

Everything starts with **chemistry**  
We make it more **innovative**



Annual Report **2019**



[www.certech.be](http://www.certech.be)

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## Editorial

Certech is a research and development partner and supplier of analytical and technological services for companies involved with activities related to chemistry: polymers; pharmaceutical, medical and health care; environment and energy; automobile and transport; packaging; construction.

Certech's mission is to provide innovative solutions to improve or develop products and processes, in accordance with the principles of sustainable chemistry and circular economy in order to meet industrial and societal needs.

Certech has been involved, either as a coordinator or as a partner, in 20 collaborative projects, 3 of which were launched in 2019. The funding sources were the European Commission (Horizon 2020 framework program), the European Regional Development Fund ("Transition" and "Interreg V"), and the Walloon Region (CWALity, Cornet, Marshall Plan, DGO4 general interest industrial research program). Those projects include acquisition of new equipment and cover the different strategic axes of Certech's development, process intensification, plastic recycling, biobased polymers and composites, energy storage, odours and emissions, volatile organic compounds and sensorial properties of materials. These represent opportunities to strengthen and develop our expertise in order to execute our mission of supporting the economic development of the industries, especially the small and medium enterprises, from the Region.

In 2019, 243 companies received support in their innovation process, 66 (27%) of which were new prospects. A total of 724 contracts were handled. The income from private contracts experienced a growth of 4 % compared to the previous year. I would like to thank all the coworkers for their contribution to this achievement.

Thierry Randoux  
General Manager

## 1. PRESENTATION of Certech ACTIVITIES

Certech (The Centre of Technological Resources in Chemistry) is a research and development partner and supplier of analytical and technological services for companies involved with activities related to chemistry: polymers; pharmaceutical, medical and health care; environment and energy; automobile and transport; packaging; construction. Certech's mission is to provide innovative solutions to improve or develop products and processes, in accordance with the principles of sustainable chemistry and circular economy to meet industrial and societal needs.

The research & development strategy is based on the synergies of three major themes, namely: environment, polymer materials technology, chemistry & industrial processes supported by an analytical & technological services platform.



## ENVIRONMENT

For more than 35 years, Certech has offered industrial support in the field of gas emission, process optimization and improved materials with reduced environmental impact. Research and Development activities include air quality, health and safety, energy and circular economy. Certech is ISO 17025 accredited for the sampling and measurement of odours and is approved for the atmospheric pollution control (odour, volatile organic compounds, noise) by Regional authorities. Certech is an active member of 11 standardisation committees (AFNOR, EN or ISO).

### **Air Quality, Health & Safety**

#### Atmospheric pollution and ambient air

In the field of outdoor environment, Certech offers sampling, on-line measurements and analysis (odour and gaseous effluents). Environmental impact is evaluated via simulations of atmospheric dispersion and neighbourhood direct assessment. Remediation pilot equipment based on catalysis or scrubbing are also available. A mobile laboratory is dedicated to carry out environmental diagnostics. It is equipped with several sampling equipment and measuring devices for the analysis of atmospheric emissions and ambient air.

#### Occupational hygiene

Key expertise in workplace air assessment include sampling and analysis of dusts, aerosols, microbiological and chemical components, noise, measurement of nanoparticles and biological agents, determination of organic vapours, evaluation of personal protective equipment (PPE), probability assessment of workstation exposure and characterization of ATEX (ATmosphere EXplosive) atmosphere.



## Energy and circular economy

Energy is clearly one of the main issues of the 21<sup>st</sup> century. Driven by the concepts of sustainability, Certech has developed expertise in chemistry for renewable energy applications by working on efficient and green materials, energy production and storage, chemical storage, sustainable and innovative process.

## POLYMER MATERIALS TECHNOLOGY

### **(Bio-based) Polymers and composites; functional barrier materials**

Certech is developing materials and their processing conditions to respond to the most stringent market needs. The intrinsic properties, the cost of raw materials and additives, the origin, processing and manufacturing conditions, health and environmental impact, recyclability are key parameters that are being considered for the development of new materials. Certech has acquired know-how in the synthesis, modification and formulation of petro-sourced and biobased thermosets, thermoplastic materials like wood plastic composites, biobased composites, barrier additives for packaging and storage tank, functional additives, and biopolymer formulations. Preparation of hybrid materials (sol gel, specialty and multifunctional coatings, zeolites chemistry, lightweight materials, cellular materials) is also one of the key competences. Certech has also developed an expertise in the field of material substitution for the plastics and composites sectors aiming at replacing raw materials which are raising potential health or sustainability issues.



### **Odours and emissions from materials and indoor air quality**

Certech conducts R&D projects, testing and consulting in the field of materials interaction with the environment. New requirements from end-users (low odour and emission products, NIAS), new directives and regulations (for example new OEM standards or construction products directive and requirements, health and environmental regulations) have a clear influence on product market acceptance and have generated a need for reliable laboratory testing conditions. By combining skills in sampling and analysis of air with expertise in materials technology, Certech has developed leading edge know-how in assessing and managing gaseous emissions produced by materials. It includes indoor air quality (IAQ), emissions from transportation or building materials, migration phenomena and organoleptic contamination of packaging materials. Certech works in partnership

with suppliers, manufacturers and end-users in order to achieve materials emission levels that are complying with the market needs.

Certech has been selected as the Belgian expert for the drafting of the European Standard EN13725 "Air quality – Determination of odour concentration by dynamic olfactometry" EN16846-1 "Photocatalysis", ISO 16000 standards "Indoor air" and ISO 12219 "Interior air of road vehicles".

Performance evaluations of air purification units are also offered.

