public authorities and has the ability to process large volumes of very high resolution imagery as for instance for the prestigious Gates Foundation in the context of the Global Polio Eradication Initiative.

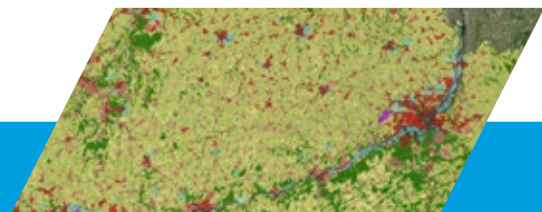
## Eo data distribution

GIM is an official distributor of imagery from most of the high resolution sensors available to date like GeoEye, WorldView, SPOT 1 to 7, Pléiades, Skysat, PlanetScope, RapidEye, Kompsat, Cosmo-Skymed,

TerraSAR- X, etc. GIM also offers a wide range of topographical data (i.e. DEM, DSM and DTM) as well as standard data pre-processing services (e.g. atmospheric correction, orthorectification, mosaicking).

## Web services, spatial data infrastructure and interoperability

GIM capitalizes on its geo-ICT expertise to design and deploy web services applications and data infrastructures based on Open Standards for the management and visualization of Earth Observation data and metadata for several of its customers.



# GROUPEMECA | B-SPRING-CEVEMA- MECASPRING-VANHULEN



Zoning Industriel des Hauts Sarts Zone II Rue Haute Claire 3 - 4040 Herstal | BE

T. +32 (0)4 289 99 99 | F. +32 (0)4 289 00 09

info@vanhulen.be

<http://www.groupeMECA.com>



AERO



SPACE



DRONE



DEFENCE

Compression, extension, torsion, double torsion springs. Bended wire. Induction coils. Leaf springs and stamped parts. Fragmentation body for grenade, mortar and rockets. Assembly of metal parts and plastic parts. Welding TIG-MIG-Laser. Surface treatments.

B-SPRING has been operating in Bosnia since 2013 and offers winding, cutting - bending - forming, machining and assembly services from its new site, which was inaugurated in 2019. It can deliver directly throughout Eastern Europe.

CEVEMA is dedicated to surface treatments such as passivation, anodizing, galvanizing, phosphating, dye penetration, nickel plating or hard chrome plating since more than 25 years.

MECASPRING, a spring specialist since 1935, is active in the fields of winding, cutting - bending - forming and machining. It specializes in the manufacturing of assembled spring parts.

VANHULEN, founded in 1907, specializes in the wire industry and more specifically in the manufacturing of induction coils which it supplies to the main players in the electrotechnical industry.

# HEXAGON | FREE FIELD TECHNOLOGIES



HEXAGON



Rue Emile Francqui 9 - 1435 Mont-Saint-Guibert | BE

T. +32 10 45 12 26 | F. +32 10 45 46 26

contact@fft.be

<https://www.fft.be>



AERO



SPACE



DRONE



DEFENCE

Hexagon is a global leader in sensor, software and autonomous solutions. We are putting data to work to boost efficiency, productivity, and quality across industrial, manufacturing, infrastructure, safety, and mobility applications.

Our technologies are shaping urban and production ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future.

With a complete range of trusted and accurate aerospace simulation software, Hexagon gives aerospace designers the ability to qualify new lightweight materials, utilise additive manufacturing processes and improve aerodynamics to build quieter and more environmentally friendly passenger aircraft. Unrivalled co-simulation capabilities enable the creation of smarter digital twins to anticipate manufacturing issues and optimise aircraft for both safety and passenger experience.

Over the past years, Free Field Technologies (FFT) has enjoyed a close collaboration with many leading aerospace companies and provided dedicated solutions matching this industry's very specific needs. The Actran software suite for acoustic simulation enables aerospace manufacturers to design and optimise products with powerful acoustic, vibro-acoustic and aero-acoustic modelling software and solutions. Both its general-purpose simulation features and its unique capabilities make it the industry standard solution to address the specific needs of the aerospace industry. Technology synergies with most structural FEA codes and CFD software match the increasing demand on multi-disciplinary coupled simulation.

FFT also provides related services: acoustic CAE consultancy (on-site or off-site), training, specific developments, contract research and provides a

range of services in the field of acoustic design. Free Field Technologies is also involved in multiple research programs in acoustics, aero-acoustics, vibro-acoustics, high-performance computing etc. Learn more at [fft.be](https://www.fft.be).

Hexagon's Manufacturing Intelligence division provides solutions that utilise data from design and engineering, production and metrology to make manufacturing smarter. Learn more at [hexagon.com](https://www.hexagon.com) and follow us @HexagonAB.

# HEXCEL COMPOSITES



Rue Trois Bourdons 54 - 4840 Welkenraedt | BE

T. +32 87 30 74 08

Jean-Francois.Bertrand@hexcel.com

<http://www.hexcel.com>



AERO



SPACE



DEFENCE

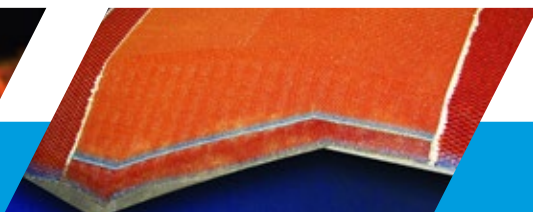
Hexcel's plant was established in Welkenraedt in 1967. It is Hexcel's European center of excellence for Engineered Core (HexWeb® EC), the name we give to our processed honeycomb parts that are machined and finished in any number of ways and then supplied as ready to fit parts to customers. Key applications for products made at Hexcel's Welkenraedt plant are aerospace structures for civil and defense aircraft, helicopters and aero-engines. Our facility is ISO 9001, AS/EN9100 Rev. D and NADCAP certified for composites processing.

HexWeb® EC encompasses a wide range of unique processing technologies used to add value to blocks or slices of HexWeb® honeycomb, also known as flat core. With advanced computer-aided design and manufacturing techniques, flat core is formed, shaped, machined and/or bonded to create high quality core details and assemblies to precise customer specifications. With over 70 years of honeycomb manufacturing experience, Hexcel is the leading supplier of Engineered Core used in commercial and military aircraft including engine and nacelle applications. The expertise of our manufacturing and engineering staff, combined with extensive research and unique core processing technologies, results in precise complex shapes and core assemblies that allow our customers to streamline their production process and eliminate capital investment through the purchase of ready-to-use honeycomb components.

HexWeb® EC provides the following advantages for your serial production program:

- High quality components
- Tight dimensional tolerances on dimensions and shapes
- Fewer manufacturing stages and processes
- Dedicated technical support from HexWeb® EC experts

Hexcel Composites sprl (Belgium) is part of Hexcel Corporation. Hexcel Corporation is a leading advanced composites company. It develops, manufactures and markets lightweight, high-performance structural materials, including carbon fibers, specialty reinforcements, prepregs and other fiber-reinforced matrix materials, honeycomb, adhesives, engineered core and composite structures, used in commercial aerospace, space and defense and industrial applications.





Rue de Gembloux, 122 - 5002 Saint-Servais | BE

T. +32 (0)81 47 02 84 | F. +32 (0)81 47 02 85

info@i-mage.be

<http://www.i-mage.be>



SPACE

I-MAGE Consult is a private company founded in 1994, run by a multi-disciplinary team of engineers, geographers and computer scientists. The company has acquired a great number of experiences in the mapping of renewable natural resources in land management and in the field of Geomatics (GIS and satellite image processing). The company has acquired a strong experience thanks to the numerous project conducted throughout the world.

I-MAGE Consult provides services and consultancies in the following areas:

- The development of GIS and EIS, data archiving, management and dissemination of information (Web Mapping and decision making tools);
- The collection (field surveys) and processing of remote sensing data;
- Earth observation derived data production and diffusion;
- IT developments and implementation of software packages;
- Environmental studies, land management;
- Spatial analyses, land-use mapping;
- Capacity building and training.

I-MAGE is delivering solutions (data and software products/services) in Earth Observation, Geographic Information Systems and Geo-informatics, R&D to private/public organizations. The company has acquired a great deal of experience in the mapping of natural resources and the management and dissemination of information. Our expertise can be summarized through a workflow process that goes from the processing of satellite images through GIS implementation and data integration, thematic analysis and applications, technology transfer.

This leads to the development of dedicated applications and decision making tools eventually correlated to Web mapping interfaces. Free Open Source software are often favoured using standards solutions, although proprietary solutions are also developed when required. While a majority of the projects are referring to Africa (French speaking as well as English speaking), important projects have been achieved in Europe, Asia, the Caribbean and Oceania.

Rue de l'industrie, 20 - 1400 Nivelles | BE

T. +32 472 88 02 91

info@id2move.eu

<http://www.id2move.eu>



DRONE



DEFENCE

ID2Move is a center of excellence for Autonomous Systems with the best equipped et most diversified indoor and outdoor test zones in Europe.

ID2Move supports the development of aerial, ground and maritime autonomous systems (with a specialization in drones) and the innovative technologies around (AI, IoT, sensors, etc.).

The indoor zone measures 670 sq. m. and is 8 m high. The floor is fully removable and can be fitted with sensors. Inside this room, a 10x10x6 m block is equipped with motion capture cameras.

The outdoor area consists of 4 ha of tarmac, to which a 2 ha automobile circuit managed by the RACB (Royal Automobile Club Belgium) can be added.

The outdoor fly area is a fully-managed restricted zone of 606 ha (EBR 67). It covers an industrial area, agricultural fields and highways. Flying over railway, forest and quarry is also possible and in the near future, over a wind turbine.

Homologation, certification and derogation can be directly managed by our team.

The underwater test zone is twofold: artificial in an indoor 3m-deep pool and natural in a former red marble quarry.

Offices, a coworking space and meeting rooms are available for hire.

Our Maker Space includes 3D printers, CNC machines, 3D scanner.

In-house coaches for technical support and business advice are available.

Highly-skilled PhDs from Brussels University (ULB) and Louvain University (UCL) are on the spot if needed.

Networking events and high-level seminars are frequently organised.

The ID2Move international network is shared with our customers.



### SPACE

Incize provides measurement, characterization and other services for radiation hardened devices and circuits as well as services for RF applications. Incize is a spin-off from Université catholique de Louvain (Belgium) where the know-how in RF and radiation hardness was accumulated. The know-how and the access to the state-of-the-art university labs enables innovation and optimization of our clients' products and processes.

Located only a few steps away from one of the best cyclotrons in Europe, Incize provides radiation hardness characterization and modelling services. The ability to characterize devices immediately after irradiation can be crucial in some experiments. Therefore, proximity of our labs to the cyclotron is an important added value.

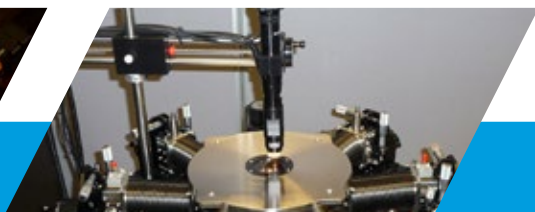
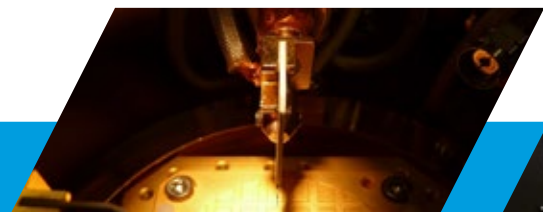
Our experts provide the following services:

- Numerical simulations of devices and materials using TCAD and Geant4 tools
- Design and fabrication of PCBs for radiation tests
- Definition of radiation test plans and related characterization methodology
- Execution of the tests in the cyclotron
- Electrical characterization before and after irradiation
- Data analysis

Incize addresses the needs of research centres, semiconductor foundries, design houses and suppliers of electronic components for space applications through its finely chosen state-of-the-art services. We have an excellent track record with our clients that include substrate suppliers, RF product suppliers, system houses and leading companies in the space and medical fields.

At the Cyclotron Resource Centre (CRC) in Louvain-la-Neuve we have access to the following irradiation facilities:

- Heavy ion
- Proton beam line
- Neutron
- Gamma



Rue des Alouettes, 1 - 4042 Liers | BE

T. +32 (0)4 278 91 60

info@ionics.be

<http://ionics-group.com/>



AERO

IONICS develops and supplies new surface technologies for metal, glass and other substrates: plasma, ion implantation and electroplating treatment.

Our customers capitalize on our innovative technologies and responsive service. Our product portfolio finds use in various industries: automotive, architecture, household appliances, telecommunication, electronics, life science,... Our vision is to be a leading company in functionalized surface treatments, enabling our customers to explore new product applications by using our smart surface solutions and technologies. Our values are integrity, cultural diversity and respect for the environment. We are committed to excellence, innovation, service and delivering tomorrow's answers today.

IONICS has a large equipment park available to lease for demonstration, feasibilities and production. Our engineering team can advise you. Co-development and projects with the Materia Nova R&D center to fine-tune your industrial solution is also possible.

For more information, please contact Fabian RENAUX, R&D Manager, [info@ionics-group.com](mailto:info@ionics-group.com).

Scientific Park CREALYS Rue Camille Hubert 29 - 5032 Gembloux | BE

T. +32 (0)81 72 86 86 | F. +32 (0)81 72 86 89

info@isomatex.com

<http://www.isomatex.com>



AERO



DRONE



DEFENCE

ISOMATEX is the global leading producer of enhanced volcanic rock filaments distributed under the trademark FILAVA™. The production of FILAVA™ is unique thanks to a genuine and innovative treatment of the raw material, basalt, which is enriched with various mineral additives to increase and guarantee its original mechanical and chemical properties.

Thanks to its innovative approach, its leading edge technological process and its tight quality control, the company ISOMATEX is known in the exclusive segment of high thermo-mechanical performance fibres as the only and therefore leading firm. ISOMATEX is keen to find the best solutions for each specific application and develops today tailored made fibres with an adapted sizing for the most prestigious companies in the segment of high-performance composite materials and technical textiles.

ISOMATEX proposes you different formats of FILAVA™:

- Single –End Direct roving from 68 TEX up to 100 TEX
- Conventional assembly Multi-end Direct roving from 136 TEX up to 2400 TEX
- Twisted yarns
- Chopped strands as from 4 mm
- Woven fabrics as from 200 g/m<sup>2</sup>
- Unidirectional tapes, Bi and Multiaxial fabrics
- Non-Woven Fabrics
- Geotextiles
- Prepreg
- Knitting for engineering composites



Boulevard Initialis 28 - 7000 Mons | BE

T. + 32 (0)65.32.85.81

[sales@xeolis.com](mailto:sales@xeolis.com)

<http://www.xeolis.com>



AERO



DEFENCE

With 15 years of experience in the OpenSource field, we provide multiple IT services and business solutions. We take care of the design, implementation, support, and maintenance of your systems. We also provide on demand development, for a solution that will meet all your expectations.

**Transport, logistics, field service, interventions management:** We provide various solutions to optimize your supply chain visibility and boost your competitiveness on the market with our panel of solutions: XEOLIS.

**XEOLIS is a collaborative platform and the heart of our solutions dedicated to industrial processes, logistics and traceability management.**

XEOLIS is adaptive and configurable. It fits many sectors, relying on a panel of bricks specialized in product traceability, field operation tracking, logistics operation management and process optimization (specific workflows, deliveries, tours, interventions, etc.). It has to be focused that, as a GS1 partner, the solution relies on its International Standards, including coding, electronic exchange of EDI information, collection and sharing of Supply Chain traceability events (EPCIS).

## Infrastructure

Our experts will analyze your systems and give you the best advices to optimize your infrastructure. We have a variety of solutions that will cover your needs, from virtualization, security, monitoring, back-up, communication, to hardware and more advanced options

## Health and clinical research

We provide solutions to obtain precise clinical data in real time with an efficient data processing. Our SensePRO solution will allow you to collect and share your data, and we will provide you with various supports (tablet, pc...) and hardware (sensors...). On demand development: For a specific solution that fits all your needs, contact us, and we will work together to achieve your goals.

Avenue de la Bergerie 91 - 1410 Waterloo | BE

T. +32 (0)479 42 96 36

frederique.jacobs@jacobs-pr.com



AERO



DRONE

## **PR Marcom professional in Aviation, Aeronautics and IT**

- Sales & Marketing Support
- Social Media Management (Content & Community Management)
- National & International Press Relations
- Corporate Communication
- Corporate Social Responsibility

## **Competences**

- Focus on delivering ROI from PR Marcom activities, with full alignment to sales and marketing
- Ability to manage senior stakeholder relationships
- Strong media relations experience (Press Relations, International environments)
- Familiar with Aviation, Aeronautics, and Technical & IT matters

## **Languages**

French / English / Dutch

## **Ecole Nationale de l'Aviation Civile [www.enac.fr](http://www.enac.fr)**

- Air Transport Management courses
- Session Nationale de la Sécurité de l'Aviation

#PRMarcom #ENAC #Sales #Marketing #SocialMedia  
#Branding #InternationalCommunication

Rue de l'Expansion 29 - 4460 Grâce-Hollogne | BE

T. +32 4 239 80 80 | F. +32 4 239 80 81

DanyDrion@jean-delcour.be

<http://www.jdcinnovation.com>



AERO



SPACE



DRONE



DEFENCE

Founded in 2006 by Jean Del'Cour, a non-profit sheltered workshop with a social integration aim, JD'C Innovation develops One-Stop Shop solutions tailored to each customer's specific needs around four core activities : Composite, Connectics, Machining and Mechatronics.

With a focus on Defence and Aerospace, and more commonly, on innovative industrial processes, our competences range from build-to-print manufacturing to complete project management integrating several specialties, including collaborative design/development, prototyping, industrialization, certification/qualification and series production.

### Composite

- Design of components + dedicated tooling.
- Metal-to-Composite reverse engineering.
- Development of Industrialization process, including integration of high precision mechanical components, electronics (RFID tags) and connectics.
- Production : pre-preg manual lay-up with various epoxy matrix material (glass and carbon) + Autoclave or Oven curing.
- Multi-material adhesive bonding, including ultrasonic and thermobonding.

### Equipment

- 3 ISO 8 (class 100000) Clean rooms (600 m<sup>2</sup>) dedicated to Fabrics Cutting / Wrapping / Bonding
- Autoclave : diameter: 2m – length: 3m – Max press. 10 bar – Max t° 200° - 4 internal vacuum sockets
- Oven (section: 2mx2m – length: 3 m) Max t° 250° - 3 internal vacuum sockets.
- High precision ultrasonic welding
- Multi-material CNC machine. NDT ultrasonic control equipment
- Automatized cutting equipment for prepreg fabrics

### Connectics

- Design and Development of customized

connecting devices for power, signal and IT.

- Prototyping, Industrialization
- Development of dedicated test benches and programs.
- Complete production management, including components supply, series production, final testing/control and logistics.

**Mechatronics :** Design and Development, Prototyping, Qualification, Industrialization and Series Production of devices integrating electromechanical components, connectics and electronics.

### Machining

- Design and development, prototyping qualification
- Industrialization and series productions of metallic components with CNC machines

**Quality Assurance :** JDC Innovation and Jean Del'Cour are EN9100 – ISO 14001 and ISO 45 001 certified. Our Vacuum and Autoclave Polymerization Process are qualified by Airbus, Safran Aero Boosters and Sonaca.

**Social engagement :** Through the development of our activities, our #1 priority at JD'C group is to promote social integration through work, by providing socially disabled people with adapted jobs, completed with education programs and dedicated training.

**References :** THALES - JOHN COCKERILL - FN HERSTAL - SONACA AIRCRAFT - THALES ALENIA SPACE - SAFRAN AERO BOOSTERS, OIP ...





# JOHN COCKERILL INDUSTRY



Avenue Greiner, 1 - 4100 Seraing | BE

T. +32 (0)4 330 20 15

industry@johncockerill.com

<http://www.johncockerill.com>



AERO



DEFENCE

CMI designs, installs, upgrades and services equipment for energy, defense, steel-making, the environment, the transport and industry in general.

Present on all five continents, CMI numbers more than 5 500 employees who combine expertise in engineering, maintenance and the management of technical international projects.

## John Cockerill Industry

As an expert in industrial processes, John Cockerill Industry has made it its mission to improve the overall performance of its customers' facilities. Its offering includes: equipments and services for the processing of steel and non-ferrous metals; thermal treatment furnaces for the milling, forging and aeronautical industries; installations for the treatment of electrolytic and chemical surfaces for all types of industries.

## John Cockerill Energy

John Cockerill Energy is a world leader in the design and supply of heat recovery steam generators (HRSG), thermal solar receivers, boilers for FLNG (Floating Liquefied Natural Gas), and industrial boilers.

John Cockerill Energy has drawn on its 200-year-long boiler-making experience to develop receivers for solar thermal tower power plants

The John Cockerill Energy offering includes industrial boilers for sectors such as chemicals, petrochemicals, biomass, etc

## John Cockerill Environment

John Cockerill Environment brings global and made to measure environmental solutions within 4 domains of expertise: water, air, waste and energy efficiency.

## John Cockerill Defense

John Cockerill Defense is the undisputed leader in multifunctional high-effect turrets in the 25 mm - 120 mm range for light and medium armoured vehicles.

## John Cockerill Services

John Cockerill Services provides advice and support to industries and operators of public infrastructures for the assembly, operational management and modernization of their facilities.



# LA NITRURATION MODERNE



Rue Gilles Galler 22/24 - 4000 Liège | BE  
T. +32 (0)4 235 47 20 | F. +32 (0)4 235 73 20  
info@lanitruration.be  
<http://www.lanitruration.be>



AERO

Surface Treatments and related activities such as Non Destructive Testing and Painting.

