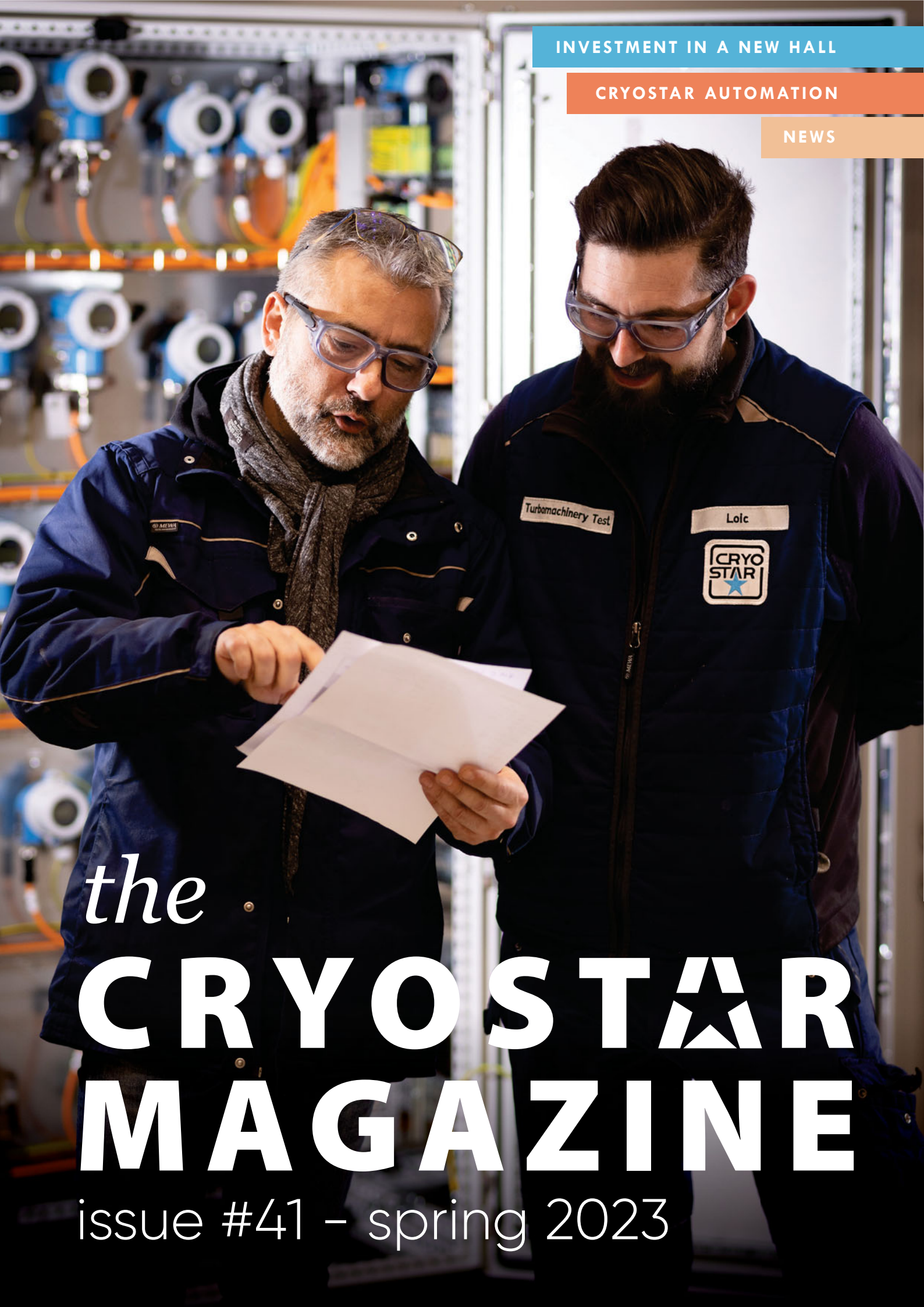
INVESTMENT IN A NEW HALL

CRYOSTAR AUTOMATION

NEWS



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CRYOSTAR MAGAZINE

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NEWS

ECO-DESIGN:

HOW DOES CRYOSTAR WISH TO ADOPT THIS NEW APPROACH?

