

The future of Innovation and Sustainability.

# R&D SUSTAINABLE RESEARCHAND INNOVATION





**R&D SERVICE** INNOVATION AND RESEARCH FOR SUSTAINABILITY.

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Themis' R&D unit drives every step of our technological innovation, designing tailor-made solutions for waste treatment.

Every innovation is born from continuous research, to optimize processes and promote a circular economy.

## **Research & Development Department**

The driving force behind our innovation

Our mission is clear: transforming waste management into tangible opportunities, combining a visionary approach with a solid scientific and technological basis. A perfect synergy between cutting-edge technologies and custom-made solutions.

This department is born with the ambition to anticipate changes in the field and lead progress towards a more sustainable future.

Thanks to a team of experts and continuous research, testing and prototyping activities, advanced technologies and customized solutions are developed, capable of optimizing waste treatment processes and significantly reducing their environmental impact.

Our projects do not just improve the efficiency of existing processes, but aim at revolutionizing the concept of waste management by promoting **innovative models based on the** Circular Economy and a more responsible management of natural resources.

Sustainability is the cornerstone of our work: we believe that every innovation must be oriented not only towards economic efficiency, but also to the protection of the planet.

For this reason, we are constantly investing in new technologies research that can reduce the use of nonrenewable resources, optimize the recovery of materials and minimize waste.

Our priority goals include the introduction of solutions that not only meet, but exceed regulatory and market standards, providing our customers with the tools to be agents of positive change.

Each innovation project is also custom-made, designed to meet the specific needs of the customers and communities we work with.

Through our daily commitment and future-oriented approach, we aim at becoming a benchmark in the sustainable waste management field by offering solutions that generate both economic and environmental value.

### Technological innovation: customized waste management solutions

The technological solutions developed by our R&D team are not limited to meeting current needs, but represent a strategic vision towards the future needs of the waste management sector.

A significant example of this constant innovation is Themis WRT, a revolutionary technology designed to deliver highly efficient and sustainable solutions. Themis WRT is undergoing a continuous process of improvement, thanks to an integrated approach combining theoretical research and practical experimentation. These tests are carried out at our specialized laboratory, the Themis LAB, where each solution is carefully validated and optimized to guarantee concrete results and superior performance.

The R&D department, together with Themis LAB, develops technologies that not only improve the efficiency of waste management processes, but also help reduce disposal costs and promote innovative use of resources.

This continuous commitment to research and the adoption of the latest technologies allow us to be pioneers in innovation and key players in sustainable progress in the field of waste treatment.







# **Research & Development**

## to support customer needs

In Themis' R&D department, our commitment goes far beyond the simple supply of technologies: we act as strategic partners, developing customized solutions that meet the specific needs of each customer.

Each project begins with a detailed analysis of the customer's challenges and goals, with the aim of providing not only an immediate response, but also added value in the long run, promoting sustainable and highly efficient solutions

Our **R&D team** ensures the validation of each phase of the project through practical tests and in-depth analyses.

Thanks to a clear and structured process, we actively involve the customer in every step, from initial concept to final realization, ensuring tangible and lasting results.

## R&D project's phases





#### Customer contact, data collection and analysis

Each project begins with a thorough discussion with the client, aimed at understanding their specific needs and the type of waste to be treated. After collecting the required data, we proceed with sampling and chemical-physical analysis of the material to identify its characteristics and define the most suitable research and development strategy.



## Pilot plant tests

In the testing phase, we carry out pilot scale tests to examine the effectiveness of the proposed solutions under real conditions and to optimize processes to ensure best performance.



## "Waste management" analysis and consultancy

We provide customized consulting to optimize waste management processes, improve operational efficiency and propose sustainable solutions. Our goal is to turn waste management into opportunities, support the Circular Economy and create lasting value for the customer.



#### Industrial plant design

Once the test results are validated, we move on to the design phase of the industrial plant, focusing on optimizing functionality and operational efficiency. Each project is custommade to meet the specific needs of the customer.



#### Installation and continuous remote support

During the start-up and operation phases, we provide ongoing support to ensure that your plant achieves and maintains its peak performance. In addition, thanks to our remote monitoring systems, we are able to monitor the functioning of installed plants in real time.





# **Provided services**

Themis LAB is much more than a simple laboratory: it represents the beating heart where ideas are transformed into concrete, effective and custom-made solutions.

This cutting-edge facility, designed to meet the sector's most difficult challenges, is where technologies come to life, from concept to reality.

Thanks to its highly specialized structure, Themis LAB offers the possibility of testing, validating and perfecting each project before its implementation on a large scale. This approach ensures that the provided solutions not only meet our customers' needs, but are also optimized from a technical, economic and environmental point of view.

The practical and dynamic approach of Themis LAB begins with careful theoretical research, which culminates in an advanced testing phase, where every idea undergoes rigorous tests and analysis. This is where science, technology and creativity meet, creating precise and customized solutions to address each customer's unique challenges. Our goal is clear: to offer innovations that not only solve problems, but also make a concrete contribution towards a more sustainable and cutting-edge future.