- Cadmium plating
- Zinc-Nickel
- TSA
- Chromic Acid Anodizing
- Sulfuric Acid Anodizing
- Passivation
- Chemical Conversion Coating
- Silver coating
- Fluorescent Penetrant Inspection
- Magnetic Particle Inspection
- Identification
- Dry Abrasive Blasting
- Wet Abrasive Blasting (vapor blasting)
- Zinc Phosphating
- Manganese Phosphating
- Painting

## References and/or Certifications

- EN9100 and Nadcap accredited.
- Qualifications certified by Airbus, Bombardier, Moog and Embraer.

Avenue Robert Schuman, 102 - 1400 Nivelles | BE

T. +32 67 79 40 80 | F. +32 67 55 27 91

info@lambda-x.com

<http://www.lambda-x.com>



SPACE



DRONE



DEFENCE

**Lambda-X provides engineering services for customized space & security optical systems working in severe environments. The company is active on the following applications:**

**Science Payloads for ISS or Sounding Rockets, Optical Payloads for Earth Observation, Metrology & Vision systems for Space exploration.**

Thanks to heritage coming from the development of more than 30 instruments deployed in Space since 1996, Lambda-X offers support to its customer in the following areas:

## Concept & Design

Lambda-X experience includes a wide range of optical technologies, such as deflectometry, microscopy, hyperspectral imaging, light scattering, tomography and many more... The solutions implemented in Lambda-X systems often combine several technologies into a single instrument, taking into account the constraints brought by allocated volume, broad temperature range of operation, mass budget, delivery time and cost. Lambda-X owns 4 patents related to optical methods.

## Performance Validation

Lambda-X optical laboratory, equipped with various alignment and metrology tools, offers the possibility of a fast experimental validation of proposed concept.

## Qualification

Starting from environmental constraints data, Lambda-X can take in charge the management of product full qualification plan.

## Manufacturing & Test in Production

Using its 650 m<sup>2</sup> clean room facilities, Lambda-X owns the mandatory infrastructure for hardware production following space and military standards.

Lambda-X is certified ISO 9001 & EN 9100.



Rue des Chasseurs ardennais, 10 - 4031 Angleur | BE

T. +32 4 365 02 43

info@lasea.com

<http://www.lasea.com>



AERO



SPACE

Manufacturer of femtosecond laser systems for micromachining in many sectors, including aeronautics and space industry.

LASEA is specialised in high precision laser machining: marking, welding, engraving, drilling, cutting, texturing, and the removal of thin layers.

The growth in laser marking applications is driven by an increasing need for part identification and traceability, for aircraft manufacturers, for instance. Product identification, in the form of simple alphanumerics to complicated graphics and codes, is proven to reduce costly errors, man-hours, and material waste.

Laser technology has proven to be the most consistent, high-speed, effective manner of permanent identification for the smallest industrial pieces.

Ultramodern clean technology, our laser micromachining system meets the highest standards in the service of research and industry.

We manufacture femtosecond laser micromachining machines and we are specialized in micromachining services like welding, marking, engraving, drilling, texturing, cutting, and removing thin layers.

We apply our expertise in many sectors: Medical Devices, Pharmaceutical Industry, Hospitals, High-quality Watch Industry, Fine Jewellery Industry, Automotive Industry, Glass Industry, Electronic Industry, R & D Centers,...

Lasea is specialized in precision micro machining machines

From **surface micromachining** to micromachining stainless steel, we have over 10 years as a pioneer in precision laser technology, and our company offers its expertise for a wide variety of athermic applications : **Laser Marking, Laser Engraving, Laser Cutting, Laser Drilling, Laser Welding, Laser Structuring and Texturing.**

Whether you need a laser drilling machine, precision laser engraving, or any other type of micron precision machining, we have the ideal solution for you. No matter what sector you're in, and no matter the job at hand, get in touch with us today to speak to one of our experts and find the perfect laser machine that meets your exact requirements.



Avenue du Général Michel 1E - 6000 Charleroi | BE

T. +32 71 305 396

gregory.fiorotto@lgm.eu

<http://www.lgm.eu>



AERO



SPACE



DRONE



DEFENCE

LGM Belgium S.P.R.L. is the Belgian subsidiary of LGM Group. We have been developing our references in the aeronautical sector by providing the highest level of reliability and effectiveness.

The key words for our expertise are RAMS engineering (Reliability, Availability, Maintainability and Safety), ILS (Integrated Logistic Support), Technical Publication, Project Management and Quality Management. LGM is your long-term partner; we make sure your product meets your customer's reliability requirements. For a maintenance application, LGM documents your solutions by taking into consideration the purpose of the system, the level of maintenance, the update of your products... Our know-how of the aeronautical sector gives us a leading asset in Project Management engineering. We support your organisation by defining and deploying new standards for process improvement. LGM is also your partner for management and support in operational quality.

Regarding Tool & Test Benches, we have developed a turnkey offer which can be adapted to your needs by a tailored approach.

- Technical Documentation: Documentation Expertise, Design and Drafting of Technical Documentation, IETM (Interactive Electronic Technical Manual),
- Development and Implementation of Documentation Management Tools,
- ASD S1000D, S2000M, IT 8805, MAT 10000, ATA
- iSpec 2200...
- RAMS Engineering: RAMS Analysis and Management of System, Software, Electronics, Mechanical Components
- Project Management: PMO, Contract Management, Risk Management, Planning, Change Management, Optimization of Industrial Performance
- Integrated Logistic Support: Maintenance Engineering, Optimization of Life Cycle Cost...
- Tools & Test Benches: Design and Development of Test Integration Tools, Integration of Software Solutions, Development of Qualification Benches, Maintenance Benches and Acceptance Test Benches Manufacturing, Maintenance Tool Development

Chemin du Stocquoy, 3 - 1300 Wavre | BE

T. +32 (0)2 513 46 73

[desenfans@m3systems.net](mailto:desenfans@m3systems.net)

<http://www.m3systems.eu>



SPACE



DRONE

## SATELLITE NAVIGATION FOR INVENTING THE FUTURE

M3 Systems Belgium provides a unique expertise in engineering services and technical solutions for satellite navigation applications. M3 Systems Belgium brings its expertise in the definition and the assessment of innovative GNSS algorithms and GNSS receiver architectures, in real GNSS data collection, and in the analysis of GNSS performances.

### Location-Based Services development

The applications of satellite radio navigation systems (GPS, GLONASS, GALILEO) have increased dramatically in recent years. M3 Systems Belgium has specialized in the development of location-based services that require a high performance level and the capability to provide a measure of the positioning information level of confidence.

### Satellite signal processing

Signal spoofing and jamming are amongst the major threats of GNSS systems. M3 Systems Belgium has developed a recognised expertise in the assessment of GNSS systems vulnerability. Based on simulation and/or on real data collection, M3 Systems Belgium is capable of characterising the impact of interference on GNSS performances. The company has also developed competencies in advanced mitigation algorithms.

### Performance evaluation

The ongoing GNSS upgrade, and the deployment of augmentation systems (WAAS, EGNOS, differential GPS, pseudolite...) have raised the need for performance evaluation. M3 Systems Belgium has become a renowned partner of institutional actors (such as ESA) for GNSS performance evaluation, including GNSS signal-in-space and receiver performances, data collection and analysis, test bench.



Rue de la Molignée 60 - 5537 Anhée | BE  
T. +32 (82) 61 16 12 | F. +32 (82) 61 36 35  
contact@mecasoft.be  
<http://www.mecasoft.be>



AERO



SPACE



DEFENCE

Mecasoft is specialized into metal precision machining using on one hand electroerosion and other high precision techniques, and on the other end a specific knowledge on micromechanics and micromilling machining developed over the years, enabling us to perform precision operations in metals up to 1-2  $\mu\text{m}$  of tolerance and roughness (Ra) of 0.03 for drilling, wire cutting and 3D control.

We manufacture parts for Airbus, Boeing, Safran, Embraer, Sabca, Sonaca, Euro Heat Pipes, Von Karman Institute, for their usual manufacturing programs (machining from 1 to 400mm) but also in their micro developments in order to gain weight and miniaturize metallic space components, like heat pipes, micro tubes for sensors and captors. We are certified EN/AS 9100 Aerospace since 15 years and therefore supply major aerospace manufacturers as well as tier-1 or tier-2 players.

Our other segments of interests are the precision industry - automotive, defence and instruments - as well as medical and pharmaceuticals (eg cryogenic microtubes, microdrops generators, microfluidics static mixers, ...).

Mecasoft R&D department frequently joins large academic research programs in applied or fundamental fields. We have several fields of interest, specifically machining of silicon carbide, as well as completing the structural weaknesses of metal additive manufacturing (ruggedness and precision) with EDM or other techniques.

## References and certifications

- Certified EN 9100-2009 and ISO 9001-2008.
- SAFRAN certification for special processes
- AIRBUS certification for EDM processes
- SABCA certification for EDM processes
- Sonaca certification for EDM processes



# METHODES & TECHNIQUES D'USINAGE



Rue du Pont Bleu, 21 - 7730 Evregnies | BE

T. +32 56 48 02 51

pf@mtusprl.be

<http://www.mtusprl.be/>



AERO

MTU sprl is your partner in the following fields:

- Machining from 2 to 5 axes: single piece, small and medium series
- Design and production of tools
- Repair and modification of tools
- Various assemblies
- Technical consultancy

A multidisciplinary team with complementary skills:

- Complex machining of all materials in FAO
- Heat treatments and surfaces
- CAD design
- Plastic injection

Productivity - Quality - Delay are the basic elements of MTU management. Innovation is at the center of our concerns to increase our competitiveness.





Rue du trou du Sart, 10 - 5380 Fernelmont | BE  
T. +3281248100 | F. +3281248101  
info@micromega-dynamics.com  
<https://micromega-dynamics.com>



Micromega Dynamics is specialized in the development and manufacturing of vibration monitoring systems, vibration reduction, high-precision mechanisms and structural control mechatronic devices. Full deployable solutions, engineering services related to vibration troubleshooting, customization of our products and developments based on customers' requirements.

Micromega Dynamics' solutions have been deployed in demanding environments such as on-shore and off-shore wind turbines, railways, quarries, construction works, rotating machinery, outdoor structures and large telescopes where performance and reliability are essential.

In addition to off-the-shelf products, Micromega proposes engineering services in order to help you to design, manufacture and implement dedicated industrial solutions in the field of on-line monitoring, vibration reduction and high-precision mechanisms.

With hundreds of customers all over the world, we have a background of 20 years in the design and production of mechatronic devices for monitoring and reducing structural vibrations.

## Rotating Machinery

Vibration Reduction Machines are now being operated at increasing rotational speeds and loads and under increasingly severe operating conditions, leading to excessive machine vibrations, hence the failure of sensitive components. Usually, situations with excessive vibrations can be solved by proper alignment and balancing techniques. But there are cases where structural resonances are excited by the machine operation resulting in a significant increase of the overall vibration level. This high vibration level can bring the machine out of its

safe operating area as advised in standards such as ISO 20816 (formerly ISO 10816).

## Semiconductor industry

Highly precise and very sensitive equipment, such as microscopes, inspection devices, imaging systems and polishing machines usually use an active or passive isolation platform. In some situations, this is not enough to keep the vibration levels low enough. It may be that local/global resonances are degrading the performance of the isolation system, because it is not stiff enough or because perturbation sources are located on the isolated part.

## Astronomy

In order to achieve the very high resolution needed to observe distant astronomical objects, mirrors of large astronomy telescopes must maintain their shape in all circumstances, despite continuously changing orientations and temperatures. To achieve that goal, mirrors are usually very thick making them expensive, heavy and leading to very strong/stiff mechanical structures to support them. Nowadays, telescope manufacturers favor thinner/lightweight mirrors that are equipped with a network of mirror shaping actuators to compensate for their insufficient stiffness, to constantly maintain the reflecting surface of the mirror in as perfect a condition as possible.

ZI Eupen/Baelen Rue du Développement 9 - 4837 Baelen | BE

T. +32 (0)87 59 39 59 | F. +32 (0)87 59 39 30

info@mockel-precision.be

<http://www.mockel-precision.be>



AERO



SPACE



DEFENCE

MOCKEL is active in the field of high precision mechanics meeting the complex needs of our customers in the defence, aeronautics and space industries. MOCKEL currently has a workforce of 55: All of our employees are specialists in the manufacture of high precision mechanical parts. The company has the state of the art machinery, the technical know-how and the necessary experience to handle all aspects of production from start to finish.

Be it large or small parts, simple or sophisticated components, series of 5 or 10,000 parts, we translate the ideas of our customers into technical excellence. All our parts are turned and milled with high precision on state-of-the-art machines.

The company offers a wide range of industrial services:

- Turning CN 2 to 5 axes
- Milling CN 3, 4 and 5 axes
- Quality control (2 air-conditioned halls)
- Finishing zone (grinding, thread-rolling, marking, etc.)
- Assembly groups

In addition MOCKEL has developed a wide range of services to satisfy the customer: Project management, supply chain management, assembly of part...; The company has also a large network of international authorized suppliers for heat and surface treatments, in order to deliver its customers with finished products.

MOCKEL is certified ISO 9001/EN 9100 and ISO 13485.

During the last years, we invested highly in automatization: robot system with two five-axis machines combined turning-milling machines... COME and VISIT US!



1<sup>ère</sup> avenue 66 - 4040 Herstal | BE

T. +32 4 248 06 00

info@mpp.be

<https://mpp.be/>



AERO



SPACE



DRONE



DEFENCE

## Acteur majeur dans le domaine des Contrôles Non Destructifs et de l'Ébavurage.

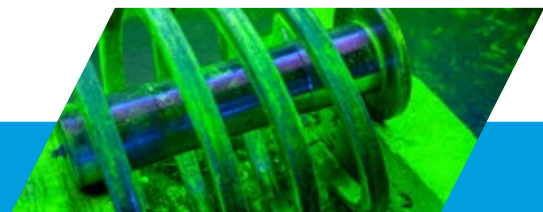
Forte d'une transformation industrielle réussie au cours de 2019, MPP se positionne comme la **solution privilégiée dans le domaine de l'aéronautique** mais également de **l'industrie** pour répondre aux besoins des clients pour **l'expertise et l'inspection non destructive** de leurs pièces ainsi que le **polissage de précision et l'ébavurage**.

MPP s'est dotée des dernières technologies que ce soient en **radiographie digitale**, en cabine/ bunker (générateur de 320 KV, tube micro-foyer 0.2 mm et Flat Panel résolution de 50 à 200 µm), en radiographie digitale sur site client (générateur mobile de 150 kV), en **inspection magnétique** (banc magnétique de dernière génération), en **courants de Foucault** toutes techniques, en ressuage par pulvérisation électrostatique, en ultrasons (équipements portables multi-éléments) et en **thermographie** (caméra haute sensibilité thermique).

En parallèle, MPP a constitué une équipe performante et flexible d'inspecteurs de niveau 2 et niveau 3 ainsi qu'une nouvelle direction commerciale.

MPP offre des installations modernes sur son site liégeois et peut également projeter ses ressources et ses moyens chez les clients afin d'apporter un **support** temporaire ou effectuer des **expertises** sur des pièces volumineuses ou critiques.

Les nombreuses **certifications** obtenues par MPP que ce soient les références internationales que sont **ISO9001** et **EN9001**, mais également celles décernées par des clients majeurs comme **SAFRAN** permettent à MPP de garantir l'implication de la société envers ses clients et la qualité du travail effectué par son personnel.



# MUBEAS SYSTEMS

Rue de l'Abattoir, 53 - 7700 Mouscron | BE

T. +32 (0)56 58 52 60

info@mubeasystems.com

<http://www.mubeasystems.com>



## Mubea Systems: the right machine for each process

Mubea Systems manufactures a complete range of 5-axis CNC machining centers: we offer machinery designed for automatic tooling of exceptionally long aluminum profiles and high speed cutting of solids in aluminum and new materials like titanium. Mubea Systems offers advanced solutions for the aviation industry.

### **2015: FIRST HIGH SPEED MEGA-FLEX FOR XI'AN AIRCRAFT INSTALLED**

Mubea Systems installed the Mega-Flex High Speed machining center for XI'AN AIRCRAFT, the biggest aircraft manufacturer and developer of large and medium-sized airplanes in China. The Mega-Flex High Speed will be used to machine Aircraft Structural Frames.

**For more information about our machines visit:**  
**[www.mubeasystems.com](http://www.mubeasystems.com)**



Le Grand Enclos 18 - 6800 Libramont | BE  
T. +32 (0)61 22 55 10  
pierreservais@skynet.be



AERO



SPACE



DEFENCE

NDTPRO SRL is a small company born in 2007 to offer Level 3 NDT consultancy to all companies from Aerospace & Defense Sector. Level 3 job is defined into aerospace standard EN4179 (qualification and certification of personnel performing nondestructive testing (NDT), nondestructive inspection (NDI), or nondestructive evaluation (NDE) in the aerospace manufacturing, service, maintenance and overhaul industries.

The activity is done on each of the following industrial methods used to check the quality of the material (usually Steel, Aluminum or Titanium alloy and composite parts)

- Liquid penetrant (PT)
- Magnetic particle (MT)
- Thermography (IRT)
- Shearography (ST)
- Eddy current (ET)
- Ultrasonic (UT)
- Radiography (RT)

For each method, Level 3 from NDTPRO must:

- Have the skills and knowledge to interpret codes, standards, and other contractual documents that control the NDT method(s).
- Be capable of assuming technical responsibility for the NDT facility and staff.
- Be capable of selecting the method and technique for a specific inspection.
- Be capable of preparing and verifying the adequacy of procedures and work instructions.
- Approve NDT procedures and work instructions for technical adequacy.
- Have a general knowledge of other NDT methods and product manufacturing and inspection technologies used by the employer.

- Have a basic knowledge of aircraft or vehicle maintenance.
- Be capable of providing or directing training, examination, and certification of personnel.
- Conduct NDT for the acceptance of parts and document the results.
- Be capable of auditing outside agencies to ensure the technical requirements of NDT are met.
- Assist all companies to take NADCAP accreditation in the field of NDT

NDTPRO makes this job for most of the aerospace companies in Belgium including Sonaca, Sabca, Asco, Sabena Aerospace, Technical Airborne Components, Precimetal, Settas, Mecaspring, Capaul, Britte and MPP, but is also active outside Belgium (in Canada and China for Safran Group).

NDTPRO responsible level 3 is accredited by Airbus, Rolls Royce, Safran, Boeing and ASNT (American Society for Non Destructive Testing), based on PhD in NDT Sciences.

Parc Industriel des Hauts Sarts 2<sup>e</sup> Avenue 65 - 4040 Herstal | BE

T. +32 (4) 249 72 11

info@nrb.be

<http://www.nrb.be>

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NRB is an ICT service provider allowing you to source or outsource IT to the degree that best fits your needs and ambitions.

## **Consultancy**

Our consultants assist and advice you on the development and the implementation of your IT strategy to support, optimise and transform your business efficiently.

## **Software**

We offer a full range of services with regard to your applications: (custom) development, implementation of market solutions, integration, and application maintenance.

## **Infrastructure services**

We provide operational management of your IT infrastructure from our data centres or from your own site.

## **Managed staffing**

We can find the resource you need to complete your IT team or to staff your project at the right cost, at the right moment and for the right time.

Avenue Albert Einstein, 2a - 1348 Louvain-la-Neuve | BE

T. +32 (0) 10 39 21 40

info@nsilitation.com

<http://www.nsilitation.com/>



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## MAKING your ELECTRONICS smaller, smarter, stronger.

nSilitation is a leading analog and mixed-signal ASICs/SoCs and semiconductor IP provider for applications areas like wireline and wireless communication, industrial, automotive, medical and aerospace.

nSilitation specializes in the development of industrial quality circuits, with expertise in mixed-signal, high-speed and/or low power analog and full-custom digital circuitry. nSilitation's circuits employ various specific enhancements to improve power efficiency, yield and reliability.

The semiconductor IPs are available as ready-to-use design kits for most popular silicon technologies. nSilitation's IC and IP design service offers top quality design, customization and support dedicated to your needs and your specifications.

The design team of nSilitation has many years of hands-on industrial level design experience on various Analog and Mixed-Signal SoCs electronic systems, as well as their characterization and qualification for production. We will support you through the whole integration and product validation phase of the IC or IP.

### ASIC Design

You have a mixed-signal electronic system on a printed circuit board? You are assembling off-the-self components to build up a complex function? Are you considering the development of a custom IC?

- Cheaper (assembly costs, reduced BOM, embedded testing)
- Smaller (in size, in weight)
- More efficient (Higher speed, lesser power, higher yield)

- Smarter (Reconfigurable)
- Stronger (IP protection, data encoding, RFID, radiation tolerant)
- Cleaner (no Pb, consumes less)
- Dedicated (to your needs, to your standards)
- Faster (time to market)

An ASIC (Application Specific Integrated Circuit) designed by nSilitation is what you are looking for! Each company and every project is different but nSilitation will help you with custom services adapted to your needs from concept evaluation to production.

### Design of two accelerometer chips and a power management chip

For a main leader company that designs and builds electrical systems for the aerospace, defence, transportation and security markets.

### Radiation tolerance characterization of ICs

For a company providing high-performance micro-satellites for Earth observation applications.

### Design of high temperature IPs

For a leading company in high temperature semiconductor solutions, delivering standard products and custom solutions for extreme temperature and harsh environments.

Boulevard Initialis 7 Boîte 2 - 7000 Mons | BE

T. +32 65 70 92 00

info@numflo.eu

<http://www.numflo.eu>

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CAE and CFD simulation software is largely used by industry today. General software tools are available on the market and cover a large variety of applications, but often fail in providing a fast, reliable and cost-effective solution to challenging industrial applications. Reliable simulations rely on understanding a large number of physical properties and models and the manipulation of various software tools. NUMFLO addresses these requirements and accompanies your CAE and CFD workflow. We provide high level consulting services and technology to simulate and optimize complex industrial components and processes.