Environmental protection and awareness of the limits of our planet's resources have led to the emergence of a new type of product or service design activity: eco-design. Eco-design aims to reduce the environmental impact of products or services. It is based on data and tools that are now sufficiently mature to be used in the industry.

The assessment of environmental impacts covers several dimensions such as raw materials and/or recycled materials consumption, fossil and/or renewable energy consumption, water, air and soil pollutions, waste generation and the transformation of natural environments and living environments. The impact on climate change is one of the assessed externalities.

The eco-design scenarios cover the creation of new concepts, the selection of new materials, the reduction of the quantities of material used, the optimisation of production technologies, logistics and the use of products, increased lifespan, recyclability, etc. Cryostar therefore needs to offer products and services that are increasingly environmentally friendly and at least as efficient as current products.

After having carried out a life cycle analysis of a new pump concept in 2022, we are now considering expanding this approach to other products, starting with a pump model for energy storage to be marketed in 2023.

From left to right: Annie Bonnot, HR Director who initiated the process - Bruno Brethes, Sponsor - Mickael Billon, Pumps Development Manager

About ten Cryostar employees have already been trained in the ECO DESIGN STUDIO life cycle analysis tool during a training course provided by CETIM in 2022.

The Chamber of Commerce & Industry of the Grand Est Region and the consultancy firm «Amulis» will accompany us for a little over a year in the integration of this eminently multidisciplinary activity. 10 companies, including Cryostar, will improve their eco-design skills.

Cryostar's goal is to integrate the eco-design approach into its product development practices, giving additional meaning to its industrial adventure while providing superior added-value to its customers and employees.

Cryostar thanks its "Machinery Design and Development" department for having carried out the analysis on the first machine and for its involvement in the continuation of the project. Bruno Brethes, Director of the Process BU and sponsor of the approach, is in charge of its implementation. Recall that the idea of adopting the eco-design approach comes from our HRD Annie Bonnot.

Cryostar pursues its growth

Cryostar's news is very dense this spring 2023, with many successes for our company and therefore for our customers, our staff and all our stakeholders.

The largest investment in Cryostar's history, worth €16 million, was commissioned in February 2023, after being officially inaugurated in early January. This impressive building dedicated to the assembly and testing of compressors and turbines, with a surface area of 1600 sqm, will allow us to secure the delivery times of our equipment for LNG carriers, essential players in the LNG supply chain, in a tense context of the liquefied natural gas market, which is expanding on a global scale.

Our Eco-design approach has been launched. Cryostar's aim is to offer products and services that are increasingly environmentally friendly throughout their long life and at least as efficient as current products. Our goal is to integrate eco-design into our product development practices, giving an additional meaning to our industrial adventure, while providing superior added value to our customers and employees.

Our Cryostar Automation entity is also very active. Specialized in industrial and medical gas cylinder filling stations, as well as in the design of complete LNG fueling stations "made by Cryostar", it inaugurated its new premises and celebrated its 20th anniversary in 2022. The fueling stations for natural gas vehicles will soon be developed in liquid hydrogen version. **The future for Cryostar Automation, thus, also lies in the development of hydrogen applications on the one hand, and predictive maintenance on the other.**

Without the women and men of Cryostar, nothing would have been possible, we owe them our successes! In this issue, you will discover our progress in terms of **Employer Brand.** You will also enjoy reading the portrait of **Stéphane Sgambati,** who will be retiring in 2023, after 35 years of loyalty to the company. His career has been intensely rich and he has been a major player in the evolution of our company. We thank him for his immense contributions!

Samuel Zouaghi

PRESIDENT

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THE PROJECT TO SUPPORT CRYOSTAR'S GROWTH

> FROM LEFT TO RIGHT: JULIEN RIVELLO, KARIM HAMMOUCHE, OLIVIER WERTH, DIDIER WALCH, DIDIER BEY

The largest investment in Cryostar's history, worth €16 million, was commissioned in February 2023, after being officially inaugurated in early January. At Cryostar, we do things in a big way! Zoom on this impressive building dedicated to the assembly and testing of compressors and turbines, called "Hall 9", with a surface area of 1600 sqm.