### **Mechanical recycling (Plastic-to-Plastic)**

Recycling of materials is one of the most challenging issues from a sustainability point of view. Certech is involved in sorting and separation processes as well as in the conversion of solid wastes into new materials. It provides assistance in material identification, processing, formulation and evaluation of recycled materials performance.

## **CHEMISTRY AND INDUSTRIAL PROCESSES**

### **Factory of the Future - Intensified/continuous processes**

Process Intensification is based on the use of small volume reactors, continuous processes, high temperatures and pressures, better heat and mass transfer. It leads to improved quality products, increasing yields, reduction of investment costs, lower energy consumption and reduced environmental and safety risks. It is a multidisciplinary approach to improve process technology and the underlying chemistry at the same time.

### **Micro/Mesofluidic reactors**

Certech is equipped with multipurpose flow reactors enabling continuous chemical processes. Main features of this equipment are the outstanding mixing and heat exchange, low internal volume with high residence time allowing the use of low quantities of reactants with an output of 5 kg a day.

Pilot reactors are also available to perform synthesis under strictly controlled experimental conditions in gas, liquid phase but also handling slurries. Different applications are covered including fine chemicals, green chemistry, polymer chemistry and medicinal chemistry.

### **Chemical recycling (Plastic to Liquid, Plastic-to-Gas)**

Chemical recycling is a process which either breaks down or selectively dissolve plastic waste into their chemical constituents and converts them into useful products like basic chemicals, new polymers/oligomers or fuel. Certech has specific skills and equipment able

to reach high pressures and temperatures that are used in the field of recycling and valorisation of plastic waste materials in a continuous way.

Certech also has a strong expertise in the field of catalytic pyrolysis for waste to fuel transformation and energy valorisation.

## **ANALYTICAL & TECHNOLOGICAL SERVICES**

Certech's industrial partners benefit from the support of a wide range of advanced characterization tools. The analytical equipment covers the physical, chemical but also sensorial properties determination:

- Physical analysis: mechanical, rheological, thermal, dynamic mechanical, morphological, barrier properties, molecular weight distribution, polymer degree of branching;
- Chemical analysis: chemical composition determination of resins and polymers, additives, fillers, qualitative and quantitative determination of complex mixtures, traces analysis, non-intentionally added substances (NIAS), reverse engineering ;
- Sensorial analysis: odour and organoleptic properties.

Certech has a 1000 m<sup>2</sup> application hall with highly flexible equipment designed for the simulation of industrial processes:

- Polymer Materials: drying, mixing, pelletizing, extrusion, foaming, injection moulding, resin transfer moulding (RTM), compounding. The available output ranges from 5g to a few hundred kg of processed materials.
- Process Intensification: versatile continuous reactors adaptable to project needs, 20 liters continuous reactor for catalytic pyrolysis, autoclaves from 75 to 1000 ml for high temperature and high pressure chemical treatment, spray-drying.



## 2. R&D COLLABORATIVE PROJECTS



In 2019, Certech was involved, either as coordinator or as a partner, in 20 collaborative projects. The funding sources were: the European Regional Development Fund (ERDF, “Transition” and “Interreg V”), Walloon Region (CWALity, Cornet, Marshall Plan, DGO4 general interest industrial research program) and the European Commission Horizon 2020 framework program.

New pieces of equipment were acquired in 2019 which were funded by the ERDF and Interreg V programs.

3 new projects were launched in 2019: PEPS, DOUDOU and PSYCHE.

## ONGOING PROJECTS

Project	Description	Partnership	Funding
Recy-Composite	Recycling of composite materials	Certech, CTP, Centexbel, Ecole Mines Douai, Armines, Crepim	Interreg V FWVI supported by the ERDF
INTERESTS	Project in the field of energy – hydrogen storage	Certech, UCLouvain, TWEED, ATM-Pro, N-Side	DGO4
STOCC	Development of materials for energy storage	UCLouvain, Certech, CSTC, CRIC	ERDF Transition
ECOLISER	Eco-binders for soil treatment, waterproofing and roads	CTP, INISMa, ULiège, ULB, CRR, Certech, Materianova	ERDF Transition

Project	Description	Partnership	Funding
MACOBIO	Biobased materials and composites	UMons, Sirris, Cen aero, Centexbel, Celabor, Materia Nova, Certech	ERDF Transition
BIOMAT	From biomass to biobased materials	UMons, ULB, ULiège, Materia Nova, Celabor, Certech	ERDF Transition
EMRA DEMO2FACTORY	Demonstration platform for SMEs in the field of materials technology characterization	Materia Nova, CRIBC, CTP, Certech	ERDF Transition
COMPOSENS	Cross-border development of composite materials (polymer-natural fibres)	Certech, Valbiom, ULiège, Ecole Mines Douai, Armines, INRA, CRITT	Interreg V FWVI supported by the ERDF
DURATEX	Development of anti-fouling and anti-microbial hydro-oleo-repellent textiles for sustainable applications in the fields of construction and architecture	Centexbel, UCLouvain, Certech, Ensait, Ceti	Interreg V FWVI supported by the ERDF
Silenthalpic	Development and optimization of double flow ventilation systems	Industrial partnership, Certech, ULiège, CSTC, Cenaero	Marshall Plan Mécatech
RemOPack	Development of new food packaging materials to remove specific undesirable odours	Certech, Celabor, IVLV, ATB	Cornet
HUMIDWRAP	Humidity and Water Regulating Active Packaging	Certech, Celabor, PTS, IVV, LBF, ZUT, COBRO	Cornet
MMAtwo	New innovative process for recycling end-of-life PMMA waste	12 EU partners, Certech	EU Horizon 2020