NUMFLO is an engineering company active in the field of CFD ("Computational Fluid Dynamics") simulations. NUMFLO offers advanced consultancy services for fluid flow analysis, design, and optimization, as well as dedicated technological solutions for fluid/solid multiphysics and heat transfer modeling. NUMFLO is a subsidiary of NUMECA International ([www.numeca.com](http://www.numeca.com)), worldwide leader in industrial CFD software development. Our activities cover a wide range of applications where fluids play an important role: Aerospace & Defense, Architecture engineering & Construction, Automotive, Consumer Goods, Energy, Healthcare and Marine & Offshore.

Our main areas of expertise are:

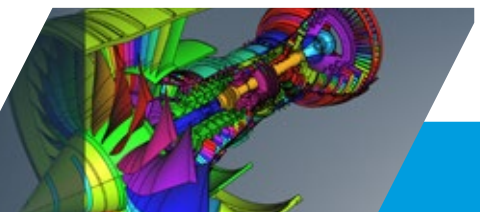
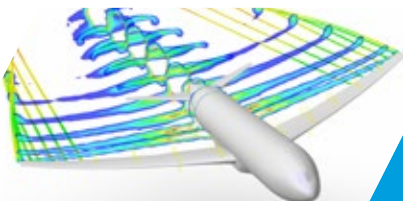
- Simulating complex fluid flows and multiphysics applications;
- Providing innovative technology and models in response to specific requirements;
- Integrating in-house or new technologies in commercial CAE software systems, guaranteeing maintainability and support.

We cover a wide range of industrial applications where fluids play an important role.

NUMFLO is working in close relation with universities and research centers worldwide and is active in several national R&D funded projects.

### References and/or Certifications

NUMFLO is a certificated company (ISO9001– AS 9100)





# OPEN ENGINEERING



Allée des Noisetiers, 2 - 4031 Angleur | BE  
T. +32 (0)4 367 89 43 | F. +32 (0)376 68 22  
info@open-engineering.com  
<https://www.open-engineering.com>



AERO



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## Multiphysics Simulations to Support your Innovations

Open Engineering is a breakthrough supplier of multiphysics software for the CAE market. Our solutions are based on our OOFELIE::Multiphysics platform, optimized for the analysis of large industrial 3D design work.

Part of the GDTech group, Open Engineering is active in the Computer-Aided Engineering (CAE) market. Open engineering designs, develops, and sells OOFELIE::Multiphysics.

Successful technical innovation is based on robust designs. A growing number of high precision applications have to perform under harsh conditions. Sensitive to multiple physical effects and to their manufacturing process, they might be influenced by their package and their surrounding environment.

The OOFELIE::MULTIPHYSICS Suite helps understanding and optimizing the performances of complex devices to make them more robust.

Our main expertise areas are in:

- Sensors, actuators, MEMS and microsystems
- Optomechanical systems and MOEMS
- Fluid-Structure Interaction applications
- Small satellites

These simulation capabilities encompass a broad range of products in the aeronautics, space, defence, automotive and electronics markets.

In complement to the development of its own engineering tools, Open Engineering performs different types of services works:

- Trainings on our multiphysics engineering software tools
- Engineering consulting
- Customized engineering software tools

Cut the number of design cycles and accelerate your innovation capacity by choosing the 3D multiphysics FEA solution from Open Engineering: the OOFELIE::MULTIPHYSICS Suite



# OPTIMAL COMPUTING

Rue de la vignette 36 - 7034 Mons | BE

T. +32 (0)498 622 632

info@optimalcomputing.be

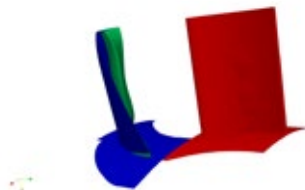
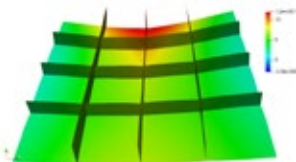
<http://www.optimalcomputing.be>



OPTIMAL COMPUTING develops software and provides consulting services in the field of numerical optimization. Our technology is based on artificial intelligence techniques and is applicable to any simulation based optimization.

We develop, Xtreme, an advanced numerical optimization software based on artificial intelligence techniques such as Genetic Algorithms and Artificial Neural Networks. Optimal Computing also provides consulting services in numerical optimization, in software engineering and also develop dedicated optimization algorithm solutions.

We have a long expertise in solving complex and real design optimization applications, developing large software based on challenging goals for our customers. Our optimization algorithms can be applied to shape optimization based on Computational Fluid Dynamics (CFD), structural mechanics or any other engineering fields. We also have very efficient algorithms for optimizing large scale sequence optimization problems such as welding sequence optimization.





Avenue du Pré-Aily, 25 - 4031 Liège | BE

T. +32 4 287 10 70 | F. +32 4 287 10 71

info@optrion.be

<https://www.optrion.be>



AERO

## Non-Destructive Testing Solution for Composite Materials and Structures

OPTRION, a spin-off of Centre Spatial de Liège and a branch of V2i, is a company specialized in optical metrology and non-destructive testing for composite material and structures.

Rue Ernest Matagne, 32 - 5330 Assesse | BE

T. +32 (0)473 54 39 99

jp.berlengee@oplusr.be

<https://oplusr-salle-blanche.com/>



AERO



SPACE

O+R est une société d'ingénierie et de construction de salles blanches, elle est composée d'un bureau d'études et de monteurs expérimentés en mécanique, électricité, automatisme, aéraulique et hydraulique. L'objectif est de fournir des salles propres dans leur globalité (selon la norme 14 644). Le travail en atmosphère contrôlée dans le domaine aérospatial ou aéronautique requiert généralement des salles blanches répondant aux normes ISO 8 ou ISO 7. Il s'agit en général de grands volumes de salles propres. Des ponts roulants sont fréquemment installés à l'intérieur des halls de production. Des postes de travail peuvent évidemment être équipés ponctuellement de tentes ou flux laminaires pour atteindre des classes plus contraignantes (ISO 4 ou 5). Chaque salle propre est conçue pour répondre à la spécificité du process en termes de température, d'humidité ou de pollution particulaire, il faut limiter tout dégagement de COV conformément à la norme ISO 16000.

### Salle propre 4.0

Produire en salle propre suppose un contrôle des paramètres en matière de pressions, d'humidité, de renouvellements d'air, etc. L'évolution récente montre un besoin accru d'archivage et le développement de logiciels de contrôle et de reporting. Nous avons développé une gestion 4.0 de nos installations, O+R est ainsi informée en temps réel, de plus, chaque jour nos clients reçoivent un fichier imprimable avec l'ensemble des valeurs de la journée. L'ensemble des données étant sécurisé 10 ans sur un serveur infraudable.

### Les espaces propres mobiles ultra propres ISO 5

O+R a développé, pour des productions ponctuelles à hautes exigences de qualité, une solution techniquement et financièrement très intéressante: la tente avec plafond ou mur soufflant. Les tentes à flux laminaire avec plafond soufflant permettent à nos clients d'obtenir dans un délai rapide et pour un budget moindre qu'une salle blanche classique un environnement ultra propre. O+R a développé une gamme de produits standardisés disponible sur son site.

Place du chapitre 16 - 5300 Andenne | BE

T. +32 (0)85 41 23 27

info@oscars-sa.eu

<http://www.oscars-sa.eu>



SPACE

Specialized in Oracle technologies (more precisely its Spatial components), OSCARS federates and optimizes the use of data coming from Geographical Information Systems (GIS). Oscars' expertise covers the installation, configuration and optimization of « Oracle Spatial » databases, consulting services in the area of enterprise GIS data usage as well as training. GIP4Airports is one of OSCARS' flagship software, a powerful analytics and geolocated information correlation tool which aims at optimizing airport management. For further information: [www.oscars-sa.eu](http://www.oscars-sa.eu)

OSCARS is an innovative independent consultancy company specialising in the Oracle Spatial sector. It can help you to make the data within your GIS profitable. The company is recognised as a reference player by Oracle, and can help you optimise your use of GIS data, thereby enabling you to increase returns on permitted IT investments... Given the various GIS players on the market, it is essential that your data be interoperable. Exploiting it for decision-making purposes is a real advantage and a source of new services. OSCARS, your partner for GIS and Oracle Spatial, is a certified company that has won several awards from the giant Oracle and is recognised as a reference partner. GIP4Airports is one of OSCARS' flagship software, a powerful analytics and geolocated information correlation tool which aims at optimizing airport management. GIP is a platform for acquiring and treating geolocalised data, allowing you to set off alerts in real time in response to previously defined spatial events. You can define your own alerts and spatial events; this generates associated workflows that you can later activate or deactivate as and when you like. GIP is a generic, non-intrusive tool essential for relevant decision-making in real time, based on position and events, whether implemented or not. The underlying GIP technology takes care of the real time monitoring and management of all equipment elements,

players and events pertaining to the airside airport zone (runways, taxiways, car parks and boarding areas). GIP4Airport goes further than the mere cartographic analysis of objects and events. The solution makes it possible for airport authorities to crossreference the data that have been collected. The purpose is to enrich the databases (AODB3) and to allow systems to communicate with each other in order to improve the management and automatic decision making process, based on the rules, constraints and performance indicators each airport has to cope with.

# PATRIA BELGIUM ENGINE CENTER

# Patria

Rue du Fonds des Fourches 23 - 4041 Herstal | BE

T. +32 (0)4 270 70 10 | F. +32 (0)4 388 39 56

[hugo.vanbockryck@bec.eu.com](mailto:hugo.vanbockryck@bec.eu.com)

<http://www.bec.eu.com>



AERO



DEFENCE

**Patria Belgium Engine Center (PBEC)** is a one-stop shop for Maintenance, Repair and Overhaul (Depot and Intermediate) services, serving both commercial and military fleets around the world.

PBEC has served as an MRO Center of Excellence for the F100-PW for over four decades, currently supporting 15 air forces, including the U.S. Air Force.

Uniquely certified by the OEM as Authorized Overhaul Facility and by US Air Force as Source Approved, PBEC also offers spare parts provisioning and trading – with shorter lead times and off-the-shelf readiness.

Our excellence built over 40yrs of business makes PBEC capable of providing customizable services, repairs and assets management according to our customer's needs.

## **Versatile and complete MRO solution**

Our comprehensive in-house capabilities (NDT/NDI, Item Repairs, Module Overhaul) provide our customers with a complete, single MRO solution resulting in competitive pricing and turn time, eliminating the need to rely on a dispersed repair network.

## **Extensive choice of Non Destructive Testing & Inspections**

PBEC is an ideal partner for NDI/NDT requirements.

## **Modern portfolio of repair capabilities**

PBEC not only restores a wide range of components in-house, but our engineering team offers custom repair processes and services according to customer's needs.

## **Efficient spare parts provisioning & trading**

PBEC can offer shorter lead times in hardware procurement with the ability to offer an attractive off-the-shelf new and serviceable parts.

## **Smart selection of engineering & logistics services**

As a reliable and knowledgeable partner, we provide custom services that aim to lower customers' overhead cost, such as material forecasting, configuration management, technical support and warehouse services.

## **Liège, a competitive logistics hub**

Located in the heart of Europe, only a few miles from a major cargo airport, PBEC leverages this highly industrialized area with an excellent infrastructure to offer more efficient transit time and lower logistics costs for our customers.

Rue Louis de Geer, 6 - 1348 Louvain-la-Neuve | BE

T. +32 10 392 258 | F. +32 10 81 63 08

info@pecherandpartners.be

<https://www.pecherandpartners.be/>



AERO

## Belgian law firm specialized in Patents, Trademarks, Design, Copyright and Domain names.

Based in Louvain-la-Neuve, close to the university, we can help you to turn your plans into tangible innovations by protecting them effectively and developing a strategic vision with you. Our highly qualified multidisciplinary team will provide you with advice in all areas of intellectual property: patents, trademarks, designs, copyrights and domain names.

Our patent attorneys, who are registered with the Belgian Patent Office (OPRI), with the European Patent Office (EPO) and on an international level (WIPO), will draft and file your patent applications, monitor them until a patent is granted, maintain your rights and defend them in the event of litigation.

The founders of P&P, Nicolas Pecher and Marco Connor, have over 30 years of experience in intellectual property, which has been acquired at well-known firms of attorneys and the EPO itself.

Our relationship with the firm Distinctive, whose representatives are accredited and registered with the EUIPO, means that we can assist you with your applications for the registration of trademarks and other intellectual property rights, or can carry out the necessary procedures to guarantee the maintenance of these rights.

Our priorities are the quality of the work carried out, the satisfaction of our clients and the professionalism and integrity of our team.

It is for all of these reasons that our clients place their trust in us, whether or not they are major players in the market. Multinational companies, SMEs, startups, research institutions, IP professionals and individuals all find answers to their needs.

Avenue Reine Elisabeth 59 - 5300 Andenne | BE

T. +32 (0)85 84 98 11 | F. +32 (0)85 84 99 52

info@pegard.com

<http://www.pegard.com>



AERO

Pegard is active in the machine-tool business for more than 50 years and became well-known in the whole industrial world for its large and precise horizontal boring and milling machines. Created in 1937 and now a subsidiary company of the group OGEPAR, Pegard engineers and delivers tailored solutions for the flexible machining of large precision parts offered to the customer in a turnkey solution. Pegard also provides services in machining and after-sales services.

## Machine tools manufacturer

Pegard is specialized in the manufacturing of large horizontal boring and milling machines and machining centers committed to high quality and performance. Our customers are users demanding ultimate levels of precision and automated machining of large mechanical parts, such as turbine rotors, valves, pumps, engine blocks, compressor housings, components for earth moving equipment...

Pegard has also developed its business in manufacturing of vertical turning lathes (Ø12504000mm table) and offers you a large panel of sharpening machines through its brand HARO Technologies.

## After-sales service

Besides its boring and milling machines and vertical lathes, Pegard offers of course a well-known after-sales service (works on site, spare parts, preventive maintenance...), the retrofit of existing machines as well as an electric department able to realize complex sub-contracting works

## Machining subcontracting

Pegard can machine your parts thanks to its large panel of machine tools. Here are our capabilities:

- CNC horizontal machining centers / 3 to 5-axis / up to 9600x3000x700mm
- CNC turning up to Ø5600x2500mm
- Flatbed grinding up to 7200x2200x1350mm
- Quality inspection (Cimcore infinite 2.0 3D arm)
- CAD/CAM softwares

## References

BOEING (Spirit aero) – AIRBUS (Premium Aerotech)  
– SONACA – ASCO – SAFRAN – TECHSPACE AERO –  
FIGEAC AERO – IBA – KENNAMETAL – CMI





# PIRON PRECISION COATINGS



Rue des 3 entités, 16 - 4890 Thimister Clermont | BE

T. +32 87 44 74 41

info@piron.be

<http://www.piron.be/>



AERO



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DRONE



DEFENCE

Thanks to its 35 years of experience in complex paint applications, Piron Precision Coatings has been recognised as a key partner for Surface Treatments and Finishing for high added value industries. Its quality culture among with its increased production capacities allows it to be an evident partner for the treatment of your production.

Our company, among with its 35 professionals, is dedicated to realising high quality paintings for demanding industries (aerospace, aeronautics, defence and security, railways, etc.)

We are used to complex treatments and paint specifications. We can work on every substrate and are able to consult you on the best treatment choices.

We are certified ISO 9001:2015 and EN 9100:2018

We are equipped with a small parts vertical blowing painting line (<250 kg and <1 cubic meter). Our Flash Off and Curing zones are separated, allowing 4 people to paint at the same time.

Our big parts painting line (<3T and 3.5 x 5 x 16 m) allows 2 people to paint at the same time.

We've got a dedicated line for composites parts treatments (surface finishing). It allows us to complete the production of unperfect surfaces.

We are also equipped with a powder coating line and we take in charge surface treatments prior to paint.

Our capacity allowed us to treat over 200.000 parts in 2018.

ZI. Rue d'Artagnan 14 - 4600 Visé | BE  
T. +32 (0)4 379 13 71 | F. +32 (0)4 379 70 00  
sa.polmans@polmans.be  
<http://www.polmans.be>



AERO



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For more than 45 years now, POLMANS has been active in precision mechanics, particularly in the fields of aeronautics, nuclear, weapons, medical, steel. Polmans has also been active in the field of plastic injection for almost 20 years.

The company is specialized in prototypes, unitary parts, in small and medium series.

## Company background

- Year of establishment: 1973
- Number of employees: 50
- Export: +/- 28 %
- Main Export countries: NL – G – CH – GB – GDL – F

## Range of products

- Turning: diameter 1 mm to 750 mm, length: 10 to 6.000 mm
- Milling:  $\leq 3.500 \times 1.000 \times 1000$  mm and  $2.000 \times 1.200 \times 1.500$  mm

## Added value

We are specialised in the manufacturing of high precision mechanical parts, from diameter 1 mm to diameter 750 mm. Maximum length: 6000 mm.

In addition to the usual CNC machines, we have several centers lathes allowing 6 axes machining. We also have welding MIG-TIG department for the manufacturing of welded and milled structures.

We are also specialised in the manufacturing of closed circuit systems, where the vacuum must be created.

We have a specific machine to realise all vacuum tests required.

We are able to machine all type of material, like steels, copper, titanium, stainless steels, nickel, etc.

We also have injection moulding machines for which we created our own design and moulds.

In addition, we have a drawing office.



Avenue Josse Goffin 158/B - 1082 Brussels | BE

T. + 32 (0)2 426 38 10 | F. +32 (0)2 426 37 60

brussels@pronovem.com

<http://www.pronovem.com>



AERO

## Towards sustainable competitive advantage...

We are an international group of law firms specialised in the field of Intellectual Property. We offer a full range of high-quality services in Intellectual Property matters, including patents, trademarks, designs, copyright, IP licensing and acquisition, IP dispute resolution and valuation of IP Rights. PRONOVEM® built up the necessary competence to help you implement available assessment and management methods for Intellectual Property Rights.

We work for international companies, SMEs and individuals with a service adapted to the size and demand of the entity. Passionate about Intellectual Property matters, we combine our legal expertise and individual engineering or scientific skills in various fields of technology: Mechanical Engineering, Electrical Engineering, Microelectronics, Material Sciences, Computer-implemented inventions, Coatings, Ranging technology, Satellite Navigation Systems, Nuclear technologies, Robotics, Telecom, Acoustics, Optics, Control systems...

# Q-SQUARE AEROSPACE



Rue de Rodeuhaie 1 - 1348 Louvain-la-Neuve | BE

T. +32 (0)485 44 25 78

info@qsquare.aero

<https://www.qsquare.aero>



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Created in 2013, located in the suburbs of Brussels, Q-SQUARE Aerospace is a highly specialized company delivering Quality Management Consulting and Audit services.

Our team is composed of senior engineers and PhDs, each demonstrating track records of more than 20 years, running R&D and Production activities in the Manufacturing, Aeronautics, Space and Defence industries.

Our consultants complete their technical experience with key Quality certificates and have all implemented/run Quality Management Systems in the industry. Some also act as 3rd party auditors (ISO 9001, AS/EN 91xx series) for worldwide-recognized certification organisms.

The combination of technical skills, quality knowledge and team management gives you the best guarantees for success. Our missions are sharply defined and run at fixed costs.

Added value is very strong, especially for fast growing high-tech companies.

## What we do?

- Audit your suppliers worldwide
- Supplement your teams with high level ad-interim Quality resources
- Run your gap analysis going to the latest revisions of aerospace standards (AS/EN 91xx)

## How we do?

In a simple, pragmatic, flexible and cost-effective manner, thinking "out of the box"

## Keywords

Quality Management, Product Quality, Aeronautics, Space, Audit, Defence, AS/EN 9100



Rue des 4 sentiers, 80 - 4430 Ans | BE

T. 0475456657

dimitri.martinot@qualitics.eu

<https://www.qualitics.eu/>



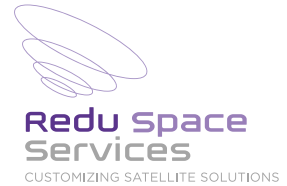
DRONE

Qualitics is a Belgian innovative company specialized in drone's inspections and materials recognition base on AI technologies in real time. We work already with several companies in Europe especially in the energetic area. We are also developing other markets opportunities where some proofs of concepts are ongoing

Qualitics is a company which provide automated solutions to use industrial drones for aerial infrastructure inspections and power lines assets inspections. Regarding actual standards for human inspection, aerial inspection is a huge step forward that enables our clients to inspect smoothly and accurately the state of their infrastructures. It is also a tremendous improvement in terms of safety for the manworkers during inspections as well as for the inspected asset itself. Qualitics developed its own product with the use of artificial intelligence and based on the latest technology including embedded super computer GPU. It recognizes in real time various equipment and can conduct inspection with its automated pilot that optimize flight time and make easier flight control at operator level. The product called « A-Eye » is developed by our internal experts team and validated by professional UAV pilots recognized internationally within the drone community. By selecting the latest powerful hardware and IA technology we are proud to say being in advance in the inspection sector regarding other implementation on the market.



# REDU SPACE SERVICES



Rue devant les Hêtres 2 - 6890 Transinne | BE  
T. +32 (0)61 22 95 18  
sales@reduspaceservices.com  
<http://www.reduspaceservices.com>



SPACE

RSS, founded in 2007 by SES & QinetiQ Space nv, operates the ESA Redu Centre including tens of antennas and operational satellite systems. ESA Redu Centre is considered as EU Critical Infrastructure and hence an ideal place to host space based activities, services and applications for Governments and Institutions with a high level of security and cybersecurity.

What are your needs in satellite communications?

## Enabling Satellite Businesses, Innovative solutions

You have in mind services involving satellite communications, navigation and/or earth observation: Our value proposition involves secure communications tailored to customer needs including cybersecurity services to make sure the satellite network is protected to the highest standards.