#### Chemical analysis

Each project begins with a complete chemical and physical analysis, essential to understand the features of the matrices to be treated. Using advanced tools and cutting-edge technologies, our team of experts accurately identifies the composition, properties and behavior of materials. These analyses do not just provide data, but are the basis for developing scientifically sound and customized solutions. Whether organic, industrial or special waste, each matrix is carefully designed to ensure the highest level of efficiency and sustainability in subsequent processes.



### Pilot plant tests

One of the distinctive features of the Themis LAB is the use of state-of-the-art pilot plants, designed to replicate real industrial plant conditions on a small scale. This step is crucial to assess the effectiveness of proposed solutions in a controlled, but representative of actual operating conditions. Each test is carefully monitored and analyzed, allowing key data collection to optimize your processes. Our approach goes beyond validating technical feasibility: we aim to improve operational efficiency, reduce costs and ensure that the final solution meets the highest standards of quality and sustainability.



#### Biocatalysis: enzymes for innovation

One particularly innovative area of the Themis LAB is biocatalysis, an approach that uses the power of natural enzymes to optimize organic waste treatment processes. Through our dedicated enzyme line, we develop highly specialized solutions that use enzymes to accelerate and improve organic degradation processes.

This technology offers numerous advantages:

- processing time reduction, increased efficiency of processes,
- environmental impact reduction, thanks to a natural and non-polluting approach
- improved quality of final results, with a more efficient recovery of useful resources.

The applications of biocatalysis are various and range from food waste treatment to biological sludge and other organic waste management. Through continuous innovation in the field of enzymes, we are redefining the boundaries of what is possible in waste treatment, ensuring solutions that combine high performance and environmental sustainability.



## **WRT** PILOT PLANT

Among our **pilot plants**, in our Legnano (MI) plant technology **Themis WRT 350**. This facility allows us

# **R&D** team and collaborations

## The heart of innovation: our R&D team

Our **multidisciplinary R&D team** is the heart of Themis innovation.

Composed of highly qualified professionals in biotechnology, engineering, chemistry, biology and sustainability, this expert group represents a unique combination of scientific and practical expertise.

Each team member is driven by a strong passion for research and a daily commitment to the development of advanced solutions, capable of successfully addressing the most complex challenges in waste treatment and sustainable resource management. Thanks to their experience and creativity, we are able to explore new technological frontiers, guaranteeing results that exceed expectations.

The dynamic and results-oriented approach that characterizes our team allows us to respond with agility to the different needs of our customers. Each project is carefully developed, combining theoretical knowledge with solid practical experimentation.

This combination enables us to offer customized solutions that not only meet technical requirements, but also promote sustainable innovation as a fundamental pillar of our work.

## Strategic partnerships with Universities and Research Centres

We firmly believe that innovation is born out of confrontation and synergy. For this reason, we actively cooperate with **universities, research centers and scientific institutions**, both nationally and internationally. These partnerships enable us to develop emerging technologies, enrich our solutions with the latest knowledge and successfully address the most complex challenges in the industry.

Our participation in **research consortia** enables us to work side by side with companies, academic bodies and organizations of various kinds. This approach facilitates the exchange of expertise, sharing resources and broadening the impact of our solutions, contributing to the implementation of ambitious and far-reaching initiatives.

Through our involvement in **research and development initiatives on a global scale**, we are able to design increasingly advanced technologies, oriented towards a sustainable future.

These collaborations allow us to:

- accelerate the implementation of innovative solutions
- promote the development of sustainable models
- contribute to the progress of the sector.

This partnership network is a key added value for us, not only to maintain our high standards of excellence, but also to drive change in an ever-evolving sector.

# EcoeFISHent

## EUROPEAN PROJECT HORIZON 2020

In the context of the **EcoeFISHent** project, funded by the European Union's **Horizon 2020** programme, our **Themis WRT technolog**y plays a key role in transforming solid residues from fish processing into a dry concentrated product. These are not mere by-products, but **high value materials** that can be used in innovative sectors such as cosmetics, nutraceuticals and the production of bioplastics.

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# Towards a sustainable future

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Themis' R&D unit is constantly looking towards the future, working on solutions that not only meet today's challenges but are also ready to face tomorrow's.

Our vision is projected towards the evolution of a more sustainable world, where every piece of waste becomes a resource and each treatment process contributes to the valorization of natural resources.

We are ready to face the challenges of the future, convinced that tomorrow's technologies can reshape our way of interacting with the world and managing natural resources. **Themis is ready to lead the change**, with smart, sustainable and cutting-edge solutions that will help shape a better future for generations to come.

Behind every innovation there is a team of motivated people, united by the passion for research and the will to overcome all limits. Together, we create technologies that are able to make a difference.





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