"We would like to thank the Grand Est Region, which has contributed 200,000 euros as part of the aid program for large companies", says Didier Walch, Director of the Information System and Industrial Infrastructures.

Launched in the summer of 2021, construction works were completed in early 2023. A few more weeks were needed to fit out the two modular halls, move some machines and allow the production and testing teams to set up their workstations.

The first 4-stage compressor assemblies for LNG carriers were started in February 2023. Production has been ramping up gradually with the aim of being fully operational by spring. At the time of writing in April 2023, the assemblies are complete and testing has been completed or is underway. These compressors are destined for shipyards.

After packaging, they will be shipped by sea from the port of Antwerp to Asia, a journey that will take 6 to 8 weeks.

"Cryostar's 4 and 6 stage compressor and turbine testing capacity is now doubled. Compressors and turbines of different sizes will be tested in order to test the different configurations planned to meet the growing demand of the LNG carrier market. We are prioritizing the assembly and testing of LNG compressors in this new hall for the first 6 months of 2023. At the end of these first months of operation, we will integrate the production and testing of turbines, in accordance with our commitments in terms of deadlines for our customers", Didier Walch continues.

From left to right: Mathieu Mangiacotti, Silvere Berlet and Arnaud Holveck

"Enhancing our assembly and testing capacities will allow us to support our significant and rapid growth by helping us to absorb our heavy load and thus reduce our lead times, while further improving the safety of our working conditions. This new hall will indeed allow us to secure the delivery times of our equipment for LNG carriers, in a particularly dynamic global liquefied natural gas market, which is in full expansion on a global scale", says Samuel Zouaghi, President of Cryostar.

Cryostar compressors are used on LNG carriers for which they constitute a strategic component. Cryostar will grow from 138 compressors delivered in 2022 to a forecast of 185 units in 2023, before reaching the 200-mark next year.

Loïc Willem

From left to right: Jeremy Pipiorski and Mathieu Mangiacotti

> ***"This new hall will contribute to the acceleration of compressor deliveries for the tight LNG market"***

A TECHNICAL FEAT

The construction of the Hall required 18 months of work, 5,000 hours of study and the involvement of 30 companies representing 48 different trades, all in accordance with Cryostar's values and accident-free!

We would like to thank our project manager Didier Bey and Didier Walch, who carried out the project from the beginning, as well as all our suppliers who have participated in the work and who have been true partners in this technical adventure. In particular, we welcome the expertise of the OTE Group and its subsidiary ITECO for project management, work monitoring and coordination of on-site workers.

A virtuous building

Cryostar has chosen an industrial building that respects the environment in terms of energy.

The building, with its unique thermal and sound insulation, includes a green roof, photovoltaic panels that will contribute to heating by heat pump, rainwater recovery for sanitary use and thermal solar panels to produce hot water.

Some key figures:

- 2 x 750 sqm of production & test areas
- 2 separate halls for assembly & test operations
- 350 sqm of office space, 2 floors of offices for 30 people
- 3 meeting rooms
- 6 slots equipped with floor rails reproducing on-site installation conditions
- 2 overhead travelling cranes with a capacity of 80 tons (height under hooks: 11 m)
- 2 overhead travelling cranes with a capacity of 20 tons (height under hooks: 8.3 m)
- 350 sqm of solar panels, interior walls covered with wood fiber panels and rock wool (limiting noise reverberation)

Visit of the Hall by the Prefect of the Region, accompanied by a delegation from the Alsace Chamber of Commerce and Industry and local elected officials, in March 2023

A COLORFUL INAUGURATION

In January 2023, we were very proud to inaugurate our new 1600 sqm building in front of an enthusiastic audience of guests.

We would like to thank our international and French customers from the Process and LNG Marine BUs, our partners, institutional and parliamentary representatives and our key account suppliers for their support and presence at our event.

After a very warm welcome, the speeches of Samuel Zouaghi, President of Cryostar, Woochul Kwon, Head of Shipbuilding Material Purchasing Department of Hyundai Group, Gaston Latscha, Mayor of Hésingue, Christèle Willer, Vice-President of the Grand Est Region, Mayor of Buschwiller and Didier Lemaire, Member of Parliament for the Haut-Rhin region, followed one another for one hour, marking an emotional moment of our inauguration.