Case Studies:

- GOVSATCOM-Mission Operations Centre: Redu is the core of the SES ESA GOVSATCOM PRECURSOR PACIS-1 project where the core satellite communications infrastructure such as the Mission Operations Centre, antenna teleport infrastructure is being validated and installed for governments and institutions in Europe.
- Cybersecurity study and demonstrator: RSS is in charge of a study and first demonstration of key capabilities for ESA to identify the mission priorities and objectives for a future Cybersecurity Operations Centre. We are carrying it this out with the support of Thales and Spacebel.

## Satellite Operations

You are interested in efficient satellite operations or a back-up: We can help you by Hosting and Maintaining & Operating your satellite communication infrastructure. We deliver top-quality 24/7 services for satellite communication systems and back-ups.

Case Studies: PROBA OPERATIONS, Earth Observation satellites, Hosting and maintenance: SES BACK-UP CENTRE

## Payload IOT Solutions

You are looking for a leading company to carry out your In-Orbit payload tests: We are the European Excellence Centre for IOT with a successful heritage of carrying out more than 50 IOT campaigns.

Case Study:

GALILEO Constellation In-Orbit Tests



# RHEA GROUP



Avenue Einstein 8 - 1300 Wavre | BE

T. 010 48 72 50

info@rheagroup.com

<http://www.rheagroup.com>



SPACE



DRONE



DEFENCE

RHEA Group is a privately-owned professional engineering and solutions company providing bespoke engineering solutions, system development and security services for critical infrastructures. Since its creation in 1992, RHEA has built a reputation as a trusted partner, developing tailored solutions that help drive organizational and cultural initiatives, leading to sustainable added value for its customers. Headquartered in Belgium, RHEA Group employs over 600 people and has offices in Belgium, UK, Czech Republic, Italy, France, Germany, Spain, Switzerland, the Netherlands, Luxembourg and Canada, and works at clients' premises throughout Europe and North America. RHEA is ISO 9001 and ISO 27001 certified.

For nearly 30 years our staff have been working in the space, security and system engineering sectors delivering the highest quality in secure design, development, roll-out, training, operations, and maintenance for business-critical systems.

One of the key areas of our space sector offering is providing secure and efficient satellite ground segment solutions, including increased levels of automation through our MOIS tool, cloud based and as-as-service solutions. Leading to a cheaper more agile and flexible solution that can be used in test, operations preparation, and real mission operations, simplifying over all the satellite ground segment and the mission operations.

Our security products and solutions provide clients with a holistic approach to cybersecurity. We can develop complete cyber resilient programmes, protect clients against cyber-attacks and deliver cyber-range capabilities for cyber-attack preparation, testing, training and disaster recovery planning.

Our engineering experts use a powerful design methodology for the early stages of projects that involve multiple disciplines, supported by our Concurrent Design Platform (Comet®) software. The concurrent design approach significantly reduces

both the cost and duration of feasibility studies and minimizes overall risk early in a project's lifecycle. RHEA extends on this by integrating security-by-design making sure (cyber) security requirements are considered from the early design stage.

Route de Fosses 50 - 6250 Presles | BE  
T. +32 (0)71 24 38 80 | F. +32 (0)71 39 47 87  
rovitech@rovitech.com  
<http://www.rovitech.com>



ROVI-TECH has 25 years of experience in the development of industrial vision control solutions and measuring instruments to propose automated conformity, metrology, appearance, shape, character reading and code control equipment, sorting and/or quality.

ROVI-TECH has the required skills thanks to a team of experts for industrial vision complemented by computer science, robotics, mechanics and electronics. We take charge of your project at the international level, from design to integration.

Expert in Industrial Vision. Our services include consulting, auditing, feasibility study in our optical laboratory, prototyping, integration of vision solutions on the production line or realization of autonomous special machines.

ROVI-TECH to master its developments which integrate many technics:

- 1D, 2D, 3D monochrome & color cameras, Stereo Vision, Laser Triangulation, Laser Telemetry, Infrared Thermography, X-Ray,
- Definition and integration of adapted lighting,
- Neural classification, artificial intelligence, Deep Learning, image processing (based on vectorization or thresholds, ...),
- With its know-how and the technologies of future industry 4.0, ROVI-TECH will follow you step by step to offer you the most adapted solutions in accordance with your needs.





Chaussée de Haecht – Haachtse steenweeg 1470 - 1130 Brussels | BE

T. +32 (0)2 729 55 11

[sales@sabca.be](mailto:sales@sabca.be)

<http://www.sabca.be>



AERO



SPACE



DRONE



DEFENCE

The Sabca Group conducts operations from the three Belgian regions (Brussels Capital Region, Charleroi in Wallonia, and Lumen in Flanders), as well as from Casablanca, Morocco. Today, Sabca benefits from a large palette of expertise, built over its 100 years of experience in designing, manufacturing, maintaining, and upgrading large and complex elements for aircraft and space launchers. Its customers and partners belong to the elite of the aerospace industry.

Sabca offers a full range of services to the civil, space and military aviation markets and recently expanded into the commercial Unmanned Autonomous Systems market as an integrator of aerospace-grade solutions for the industry. For more information: [www.sabca.com](http://www.sabca.com)

Sabca is a part of Blueberry, a unique industrial ecosystem in the Belgian aerospace industry which is owned by Sabena Aerospace (holding company) and by the Société Fédérale de Participations et d'Investissements (SFPI/FPIM).

Through its subsidiaries, Blueberry is active in the design, development and manufacture of aviation and aerospace equipment, offers maintenance services for aircraft and brings solutions to drive the sustainable development of the industry as a whole. In doing so, the group addresses its customers business needs from end-to-end.

The group has four sites in Belgium (Zaventem, Haren, Gosselies and Lumen), is active in more than 10 countries around the globe and has more than 1200 employees in Belgium and abroad and a cumulated turnover of 250M€. For more information: [www.blueberrygroup.be](http://www.blueberrygroup.be)



# SABENA AEROSPACE



Brussels Airport, building 31 - 1930 Zaventem | BE

T. +32 2 723 42 74 | F. +32 2 723 42 91

[mcc@sabena-aerospace.com](mailto:mcc@sabena-aerospace.com)

<http://www.sabena-aerospace.com>



AERO



DEFENCE

Sabena Aerospace is a leading independent and international aviation solutions provider for civil and military operators. Our century of experience enabled us to develop an internationally recognized expertise and savoir-faire as well as a responsive internal capability. Our mission is to facilitate and optimize our clients' business by offering highly qualitative, customized and efficient solutions.

## Sabena Aerospace Engineering supports its customers with 5 different types of services:

- **Line Maintenance** support of major airlines in Brussels, Antwerp, Luxembourg and a series of outstations on the African continent
- **Engineering & CAMO** support of major airlines through our centralized Engineering Service Center in Brussels
- **Component Repair Services** for a wide range of aircraft components: Nacelle, Flight controls, Composite, Wheels&Brakes, L.S.E. & Tubing
- **Flex Aviation Service Team** providing Cabin Maintenance, Aircraft Decoration, On-Site Manpower and AOG assistance to our customers
- **Defence & Government** activity supporting Belgium's C130 fleet with heavy maintenance and NATO's AWACS fleet with component repair



# SAFESKY

Avenue du Champ de la Bloquerie 42 - 1420 Braine-l'Alleud | BE

T. +32486965185

info@safesky.app

<https://www.safesky.app/>



AERO

## Make the Sky the safest place on Earth.

SafeSky is the anti-collision application for all pilots flying at low and medium altitudes.

In addition to sharing your position with other SafeSky pilots, you also get visibility of transponder traffics, such as ADS-B, OGN tracker, FLARM, FANET and many more.

Become an actor for more security in the sky today, and join the growing SafeSky community of 25 000 pilots in Europe!

# SAFRAN AERO BOOSTERS



Route de Liers 121 - 4041 Herstal | BE  
T. +32 (0)4 278 81 11 | F. +32 (0)4 278 52 07  
<http://www.safraan-aero-boosters.com>



AERO



SPACE

Safran Aero Boosters designs, develops and produces modules, equipment and test cells for aerospace engines. Thanks to its high-tech products, the company equips the Ariane launcher and most commercial aircraft engines in all thrust ranges. Based in Liège, Safran Aero Boosters has approximately 1,450 employees on an integrated 65,000 m<sup>2</sup> site.

## **BOOSTERS:**

### **Low-pressure compressors and front bearing support**

- Responsibility of low-pressure compressors for CF34, CFM56, GE90, GE9X, GENx, GEPassport, GP7200, LEAP and Silvercrest engines
- Technology for developing more environmentally-friendly engines: light-weight booster (BluM® and composites) and high-speed booster
- Partnerships with Safran Aircraft Engines, General Electric and Pratt & Whitney

## **OIL SYSTEMS:**

### **Lubrication units, oil tanks, heat exchangers, special valves**

- Responsibility of lubrication equipment for CF34, CFM56, GE90, GE Passport, LEAP, PW1000G (for MRJ, C-Series, E-jet), Silvercrest, TP400, SaM146 and helicopter engines
- A shift towards "more electric" aircraft and thermal management Maintenance, Repair and Overhaul for over 50 customers

## **TEST CELLS:**

### **Turnkey test cells, testing equipment, data acquisition and control systems**

- Responsibility of military and civil test cells from A to Z, modernization and adaptation of test cells for all types of engine (turbofan engines, turbojets, turboshaft and engine components)
- Shift towards smart cowlings and more environmentally-friendly test cells (studies to find solutions that cut fuel consumption and recover energy)
- 50 customers: engine manufacturers, maintenance centers and armed forces
- SPACE EQUIPMENT

## **SPACE EQUIPMENTS:**

### **Flow control valves for launcher engines and tanks**

- Responsibility of flow regulation valves for the Vulcain 2® and Vinci® engines and stages
- Shift towards electrically actuated valves and boost enhanced features
- Partner of Airbus Safran Launchers for Ariane 5 & 6



Avenue de l'Indépendance 37 - 4020 Liège | BE

T. +32 (0)497 52 89 64

[h.antoine@sagita.be](mailto:h.antoine@sagita.be)

<http://www.sagita.be>



AERO



DRONE

Sagita develops turbines and centrifugal compressor specifically designed to drive contrarotating helicopter rotors.

Aside we also develop and test VTOL drones and Urban Air Mobility solutions using the patented turbine driven rotor.

Aeronautics: we are presently studying a hybrid electric VTOL aircraft for the Urban Air Mobility burgeoning market.

Drones: We develop the S75 drone: this is a 75 kg MTOM VTOL UAV. The S75 prototype presently undergoes test and demo flights. The 15 kW engine and 25 l fuel tank provide autonomy for 6 hours. Payload 20 kg. Intended use: surveillance of extended areas, naval or terrestrial.

Engineering: Aerodynamic and structural design of centrifugal compressors and of contrarotating radial turbines. Design of coaxial helicopter rotors and control system.



# SCANWORLD - PART OF CONSTLLR



Rue des Chasseurs Ardennais 6 - 4031 Angleur | BE  
T. +32(0)4 361 81 11  
hello@scanworld.be  
<https://www.scanworld.be/>



SPACE

ScanWorld delivers products based on Earth Observation data to support regenerative agriculture and forestry worldwide.

In parallel, we are also developing an infrastructure to deliver affordable, hassle-free and easily accessible hyperspectral imagery and analytics.

This notably includes a constellation of hyperspectral satellites; the first launch being planned for mid-2024.

Hyperspectral data is a key tool to measure proteins, metabolizable energy, water, identify diseases, etc. – all of which are essential for the future of agriculture.

## Areas of Applications

Agriculture & Forestry: Drought or diseases alerts, life-cycle monitoring, ...

Environmental Monitoring: Water or land pollution, hazardous material detection, ...

Energy & Infrastructure: Leak detection, health monitoring, ...

Resources & Mining: Industrial footprint, minerals identification, ...

## Our timeline

TODAY: Database and aerial imagery Today Database of hyperspectral aerial imagery, and on-demand flights

2023 Proof of concept in orbit Bi-monthly revisit rate Satellites

2025 First batch of 4 satellites Weekly revisit rate

## About ConstellR

ConstellR will provide the world's most precise as well as cost-effective global temperature monitoring system from low earth orbit to support agricultural decision making in time. Our precise temperature product will enable efficient management of input resources, e.g., in watering while improving yields and making yield estimates more accurate and accessible earlier than ever before. The first satellites are expected to launch in 2023 with an early demonstrator offering first commercial imagery already in early 2022.

Chaussée de Nivelles 28-30 - 1420 Braine-l'Alleud | BE

T. +32 (0)2 389 09 60 | F. +32 (0)2 389 09 89

sales.be@secotools.com

<http://www.secotools.com/be>



AERO

Seco Tools has an established reputation as a leading manufacturer and supplier of carbide cutting tools and associated equipment.

Seco's range of products includes a complete program of tools and accessories for turning, milling, drilling and reaming and attachment systems of additional tools. With over 25,000 standard products, Seco is a leading provider of complete solutions for metalworking and machine tools.

The company headquarters are located in Fagersta in Sweden. Seco is present in over 50 countries worldwide, with 40 branches, distributors and channel partners.

For more information, visit the website  
[www.secotools.be](http://www.secotools.be)



# SENSY LOAD CELLS



Zoning Industriel de Jumet - Allée Centrale - 6040 Jumet | BE

T. +32 (0)71 25 82 00 | F. +32 (0)71 37 09 11

srs@sensy.com

<http://www.sensy.com/>



AERO



SPACE



DRONE



DEFENCE

Established in 1985, SENSY LOAD CELLS is a Belgian manufacturer of both standard and custom-made load cells, load pins, force and torque transducers. These sensors are intended for systems for force, torque and level measurement, load limitation and for all industrial sectors, including the most demanding ones, such as in industry, Oil & Gas and **Aerospace**.

We are used to working for the aerospace and space sectors. Here are some applications examples of our standard and custom-made force sensors:

- stabilizer propulsion;
- sensors for cylinders;
- fatigue simulations;
- multi-axis measurement of force and torque for wind-tunnel testing;
- dual instrumentation designed for turbulence;
- force and torque actuators measurement;
- testing embedded systems;
- etc.

One of our major achievements is to work for ESA (European Space Agency) and also for some helicopters, airplanes and UAV's manufacturers. Some of our load cells are incorporated in VEGA and ARIANE rockets.

SENSY's quality system is ISO 9001:2015 certified. Our procedures and processes are in accordance with the EN9100 quality standards. We are also ATEX, IECEx and CSA certified in order to produce and sell intrinsic safety transducers all over the world.



# SHUR-LOK INTERNATIONAL



A PCC COMPANY

Parc Industriel - 4800 Petit-Rechain | BE  
T. +32 (0)87 32 07 11 | F. +32 (0)87 32 07 12  
sales.sli@shur-lok.com  
<http://www.pccfasteners.com>



AERO



SPACE



DEFENCE

Shur-Lok International is a world leader in the design and manufacture of critical performance fasteners which have become industry standards for Aerospace civil and military applications.

Shur-Lok International has also strong expertise in producing hard metal machined parts for Aircraft engine and Helicopter components.

Shur-Lok International is EN 9100 & NADCAP certified and processes all aerospace materials, specifically high-alloyed steels, stainless steels, high-temperature-resistant steels, titanium or aluminium.

SL Fasteners are used in high vibration and load transfer applications to provide superior alignment, load transfer, resistance to wear and movement, and ease of assembly. Our key product lines include bearing locknuts, barrel nuts, expandable diameter fasteners, studs and inserts, lockwireless fittings, and sandwich panel inserts.

Shur-Lok serves its worldwide customers from two design and manufacturing centers: Shur-Lok Company operates a 75,000 sq. ft. facility in California and a 48,000 sq. ft. facility in Belgium.

Shur-Lok International is part of PCC Airframe – Engineered Products Division, Precision Castparts Corp. (PCC) a worldwide, diversified manufacturer of complex metal components and products. Precision Castparts Corp. is leader in structural investment castings, forged components, and airfoil castings for aircraft engines and industrial gas turbines. Airbus, Boeing, GE, Rolls-Royce, and many other leading manufacturers depend on us for critical airframe, engine, power generation, medical, and general industrial components.

With few exceptions, every aircraft in the sky flies with parts made by PCC. PCC is a wholly-owned subsidiary of Berkshire Hathaway Inc.



Rue des chasseurs Ardennais 8 - 4031 Angleur | BE

T. +32 (0)4 361 69 69 | F. +32 (0)4 361 69 80

didier.granville@siemens.com

<https://www.plm.automation.siemens.com/global/en/products/simcenter/>



AERO



SPACE



DEFENCE

The Walloon Establishment Unit of Siemens Industry Software NV called "Centre d'exploitation et de compétence Samtech", develops since 1986 the general-purpose Finite Element Analysis software Simcenter Samcef™, including its version embedded in Simcenter Nastran™, and the customizable collaborative engineering platform Simcenter Aerostructure dedicated to the certification of Aircraft Structures.

Siemens Industry Software provides a complete suite of engineering 3D simulation software for loads computation, topology optimization, structural sizing, thermo-mechanical stress analysis of structural components and non-linear structural dynamics analysis of whole machines, made of both metallic and composite materials. Rotating machines is a specialty of Samcef simulation software like aircraft engines, gas turbines, steam turbines, open rotors, tilt-rotors, helicopter rotors, ... Siemens Industry Software also delivers advanced simulation solutions for the modelling of space deployable and inflatable structures and finally for the simulation of manufacturing processes with the purpose of predicting structural parts distortion in additive and composite manufacturing.

The Samcef software technology has an unsurpassed reputation for its quality and reliability. It has been adopted by many major companies across all engineering disciplines as an integral part of their design process. It is an important technology contributor to the Siemens Industry 4.0 vision based on Digital Twins, from Product Design until Simulation in Service, going through all the steps of manufacturing.

## References and/or Certifications

Major Aerospace worldwide customers like AIRBUS, AIRBUS Defence&Space, AIRBUS Group Innovations, AIRBUS Helicopters, Leonardo, SAFRAN, SAFRAN Aero Boosters, SONACA, SABCA, AMOS, V2I, GDTECH, CENAERO, AIR Liquide, AVIC, CNES, COMAC, DGA, ESA, GTRE, JAXA, KARI, MBDA, Rolls Royce, Sagem Defence&Security, Turkish Aerospace Industries or Thales Alenia Space trust the expertise of Siemens Industry Software.



Hecq 29 - 7160 Chapelle-Lez-Herlaimont | BE

T. + 32 (0)476 40 11 72

john.pyrgies@gmail.com

<http://www.skyangels.eu>



DRONE



DEFENCE

SkyAngels is a Walloon "Young Innovative Company" incorporated in 2014. Its mission is the design, the development and the DO178C certification of "intelligent" avionics software embedded in autonomous drones supporting the critical missions of military, police and civil security forces.

### **SkyAngels current research themes are:**

- The design, the development and the DO178C certification of "intelligent" (i.e. based on artificial intelligence) embedded avionics software implementing critical functions (ex sense-and-avoid) for enabling the autonomy of Unmanned Aerial Vehicles used to support the critical missions of military, police and civil security forces. This research is led in the scope of a PhD thesis initiated at the Namur University, in collaboration with the Belgian Royal Military Academy and the "Centre d'Excellence Drone" of the French Air Force.
- The threat modelling of terrorist attack scenarios led with commercial micro-drones and the integration of mitigating technologies within systems aimed to detect, classify, track and neutralize, with electronic and kinetic means, a swarm of hostile drones. The research also includes the design of "intelligent" software controlling those Counter-UAVs systems.
- The cybersecurity measures protecting governmental UAVs from cyberattacks.
- The applications of UAVs for Search-And-Rescue and the transport of emergency medical equipment.
- The concept of "UAVs-carrier airship" (Zeppelin like) used for military missions.

Rue de l'Economie 13 - 4431 Loncin | BE  
T. +32 (0)4 264 41 21 | F. +32 (0)4 264 12 10  
info@sobelcomp.be  
<http://www.sobelcomp.be>



AERO



DRONE



DEFENCE

Sobelcomp is a Belgium industrial sub-contractor founded in 2006 who studies and produces parts made from composite materials for clients.

As a company active in the Aerospace and defence sectors it has committed to a high-quality approach and has had its quality management system certified according to standard AS/EN/JISQ 9100 (and ISO 9001).

Also convinced that innovation is the driving force behind its activity Sobelcomp has invested for many years in the development of its engineering office.

## The services we provide through our engineering office are

- Study and design of parts, mold and tooling
- Calculation by finite elements
- Qualification of processes and materials

## Through our workshop, parts are

- Manufactured using different processes like RTM, RTM Light, Infusion, Pre preg
- Assembled by gluing or riveting
- Painted in our painting booth

We are able to produce 10 to 5000 parts per year each weighing between 5 and 200 kg.

## Concerning quality

- We are able to do non-destructive testing (NDT). In fact we are EN4179 certified to do infrared testing also called thermography.
- We are also able to do dimensional inspection with our 3D Faro arm.

## Aviation activity

Safran Aero Booster: Sobelcomp designs the moulds and produces the air intake sleeves and the cowlings for plane engines. These are used when the engines are undergoing maintenance on test cells to simulate the airflow.

In order to satisfy Safran Aero Booster, Sobelcomp had to show inventiveness and competitiveness by offering technical solutions based on its expertise.

## Defence activity

FN Herstal: Sobelcomp has been studying a structural part from a helicopter. Thanks to its innovation, Sobelcomp was able to offer its client a part with a 40% mass gain.