Project	Description	Partnership	Funding
Flow4Syn	Flow chemistry process to convert biobased feedstocks	Certech, UCLouvain, ULiège	ERDF Transition
Flow4Reactors	Microstructured and catalytic intensified reactors	Certech, CRIBC, UCLouvain, ULiège	ERDF Transition
Flow4Solids	Continuous process for the synthesis, drying and final shaping of solids	Certech, UCLouvain, ULiège	ERDF Transition
Flow4AI	Optimization and intensification of a continuous process for the manufacturing of large crystallites boehmites	Industrial partner, Certech	CWALity

## NEW PROJECTS

Project	Description	Partnership	Funding
PEPS	To boost the cross-border potential of additive manufacturing processes	CRITT MDTS, Ecole Mines Douai, Armines, Certech, Materialia, Plastiwin	Interreg V FWVI supported by the ERDF
DOUDOU	Cross-border development of innovative materials-how to give higher value to plastic waste?	Ecole Mines Douai, Armines, Plastiwin, CTP, TEAM2, Plastiwin, Flam3D	Interreg V FWVI supported by the ERDF
PSYCHE	Conversion of plastic waste into chemical compounds of interest via gasification	UGent, UCLouvain, CNRS, ENSCL	Interreg V FWVI supported by the ERDF

### PEPS and DOUDOU

The additive manufacturing processes present a wide range of possibilities where the only limit is the imagination in terms of design and flexibility of the process. However, the market lacks mass-manufactured technical polymers with functional properties for 3D printing processes.

Our goal is, on the one hand, to increase the availability of materials that can be used in additive manufacturing processes while giving them innovative functionalisation in order

to increase their added value. On the other hand, additive manufacturing is also a higher value-added outlet for recycled plastics.

The PEPS and DOUDOU projects integrate the following topics:

- Identification of relevant plastic outsourcings
- Formulation of polymer systems
- Extrusion of calibrated filaments for FDM printing
- Physical-chemical and rheological characterization of the polymer materials and products obtained
- Emissive aspect of the materials and during the 3D printing process



DOUDOU



PEPS

### PSYCHE

Thermo-chemical recycling, as an alternative technology to mechanical recycling, is a solution to avoid the landfilling of waste streams such as multi-layers plastics, composites, mixes of low quality plastics and contaminated plastics. This technology enables the chemical transformation of wastes into raw materials that can be used in the manufacturing of new products.

Our R&D project aims at the production of olefins from plastics waste via an innovative synthetic pathway. Wastes will be gasified to obtain syngas that will be converted into olefins after a purification stage, thanks to a Fischer Tropsch process. Once purified, these olefins will be used in the chemical industry, for example as reactants for plastics manufacturing.

In the framework of this project, Certech provides its expertise in:

- Thermochemical conversion of waste
- Analysis and gas purification
- Catalysis
- Process intensification



PSYCHE

## NEW EQUIPMENTS

### EMRA DEMO2FACTORY

- Pyrolyser-thermodesorber-GC-MS with direct introduction in mass spectrometry option: Pyrolysis coupled with mass spectrometry is a particularly well-suited technique for the characterization of complex compositions (polymers, copolymers, rubbers or other non-soluble products), additive analysis, reverse engineering. The system available at Certech is automated, very flexible and allows the pyrolysis of solids and liquids up to 1000 ° C, at speeds ranging from 0.02 to 100 ° C / s. The thermodesorption unit can be used sequentially with the pyrolyzer on the same sample, which allows to obtain pyrograms containing a maximum of information. The thermal decomposition products are analyzed by GC-MS. The mass detector is equipped with a direct introduction probe (DIP). This accessory allows the injection of liquid and solid samples that do not require chromatographic separation and without special preparation. The probe can be programmed with several ramps and heating rates from 0.1 to 2 ° C / s up to a maximum temperature of 400 ° C.
- A GC-TOF-MS-Sniffing instrument was acquired for enhanced VOC analysis and for chemistry/odour correlation. The Time-of-Flight Mass Spectrometer (TOFMS) provides a powerful combination of sensitivity and spectral quality for improved screening of VOC and detection of odorous compounds at trace levels. This detector is able to acquire full-range spectra with sensitivities better than those achieved by traditional quadrupole MS in selected ion monitoring (SIM) mode. The instrument is equipped with a platform for multiple VOC sampling methods:
  - Thermal Desorption
  - Automated high-capacity sorptive extraction (Hisorb™)
  - Headspace and headspace-trap, Dynamic Headspace (micro-chambers  $\mu$ CTE™)



### Intense4Chem portfolio: Flow4Solids project

- Pilot spray dryer with an inerting closed loop system: Spray drying is an appropriate process to dry with high efficiency formulations. Solid particles can

be obtained rapidly by spraying a solution at high temperature using a warm gas flow (air or inert). This process enables a fine control of the properties of the particles in term, for instance, of density, size or humidity. The pilot unit is composed of a two-fluid-nozzle leading efficiently and repeatedly particles ranging from 1 to 30  $\mu$ m, depending on the size of the nozzle and the flow rate of the atomization gas. The drying can be performed at temperatures up to 200°C for a flow rate from 0.1 to 15mL/min. The solid is then immediately recovered using a cyclone; 3 sizes of cyclones being available.



### COMPOSENS project

- Continuous fiber impregnation system: the equipment uses a W-shape geometry, the different microfibers of the strand are separated and impregnated with thermoplastic, then reassembled in the end of the die. The quality of the impregnation depends, on the quantity of microfiber in a section of the strand and on the viscosity of the polymer. The die can reach temperatures of 350 ° C, and tensile forces of 500N can be applied. The fiber strand must be less than 5mm in diameter and at least be able to withstand the applied tensile force. The fibers thus impregnated can be woven and then thermoformed to obtain thermoplastic parts reinforced with continuous fibers.