Our guests praised the aesthetics and the technical prowess of the building, but also the strong Cryostar's corporate culture and the pride of its staff to work there and to participate in its development.

NEWS

EMPLOYER BRAND

Top employers

To find out what the French think of the country's largest employers, the French monthly magazine "Capital" has joined forces with a world specialist in economic data analysis, the Statista Institute, which has undertaken a vast survey over several months based on an online poll of 20,000 employees working in companies with more than 500 employees in France.

Cryostar is in second place among the companies best rated by their employees in the «industrial machinery and equipment» category.

We are very happy and proud of this result which testifies to the quality of the employee experience within our company, the pride of belonging of our teams and the attractiveness of our Employer Brand.

CRYOSTAR scores 99 out of 100 on the gender equality index

In 2018, the French government introduced an innovative tool: the gender equality index. **Cryostar has declared an overall index of 99 points out of 100 in 2023.**
This score undeniably testifies to the respect of the principle of equal pay between women and men at Cryostar France, a requirement that is an integral part of the company's culture and Human Resources policy.

A day with Cryostar Autom a must in cryogenics

> FOCUS ON CRYOSTAR AUTOMATION, A RENOWNED SUPPLIER OF INDUSTRIAL AND MEDICAL GAS CYLINDER FILLING STATIONS, AS WELL AS COMPLETE LNG FUELING STATIONS. ITS PROFESSIONALISM AND EXPERTISE ARE ACKNOWLEDGED BY THE FIFTY OR SO EUROPEAN AND WORLDWIDE CUSTOMERS WHO PLACE THEIR TRUST IN THE COMPANY, WHICH GENERATES ALMOST ALL OF ITS TURNOVER FROM EXPORTS. SOME FIFTY EMPLOYEES, UNITED BY A TRUE FAMILY SPIRIT, FORM THE CEMENT OF THIS SUCCESS STORY WHICH HAS LASTED FOR OVER 20 YEARS!

"We entered the LNG fueling station market in 2008, with first references in the United States and Tasmania,» explains Claire Rivollier, Director of the Distribution BU to which the Cryostar Automation entity is attached. "Since 2001, we have delivered more than a hundred filling stations for industrial and medical gases and more than 230 LNG fueling stations worldwide. We are also certified for medical applications of the cylinder filling stations and have a frame agreement for LNG stations with Shell, to whom we have already delivered more than 40 LNG stations".

The Cryostar Automation teams

"This Cryostar entity nestled in the Aveyron region of France is small and agile in size, but big in heart and generous in its actions and commitments, says Samuel Zouaghi, President of Cryostar. Cryostar Automation has always been able to cultivate its specificities while contributing significantly to the success of the Cryostar group. Without the men and women of Cryostar Automation who are the soul of the company, nothing would have been possible. May their skills and expertise, but also their generosity and team spirit, be recognized and saluted here".

"Cryostar Automation is above all a state of mind. The teams have qualities of commitment, generosity and customer