Rue de Ransbeek 310 - 1120 Neder-Over-Hembeek | BE

T. + 32 (0)2 264 2111

[ludovic.odoni@solvay.com](mailto:ludovic.odoni@solvay.com)

<http://www.solvay.com>



AERO

Solvay is a multi-specialty chemical company, committed to developing chemistry that addresses key societal challenges. Its products and solutions are used in planes, cars, smart and medical devices, batteries, in mineral and oil extraction, among many other applications promoting sustainability. Its lightweighting materials enhance cleaner mobility, its formulations optimize the use of resources and its performance chemicals improve air and water quality.

## Cleaner mobility

Manufacturers have to comply with ever more stringent regulations on CO<sub>2</sub> and particulate emissions while meeting consumer demand for safer and more environmentally sustainable travel. Our solutions contribute to cleaner, safer and more energy-efficient modes of transportation. We produce lightweight materials for both the automotive and aerospace industries to help make vehicles and aircraft more fuel-efficient and cost-effective.

We provide products that improve powertrain efficiency through effective thermal control and protection against corrosion. In the field of electric vehicles, we contribute to developing batteries offering higher energy density and greater power. Our high-performance silica reduces the rolling resistance of tires, which helps cut CO<sub>2</sub> emissions, while we also produce rare earth materials that help reduce NOx emissions from diesel engines.



# SONACA GROUP



Route nationale 5 - 6041 Gosselies | BE  
T. +32 (0)71 25 51 11 | F. +32 (0)71 34 40 35  
sales@sonaca.com  
<http://www.sonaca.com>



AERO



SPACE



DRONE



DEFENCE

Sonaca Group is a top 10 Aerostructure player combining 2 strong companies: LMI Aerospace and Sonaca

Sonaca Group is an aerospace company active in aerostructure (Design & Build and Build to Print), services, innovation, space and defense. Sonaca Group has one-stop shops and integrated teams of design and industrial professionals who can provide responsive solutions tailored to customers' needs. Sonaca Group can offer the best price combination with the latest automation technologies, low cost country manufacturing facilities and worldwide engineering offices. Year after year, Sonaca Group is recognized by its customers as "best-in-class" for quality and delivery performance of reliable industrial solutions. Thanks to its global footprint, Sonaca Group is close to customers, accompanying them from early design stages to in-service support, focusing on reducing overall costs. Sonaca Group is founded on bringing together two strong companies: LMI Aerospace and Sonaca.



Rue des Chasseurs Ardennais 6 - LIEGE Science Park - 4031 Angleur | BE

T. +32 (0)4 361 81 11 | F. +32 (0)4 361 80 20

[sales@spacebel.be](mailto:sales@spacebel.be)

<https://www.spacebel.be>



SPACE

## REACHING INTO SPACE TOGETHER

Established since 1988, SPACEBEL is a Space systems and software engineering company that has grown in the Space market to become a trusted developer of advanced IT solutions and a related service provider. SPACEBEL is also in the international mix of small satellite system suppliers.

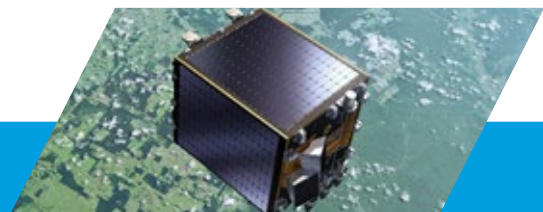
The company operates in the Space and Earth monitoring applications sectors, serving Space agencies, government departments, major aerospace companies, European institutions as well as the commercial market.

SPACEBEL is active in several domains including Earth observation, Space flight, science, telecoms, navigation, exploration, launchers, balloons and space situational awareness.

Our skills range from the design, development, integration, validation of IT systems for the Space industry over geospatial information systems to the mission definition and analysis of Earth observation mini satellites.

- SPACEBEL delivers on-board control and data handling software for satellites and space vehicles, satellite simulators, control and mission centres as well as EO Web services provisioning infrastructures. So far, SPACEBEL has contributed to the success of more than 40 Space missions aimed at better understanding the Earth and the Universe.
- SPACEBEL offers Earth observation services for forestry, water, industrial risks, atmosphere, mine exploitation and natural resources management and contributes to help decision makers worldwide in protecting and improving people's life sphere.
- SPACEBEL has the capacity to provide complete Earth observation solutions, including user requirements and system definition.

SPACEBEL offices are located in Belgium (Liège, Brussels), France (Toulouse) and Poland (N7Space - Warsaw).



Rue Capitaine Aviateur Jacquet, 44 - 5000 Namur | BE

[b.debroqueville@stemme.be](mailto:b.debroqueville@stemme.be)

<https://www.stemme.com/>



AERO



DRONE

Stemme Belgium is a new company based in the airfield of Namur.

Stemme Belgium is a subsidiary company of the German company Stemme AG owned since 20 years by Olivier de Spoelberch. Stemme AG represent more than 120 employees in Germany. Since more than 40 years Stemme imagine and build ultra performer gliders with retractable engine. The system of the S12 glider is totally unique with a retractable propeller in the front of the glider. The S12 is a glider capable to flight more than 2.400 kilometers in one day without engine.

Stemme Belgium is based in Wallonia to imagine with Sonaca and Sabena a drone capable to flight in the stratosphere to make some earth observation. This joint venture between those three companies is very ambitious. We expect to flight in the stratosphere at the end of 2020.



151 Rue des Ormes - 4800 Lambermont | BE

T. +32 (0)87 709 660

<http://www.taipro.be>



AERO



DRONE

Taipro Engineering stands for " Tailored microsystems improving your Product "

Since 2009, Taipro Engineering performs high added value electronic and microelectronic projects. Our mission is to help you in your projects from your idea to production.

### **Sensor & Instrumentation**

MEMS, Image sensor, IR sensor, Photodetector,...  
Multi sensors module, Smart sensors, Hybrid &  
Standard electronics, Components selection

Advantages : Miniaturization, Resistance to harsh  
environments, Unlimited creativity

#### LED Lighting

LED module design, Driver design , Schematic  
& PCB design, Use of bare dies, Components  
selection, Prototyping & production

Advantages: Miniaturization, Thermal management,  
Efficiency, Harsh environments, High or low power,  
Time to market

### **Internet of Things**

Electronic design, Components selection, Hybrid  
electronics, Prototyping & production

Advantages : Miniaturization, Energy saving, Harsh  
environments, Unlimited creativity, Time to market

# TECHNICAL AIRBORNE COMPONENTS



Rue des Alouettes 141 - 4041 Milmort | BE  
T. +32 (0)4 289 97 50 | F. +32 (0)4 264 96 70  
sales@tecairco.be  
<http://www.tecairco.be>



AERO



SPACE



DRONE



DEFENCE

Technical Airborne Components Industries (TAC), established in 1981, designs and manufactures rods and struts for the aerospace industry. TAC is recognized worldwide as the reference source for high quality, custom engineered control, structural and system rods.

Its expertise in design, development and manufacturing of metallic & composite struts and rods is complemented by related machined parts (e.g. cranks, brackets), special tubular links, telescopic rods, torque shafts and special rod ends.

As one of the leading suppliers in this industry TAC today supplies to its customers all over the world products for all segments in aerospace: commercial aircraft, regional and business jet, helicopter, military and space programs.

Whether your needs are for specific design, innovative solutions, built to print or standard items TAC will provide a tailor-made answer for all requirements of aeronautical struts & rods.

180 employees are working at TAC offering the complete scope of competence from developing solutions to performing qualification testing and hence rapid prototyping and production.

## References and/or Certifications

- Certification EN 9100
- NADCAP certification NDT
- ISO 14 001



Avenue des Artisans, 36 - 7822 Ghislenghien | BE

T. +32 (0)68 84 24 59

info@technochim.eu

<http://www.technochim.eu>



AERO

## Technochim, specialist in metal surface treatments.

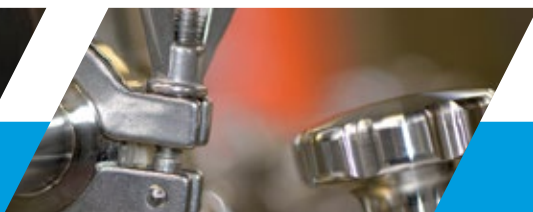
Technochim is a company specialised in mechanical, chemical and electro-chemical treatments of metal surfaces.

These treatments are carried out on metals in order to modify their surface properties to increase their resistance to corrosion or for decorative purposes. For carbon steel, it may also constitute a base to improve adhesion of subsequent treatments such as painting, etc...

Among the different treatments at which Technochim excels, we mention in particular:

- chemical and electrochemical polishing of titanium alloy parts printed by additive manufacturing: improvement of surface finish by reducing roughness ;
- chemical cleaning of aluminum alloy parts printed by additive manufacturing: removal of residual powders (free or sintered) in internal channels by dynamic circulation in a 2-steps process ;
- degreasing, pickling, passivation, electro-polishing, mechanical polishing, shot blasting and de-roughing of stainless steel;
- descaling, rust removal and de-silting of HVAC equipment, in which carbon steel, brass, copper, etc. is found... ;
- pickling and anodising of titanium;
- application of nanostructure ceramic coatings on metals which improve functional qualities ;
- chemical machining of parts made by additive manufacturing (aluminium, titanium).

These operations are performed either on site at its customers, or in its own workshops located in the industrial zone of Ghislenghien in Belgium not far from the French border.



Rue de la Lys, 21 - 7500 Tournai | BE

T. +32 (0)69 25 73 11

technord@technord.com

<http://www.technord.com>



AERO

## FLEXIBLE SOLUTIONS, STRONG EXPERTISE

Technord is a global systems integrator specialised in electrical engineering combining different disciplines from high-voltage electricity to industrial IT systems and MES/MoM, including new technologies for Industry 4.0, to provide customers with guaranteed optimum productivity and flexibility for their industrial processes.

### Technology Certifications

Our teams are certified at the highest levels by the market leaders in technology solutions developed for the manufacturing industry.

#### SIEMENS

- PCS 7 Applications
- SCADA
- Industrial Strength Networks
- Factory Automation
- Process Control System
- Industrial Communications
- SIVACON Basse Tension S8
- Solution Partner Automation in Pharmaceutical Industry
- Solution Partner Automation in Glass Industry
- Simatic IT eBR
- Siemens Industry Software – Solution Partner: Channel Sales
- MindSphere

#### WONDERWARE – AVEVA Endorsed System Integrator

- Labels Xcellence Opérationnelle (EMI, MES)
- Application Server 2017-2020
- Historian Server
- Historian Client
- MES Operations 2014R2/2017R2
- Workflow Management
- MES Performance
- InTouch for System Platform 2020

- Communication Driver

#### IBM

- Registered Business Partner
- IoT Watson Cloud Platform

#### SCHNEIDER ELECTRIC

- Schneider Electric AllEcoStruxure AVEVA System Platform Certified in Alliance Program

#### ROCKWELL AUTOMATION

- Recognized System Integrator
- ThinManager Certified Integrator
- Logo Rockwell Automation

#### ABB

- ABB Authorized Value Provider

#### MESA

- Manufacturing Enterprise Solutions Association, certification dedicated to M.E.S.

#### PILZ

- Pilz System Partner

#### PANORAMA

- Panorama Certified Integrator

#### VERSIONDOG

- Versiondog by Novotek

#### INDUCTIVE AUTOMATION

- Ignition Certified Integrator

# TELESPAZIO BELGIUM



Rue devant les Hêtres 2 - 6890 Transinne | BE

T. +32 (0)61 23 00 04 | F. +32 (0)61 23 02 69

info.be@telespazio.com

<https://www.telespazio.be>



SPACE



DRONE



DEFENCE

Telespazio Belgium, a subsidiary of Telespazio (a joint venture between Leonardo, 67%, and Thales, 33%), provides cutting-edge services and applications, engineering services and support in the field of space programs and high technology projects.

As part of one of the world's leading operators in the field of satellite solutions and services, Telespazio Belgium is at the forefront of providing advanced and innovative satellite services in navigation, earth observation and space operations

Formerly operating under the name Vitrociset Belgium, the company, located in Transinne, in the Galaxia park, has been present in Belgium for 40 years, initially supporting the operations of the ESA Redu Ground Station, and now mainly focused on the Integrated Logistic Support of the Galileo ground segment remote sites and the provision of high quality engineering support to agencies and manufacturing companies in the space domain.

The company employs more than 150 people of 24 different nationalities with an average age of 39. In 2020, it achieved a turnover of over 44 million euros and a net profit of 2.7 million euros.

The integration of Vitrociset's competences within the Telespazio group offers great opportunities for Belgium to position itself as one of the European leaders in research and development in the space sector.

It is important to underline how the company, by its nature and its international contacts, can also represent a bridge between local interests and the international dimension, thus contributing to the maximum achievement of Belgium's ambitions.

Telespazio is involved in a large number of projects aimed at improving space services in a wide range

of domains: advanced services for agriculture, maritime traffic and disaster management, navigation and telecommunications services, cybersecurity, etc. These services aim to improve the use of satellites and make the most of the data they produce in order to be more efficient.

Telespazio Belgium offers high-tech solutions in these areas and provides engineering and advanced logistics services to the systems that implement them.

The monitoring of the operations of the Galileo stations around the world from the Galileo Integrated Logistic Support Centre in Transinne is a perfect example of the important role we play on an international level. So, while Telespazio Belgium has its head in space, it has its feet firmly planted on the ground, working for a future of sustainability and innovation.

# THALES ALENIA SPACE IN BELGIUM



Rue Chapelle Beaussart 101 - 6032 Mont-sur-Marchienne | BE

T. +32 (0)71 44 22 11 | F. +32 (0) 71 44 22 00

info.belgium@thalesaleniaspace.com

<http://www.thalesaleniaspace.com>



SPACE

Thales Alenia Space - a joint venture between Thales (67%) and Leonardo (33%) - is present in Belgium with three sites in Charleroi, Hasselt and Leuven. Thales Alenia Space is an expert in several high-technology fields. The company is the Belgian front-runner in space electronics applications for satellites and launchers, a world leader in power conditioning and distribution for satellites, a key supplier of electronics for European launchers and will be the first automated factory of space PhotoVoltaic Assemblies (PVA) in Europe.

## Satellites are our core business...

The Belgian entity of Thales Alenia Space is a world leader in satellite power conditioning and distribution. The product range covers needs from observation microsatellites up to the large geo-stationary satellites for telecom applications, with power requirements from 250 W up to 20 kW. The company also enjoys a position at the forefront of flight electronics products: avionics, power supplies for plasmic propulsion thrusters, power supplies for travelling wave tubes, DC/DC converters and other dedicated power products.

With the construction of a one-of-a-kind center of excellence in automated manufacturing, Thales Alenia Space confirms its position at the forefront of digital innovation and its ability to accompany its partners through the transformational evolution of the space industry.

## On board all European launchers

Thales Alenia Space in Belgium is the N°1 supplier of onboard electronics for Ariane 5, designing and manufacturing more than 50% of the electronic systems on each launcher. These systems perform a variety of functions, including onboard electricity distribution, management of the thrust-vectoring nozzles that keep the launcher on trajectory, spatial positioning, separation of the launcher stages and the satellite's protective nose fairing during flight, and safeguard system. The Thales Alenia Space team in Belgium will also be supplying the safeguard system for Ariane 6. We also produce the safeguard system for Soyuz launched from French Guiana. We are also taking part in preparing the Vega launcher.



Rue en Bois 63 - 4040 Herstal | BE  
T. +32 2 391 22 11  
yves.looverie@be.thalesgroup.com  
<http://www.thalesgroup.com>



AERO



DEFENCE

Thales Belgium has served worldwide and the Belgian defense, security, safety and transportation markets for more than 50 years. Today the Group employs more than 300 people at 4 sites across Belgium, in Brussels, Herstal, Hasselt and Tubize. Thales has developed close ties with Belgian industry over many years, and has worked hand in hand with universities and research institutes to develop innovative products for its customers.

## Added value

- Supplier of tactical communication systems & sensors for Air, Land and Naval sectors
- Partner of NATO's program to upgrade its AWACS Airborne Warning and Control System
- Unique company able of offering and mastering the whole air-to-ground rocket system
- Mastering following technologies: propulsion, pyrotechnics, mechanics, electronics, ballistics, guidance
- Unique Cyberlab platform to prepare companies for the most dangerous cyber-attacks

## Range of products

- 2.75"/70 mm air-to-ground rockets systems for aircraft & helicopters
- Tactical communication systems and a variety of onboard sensors for all platforms
- Modernising the communications systems as a Tier 1 supplier to aircraft manufacturer as with our Multifunction Airborne Communication System (MACS)
- Cryptographic & cyber security solution to protect on-board data
- Digitalisation of aircraft operations based on Electronic Flight Bag (EFB) solutions

## Main references

- Customers & partners: Nato / Napma, Belgian Defense, Luxembourg Army, Boeing, Raytheon, Northrop Grumman, Lockheed Martin, Thales Avionics, Thales Communications & Services, Astrid, Airbus, Stib Brussels, Eurocontrol
- OEM: Airbus Helicopters, Hindustan Aeronautics, Leonardo Helicopters, BAE Systems, Denel, H3 Defense
- Rocket systems have been adopted by 55 countries and 70 armies worldwide

## Certification

Thales Belgium is certified according to ISO 9001:2015 and qualified supplier by various helicopter and aircraft OEM's

Avenue Pré Aily, 25 - 4031 Angleur | BE  
T. +32 (0)4 287 10 70 | F. +32 (0)4 287 10 71  
info@v2i.be  
<http://www.v2i.be>



AERO



SPACE



DRONE



DEFENCE

## Full service in vibrations: coupling numerical simulation and experimental testing Development of tailor-made acquisition and monitoring solutions

V2i's know-how is based on researches of international repute of the University of Liège in the field of structural dynamics and is continuously improved and updated by massive **R&D** programs.

As an engineering company specialized in mechanical vibrations, our skills cover:

- **Numerical simulation** of structures and fatigue studies to predict their behaviour under environmental vibrations,
- **Testing** of equipment under severe environment and data **correlation with** results from simulation,
- A deep knowledge of **fatigue** phenomena to predict lifetime,
- All associated services: instrumentation, tooling design and verification, specification definition and analysis,
- Expertise in **rotordynamics** and vibrations of structures to detect and diagnose faulty behaviors,
- **Vibration** and other physical quantities **measurement, data collection and analysis onsite** or in laboratories, high-sampling frequency signal analysis, advanced data processing in real-time and database operation.

In addition to these services, V2i acquired a strong experience in the development of **tailor-made acquisition and monitoring systems** for test rigs and zero-defect manufacturing applications in Aerospace and other fields of industry.

### Certifications

- ISO 9001:2008
- Safran / Rolls-Royce
- Certified LabView Developers / NI Alliance Partner

### References

Safran - Rolls-Royce - Thales - Ariane Group - Sabca - Sonaca - FN Herstal - CMI





Rue Fond Cattelain, 2 - 1435 Mont-Saint-Guibert | BE  
vdessard@protonmail.com  
<http://www.vddtech.com/>



AERO

## Highly Integrated Isolated Power Circuits

Integrated circuit optimized for sustainable power electronic applications & Seamless and safe interfacing of low-voltage digital controls with high-voltage power parts

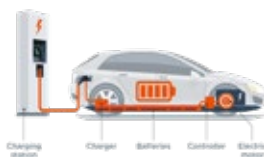
VDDTECH was founded in 2017 with the mission of developing innovative integrated circuits to meet the challenges posed by the rapid growth of power electronics. Whether in terms of power consumption reduction, miniaturisation of components or the ability to operate in harsh environments, our solutions address the main constraints posed by the energy transition.

Our current galvanically isolated integrated circuits can sustain extreme voltage transient events (above 200V/ns) and present the lowest coupling capacitor of the market. They are particularly suitable for interfacing GaN transistor switches with ON time as low as 10ns.

Our chips provide long-term isolation of 600V (5kV surges) and remain functional above 150°C (300F).

With our solution, you will reduce the cost per power density of your power electronic modules, contributing to a greener world.

- Digital Isolators - 2 channels
- Analog Isolators - Error Amplifier
- Isolated Supply - Transformer Driver
- Isolated Intelligent Power Switch - GaN
- EVK (Evaluation Kit) - Isolated Buck Converter



Chaussée de Liège 221 - 5100 Namur | BE  
T. +32 (0)81 30 24 01 | F. +32 (0)81 30 41 67  
info@walphot.com  
<http://www.walphot.com>



SPACE

## USER-DRIVEN AND DETAILED GEO-SPATIAL PRODUCTS AND SERVICES

In support to local and regional authorities as well as private customers, WALPHOT develops remote sensing services in Belgium, Luxembourg and within European projects since more than 45 years. WALPHOT is the specialist of the whole chain of geographic data processing from the acquisition of information (spaceborne or airborne) to the supply of tailor-made solutions in mapping, geodatabase and spatial modelling.

### Geo-information and mapping solutions

WALPHOT supports customers in their spatial management needs. Pro-actively and in response to regional and national tenders, to European directives and policies and to International regulations, WALPHOT provides 3D mapping solutions to various planning authorities. Our applications cover a wide range of domains including border management, land planning, industrial emergency, railway network management, large-scale mapping, heat loss studies or regional airfields maintenance plans.

### Customized responses for spatial management

Thanks to the expertise in precise aerial photography and very high resolution imagery, WALPHOT produces high quality 2D/3D customized geographical products. Involved in several European Commission and European Space Agency projects, the company offers products and services using aerial and/or satellite imagery (optical and radar) as input data for the Copernicus program. Contact us to set up your own geo-spatial solution.



Rue d'Abhooz 25 - 4040 Herstal | BE

T. +32 (0)4 367 07 92

info@xris.eu

<http://www.xris.eu>



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DEFENCE

## X-RIS ACTIVITIES:

X-RIS's number one priority is to develop portable and stationary digital radiology solutions that are very user-friendly and intuitive for industrial, laboratory and security applications without skimping at any time on the image quality.