### PEPS and COMPOSENS projects

- Filament extrusion line for 3D printing: an extrusion line was acquired to produce filaments calibrated for FDM (Fused Deposition Modeling) technology, consisting of a vacuum conformation bath that can reach temperatures of 45 ° C, a laser cell to control the drawing system (caterpillar haul-off) in continuous and a winder. Depending on the material and the target diameter, the production

- speed can reach 100 m / min. Diameters between 1.5 and 4 mm to within 10 µm can be obtained, in particular the conventional diameters of 1.75 mm and 2.85 mm. Upstream, we are equipped to characterize (rheology, mechanical properties, etc.), formulate, filter and granulate all types of polymer flux (recycled, charged, etc.) in order to obtain good quality filaments that can be used in conventional FDM equipment. Downstream, we can validate the filaments produced using a standard FDM printer.



#### MMAtwo project (Horizon 2020 project - Grant agreement No 820687)

- A new dynamic olfactometer anticipating the future requirements of EN13725 standard has been acquired and installed in one of our sensory rooms. The system offers a maximum flexibility in terms of panel management (modular boards for 4 to 6 members in parallel), presentation modes (forced choice and yes-no modes available), ease of maintenance (removable modules including the dilution unit) and data treatments. In addition to the quantification of odour concentrations, it allows intensity and hedonic tone rating.



### 3. INDUSTRIAL PROJECTS & SERVICES

#### TECHNOLOGICAL GUIDANCE AND VALORISATION PROJECTS

Certech collaborates with industrial companies in their development projects and fosters technological innovation. Concrete solutions, in-depth assistance and technical advice are provided by teams with recognised skills and knowledge. Semi-industrial and pilot equipment are also made available to industrial partners.

The Certech experts are available for industries looking to improve their products/processes or looking to develop new products/processes. Support projects include feasibility studies, assistance or collaboration on R&D projects, technological transfer or the introduction of new products and processes, help with drafting new specifications, etc. This guidance is supported by literature survey, which enables experts to stay permanently up to date on the scientific and technical progress made within their field of activity which presents a high potential for industrial innovation.

Services activities include analytical support using a wide range of advanced equipment, problem solving, quality control and regulatory assessment.

In 2019, 243 companies received support in their innovation process, 66 (27%) of which were new prospects. A total of 724 contracts were handled.

#### FINANCIAL SUPPORT to INDUSTRY

Technology cheques

Available since January 1st 2009, the “Chèques Technologique” program is a financial support tool for SMEs needing technological expertise on a specific topic. This support may take the form of preliminary testing, calculations and analysis, carrying out all or part of the design and/or adaptation of products, processes or services, or the resolution of technical problems related to the quality and compliance of newly-developed products, processes and services. In 2019, Certech provided support to 10 companies using this funding mechanism.



### Technical Feasibility

The Technical Feasibility projects supported by the Walloon Region are a financial aid mechanism to help SMEs in their innovation process, designed to develop their ideas prior to the development of a product or service.

It allows companies to use external research organisations to carry out technical services. Certech provides support to SMEs in project filing. The notification of the Walloon authorities is given within the 3 months following the submission of the application.

### KMO Portefeuille (Flanders)

Certech is eligible for technological consulting and contracting supported by Flanders via the KMO-Portefeuille. KMO-Portefeuille is a subsidy measure for Flemish SMEs who may receive subsidies up to 4000 euros per calendar year.



### Research tax credit (France)

The accreditation by the French authorities to the Research Tax Credit (CIR) was renewed for the period 2020-2024. This mechanism provides a tax advantage to companies subject to income tax. CIR finances all R&D activities: basic research, applied research and experimental development.



## PARTICIPATION in TECHNICAL STANDARDISATION COMMITTEES



Thanks to its expertise based on R&D activities, Certech is an active member of several technical standardisation committees dealing with air quality, odours and volatile organic compounds (VOC), photocatalysis and electronic cigarettes.

Certech is helping industry professionals to:

- understand the aspects related to technical and scientific standardisation and regulations;
- stay up to date with methods and trends in standardisation and regulations in their specific sector;
- Implement the standards in their daily activity.

ISO/TC 146	Air quality
CEN/TC 264	Air quality
CEN/TC 386	Photocatalysis
AFNOR B44/A	VOC and odours, photocatalytic materials, chamber recycling test

## QUALITY

Certech operates under the ISO 9001:2015 quality management system. The certification was renewed for the period 2019-2021.



The BELAC accreditation certificate nr 400-TEST was confirmed for the sampling and analysis of odours by dynamic olfactometry following the ISO 17025 technical requirements.



Certech has been granted a Renault Nissan accreditation for the new method RNES-B-20116 v1.0: "VOC and aldehydes & ketones screening by micro-scale chamber test". Certech already operates under the accreditation from Renault, Nissan and PSA according to the technical requirements of ISO 17025 to measure odours and VOCs on materials and parts.



- VOC, aldehydes & ketones, odour analyses from entire parts after conditioning in 1 m<sup>3</sup> chamber: D49 3027-C / RNES-B-00114 v1.0, D49 3085-B / RNES-B-00114 v1.0 and D49 3046-C / RNES-B-00096 v1.0
- VOC analyses on materials: D42 3109-C / D10 5495-E
- Aldehydes and Ketones analyses on materials: D40 3004-A / D40 5535-E
- Odour from materials: D49 3001-E / RNES-B-00096 v1.0 / D105517-G
- VOC analyses on adhesives and sealants: D41 3144-A

Certech is approved by the Walloon Region for the sampling and analysis in the field of air pollution. The approval has been renewed for the period 2019-2023.



Wallonie

#### EVENTS: Open house event for industry partners, March 28.

An open house event was organised on March 28 and gathered about 50 industry delegates. It was an opportunity to meet our experts, visit the facilities and discover our latest developments and equipment.