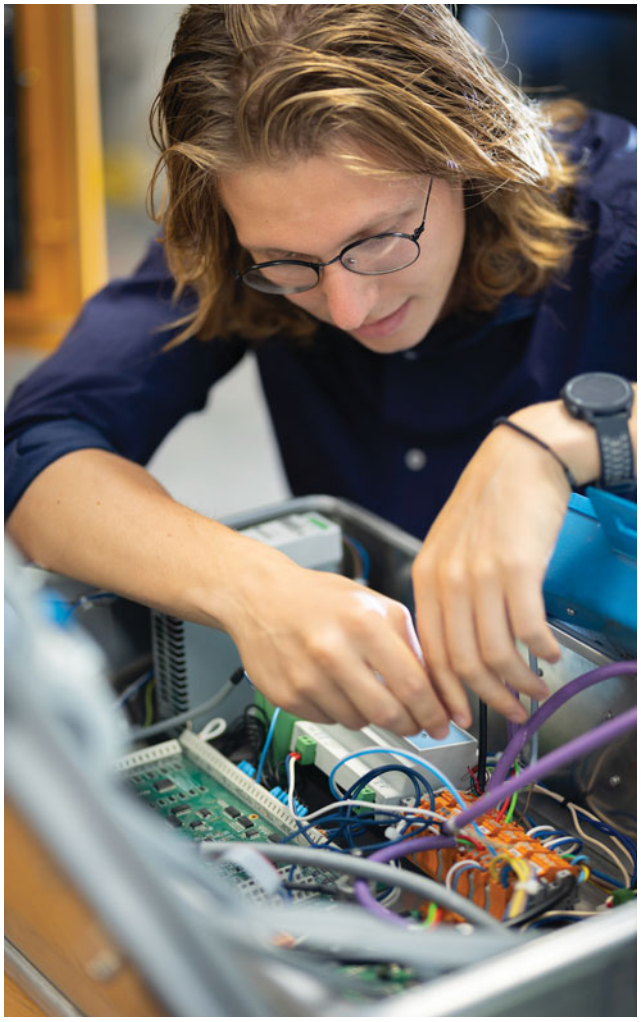
ation:

satisfaction. I am proud and happy to be part of this entity for more than 15 years now", says Philippe Fauvel, Sales, Customer Service and Project Execution Manager.

All the professions are represented, the teams work in close collaboration, including with Cryostar's head office in Hésingue: Sales, Technical Sales Support, Project Execution, Customer Service, Engineering (an electrical division, an automation division, an electronics division and an IT division), Workshop, Purchasing, QHSE, Global Service, not forgetting the twenty or so external people who provide support to Cryostar Automation. Recognized for their successful integration, appreciated by their colleagues, only the color of their badge differentiates them from the Cryo'Stars. They have worked and continue to work for the success of Cryostar Automation.

Let's detail the Sales team, whose technical and commercial knowledge and reliability are appreciated by its customers. The Project Execution team is recognized for its technical expertise and rigor as well as its highly developed interpersonal skills; it is a pillar that can be counted on when implementing the largest projects. The Production team manages planning, industrialization, warehousing and methods on a daily basis, using many of the same tools and procedures as in Hésingue. The Workshop, the heart of the reactor, is dedicated to the assembly and testing of products. It is historically qualified in the assembly and testing of skids for high-pressure oxygen applications, with an extremely high level of requirement and its professionalism is growing. This has enabled the team to adapt very quickly to the requirements of the most demanding customers such as SHELL, Engie, Linde or Messer.

"In terms of quality, our aim is to work in complete synergy on the two sites of Hésingue and Capdenac by adopting the same operating rules. Regular interaction between the teams at the two sites generates emulation in terms of organization and mutual support for each other's methods and activities, even if the products are different", explains Mathieu Poncet, Quality Manager.