The company is located at Liège in Wallonia (Belgium), an area that benefits from a worldwide reputation for its competences in industrial x-ray.

X-RIS was founded in 2010 and since then has developed its own range of X-ray generators, detectors and its software platform: Maestro. X-RIS also designs and manufactures its own mechanical and electro-mechanical solutions for Dxbbox cabinets or for special solutions.

Company philosophy is to provide user-friendly and efficient solutions that fit at best the application needs. To achieve these goals, X-RIS relies on the complementary competences of its young, dynamic and highly skilled team.

The company counts today 23 collaborators and is particularly technologically-oriented: more than the two thirds of the team are graduated engineers. We also collaborate with several universities and R&D centers in Belgium and abroad. X-RIS principally works with the Security and NDT department and collaborated with FBI, Safran, Airbus, Pratt & Withney, Dassault, Total, and more.





# Universities & University Colleges





Rue des Professeurs Jeneer et Brachet 12 CP 300 - 6041 Gosselies | BE  
T. +32 (0)2 650 20 37  
kevin.deplus@ulb.be  
<http://www.ulb.be>

## **Aero-Thermo-Mechanics (ATM)** **Pr. Patrick Hendrick**

The ULB-ATM department is active fluid mechanics in propulsion systems for aircraft, rotorcraft, rockets and UAVs (rotor type and fixed wing type) at experimental level and CFD. Simulation of flow for reentry vehicles and alternative fuels such as hydrogen for aircraft and UAVs is also studied.

ATM has develop a strong expertise in the field of gas turbine engine lubrication systems and their specific two-phase flow (EU FP7, H2020 and CS projects) and works very closely with top industry players in Europe, offering them unique test facilities for these systems. Unique hybrid rocket engines (2 kN thrust) test facilities are also available.

Skywin Projects: INHEX, SARAH-LE, 4EQUIP

## **Materials Engineering, Characterization, Synthesis and Recycling (4MAT)** **Pr. Stephane Godet**

Research activities of 4MAT cover the entire life-cycle of inorganic materials from their synthesis and processing to the end of life. A special focus is given on optimizing the micro-structures of bulk material and thin films by studying the relationship between process parameters and material properties.

Skywin Projects: AERO+ and FASAMA (limits of Ti alloys in additive manufacturing for the aeronautical industry)

## **Structural and Material Computational mechanics (BATir-SMC)** **Pr. Thierry Jacques Massart**

The BATir-SMC research group develops advanced computational modelling methods for mechanical and coupled problems and works with the European Industry in several top EU research initiative.

The field of application covers the modelling of complex composite materials (3D woven, NCFs, Zpinned), the study of microstructural plasticity processes in multi-phase metallic materials, the modelling of lightweight materials (foams, 3D printed lattices), as well as structural health monitoring.

## **Bio, Electro and Mechanical System (BEAMS-Embedded Electronics)** **Pr. Frederic Robert**

The BEAMS - Embedded electronics research group activities focus on four major axes

- Multi-processor System-on-Chips (MPSoC) with real-time operating systems (RTOS)
- Better algorithm/architecture adequation using system-level design flows
- 3D-chips design and optimization
- Control of power electronics devices

Applications ranges from telecommunications to industrial technologies, platform, operating systems and monitoring systems.

## **Bio, Electro and Mechanical System (BEAMS-Mechatronics)** **Pr. Christophe Colette**

The BEAMS-Mechatronics team develop (conception and experimental validation) instruments and robust strategies for the active control of structural vibration of equipment such as

- large space telescopes
- Interferometric inertial sensors
- gravitational wave detectors
- Multi-degree-of-freedom nanopositioning systems

## **Department of System Analysis and Control Engineering (SAAS)**

**Pr. Michel Kinnaert / Pr. Emanuele Garronne**

The SAAS laboratory research team is mainly active in two types of automation and predictive control systems.

- Model-based condition monitoring real time systems for electro-mechanical (aircraft lubrication, satellites power, Li-Ion battery,...) and industrial application (monitoring and predictive maintenance).
- Drone control and mission planning for innovative operations under constraints (sliding, manipulating, towed drones,...).

## **OPERA – Wireless Communications**

**Pr. Philippe De Doncker / Pr. Francois Horlin**

The team at OPERA-WC develops new signal processing solutions for emerging digital communications systems, aiming especially at the system integration and terminal implementation. The research covers satellites (eg. digital compensation for analog front-end impairments), defense (SWS project) and IOT / drones applications.

## **Microgravity Research Centre**

**Pr. Franck Dubois**

MRC main research activities concern the physics of fluids and interfaces such as evaporation, condensation, thermos-diffusion and aerosols physics. The second area of expertise of the lab is optical diagnostics, digital holographic microscopy, image processing and non-destructive testing using optical metrology.

The team has access parabolic flight facilities and has been involved in numerous ESA and NASA projects, studies and experiments performed under microgravity conditions.

## **Transfers, Interfaces and Processes (TIPs)**

**Pr. Pierre Colinet**

The TIPs team research new theoretical, numerical and experimental methods allowing to understand and predict the behavior of multiphase systems, and to design or optimize industrial processes. Some of these research activities involve the development of experiments in microgravity (sounding rockets, Space Station) under ESA or EU projects.

## **Laboratory of Neurophysiology & Movement Biomechanics (LNMB)**

**Pr. Guy Cheron**

The LNMB is involved in the fields of Human Space Science, BCI and basic Neuroscience. The main study areas are

- EEG and evoked potential studies during virtual navigation in the ISS
- Neural Networks & Deep Learning on brain derived signals and movement
- Brain to Brain interaction in social contexts

## **IGEAT-Geospatial Analysis (ANAGEO)**

**Pr. Eléonore WOLFF**

The ANAGEO group at IGEAT-ULB Earth has developed a high level of expertise in extracting information from and interpreting high-resolution remote sensing data (aerial photos and satellite images).

The actual research is mainly oriented on mapping and monitoring human structures (land cover, land use, urban growth, refugee camps,...), demographic evolution, ecological corridors, geographical risks and vulnerability,...

## **Quantum Chemistry and Photophysics (CQP)**

**Pr. Pierre-François Coheur**

The CQP field of research is gaseous atoms and molecules, isolated or in natural atmospheres. Combining ab initio calculations, high resolution spectroscopy and atmospheric remote sensing, CQP has develop pioneering research in infrared remote sensing and contributes to Earth observation satellite missions (eg. IASI (CNES) mission) and current/future space programs (eg. Venus Express).

Interface Entreprise – Université de Liège Avenue Pré Aily 4 - 4031 Liège

T. +32 (4) 349 85 13

[o.gillieaux@uliege.be](mailto:o.gillieaux@uliege.be)

<https://www.uliege.be>

The University of Liège has a long tradition in aerospace shared between five departments and one research center: Department of Aerospace and Mechanical Engineering (A&M), Urban & Environmental Engineering (UEE), Electrical Engineering and Computer Science (EEI Montefiore), Chemical Engineering: Space sciences, Technologies and Astrophysics Research unit (STAR) and Centre Spatial de Liège (CSL).

## A&M Department

The **Aeroelasticity and Experimental Aerodynamics Research Group** conducts cutting edge research in the areas of experimental and theoretical aeroelasticity and aerodynamics, with particular applications aircraft, rotorcraft, drones and wind turbines. The research group collaborates closely with the ULiège's large multidisciplinary subsonic wind tunnel.

The **Computational & Multiscale Mechanics of Material** focuses on the development of multi-scale numerical methods for complex non-linear engineered materials, such as composites, foamed materials, and MEMS.

The **Metallic Materials Science Unit** studies the manufacturing processes, properties and microstructural characterization of metallic materials. The group has three laboratories, one for microstructure studies, one for the determination of thermal properties and one for damage studies.

The **Computer Aided Geometric Design** group is active in research in CAD/CAM/CAE and the link with novel numerical simulation techniques. Aeronautical applications include X-FEM simulations of composite structures (structural analysis or manufacturing techniques)

The **Non-Linear Computational Mechanics** group specializes in tailored software development and numerical simulation of problems involving large deformations, complex contact situations and multi-physics couplings. The group's finite element software METAFOR can deal with complex material behaviors including damage and fracture propagation for both metallic and composite materials.

The **Mechanical Vibrations Lab** focuses on the theoretical and experimental dynamic analysis of jet engine mechanical components. The main topics on which the lab has developed a strong research

expertise are the following: structural design of aircraft engines, turbomachinery rotordynamics, vibration testing and modal analysis.

The **Multibody & Mechatronic Systems Lab** develops computer-aided tools for the mechanical and control design of deployable space structures, large telescopes, robots, machine tools, wind turbines, vehicle suspensions and powertrains. The team is also involved in the Laboratory of Human Motion Analysis of ULiège.

The **Multiphysics & Turbulent Flow Computation** group is specialized in computations of turbulent flows and complex multiphysics phenomena covering a broad range of applications in aerospace and other fields, ranging from turbulent combustion in scramjet engines to polymer drag reduction in turbulent incompressible flows.

The **Precision Mechatronics Laboratory** (PML) is developing instrumentation and strategies for actively measuring and controlling the vibrations of structures. Over the years, it has developed internationally recognized expertise in high precision control of large instruments dedicated to experimental physics, including gravitational wave detectors, particle colliders, segmented ground and space telescopes, satellites and light sources.

The **Space Structures and Systems Laboratory** research activities include spacecraft structures, nonlinear vibrations, astrodynamics and low-energy spacecraft transfer trajectories, ray tracing methodologies for thermal radiation, system identification, structural health monitoring and vibration mitigation.

The **Turbomachinery and Propulsion Lab** carries out research in turbomachinery design and aerospace propulsion using numerical methods and high-performance computing. The lab also runs a number of dedicated test benches.



## Urban & Environmental Engineering (UEE)

The **Materials and Structures Mechanics laboratory** offers possibilities for aeronautical firms to carry out mechanical tests on different types of aircraft components, such as rods, lubrication groups, bearing supports, flap actuator parts and composite or metallic engine components.

**Materials and Solid Mechanics team** focuses on materials (steel, Ti, Al...), their characterization, forming processes and behavior modelling. Development and identification of constitutive thermo-mechanical-metallurgical laws rely on macroscopic phenomenological or multi-scale approaches and crystal plasticity models. Implemented within FEM codes, these laws and post processors predict stress, strain, microstructure, rupture during forming processes, static or cyclic loading. Fatigue, creep, corrosion and additive manufacturing are the current topics. Since 1984, MSM team has developed its own non-linear finite element code Lagamine.

## EEI-Montefiore Department

**Applied and Computational Electromagnetics (ACE)** group: Electromagnetic Compatibility (EMC) tests according to MIL STD 461 (D/E/F) and RTCA DO 160 in reverberating and semi-anechoic chambers. Modeling of electromagnetic systems from statics and quasistatics to wave scattering and optics.

**INTELSIG** specializes in the acquisition, processing, analysis, and exploitation of a variety of signals and images for a variety of applications. It routinely deals with audio, sound spatialization, biomedical signals, radar signals and images, stereoscopic 3D images, lidar images, video analysis, motion analysis, etc.

The **Microsys laboratory** carries out exploratory R&D in the fields of microsystems and energy harvesting or scavenging systems. Microsys is involved in the design and integration of ultra-low power wireless sensor microsystems for structural health monitoring and environment sensing in harsh conditions.

## Chemical Engineering

CRYO - Cryotechnology: The **CRYO group** has specialized in solving dedicated problems on components or equipment of cryogenic engines for the European spacecraft "Ariane". To achieve this, specific test benches are operated, with the essential characteristic of an extremely complete instrumentation managed by a high-performance and flexible data acquisition system.

## Space sciences, Technologies and Astrophysics Research unit (STAR)

More than 100 scientists of STAR unit at ULiège conduct cutting-edge research focussing on:

- **Planetology:** detection, characterization and direct imaging of exoplanets, study of planets and small bodies of the Solar System, composition and dynamics of Earth's atmosphere;
- **Stellar astrophysics:** observational characterization and modelling of stars and their evolution, interaction of stars with their surroundings, high-energy emission;
- **Cosmology,** dark energy, extragalactic astrophysics & astro-particles: quasars, gravitational lensing, gravitational waves, large-scale structures, dark matter, cosmic rays;
- Instrumentation: **Earth observation** and astronomy payloads and satellites, ground-based instruments, custom-designed instruments dedicated to special applications.

STAR researchers are involved in the development of space missions and ground-based instruments, as well as in the gathering and modelling of data obtained using the largest international observatories and with STAR-owned telescopes (like TRAPPIST). STAR includes a wide interdisciplinary expertise in the field of instrumentation, through the research division of the Centre Spatial de Liège, which links the mission definition to the scientific interpretation of data.

1, Place de l'Université - B-1348 Louvain-la-Neuve | BE

T. +32 (0)10 47 21 11 - F +32 (0)10 47 29 99

LTTO@uclouvain.be

<https://uclouvain.be>

With more than 3000 researchers and an annual research budget of 225 M€ (European, national and regional programs), the research is a true driving force behind UCLouvain's activities. The Knowledge and technology transfer office of UCLouvain can advise you to find the most appropriate contact especially for expertise that does not appear hereafter.

## **Materials**

### **Composites, hybrids and architected materials**

Structural / Bio-sourced / Nano-composites, Hybrid materials, Functional properties, Coatings, Mechanical behaviour, Tribology, Thermosets & thermoplastics - Thomas PARDOEN, Christian BAILLY

### **Polymers and functional surfaces**

Polymer morphology and processing, Smart coatings - Alain JONAS

### **Nanomechanics and nanophysics**

Materials characterisation, Atomic force microscopies - Bernard NYSTEN

### **Materials manufacturing**

Metal Processing, Metal additive manufacturing, Friction stir welding, Friction stir processing, Plasticity & Damage - Aude SIMAR, Thomas PARDOEN, Pascal JACQUES

## **Sciences and engineering**

Centre for Space Radiations

Planets, Inside, Rotation, Internal geophysics, Space Radiation - Véronique DEHANT

### **Cosmology, Universe and Relativity at Louvain**

Cosmology, Gravitation, Universe Sciences - Christophe RINGEVAL

### **Neural control of movement**

Dexterous manipulation, Motor control, Microgravity, Parabolic flights - Philippe LEFEVRE, Jean-Louis THONNARD

### **Mathematical Engineering**

Optimization and Control, Graph theory, Collaborative / Multi-agent / Decentralized systems - Raphaël JUNGERS, Julien HENDRICKX

## **Mechanics**

## **Mechatronic, Electrical Energy, and Dynamic Systems**

Optimal design and control of electrical actuators and electrical drives, Multibody and Multiphysics Modeling, ROBOTRAN software - Bruno DEHEZ, Paul FISETTE

### **Biomechanics**

Experimental biomechanics, microCT imaging, 4DmicroCT, Mechanical testing, Contrast-enhanced microCT - Greet KERCKHOFS

### **Civil and environmental engineering**

Drone-Based Additive Manufacturing, Robonomerization of the construction, Geophysical & environmental fluid dynamics, UAV-based photogrammetry - Pierre LATTEUR, Sandra SOARES FRAZAO

### **Fluid mechanics**

Multi-phase flows, Reacting flows, Propulsion, Numerical modeling, HPC - Miltiadis PAPAEXANDRIS

### **Turbulence and Vortical Flows, Aerodynamics and Control**

Numerical Methods, Scale Resolving Simulations, Wake Flows, Wind Turbines, Collaborative Control of Distributed Systems, HPC - Philippe CHATELAIN, Grégoire WINCKELMANS

### **Earth observation and climate**

### **Environmental Sciences, Environmetrics and Geomatics**

Optical and SAR Remote Sensing Algorithms Development, Agriculture and Forest Monitoring, UAV systems, GPR - Pierre DEFURNY, Sébastien LAMBOT, Quentin PONETTE

### **Geography, Land use change monitoring**

Remote sensing of agriculture, Forest cover and other land use / land cover changes, for understanding drivers of land-use change - Patrick MEYFROIDT

## **Earth system science**

Tipping points, Optimal decision, Anthropocene trajectories - Michel CRUCIFIX

## **Information & Communication Technologies**

### **Communication Systems and Networks**

Signal Processing for Communications, Estimation (synchronization) and Detection, Positioning & localization, Radar - Luc VANDENDORPE

### **Electronic Circuits and Systems**

Radiation effects and hardening, Design & Characterization, CMOS, Sensors, Ultra-low power microsystems - Denis FLANDRE, David BOL, Laurent FRANCIS

### **Microwave Engineering and Applied Electromagnetism**

Satellite communications, Antenna arrays, Meta-materials/surfaces, Radar, Computational electromagnetics - Danielle VANHOENACKER, Christophe CRAEYE, Claude OESTGES

### **Secured systems engineering**

Software vulnerability detection, Malware detection, Blockchain, Formal methods, Software/model based testing - Axel LEGAY

### **Crypto group**

Cryptography and information security, Embedded systems, Efficient and secure implementations - François-Xavier STANDAERT, Olivier PEREIRA, François KOEUNE

### **Networked systems security**

Security of communication networks and networked applications, IoT, Anomaly and intrusion detection - Ramin SADRE

### **Cloud and Large Scale computing**

Distributed systems, Systems security, Dependability, Blockchains - Etienne RIVIERE

### **IP Networking**

Lab Internet Protocols, Multipath TCP, Multipath QUIC - Olivier BONAVENTURE

### **Louvain Verification Lab**

Functional Requirements Coverage, Autonomous

space-bound applications - Charles PECHEUR

## **Technological platforms**

### **Cyclotron Resources**

Centre Radiation testing, Electronics, Cyclotron, ESA external test facilities - Marc LOISELET, Nancy POSTIAU

### **Lasers & Optics**

Laser, Optical characterization, Spectrometry, Spectroscopy - Clément LAUZIN

### **Micro- and Nano-Fabrication Platform**

Electronics, Micro- and nano-fabrication, 1000 m<sup>2</sup> cleanroom - Christian RENAUX, Sorin MELINTE, Sébastien FANIEL

### **Surface Characterisation**

Surface characterisation, ToF-SIMS, XPS - Arnaud DELCORTE, Claude POLEUNIS, Pierre ELOY

### **Wallonia Electronics and Communications Measurements**

Electrical and electromagnetic characterization (DC - 130 GHz), Micro- and nanotechnology, Anechoic chamber - Pascal SIMON, Valeriya KILCHYTSKA

### **Microscopic Characterization of functional and nanostructured materials**

Optical, electron and scanning probe microscopies, FTIR and Raman spectroscopies - Luc PIRAUX, Delphine MAGNIN

### **Structural Molecular Analysis**

RMN, Mass spectroscopy, XRD, Chromatography - Yaroslav FILINCHUK, Koen ROBEYNS

### **Processing and Characterisation of Inorganic materials**

Processing of metallic materials, Shaping and forming, Microstructure characterisation and analysis, (micro) Mechanical testing - Marc SINNAEVE, Pascal JACQUES

### **Human sciences**

Institute for Interdisciplinary Research in Legal Sciences

Tech law, ethics and anthropology, Privacy, Intellectual property - Christophe LAZARO, Alain STROWEL

Place du Parc, 20 - 7000 Mons | BE

T. +32 (0)65 37 47 92

severine.coppee@umons.ac.be

<http://www.umons.ac.be>

The University of Mons deploys its scientific expertise in areas like materials sciences and engineering, information technology and computer science, biosciences... Most of the research at UMONS is organized in 10 institutes which cover: New Arts and Media Technologies (NUMEDIART), Biosciences (BIOSCIENCES), Information Technologies and Informatics (INFORTECH), Language Sciences and Engineering (LANGUAGE), Materials Sciences and Engineering (MATERIALS), Risk Management Sciences (RISKS), Complex Systems (COMPLEXYS), Energy (ENERGY), Health Sciences and Technologies (HEALTH), Human and Organizational Research and Development (HUMANORG).

The university maintains many fruitful exchanges with its Multitel, Materia Nova and INISMa research centres and with the spin-offs and startups which gravitate around it.

UMONS is active in many scientific disciplines related to Aeronautics and Space research development: Materials and production technology, Fluids mechanics and thermal engineering, Reliability and maintenance, Surface treatment and last but not least, Information and Communication Technologies.

## **Materials and production technology**

UMONS develops an expertise in the field of manufacturing processes. Specific research projects address design of closed mold composite parts for aircrafts or simulation of high-speed machining.

Other topics to be mentioned are the design of piezoelectric motors to provide a gain in weight and control in space applications, the gained experience in additive manufacturing methods such as EBM, the development of reinforced high temperature thermoplastic and thermoset resins, and the design of power electronic motor drives.

UMONS has some projects related to the manufacturing of composites parts for aircraft applications by a specific process, Resin Transfer Molding, which consists in injecting some resin in a closed mold filled by a fibrous reinforcement.

Keywords: Resin Transfer Molding, piezoelectric actuators, Virtual Manufacturing, composite materials, Additive Manufacturing, thermoplastic and thermoset resins, dc-dc converter, wide bandgap components, organization of production units and operational maintenance.

## **Fluids mechanics and thermal engineering**

UMONS research efforts concentrate on the study and simulation of any type of flow. Research is mainly carried out with advanced CFD (Computer Fluid Dynamics) software. Numerical simulation methods for radiant transfer in absorbing media are also developed in UMONS as well as combustion gases special properties modeling.

In particular: Modeling, development and simulation in Computation Fluid Dynamics (CFD) for aeronautical, turbomachinery and multiphysical applications. The main development themes concern fluid-structure interactions, advanced preconditioning methods and turbulent transition modeling. Applied studies are focused on design and optimization for flow problems in facilities or engines (optimization of fans, compressors and turbines, design of separator and cyclone chambers...)

Keywords: Design and optimization of fan and turbo-generators blades, modeling and numerical simulation of high temperature systems, turbo-alternators cooling.