#### EVENTS: Emissions & Odours from materials: Workshop & Conference, October 7 & 8.

The 14th edition of the "Emissions and odours from materials" took place on October 7 and 8. A workshop on odours and VOCs remediation specifically dedicated to industry partners was held on Certech facilities followed by a conference in Brussels. Around 100 participants from all-over the world attended the two-day confirming the interest of the industry for this topic.

During the last two decades, there has been increasing concern within the scientific community over the effects of VOC exposure on health. Public awareness of environmental, health and safety issues related to air quality has grown significantly. Regulations and labelling of products have been promoted by the governments, resulting in ever more stringent specifications for the industry regarding the emission of volatile compounds from materials.

Plastic materials, coatings and inks, adhesives, flooring materials, furniture, textiles, insulating materials emit volatile organic compounds (VOC) that contribute to the indoor air quality in terms of odours and pollutants. In food, pharmaceutical and cosmetic industries, volatiles released by the packaging can have an impact on the organoleptic perception of the products and even on their quality. Non-intentionally added substances (NIAS) present in a food contact material/article are chemical products that can migrate from the material into food and requires often high sensitive analysis.

New consumer products and new biobased/recycled materials coming today on the marketplace have to be evaluated for their VOC release, including their contribution to the odour perception of the products.

The need for communication between professionals working on this subject is obvious, particularly with respect to discussing research results, disseminating information, promoting activities ...

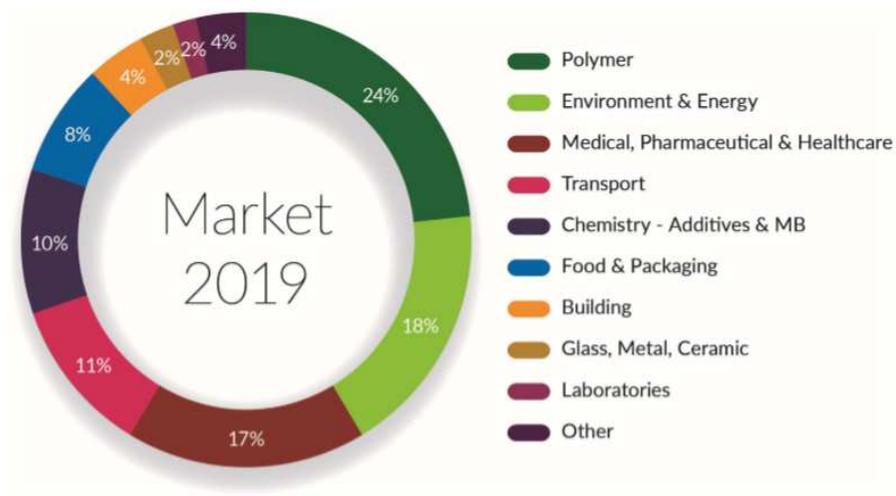
With the participation of leading industry professionals, standards & regulatory experts, R&D scientists, material specialists, industry analysts and market players, the conference offers an ideal platform for best practice sharing and acquiring new knowledge from participants and speakers.

## EVENTS: Open house event for Mars and Mercury Club, October 11.

An open house afternoon was organized as part of the Mars and Mercury Club national day and gathered about 120 delegates. It was an opportunity to demonstrate the capabilities to support the innovation process in the industry.

## MARKETS SERVED

Major markets for 2019 include plastic industry (polymer producers and end-users 24%), environment and energy (18%), medical, pharmaceutical and healthcare (17%), transportation (11%) and chemicals (10%).



## 4. PARTICIPATIONS and COLLABORATIONS

### PROFESSIONAL BODIES



[www.essenscia.be](http://www.essenscia.be)



[www.uwe.be](http://www.uwe.be)



[www.wal-tech.be](http://www.wal-tech.be)



[www.src.be](http://www.src.be)



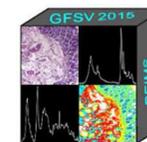
[www.valbiom.be](http://www.valbiom.be)



[www.suschem.org](http://www.suschem.org)



[www.gn-meba.org](http://www.gn-meba.org)



[www.gfsv.net](http://www.gfsv.net)



[www.4spe.org](http://www.4spe.org)

## CLUSTERS



[www.greenwin.be](http://www.greenwin.be)



[www.clusters.wallonie.be](http://www.clusters.wallonie.be)



[www.iar-pole.com](http://www.iar-pole.com)

## STAKEHOLDERS IN



Valore sa: company active in the production and marketing of formulated products



Uniteq sa: company specialised in manufacturing of fire-fighting products



[www.polemecatech.be](http://www.polemecatech.be)



[www.clusters.wallonie.be](http://www.clusters.wallonie.be)



[www.bbi-europe.be](http://www.bbi-europe.be)

## COLLABORATION



Certech is an Authorised Partner Laboratory from Agilent Technologies. The collaboration covers all aspects of molecular weight and chemical composition distribution by gel permeation chromatography (GPC), temperature rising elution fractionation (TREF) and odours and emissions from materials using thermal desorption gas chromatography mass spectrometry (TDS-GC-MS).



Certech is member of the Editorial Board of the International Journal of Polymer Analysis and Characterization (IJPAC)

## 5. PUBLICATIONS, LECTURES & ATTENDANCE at CONFERENCES & TRADE SHOWS

### Books:

- Sonochimie organique : les ultrasons en synthèse organique verte, Draye M. ; Estager J. ; Kardos N. ; *Méthodes d'activation en sonochimie (vol.2)*, 1-82, ISTE Editions, London, United Kingdom, ed. J.P. Goddard, M. Malacria, C. Ollivier (2019).