Nicolas Vuillermoz

A taste for innovation and passion qualifies the design office teams

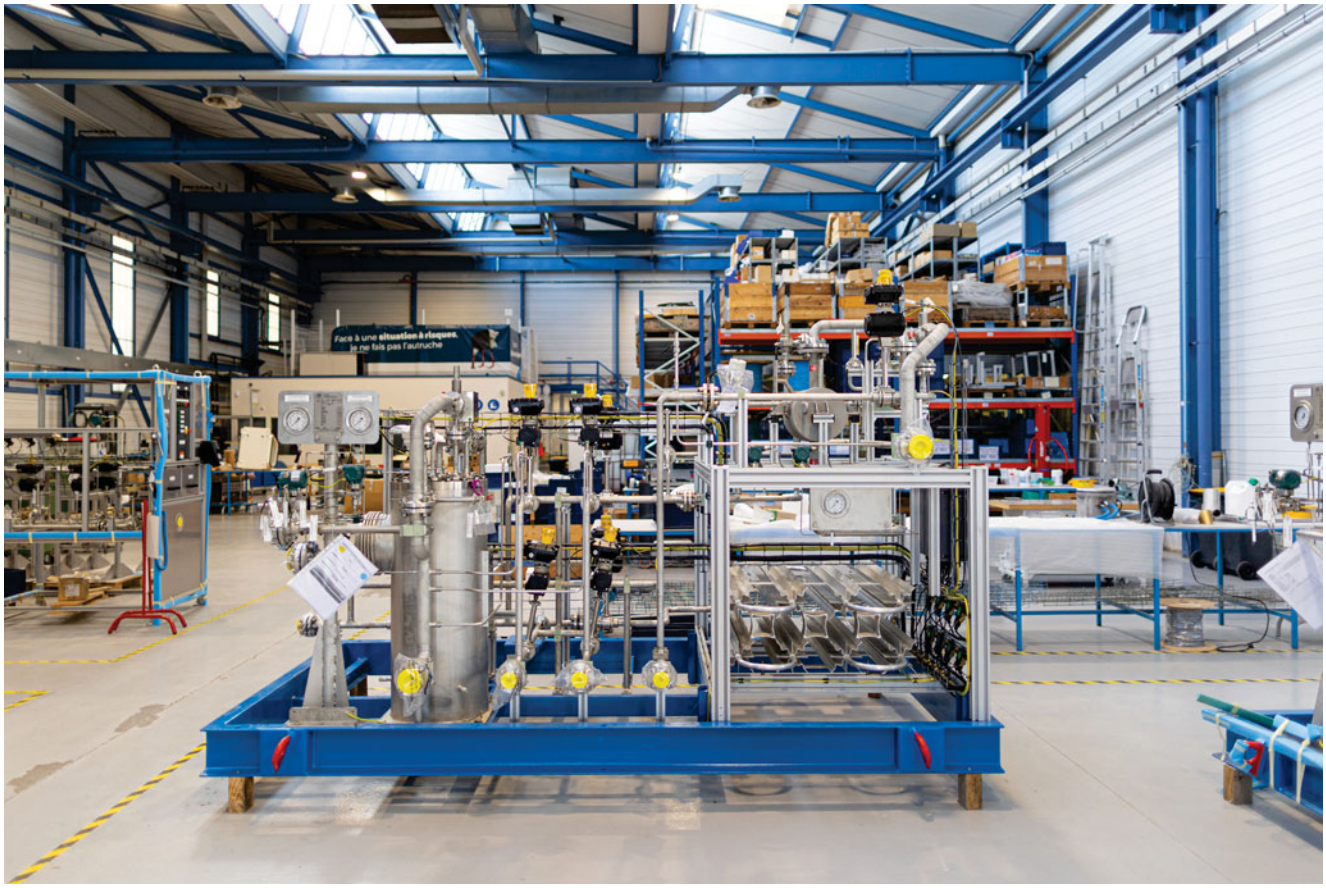
"This team with its specific and sophisticated skills fits perfectly with our positioning. By turning to Cryostar Automation, our customers are looking for top-of-the-range solutions, and this is precisely the core of our offer", continues Samuel Zouaghi, President of Cryostar.

Cryostar Automation can indeed boast of very specific and sharp skills within its various Engineering teams, especially in electronics:

"We develop and produce our own electronic cards for the natural gas dispensers of our LNG fueling stations. These electronic cards are validated by the "weights and measures" notify body, certified as "CRYOSTAR electronic cards": this is a major strength of our entity and its core competence, beyond mechanics, insists Philippe Fauvel. It should also be emphasized that our products are very successful in terms of human machine interface: very graphic, fun and ergonomic, our solutions are very easy to use, with an interface that looks like a mobile phone. We are recognized worldwide for the quality and functionality of our products".

The other great strength of the entity is its Customer Service

The Customer Service team is very attentive and goes out of its way to help solving any problems encountered by customers. *"Our after-sales service runs 24/7 with a hotline service and a person working at night. We can take over remotely to solve problems at our customers' sites. Our installation team is involved at all stages, right up to the delivery of the equipment to the site, installation monitoring and commissioning on site"*. In the last few months, Cryostar Automation's Customer Service team has been strengthened, with in particular a pole dedicated to this new equipment commissioning support, which has succeeded in creating a good and strong synergy with the Global Service field service engineers.



Claire Rivollier, Director of the Distribution BU

Development of complete turnkey LNG fueling stations

The design of an LNG fueling station «made by Cryostar» includes all the elements present in a station: a dispenser, pumps, a point of sales and the whole control system of the complete station. The natural gas vehicle fueling stations will soon be developed in a liquid hydrogen version for Europe.