## **Reliability and maintenance**

UMONS research activities aim at developing techniques to improve the safety of mechanical equipment and optimize their maintenance strategies. UMONS has significant expertise in structure dynamics, rotating machines, and vibratory solicitations.

Past and current research activities include: experimental modal analysis and finite element model updating, identification of input forces by inverse methods, vibration testing and

finite element modeling of electronic boards embarked on spatial vehicles, equivalence criteria between vibration tests, analysis and modeling of pyroshocks, prediction of ground vibrations induced by railway vehicles.

**Keywords:** Diagnosis of vibration problems, estimation of the residual lifetime of equipment, optimization of maintenance policies, predictive maintenance of electromechanical devices, pyro-technical shocks on electronic spatial devices, maintenance 4.0, health management.

### **Surface treatment**

Materials performances depend on the properties of their surface and on the interactions of the latter with the surrounding media. Modifying a surface or introducing surface layers contribute to optimizing materials properties or make new properties appear (self-healing, corrosion resistance, wetting, absorption, friction and wear, optics, viscosity, etc.). UMONS research activities focus on this.

UMONS is also specialized in the study of surfaces and interfaces: with the structural, electronic, and optical properties (OLEDs and organic solar cells), thin film deposit (plasma technology) and surface analysis (depth profiling and elemental composition).

**Keywords:** Plasma surface treatments, thin organic coating, surface functionalization, corrosion resistance, surface and interface characterization, chemical sensors, electrochemistry of functional coatings, texturing surface.

### **Information and Communication Technologies**

With the recent deployment of drones and the growing need to process and interact with large multimedia databases, mastering and developing innovative data processing techniques has become a crucial expertise in many areas including aerospace and aeronautics. UMONS has leading-edge expertise in image and speech processing (also in noisy environments) and human-machine interfaces. It has also developed specific skills in positioning

and indoor/outdoor geolocalization (in airports) and eye-tracking in virtual spaces (VR) which could be applied to space conditions.

UMONS also benefits from a large group of experts filling the entire data chain, including:

- optical-fiber-based sensors, low-power sensors, GPS receivers for nanosats, embedded signal processing and edge computing ;
- selection of the appropriate wire and wireless transmission technologies and standards, low-power transmission, indoor/outdoor geolocalization and transmission in adverse conditions ;
- cloud storage, parallel and distributed computing ;
- data mining, artificial intelligence (AI) and Edge AI.

The Fablab Mons, which benefits from a specific focus on Internet of Things (IoT) brings the research results and experts in this field closer to entrepreneurs and industries to create innovative solutions.

**Keywords:** Artificial intelligence, speech and image processing, AR/VR, (edge) AI, indoor geolocalisation, IoT, GPS, HPC, telecommunications.

Research Administration Office / Technology Transfer Office

Rue de Bruxelles 61 | 5000 Namur | BE

T. +32 (0)81 72 57 08

jerome.mallarge@unamur.be

[www.unamur.be/recherche](http://www.unamur.be/recherche)

Recently updated, the University of Namur research landscape includes 11 transdisciplinary research institutes. Research activities lean on state-of-the-art scientific equipments, technical knowhow and sharp expertise, grouped in 8 technology platforms (<http://platforms.unamur.be/>). Researchers develop inter- and transdisciplinary projects in fundamental as well as in applied research. They are accessible to the scientific community as well as to industries. The University of Namur maintains the appropriate balance between fundamental and applied research.

## **Namur Digital Institute - NaDI**

Jean-Marie Jacquet/Yves Pouillet

nadi@unamur.be

+32(0)81 72 50 01

<https://nadi.unamur.be>

Grouping five research centers from various disciplines, ranging from sociology, philosophy, law, management to computer science, the Namur Digital Research Institute offers a unique multidisciplinary expertise to all areas of informatics, its applications and its social impact.

The conviction that led to the creation of NaDI is the need to cross disciplinary perspectives on the ubiquitous digital technology that changes the lives and behaviours of our administrations, companies and individual citizens. NaDI currently brings together about 150 researchers and works on many research projects related to the digital technology, both at the Regional, Belgian and European levels.

Among the main expertises offered by NaDI are formal methods, man-machine interfaces, requirement engineering, modeling techniques to reason and design complex software systems, testing, quality insurance, software product lines, databases, big data, machine

learning and more generally artificial intelligence, security, privacy, ethics by design, technology assessment and legal reasoning.

## **Namur Institute for Complex Systems - naXys**

Anne-Sophie LIBERT

naxys@unamur.be

+32 (0)81 72 49 46

[www.naxys.be](http://www.naxys.be)

From the space debris to the whole universe, in the solar and extrasolar systems, naXys, the Namur Institute for Complex Systems is renowned for its numerical and analytical approaches of space dynamics. The naXys institute has a strong research component in orbital motions, space geodesy and physical cosmology. The researchers are partners of several space missions (BepiColombo, Euclid, Juice, Cheops) where their theoretical approaches are appreciated in the mission analysis and preparation phases; they contribute to the modeling of the dynamical problems and observables, as well as to the building and refining of suitable numerical software and tools (frequency analysis, efficient algorithms, statistical forecasts, chaos detection, stability criteria).

In many industrial and research projects, one attempts to improve a system by modifying its decision variables subject to constraints: this is optimization. naXys focuses on the numerical solution of such problems that is the effective calculation of the best values for the decision variables. It focuses in particular on nonconvex and large scale instances. Both theoretical questions, such as design and convergence properties of the algorithms, and associated software issues are studied.

## **Research Center in Physics of Matter and Radiation - PMR**

Laurent HOUSIAU  
laurent.houssiau@unamur.be  
+32 (0)81 72 45 12  
<http://pmr.unamur.be/en>

The 5 research themes of the Department are interconnected, environment, for instance, being linked to progress in materials, but also to developments in laser spectroscopy, theoretical calculations and life sciences. All 5 themes deal with the interaction between matter and radiation.

The PMR shows a great expertise in the development of innovative materials. The new materials generally present surfaces or interfaces which give them original properties. The PMR has developed a great expertise in the field of all types of thin film deposition by different physic-chemical techniques. The new materials are very often nanomaterials, such as nanoparticles ( $\text{TiO}_2$ , ...), functionalized carbon nanotubes, nanocomposites, bioinspired materials, etc. A long experience in digital modelling for solid physics and the access to powerful computers enables to explain, even predict, numerous experimental observations. The development of all these new materials is regularly done in partnership with Walloon industries.

The PMR develops also very high resolution spectrometers based on laser diodes and  $\text{CO}_2$  lasers to study gas phases in atmosphere. It is also active in remote spectroscopy of planetary atmosphere or the simulation of nuclear reactions produced in stars.

## **Laboratory of Chemistry and Electrochemistry of Surfaces - CES**

Zineb MEKHALIF  
zineb.mekhalif@unamur.be  
+32(0)81 72 52 30  
<https://www.unamur.be/sciences/chimie/ces>

The CES research focuses on the design of surface and interface materials and their fabrication by chemical processes, in particular electrochemistry, self-assembly and soft chemistry. These surface materials can be thin or ultra-thin organic and / or inorganic film assemblies on metal substrates, metal oxides, and polymeric films. The team's research fits naturally into the general theme of structured surface materials considering micrometric and / or nanometric scales. The studies are carried out with the aim of maximizing the performances (desired properties, durability, reliability, cost and ecological constraints), the chemical selectivity of the compounds to the targets (surfaces, polymer matrices, etc.) and the control of structure at the molecular level.

The EMMA research pole focuses on the relation between mechanical devices and their environment (vibrations, acoustics, ageing, air quality, sensing) as well as on the performance, stability and technology of mobility platforms in the air, sea, and land domains whether manned or unmanned.

## Environmental Mechanics and Mobility Applications

The EMMA research pole focuses on the relation between mechanical devices and their environment (vibrations, acoustics, ageing, air quality, sensing) as well as on the performance, stability and technology of mobility platforms in the air, sea, and land domains whether manned or unmanned.

### Research units

#### Research Unit Fluid Dynamics

POC: Maj. Bart Janssens

The Research Unit Fluid Dynamics is concerned with the numerical and experimental investigation of flow problems. We treat a myriad of topics, such as the dispersion of particles, external and internal aerodynamics and the propagation of acoustic waves. The scope and objectives of the studies can range from the application of existing models and measurement techniques to the development and implementation of custom-built models. This expertise will often serve to support work in the other research units.

#### Research Unit Structures and Materials

POC: LtCol. Dr. Kristof Harri

This research unit primarily deals with the mechanical loading of materials and structures in a general context and more specifically with the vibrational behavior of structures and systems: the dynamic reaction and the endurance of structures and systems, vibration control and simulation and fatigue monitoring. To study these topics, an electrodynamic shaker with a maximum capacity of 18 kN is used, which can be fitted into a climatic chamber. Failure analysis of structures in service is a major activity and service offered to the Defense Materials Resources Directorate. Another important activity consists of the study of the static and dynamic mechanical behavior of metallic materials at high strain rate and different

temperatures above and below room temperature.

#### Research Unit Mobility & Propulsion

POC: Maj. Benoit Marinus

The research unit Mobility & Propulsion focuses on the performance and stability of mobile platforms. Its members conduct active research in the air domain around propellers (Low-noise Design of Propellers, Tailored High-Altitude propeller), as well as various expert assessments: land vehicles stability and aerodynamics, and ship stability. Unmanned systems are of course a center of interest. This unit maintains a close link with the Applied Vehicle Technology panel of the NATO Science & Technology Organization.

#### Research Unit Robotics & Autonomous Systems

POC: Geert De Cubber

The research unit Robotics & Autonomous Systems focuses on two research domains. On one hand, we aim to enhance the good use of unmanned ground, aerial and marine systems for tough applications by studying the human factors and by developing novel perception, collaborative control, Artificial Intelligence and validation methodologies. On the other hand, we tackle the cyber-physical risks related to these systems by developing novel countermeasures. The lab conducts research in varied domains, ranging from very fundamental aspects to the development of prototype products.

### Laboratories

#### Dynamics of Mechanical Structures (LDMS)

POC: Maj. Kristof Harri

This laboratory supports especially the research cell: ageing and vibrations. The laboratory is able to perform vibration testing (combined with temperature testing) in order to simulate the environmental conditions that act on a product or



on structures. LDMS is accredited by the Belgian Government. The main piece of the laboratory is an electrodynamic shaker with a maximum capacity of 18 kN, which is able to work vertically as well as horizontally (by means of a slip table). To combine the vibration tests with temperature tests, a climatic chamber of approximately 1 m<sup>3</sup> can be fitted to the shaker.

### Materials

POC: Luc Rabet

The Materials Lab is equipped with state of the art lab instruments for determining the static and dynamic mechanical behavior of materials (tensile machines of 50, 100 and 300 kN, a torsion machine up to 5 kNm, a fatigue testing machine, an impact testing machine, Split Hopkinson Pressure Bars with a robot for high and low temperature tests.

For further materials characterization and also to conduct failure analysis, the lab is equipped with metallographic preparation tools, a spark excitation OES spectrometer, several light optical microscopes and an environmental scanning electron microscope with EDX spectrometer and an Electron Back Scatter Diffraction device.

### Fluids Dynamics laboratory

POC: Maj. Janssens en Maj. Marinus

The main experimental facilities of the fluids dynamics laboratory are

A 60x60cm low-turbulence wind tunnel (up to 40m/s);

A 40x40cm windtunnel (up to 30m/s);

A Particle Image Velocimetry system, one Laser-Doppler Anemometer, two Hot-Wire Anemometers, two Aerodynamic Balances.

### Robotics & Autonomous Systems

POC: Geert De Cubber

The Robotics & Autonomous Systems laboratory supports the related research and academic

activities and provides expertise towards Belgian Defence units and designated partners.

It is essentially equipped with

- Rotary wing Unmanned Aircraft Systems  
A series of rotary wing drones are available. The larger ones are used to support research activities in the field of 3D perception, search & rescue and humanitarian demining. The smaller ones are used to support research on human factors and for student projects.
- Fixed wing Unmanned Aircraft System  
One fixed wing drone, type TALON, is available. It is used to support research on rapid 3D aerial perception and mapping.
- Unmanned Ground Vehicles  
Several unmanned ground vehicles are available. The larger ones are used to support research activities in the field of 3D perception, artificial intelligence, search & rescue and humanitarian demining. The smaller ones are used to support research on heterogeneous multi-agent control & collaboration strategies and for student projects.

### Facilities

#### Computing cluster

A High-Performance Computing cluster with 904 cores, the associated scheduler and licensed software for various applications (Matlab, Mathematica, Labview, Julia, Tecplot, Ansys suite, Siemens StarCCM+, 3DS Simulia PowerFlow suite, Autodesk Inventor, FEKO...) and in-house codes (PropNOISEBB, ShipSTAB...) is available to conduct the necessary simulations.

#### Deep Learning Computing Infrastructure

In order to support the research activities in the domain of artificial intelligence for robotic agents, a dedicated deep learning computing infrastructure is available.

Chaussée de Fleurus, 179 - 6040 Gosselies | BE

T. +32 (0) 71/53 17 52

[info.tec.char@condorcet.be](mailto:info.tec.char@condorcet.be)

<http://www.condorcet.be>

The Provincial High School Condorcet offers about fifty courses (bachelor's and masters).

Condorcet High School train graduates in Aero-technics.

Applied research and community services are important activities in the high school. These businesses, in close contact with professional circles, contribute to the scientific quality of the teaching provided and the influence of the high school in society.

# HAUTE ECOLE DE LA PROVINCE DE LIÈGE



Quai des Carmes, 45 - 4101 Jemeppe-sur-Meuse | BE

T. +3242795520

[hepl@provincedeliege.be](mailto:hepl@provincedeliege.be)

<http://www.provincedeliege.be/hauteecole>

## Welcome to the Higher Education Institution of the Province of Liège !

The Higher Education Institution of the Province of Liège awards a wide range of Master and Bachelor Degrees in many subjects.

Whatever the field of study, our Institution offers trainings combining theoretical and practical aspects as it allows students to carry out field placements and meet the professionals.

From their very first year of studies, students are confronted with the real and professional world and are provided with efficient tools to do so.

Though it remains a « school within the city », our Institution is fully involved in the Bologna Process and aims to open up to the whole of Europe. It has been collaborating, for years now, with other European HEI's and has developed fruitful mobility programmes for students.

Proud to be known as a welcoming institution, the Higher Education Institution of the Province of Liège is fully integrated in the new European Higher Education Area.



Rue Saint-Donat, 130 - 5002 Namur | BE

T. +32 63 58 89 40

ingenieur.virton@henallux.be

<http://www.henallux.be>

La Haute École de Namur-Liège-Luxembourg (HENALLUX) forme des ingénieurs dans les domaines de l'électromécanique en son campus de l'École d'Ingénieurs de Pierrard-Virton.

Les ingénieurs possèdent des connaissances scientifiques, techniques et éthiques solides qui leur permettent de:

- proposer des solutions adéquates et innovantes à des problèmes ouverts ;
- concevoir de nouveaux produits et procédures répondant aux besoins actuels ;
- utiliser des technologies de pointe dans le domaine de la robotique, du machine-learning, de l'intelligence artificielle, de la conception numérique, du BIM, du développement durable... ;
- faire face à la transition énergétique, au numérique universel ;
- construire une ingénierie durable avec une technologie responsable ;
- développer une démarche réflexive globale, collaborative et sociétale.

Le centre de recherche de l'École d'Ingénieurs de Pierrard-Virton propose un large éventail de Formations Continues, Recherches Appliquées et Services à la Société (FoRS).

Parmi cet ensemble de savoir-faire, le centre de recherche FoRS a tout particulièrement développé ses compétences dans les disciplines faisant partie de: la modélisation, l'automatique, la mécanique, la robotique, la productique, l'énergétique, l'analyse du cycle de vie (ACV), l'informatique, l'internet des objets, l'intelligence des données, le machine-learning et la (cyber) sécurité.

La cellule FoRS et les étudiants de l'École d'Ingénieurs de Pierrard-Virton participent à des projets de recherche en partenariat avec des entreprises et des universités locales et internationales dans différents cadres:

- au stade exploratoire (essais, calculs...);
- en faisabilité technique (prototypages...);
- en faisabilité logicielle (applications web et/ou mobiles...);
- au développement de nouveaux produits, procédés ou services.



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# Research Centers





Avenue Gouverneur Cornez 4 - 7000 Mons | BE

T. +32 (0)65 40 34 34 | F. +32 (0)65 40 34 60

info@bcrc.be

<http://www.bcrc.be>

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BCRC, the Belgian Ceramic Research Center, has a proven expertise in the field of technical ceramics and metal-ceramic composites.

In order to provide state of the art support to the industry, our experts rely on 2 technological platforms. The sintering platform proposes several densification techniques (SPS, Gas Pressure Sintering, HIP, HP...) to address all kind of ceramics oxides, nitrides, borides, carbides... The second platform gathers original rapid manufacturing technologies: selective laser melting, laser cladding, inkjet printing, laser and hybrid milling.



Rue des Frères Wright 29 - 6041 Gosselies | BE

T. +32 (0)71 91 09 30 | F. +32 (0)71 91 09 31

info@cenaero.be

<http://www.cenaero.be>



AERO



SPACE



DEFENCE

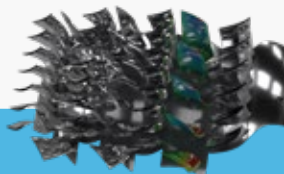
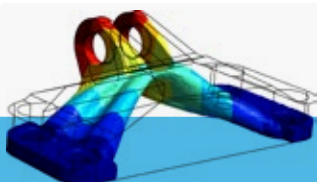
Cenaero is a private non-profit applied research center and provides to companies involved in a technology innovation process numerical simulation methods and tools to invent and design more competitive products. Internationally recognized, in particular through its research partnership with Safran, Cenaero is mainly active in the fields of aeronautical design, spacecrafts, manufacturing processes, and buildings and smart cities.

Cenaero provides expertise and engineering services for high performance composites, optimization and uncertainty quantification, multidisciplinary topology optimization, metallic manufacturing processes modeling, high resolution computational fluid dynamics, hypersonic flows and ablative materials, thermo-fluid processes and systems modeling, turbomachinery design, and high performance computing.

Cenaero also provides software through its massively parallel multi-physics platform Argo, its manufacturing process simulation and crack propagation platform Morfeo and its design space exploration and optimization platform Minamo.

Cenaero operates a high performance computing infrastructure (14,000 computing cores, tier1.cenaero.be/en) for fundamental, applied and industrial research. The center operates also a laboratory for prototyping, manufacturing and non-destructive testing of composite structures. The facility includes an oven, an injection piston, a RTM press, a 5-axis CNC machining center as well as the possibility to perform 3D scans with a laser arm and ultrasonic inspection.

Cenaero is certified against the EN 9100:2018 and ISO 9001:2015 standards.



rue du travail, 5 - 4460 Grâce-Hollogne | BE

T. +32 (0)4 296 82 00

[g-h@centexbel.be](mailto:g-h@centexbel.be)

<https://www.centexbel.be>



AERO

Centexbel is the accredited research center and scientific and technical center of the Belgian textile industry.

## Equipment

State-of-the-art lab equipment ISO 17025 accredited labs, specialized in the evaluation of the mechanical, physical, chemical, microbiological properties and burning behaviour of textiles

## Functional Thermoplastic Textiles

Formulation of (bio)polymers, polymer blends and recyclates with functional additives compatibilisation recycled polymers and polymer blends further processing including fibre-reinforced composites and 3D printing (additive manufacturing) multiple thermoplastic textile developments for new markets

## Textile Functionalisation & Surface Modification

Material development for optimised textile properties matching performance and legislative requirements optimising sustainable textile processing: UV-LED curing, hotmelt, plasma technology biobased additives creating energy harvesting and storing (bio)textiles exploring market opportunities

## Health, Safety & Security

Hygiene and barrier functions of medical textiles advanced protection and comfort for enhanced safety equipment biocompatible materials for medical applications

## Plastics Characterisation, Processing & Recycling

Material characterisation: identification of properties and processability industrial valorisation of biopolymers eco-friendly functionalisation polymer recycling and compatibilisation

Aéropole Avenue Jean Mermoz 28 - 6041 Charleroi | BE

T. +32 (0)71 15 93 62 | F. +32 (0)71 15 93 63

info@cetic.be

<http://www.cetic.be>

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The Centre of Excellence in Information and Communication Technologies (CETIC) helps companies to enhance software-based solutions and to integrate ICT innovations into their products, processes and services. CETIC continually develops its expertise through collaborative research projects involving regional and European actors.

CETIC provides expertise in three complementary axes: software engineering, ICT technologies and embedded systems.

**CETIC can support the Aeronautics sector with methods and tools**

- for developing high-quality IT solutions;
- for Model Driven software engineering;
- to enhance software reliability, safety or security;
- for compliance with international standards, where software or embedded systems development life-cycle are impacted.



Rue de Liroux, 9 - 5030 Gembloux | BE

T. +32 (0)81 87 41 61

[v.planchon@cra.wallonie.be](mailto:v.planchon@cra.wallonie.be)

<http://www.cra.wallonie.be>



SPACE



DRONE

Founded in 1872, the Walloon Agricultural Research Centre (CRA-W) is a Public Research Organization (PRO) offering a multidisciplinary scientific expertise in the fields of the agriculture and the agrofood industry

The Agriculture and Natural Environment Department and the Production and Sectors Department cover various activities:

- Technico-economic research on GNSS-based systems and TIC (busCAN, ISOBUS) for agricultural machinery (navigation aids, auto-guidance, field operations) to reduce inputs (pesticides, fertilizers, energy) while increasing worker's comfort.
- Applications of the Earth Observation to the crop management at field and regional levels (biomass assessment and environmental indicators), models and Decision Support Systems (e.g. crop nitrogen status) using temporal, multi-sensors information and assimilation techniques.
- Earth Observation services for crop growth monitoring and crop damage assessment Systems for crop yield estimations and natural risk management.