## Scientific Papers:

- Versatile and scalable synthesis of cyclic carbonates under organocatalytic continuous flow conditions, Gérardy R.; Estager J.; Luis P.; Debecker, D.; Monbaliu J.C.; *Catalysis Science & Technology*, 9, 6841-6851 (2019) (front cover feature).
- “Click” silica-supported sulfonic acid catalysts with variable acid strength and surface polarity, Kasinathan P.; Lang C.; Radhakrishnan S.; Schnee J.; d’Haese C.; Breynaert E.; Martens J.A.; Gaigneaux E.M.; Jonas A.M.; Fernandes A.E.; *Chem. Eur. J.*, 25, 6753-6762 (2019). (“hot paper”, front cover feature).
- Synthesis of discrete catalytic oligomers and their potential in silica-supported cooperative catalysis, Chandra P.; Jonas A.M.; Fernandes A.E.; *RSC Adv.*, 9, 14194-14197 (2019).
- Ionization mechanism in gel permeation chromatography mass spectrometry (GPC-MS) with atmospheric pressure chemical ionization (APCI) interface, Boborodea A.; Haex M.; J. Polym. Anal. Charact. 24(6):24, 496–503 (2019).
- Maîtrise des substances dangereuses : techniques d’analyse et méthodologie d’approche, Moro S.; *Arcopnews* n°261 (2019).
- Sustaining the transition from petro- to biobased chemical industry with flow chemistry, Gérardy R.; Morodo R.; Estager J.; Luis P.; Debecker D.; Monbaliu J.C.; *Topics in Current Chemistry*, 377(1), 1-35 (2019).

## Lectures:

- Reduction of odour/VOC emissions from biocomposite materials: Selection of suitable additives, Brasseur C.; 10<sup>th</sup> Multidimensional chromatography Workshop (MDCW), January 21-23, 2019, Liège (B).
- GC-MS-sniffing and GC×GC-HRTOFMS analyses as methodology for the selection of suitable additives to reduce undesirable odour / VOC from composites materials, Demeyer M.; 21<sup>th</sup> Workshop: Odour and Emissions of Plastic Materials, March 19-20, 2019, Kassel (D).
- Catalytic upgrade of biobased chemicals using microfluidic devices, Estager J.; Gauchet A.; Boborodea A.; Duwez C.; Debecker D.; Li W.; Luis P.; Nikolaeva D.; Gérardy R.; Monbaliu J.C.; International Symposium on Green Chemistry, May 13-17, 2019, La Rochelle (F).
- Tuning the acid strength and surface polarity of silica-supported sulfonic acid catalysts, Fernandes A.E.; International Symposium on Green Chemistry, May 13-17, 2019, La Rochelle (F).

- Recyclage chimique des composites, avec (notamment) l’exemple du projet RECY-COMPOSITE, Dubois M.; European Chemical Recycling Conference – Challenges and Opportunities, June 04, 2019, Brussels (B).
- GC-MS-sniffing and GC×GC-HRTOFMS analyses as methodology for the selection of suitable additives to reduce undesirable odour / VOC from composites materials, Demeyer M.; Colloque SFIP : Plasturgie et automobile : Quelles innovations ? Quelles attentes ? June 5-6, 2019, Douai (F).
- Techniques d’analyse et méthodologie d’approche, Moro S.; Colloque EU-OSHA - maîtrise de l’usage des substances dangereuses en collaboration avec ARCoP/SPF Emploi, June 27, 2019 Brussels (B).
- Odeurs industrielles: Les comprendre et les traiter, Lalande D.; P’tit Dej Technologique Innovatech, September 12, 2019, Seneffe (B).
- Evaporative light scattering detector with linearized signal for high temperature gel permeation chromatography, Boborodea A.; Polymer Testing and Analysis, September 18-19, 2019, Düsseldorf (D).
- Thermal desorption and GC×GC-HRTOFMS for the identification of odorous compounds in complex polymer matrices, Brasseur C.; 5<sup>th</sup> SBSE International Meeting, September 23, 2019, Paris (F).
- Emissions and odours from recycled methyl methacrylate and derived polymer, Brasseur C.; Borcy A.; Lemenu C.; De Groote P.; Dubois J.L.; van der Heijden S.; 14<sup>th</sup> edition of Emissions and odours from materials conference, October 10, 2019, Brussels (B).
- Recent Developments in GPC Techniques and Methodologies at Certech, an Agilent Partner Lab, Boborodea A.; Brookes A.; The fall meeting of the Discussion Group on Separation methods for Polymers (DSP), November 7<sup>th</sup>, 2019, Breda (NL).
- Microfluidics applied to chemistry : a green, safe and productive paradigm, Estager J.; Boborodea A.; Dubois C.; Duwez C.; Debecker D.; Nikolaeva D.; Luis P.; Gérardy R.; Monbaliu J.C.; P’tit Dej Microfluidique Innovatech, November 21, 2019, Seraing (B).

## Posters:

- Continuous Flow synthesis of cyclic organic carbonates catalysed by organic salts, Gérardy R.; Estager J.; Debecker D.; Luis P.; Monbaliu J.C.; Flow Chemistry Europe, February 26-27, 2019, Cambridge (UK).
- Catalytic pyrolysis of biomass for biobased molecules, Estager J.; Gauchet A.; International Symposium on Green Chemistry, May 13-17, 2019, La Rochelle (F); (*IFP Energies Nouvelles award for best poster of ISGC 2019*).