# CENTRE DE RESSOURCES DU CYCLOTRON

Chemin du cyclotron, 2 - 1348 Louvain-la-Neuve | BE

T. +32 (0)10 47 29 98

Carine.Baras@uclouvain.be

<https://www.uclouvain.be/en/research-institutes/irmp/crc>



SPACE

## Tests of electronic devices

CYCLONE, the cyclotron of Louvain-la-Neuve is able to accelerate different types of ions which may be used for the characterization of electronic components. Several beam lines are used for these tests : Heavy Ion Facility (HIF), Light Ion Facility (LIF), Neutron Irradiation Facility (NIF). A Cobalt60 source is also proposed for Gamma Irradiation (GIF)

The beam time planning is defined every six months for the heavy and light ions. If you want to reserve a period, please send us the beam request form on our website. For other types of beams, please contact us.

### **Beam parameters for Heavy ion Facility (HIF):**

The beam flux is variable between a few particles/(sec.cm<sup>2</sup>) and 1.5E4 particles/(sec.cm<sup>2</sup>). The beam flux can be modified from the user station, this is done with injection grids (for a constant attenuation factor) or by inflector bias variations (for intermediates values). The homogeneity is  $\pm 10\%$  on a 25 mm diameter.

### **Light Ion Facility (LIF)**

Available energies @ LIF Different available energies have been calculated using SRIM code taking the different beam line items into account (beam diffusion foil, pressure window, air and transmission chamber). With a combination of 5 blocs, 17 different energies are possible at the DUT position

For the 10MeV beam (produced with 5 degradors from a 65MeV primary beam), the FWHM is 5 MeV. Flux For beam flux, the health physics department sets the maximal limit to 2E8 part/s.cm<sup>2</sup>. Lower beam flux can be reached, down to a few thousand part/s.cm<sup>2</sup>. Higher beam flux can also be available on special request. Homogeneity A  $\pm 10\%$  homogeneity has been measured over 80mm in the horizontal direction and over 80mm in the vertical direction

Avenue du Bois Saint-Jean 21/B27 quartier Polytech 4 - 4000 Liège | BE

T. +32 (0)4 254 62 11

info@crmgroup.be

<http://www.crmgroup.be>



AERO



SPACE

**CRM Group is an R&D center with a high level of expertise in metal industry, surface treatment, innovative design, hybrid, additive manufacturing ...**

CRM Group is an R&D organization active in the field of metal and steel production with the mission to develop new processes, products and applications. CRM was funded in 1948 to become the collective research Centre for the Steel and Non-Ferrous Metal Industries with laboratories and pilot facilities located at Liège and Gent. CRM Group employs 265 employees and researchers.

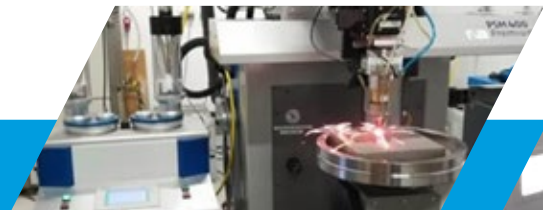
At CRM Group, the activities are centred on the production, transformation, coating and use of metallic materials. We offer R&D and technology solutions focusing on the development of innovative processes and products that create value for our industrial partners (42 members in 2018).

CRM is involved in several projects for AEROSPACE industry.

As concerns ESA projects, CRM is running three activities in the field of additive manufacturing (AM). The first of them is focused on the surface processing of parts made by AM. the second focuses on primary structures made by AM ;the third is dedicated to the development of New Aluminium alloys .

Furthermore, CRM has developed for ESA face change materials heat storage devices devoted to electronic thermal stability.

CRM is developing an extensive expertise in the field of HYBRID ADDITIVE MANUFACTURING for aerospace/aeronautic applications.





Avenue Pré-Aily - 4031 Angleur | BE

T. +3243824600

[csl@ulg.ac.be](mailto:csl@ulg.ac.be)

<http://www.csl.uliege.be>



SPACE

Created by the ULiège, the *Centre spatial de Liège* is a research center dedicated to space instrumentation including environmental test facilities and high level laboratories. It works for the European Space Agency (ESA), for the space industry and for regional firms.

CSL activities are organized in 3 programs:

- Tests: characterization and qualification of space hardware in severe environment.
- Space Systems: definition, design, integration, ground and flight calibration of scientific payloads under the authority of Space Agencies (ESA, NASA, JAXA...).
- Technology: research & development support in the following fields: Optical Design & Metrology, Mechanical & Thermal

## Signal Processing

CSL activities on radar imagery processing have resulted in the creation of the "Space Environment and Remote Sensing Group" which has acquired an international reputation in the field of SAR data processing.

## Electronics

The lab has a state of the art expertise in micro-controllers, digital electronics, analog circuits, radiation resistance, ITAR, etc. The team has the ability to join those expertises in order to design, integrate and validate global electronic systems for the space payloads.

## Surface Engineering

Our lab mastered surface treatments based on deposit coatings, ion beam figuring, reactive plasma etching, surface micro texturing and related metrology.

## Lasers & NDT

The competences of the group are centered on laser metrology system developments. Typical

systems developed are a high resolution holographic camera for non-destructive testing and full-field deformation metrology, laser distance-meter, ...

The group extends its expertise to other techniques: shearography, thermography, laser ultrasounds.

## Optical design & Metrology

The Optical design and metrology lab covers different activities: Development of optical ground support equipment, new metrology tools, flight metrology instrumentation, and support to industry in metrology problems.

## Mechanics & Thermics

Amongst the wide spectrum of our competences, we want to highlight: Cryogenics, space mechanisms for optical instruments, solar concentration, thermal control.

## Test facilities

The CSL performs various qualifications on space instruments or equipments by submitting them to environmental space conditions. The specific CSL assets in the test laboratory are: Hyperclean environment, tailored thermal environment from cryogenics (4°K) to hot cases (160°C), optical oriented design and calibration expertise.

## Quality

The lab is especially becoming a reference in organic contamination analyses, performed to verify that the stringent contamination and cleanliness specifications applied to spacecraft materials and associated equipment are met.



AERO



SPACE



DRONE

The Scientific Institute for Public Services (ISSEP) is a Public Research Organisation carrying in-situ measurement of environmental data since 1990.

ISSEP has a legacy of over 100 years of research and expertise in environmental monitoring in Wallonia. It is the worthy successor to the Mining Institute (1902-47), the National Institute of Coal Industries (INICHar-1947-67), and the National Institute of Extraction Industries (INUEX-1967-90). The Institute supports administrations and private companies in risk assessment and environmental metrology, with networks for air, waters, soil, waste, sediments, and ionizing radiations.

By characterising the environment through regulatory, normative and technical observations as well as comparing data, ISSEP supports the regional and local authorities in making the right decisions when it comes to environmental policies. ISSEP is also distinguishable for its benchmark laboratory, the only one in its field in Wallonia. ISSEP provides all those involved in the public and private sectors with an independent, transparent, and impartial public service.

Since 2016, a new unit integrates in-situ and Earth Observation data in environmental decision making. Current studies within the Remote Sensing and Geodata Unit focus on land cover/use monitoring, change detection, risk assessment and geodata integration. Earth Observation data processed include satellite, aerial and RPAS data. The unit participates to international project in Europe and Africa. Finally, ISSEP is a member of the Copernicus Relays Wallonia and organizes, with the Spatial Cluster Skywin, the Earth Observation Working Group (GTEO) gathering numerous institutions from the Walloon EO ecosystem.





Avenue Nicolas Copernic 3 - 7000 Mons | BE

T. + 32 (0)65 55 49 02

info@materianova.be

<http://www.materianova.be>



AERO



SPACE



DEFENCE

Materia Nova, R&D center located in Mons, Belgium, is recognized as a technological accelerator of sustainable innovations in the field of new materials and processes. The approach of Materia Nova is based on an open and collaborative innovation.

The R&D center offers five different services: Materials and Processes conception and innovation, Equipment Design and Process Upscaling, Analysis and Characterization, Life Cycle Thinking, Project Development and Management

From the understanding of the problems and requirements of our customers, we jointly select the best scientific and technical solutions which are then tested on a pilot-scale before industrialization. The development and the service provided are always unique and customized and give effective solutions as well as a major competitive advantage to our customers.

## OUR TECHNOLOGIES AND SOLUTIONS

Our expertise in Processes (dry and wet deposition, compounding, bioprocesses, 3D printing, plasma reforming...), Materials (sol-gel, metallic and inorganic coatings, paints and varnishes, (Bio) polymers) and Smart Devices (biosensors, optoelectronic, thermoelectric, electrochromic devices) is a fertile ground for our strategic axes:

- Materials Sciences and Engineering
- Metal materials & industrial processes
- Energy
- Health Sciences and Technologies

## OUR BUSINESS AREAS

- Aeronautics
- Space
- Engineering
- Transport

Materia Nova is present with the big names in the Automotive and Aeronautics, Space and Defence sectors: SONACA, SAFRAN, AIRBUS, VALEO,

THALES ALENIA SPACE ... have chosen us as an expert partner on key development projects for energy-saving solutions and increased durability: non-stick coatings to reduce friction on the surface of aircraft wings, non-soiling and self-repairing, wear-resistant surfaces, etc.

## OUR STRENGTHS

- A multidisciplinary team of experts
- A wide range of cutting-edge equipment
- An open and collaborative innovation strategy at national and international level
- Innovative projects for and with industrial companies
- Collaborations with R&D centers and universities worldwide
- A strong network of companies, spin offs and start-ups (B-SENS, ESIX, IONICS and NANO4)



Parc Initialis - Rue Pierre et Marie Curie 2 - 7000 Mons | BE

T. + 32 (0)65 34 27 19 | F. + 32 (0)65 34 27 98

info@multitel.be

<http://www.multitel.be>



AERO



SPACE



DRONE



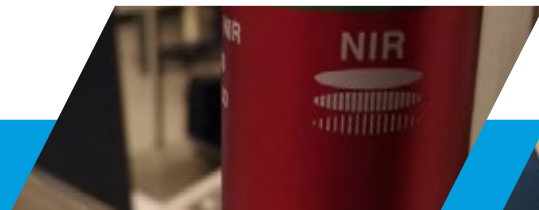
DEFENCE

Multitel is an innovation centre, leading applied research and development activities for industry leaders and SMEs.

Multitel's mission is to promote innovation by providing market-driven scientific and technical support for developing, implementing and monitoring new technologies, in a variety of technological domains

More precisely for aerospace sector, activities of Multitel concern:

- prototyping of optical fibre sensors for SHM (Structural Health Monitoring), fibre lasers (for LIDAR applications), material processing (composite materials, surface texturisation) and non-destructive characterization (THz, OCT), custom optoelectronic systems
- (speech oriented) HMI for aeronautics
- communication systems (GCS/UAV -5G, Tactical data link L16, L22)
- certifiable navigation (DO-178, DO-254, certifiable AI)
- satellite based IoT systems
- satellite/drone image processing (visible, IR, hyperspectral,...)
- image oriented non-destructive quality control.



Liège Science Park Rue du Bois Saint Jean 12 - 4102 Seraing | BE

T. +32 (0)498 91 93 77

jean-claude.noben@sirris.be

<http://www.sirris.be>



AERO



SPACE



DRONE



DEFENCE

## Sirris, the Collective Center for the Belgian technological industry.

Sirris is the collective research center of the technological industry created to strengthen the competitiveness of this sector through technological progress and innovation.

By offering its services, Sirris helps companies in a targeted way to make the transition from technological know-how to marketable innovations. With 70 years of experience, field expertise, practical help and tailor-made information, Sirris helps its members to progress.

We can offer several key assets for industry that want to remain innovative:

- a pool of experts in all relevant disciplines, for example: intelligent, lightweight or miniaturized product design; software engineering; mechatronics; data processing
- many contacts in a solid network with the academic world and industry
- several specialized labs, for a quick assessment of feasibility:
  - Smart Connected Innovation Lab > for products with software components
  - Product Development Hub > for intelligent, lightweight, or miniaturized products
  - Software Engineering Lab > for products with a high software component
  - Data Innovation Lab > for challenges in the field of data analysis
  - Mechatronics experts

- a holistic view of value and technology chains
- continuously updated knowledge on key technologies and processes
- a long list of references
- several demonstrators illustrating the challenges and opportunities



# VON KARMAN INSTITUTE FOR FLUID DYNAMICS



Chaussée de Waterloo 72 - 1640 Rhode-Saint-Genèse | BE

T. + 32 2 359 96 11 | F. +32 2 359 96 10

peter.simkens@vki.ac.be

<http://www.vki.ac.be>



AERO



SPACE



DEFENCE

The von Karman Institute for Fluid Dynamics (VKI) is at the leading edge of Fluid Dynamic research for aerospace:

**Aeronautics:** aero-propulsion and energy conversion by means of rotating machines, performance of aircraft engines, lift performance

**Space:** space vehicle re-entry, thermal protection, cryogenic propellant management for spacecraft, electrical propulsion, CubeSat missions

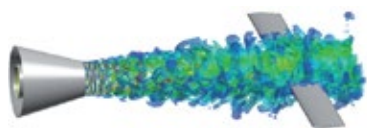
The von Karman Institute for Fluid Dynamics (VKI) is a non-profit international educational and research organisation specialized in Fluid Dynamics, in the areas of Aeronautics & Space, Environmental & Industrial Flows, and Turbomachinery & Propulsion. What started in 1956 with international postgraduate education, has developed into a widely recognized center of excellence in fluid dynamics, combining education and research in a truly international and intercultural environment.

For aeronautical applications, VKI specializes in activities related to aero-propulsion and energy conversion by means of rotating machinery. Advanced aero-thermal research is carried out on the cold fan and compressor side, as well as on the hot turbine side. VKI teams up with the major engine manufacturers: VKI has been recognized a strategic research partner of the Safran group. VKI also performs research on high lift devices and on coatings to improve the lift of aircraft wings.

For space applications, VKI focuses on the modelling, simulation and experimental validation of atmospheric re-entry flows and thermal protection systems. VKI has recently executed in-flight testing and validation of re-entry, with

the Qarman CubeSat. VKI is also active in cryogenic propellant management and is pioneering in electrical propulsion.

VKI operates more than 50 different testing facilities and wind tunnels. This infrastructure is the backbone of VKI's unique position in the world of Fluid Dynamics research; it allows VKI to study complex flows with speeds ranging from a few mm per second up to mach 14. The infrastructure is also the foundation for the cross-fertilization between experimental testing and numerical simulation. VKI acts as a reference laboratory for ESA.





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# Training Centers



Chaussée de Fleurus 179 - 6041 Gosselies | BE

T. +32 (0)71 34 81 80 - F. +32 (0)71 34 81 81

info@wan.be

<http://www.wan.be>

The WAN is an “assembly ground” of training. The WAN relies on different partners, such as centres of competency, aeronautical schools, Belgian Air Force and major players of industry (SONACA, SABCA...). The WAN covers all the needs of the aerotechnical sector.

## Production

All technologies and methodologies linked to design, manufacture, repair and inspect cells, engines, avionics. Such as: CAD/ CAM (CATIA v5 & v6), analysis and functional dimensioning, operating gamuts, process understanding and assembly techniques (metallic/ composite), non destructive testing, finite element analysis and resolution methods (SAMCEF/ NASTRAN), quality (EN9100/EN4179), Lean Manufacturing, SPC methodologies...

## Maintenance

Trainings for jobs in airports or industrial aeroplane workshops, propulsion mechanisms, onboard equipment. Approved as official training centre (EASA BE.147.002), the WAN provides recognised (meets EASA Part-147 requirements) basic training for Part-66 Aircraft Maintenance License A1, A2, B1.1, B1.2, B2 and aircraft type training for Airbus or Boeing ranges for B1.1, B2 and C. Many others tailored courses and exams are possible in French or English. For its training, lectured by highly qualified senior instructors, the WAN owns a functional Boeing 727 and various aircraft parts, engines, avionics.

## Automated Fiber Placement

An AFP machine manufactures complex shapes using composite material. An Ingersoll AFP is installed at SONACA facilities. The centre is able to conduct research for advanced aerospace applications and industrial process development. The WAN's main target is to train specialised people using AFP technology.



# TECHNIFUTUR



**TECHNIFUTUR**  
CENTRE DE COMPETENCES

Liège Science Park Rue du Bois Saint-Jean 15-17 - 4102 Seraing | BE

T. +32 (0)4 382 45 00 - F. +32 (0)4 382 45 46

info@technifutur.be

<http://www.technifutur.be>

Training, awareness, advising, e-learning and e-business are our assignments. They cover various fields, such as aeronautics, assembly, automation, design, measurement and inspection, machining, image and multimedia, etc. They meet the requirements of the regional, national and international industrial environment.

We target company staff, job seekers, teachers and students (for more information, go to our website [www.technifutur.be](http://www.technifutur.be)).

More particularly and for more than 10 years now, Technifutur has been providing training to aircraft maintenance mechanics in the aviation sector. In 2007, the "Service Public Fédéral de la Mobilité et du Transport Aéronautique" granted the PART 147 approval, officially acknowledging Technifutur's competency and their right to conduct training and examination and to issue certificates for aircraft maintenance mechanics in accordance with the requirements of PART 66 levels A1, A2, A3 and A4.

On the basis of this recognition, of the acquired experience and the needs expressed by the aircraft industry, Technifutur now aims at expanding their skills and achieving the approval to provide levels B training and examination.

Technifutur is also recognized worldwide for its welding and non-destructive testing training courses.





# EURO SPACE CENTER



Rue Devant les Hêtres, 1 - 6890 Transinne | BE

T. +32 (0)61 65 64 65 | F. +32 (0)61 65 64 61

info@euospacecenter.be

<http://www.euospacecenter.be>



SPACE

Opened in June 1991, Euro Space Center is a discovery and recreation centre on the theme of space exploration and its impact on our daily lives.

Euro Space Center has become a leader in Belgium for the dissemination of knowledge about space sciences and technologies. Euro Space Center is open to the general public all year round and also welcomes trainees from 30 different countries.

The goal is to spark a love for the sciences and innovation. Euro Space Center and its high-tech environment are unique in Europe.

They enable young people and adults to learn about astronomy, robotics, space engineering and more. Euro Space Center also lets people (re)discover an exceptional human adventure : mankind's conquest of space.

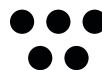




# Partners







The Wallonia Export-Investment Agency (AWEX) is the Wallonia Region of Belgium's government agency in charge of foreign trade promotion and foreign investment attraction. The agency has a worldwide network of 109 Economic Commercial Advisors.

As a **foreign trade agency**, AWEX carries out a mission of promotion and information for the benefit of both Wallonia and the foreign business community.

Upon request, AWEX assists buyers, decision-makers, importers and foreign prospects by:

- Providing economic data on Wallonia and its export potential
- Disseminating information on products and services from companies located in Wallonia
- Identifying companies in Wallonia for international partnerships
- Distributing lists of exporters from Wallonia

As an export partner for Wallonia-based companies, AWEX offers a wide range of export-oriented services and activities:

- General and commercial information on foreign markets
- Market studies tailored to specific areas upon request
- Organization and planning of marketing activities (international trade shows, economic missions, sector-based contact days...)
- Establishing contacts with international organizations
- Promoting Wallonia's export potential abroad
- Financial support and export financing
- Training in international careers

As a foreign investment agency, AWEX has an overall responsibility for the attraction of foreign investment in Wallonia. This includes seeking out and providing information to potential foreign investors. The agency also offers a pro-active follow-up service to investors already established in Wallonia. In addition, it is in charge of identifying new foreign investors for the acquisition of industrial sites under restructuring process.

**Feel inspired**  
Tomorrow starts today



# TECHNOLOGICAL AND SCIENTIFIC NETWORK

## SPW Recherche

The operational Directorate General for the Economy, Employment and Research (Research Department) offers a range of incentives and forms of assistance to increase the technological potential of researchers based in the Walloon Region.

<https://recherche.wallonie.be>



## EEN network

Assistance to your SME to develop and exploit your technological expertise by setting up European partnerships

[www.wallonieeurope.be](http://www.wallonieeurope.be)



L'Europe à la portée de votre entreprise.

## Synhera

The research support and promotion office that represents applied research within French-speaking Universities and associated Belgian Research Centres.

[www.synhera.be](http://www.synhera.be)



## LIEU Network

Provides access to the resources and competences of universities and higher education institutions

[www.reseaulieu.be](http://www.reseaulieu.be)



## NCP-Wallonie

Free professional assistance at every stage of your European research project.

[www.ncpwallonie.be](http://www.ncpwallonie.be)



## A6K

A shared platform in engineering sciences bridging industry and research for Energy, Industry 4.0, 5G, Communication and Embedded Systems.

[www.a6k.be](http://www.a6k.be)



## ID2Move

A center of excellence for Autonomous Systems with diversified indoor and outdoor test zones in Europe.

[www.id2move.eu](http://www.id2move.eu)



## Wallonia Clusters

Network of technological clusters active in Wallonia

<http://clusters.wallonie.be>





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Skywin is the Walloon Aerospace cluster (Belgium) consisting of an association of companies, research organisations and training centres engaged in public-private partnerships and in the implementation of innovative collaborative projects.

Skywin Wallonie asbl  
Rue de Rodeuhaie 1  
1348 Louvain-la-Neuve (Belgium)  
RPM TVA BE 0887.760.430

**Phone:** +32 10 47 19 44

**E-mail:** [info@skywin.be](mailto:info@skywin.be)

[www.skywin.be](http://www.skywin.be)



[skywin.be](http://skywin.be)

[wallonia.aero](http://wallonia.aero)