- Continuous, Greener Synthesis of Metal-Organic Frameworks Deresteanu O.; Collignon F.; Lalande D.; Ben Mustapha L.; POPS2019, September 09-13, 2019, Heidelberg (D).
- Including GCxGC-HRTOFMS as a Powerful Tool in the Methodology for the Selection of Suitable Additives to Reduce Undesirable Odour/VOC from Biocomposite Materials, Demeyer M.; 5<sup>ème</sup> colloque Fibres naturelles et polymères, September 19, 2019 Troyes (F).
- Continuous, Greener Synthesis of Metal-Organic Frameworks, Deresteanu O.; Collignon F.; Lalande D.; Ben Mustapha L.; EuroMOF 2019, October 27- 30, 2019 - Maison de la Chimie, Paris (F).

### They talk about us:

- September 2, 2019 La DH : Seneffe: les nuisances olfactives sur la table des industries.  
<https://www.dhnet.be/regions/centre/seneffe-les-nuisances-olfactives-sur-la-table-des-industries-5d6d226b9978e24807254b44#.XW1Bl6X5KQU.email>
- October 11, 2019 Antenne Centre : Saint-Vaast : l'innovation des entreprises belges au centre de la journée "Mars et Mercure".  
<https://www.antennecentre.tv/article/saint-vasst-linnovation-des-entreprises-belges-au-centre-de-la-journee-mars-et-mercure>
- May 2019 DG Regio Belgian-French technology for recycling composite materials, paper related to the RECY-COMPOSITE project.  
[https://ec.europa.eu/regional\\_policy/en/projects/belgium/belgian-french-technology-for-recycling-composite-materials](https://ec.europa.eu/regional_policy/en/projects/belgium/belgian-french-technology-for-recycling-composite-materials)

### Conference and Trade show Attendance

Event	Date	Location
Réunion GFSV	15-01-19	Paris (F)
2019 HARMONI Summit - The Right Framework for Innovation	16 to 17-01-19	Brussels (B)
Réunion GN-MEBA	18-01-19	Paris (F)
10 <sup>th</sup> Multidimensional Chromatography Workshop	21 to 23-01-19	Liège (B)
B2B MATCHMAKING "PLASTICS IN MEDTECH AND LIFE SCIENCES"	12-02-18	Aachen (D)
Réunion de normalisation AFNOR B44A, photocatalyse	04-02-19	Lyon (F)
21 <sup>st</sup> Conference Odour and Emissions of Plastic Materials	19 to 20-03-19	Kassel (D)
Which sustainable future for plastic	21-03-19	Mons (B)
Journée d'étude BSOH direct reading instruments in occupational hygiene	22-03-19	Brussels (B)
Réunion de normalisation CEN/TC386 photocatalyse	27 to 28-03-19	Brunswick (D)
SPE - Additives & Color Europe Conference	27 to 29-03-19	Frankfurt (D)
Hydrogen Days 2019	27 to 29-03-19	Praha (CZ)
Colloque SFIP - Fabrication additive : les facteurs clés de succès pour la production série de pièces polymères	3 to 4-04-19	Lyon (F)
Plastic Recycling Show Europe	10 to 11-04-19	Amsterdam (NL)
Workshop Mousses Polymères	11 to 12-04-19	Paris (F)
5 <sup>th</sup> Edition GreenWin International Conferences Green Chemistry - White Biotechnology	08-05-19	Gosselies (B)
Plastiwin réunion plénière, AG & Plastiwinner	09-05-19	Les Isnes (B)
GFSV 2019	13 to 16-05-19	Lyon (F)
International Green Chemistry Conference - ISGC 2019	13 to 17-05-19	La Rochelle (F)

Event	Date	Location
Séance d'information du NCP Wallonie sur les appels H2020	21-05-19	Louvain-la-Neuve (B)
Workshop Plasturgie & Design	21-05-19	Lille (F)
European chemical recycling conference 2019: Challenges and Opportunities	04-06-19	Brussels (B)
Congrès international Plasturgie et Composites de la SFIP et de l'IMT Lille Douai (Plastiques et Automobile: Quelles innovations? Quelles attentes?)	5 to 6-06-19	Douai (F)
Automotive Materials	17 to 18-06-19	Munich (D)
Ecole d'été en calorimétrie et analyse thermique	16 to 21-06-19	Lyon (F)
Colloque dans le cadre de la campagne sur la maîtrise de l'usage des substances dangereuses en collaboration avec ARCoP	27-06-19	Brussels (B)
Journée thématique GN-MEBA	3 to 4-07-19	Poitiers (F)
14 <sup>ème</sup> Journée Promotion Procédés Produits : Valorisation thermochimique des combustibles solides	04-07-19	Nancy (F)
Réunion préparatoire EnCN en Wallonie	18-07-19	Wavre (B)
Skywin/Plastiwin seminar - High Performance ThermoPlastics Materials	04-09-19	Namur (B)
Polymer Testing & Analysis	18 to 19-09-19	Düsseldorf (D)
5 <sup>ème</sup> Colloque Fibres Naturelles et Polymères	19-09-19	Troyes (F)
5 <sup>th</sup> SBSE Technical Meeting (TD + SBSE)	23 to 24-09-19	Paris (F)
ISO/TC146 Meeting annuel normalisation Air Quality - SubComm. QAI/ALTr/AAmb/Aex/Auto	7 to 11-10-19	St Augustin (D)
14 <sup>th</sup> edition of Emissions and odours from materials conference	08-10-2019	Brussels (B)
EuroMOF 2019	26 to 31-10-19	Paris (F)
Belgian Plastics Day 2019 - Plastics in a Circular Economy	07-11-19	Brussels (B)

Event	Date	Location
Discussiegroep Scheidingsmethoden voor Polymeren (DSP)	07-11-19	Breda (NL)
Séance d'information "Permis d'environnement"	14-11-19	Marche-en-Famenne (B)
Partnering event Cornet	27-11-19	Namur (B)
Roadmap session ELV waste composites and plastics	05-12-19	Brussels (B)
Energy Campus Nuremberg meets Wallonia	9 to 10-12-19	Louvain-la-Neuve, Seneffe, Brussels (B)

## 6. Key Figures

### Balance sheet

<b>Assets</b>	<b>2019</b>	<b>2018</b>
<b>Fixed assets</b>	<b>2.361.605</b>	<b>2.101.794</b>
Scientific equipment and installations	2.357.767	2.097.956
Intangible assets	3838	3838
<b>Current assets</b>	<b>8.499.668</b>	<b>7.851.512</b>
Accounts due within one year	2.465.268	2.418.324
Cash investments	2.240.592	870.866
Cash	3.396.486	4.286.186
Adjustments (accrued income)	397.322	276.136
<b>Total assets</b>	<b>10.861.273</b>	<b>9.953.306</b>

### Liabilities

	<b>2019</b>	<b>2018</b>
<b>Reserves</b>	<b>6.172.282</b>	<b>5.512.899</b>
Social reserves	2.128.173	1.928.173
Accumulated reserves	2.832.111	2.529.017
Investment subsidies	1.211.998	1.055.709
<b>Provisions for contingencies and losses</b>	<b>241.579</b>	<b>302.856</b>
<b>Debt</b>	<b>4.447.412</b>	<b>4.137.551</b>
Accounts payable after one year	1.550.418	1.593.880
Accounts payable within one year	2.891.368	2.471.230
Adjustment accounts	5.627	72.440
<b>Total liabilities</b>	<b>10.861.273</b>	<b>9.953.306</b>

## Income statement

Income statement	2019	2018	Workforce	2019	2018
<b>Turnover</b>	<b>5.149.056</b>	<b>4.784.224</b>	<b>Total Headcount</b>	<b>40</b>	<b>40</b>
Contract operations	2.726.141	2.615.983	Total FTE	37,2	37,2
Public research subsidies	1.569.339	1.429.166	FTE Scientists	33,8	33,8
Depreciation subsidy allowances	431.458	310.074	FTE Technicians	1	1
Other revenues	429.143	429.001	FTE administrative staff	2,4	2,4
<b>Expenses</b>	<b>3.840.856</b>	<b>3.684.109</b>			
Supplies and services	830.714	775.156			
Subcontracting	111.316	154.565			
Salaries	2.898.826	2.754.388			
<b>Depreciation, provisions and loss of value</b>	<b>788.673</b>	<b>638.237</b>			
<b>Financial revenues</b>	<b>733</b>	<b>2.239</b>			
<b>Financial expenses</b>	<b>7.899</b>	<b>8.759</b>			
<b>Exceptional expenses and Taxes</b>	<b>16.291</b>	<b>25.582</b>			
<b>Net Result</b>	<b>503.094</b>	<b>429.776</b>			

## Certech Management

### General Assembly - Board of Directors

				Industry	
	UCLouvain	Alain Jonas			
		Eric Gaigneaux			
		Nathalie Burteau			
	Total	Jean-Pierre Dath	Chairman	√	
	Umicore	Jean Scoyer		√	
	Dow Silicones	Serge Creutz		√	
	Cargill	Stéphane Biltresse		√	
	Veolia	David Benanou		√	
	GMA Consult	Gisèle Maréchal		√	
	it4ip	Yves-Jacques Schneider		√	
	Grando	Yves Charlier		√	
	IDEA	Maité Dufrasne		√	
		Philippe Busquin			
	Guest	Thierry Randoux	General Manager		
	SPW-EER	Emmanuel Delhaye	Observer		
	UCLouvain	Thomas Pardoën			

### Scientific and industrial Committee

UCLouvain	Michel Devillers
	Olivier Riant
	Jean-Francois Gohy
	Juray Dewilde
	Alain Jonas
	Evelyne Vanruymbeke
essencia	Frédéric Druck
Total	Philippe Lodefier
Sonaca	Dimitri Gueuning
EIRMA	Michel Judkiewicz

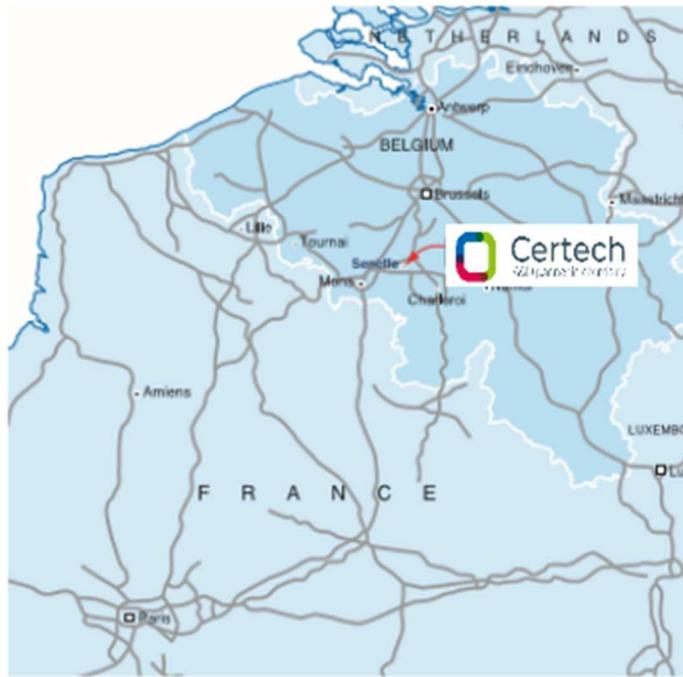
### General Management

General Manager	Thierry Randoux
Business Manager- Deputy General Manager	Catherine Henneuse

### Auditor

Avisor scrl	Dorothee Hurteux
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Wallonie