"The future for Cryostar Automation will clearly involve the development of hydrogen applications on the one hand, and predictive maintenance on the other. This will require intelligent systems, interactivity, work on our algorithms, etc. Some high-impact development initiatives, oriented towards predictive maintenance, will be carried out by Cryostar Automation in the near future", concludes Philippe Fauvel.

Christophe Letertre

In short

Cryostar Automation was created in 2001. Within Cryostar's Distribution Business Unit, this entity is specialized in industrial and medical gas cylinder filling stations, as well as the design of complete LNG fueling stations "made by Cryostar".

In 2022, Cryostar Automation inaugurated its new premises and celebrated its 20th anniversary.

STÉPHANE SGAMBATI

MAJOR CONTRIBUTIONS TO CRYOSTAR'S DEVELOPMENT

We would like to pay tribute to Stéphane Sgambati who will be retiring in 2023, after 35 years of loyalty to the company. Stéphane's career has been intensely rich and he has been a major player in the evolution of our company.

He has spent most of his career in the design office, R&D and development activities. Cryostar owes him the design of a large part of the products that have made the company's reputation internationally in the industrial gas, natural gas, clean energy and hydrogen markets. From pumps to turbines to compressors (see our sidebar for more details), Stéphane has left his mark everywhere, developing high-tech cryogenic equipment for the world's leading industrial and natural gas production and distribution companies.

His 3 values

- **Passion for the Job:** "*I was very interested in the field of turbo machines! It's a great technology, in constant evolution. The passion for the job is also fed by teamwork. Being united within a team is in a way the basis for success.*"
- **Customer satisfaction:** "*My motto has always been to never let a customer down on a site, we are known for that at Cryostar. We have worked hard on machine set-ups on customer sites, we have deployed a plethora of customer interventions all over the world, I am quite proud of this record*".
- **Dare!** "*Innovation is successful disobedience. This sentence from JF Caron is very accurate! Taking risks, but calculated risks of course, daring: this is the secret to innovation, in my opinion. It's above all a state of mind*", says Stéphane. One recognizes here the engineer's word! Stéphane is indeed a graduate of a renowned French engineering school (INSA Lyon), specializing in rotating machines.

Stéphane wishes Cryostar and its teams every success for the upcoming challenges.

Samuel Zouaghi, Cryostar's President: "*I would like to underline and salute, on behalf of Cryostar, as well as on my own behalf, Stéphane Sgambati's invaluable contributions to the development of Cryostar, whose entire product range reflects his commitment as well as his great technical expertise*".

STÉPHANE SGAMBATI, A PLETHORA OF PRODUCT DEVELOPMENTS

We can only mention a few of the most significant developments that we owe to Stéphane Sgambati, as the list would be too long:

- The **MCP range of pumps:** modularized single-stage pumps
- The **range of Vertical Pumps (VP)** from 20 to 650 kWh, multistage up to 12 stages
- The **Subtran range of submersible pumps** for LNG filling stations and LNG carriers
- Very **high-pressure piston pumps HPP** (up to 600 bar) and MRP up to 500 bar for the liquid hydrogen market
- **CM4 and CM6** 4 or 6-stage compressors and companders (combining expander and compressors), found on LNG carriers
- The **MCM 300** on magnetic bearings with high frequency motor, the latest innovation, to allow the re-liquefaction of methane in the new Ecochill process
- The **TG 500 turbines** where Stéphane has brought the dry gas seal (DGS) technology to the cryogenic level, for hydrocarbon applications, as well as a TG range with integral gearboxes.
- Part of the **MTC range:** machines on magnetic bearings for gas treatment
- The **GTC120,** the first cryogenic turbo-expander on aerostatic gas bearings.
- The largest machine developed in terms of power was a **TG 800-150 turbine** for a geothermal application with a design power of 15 MW. And recently the largest in terms of diameter-900mm: a **TG 900-180 turbine** for a CORC (Cold Organic Rankine cycle) application.
- The **TC 400** and **TC 500 range for air separation units (ASU):** sizes adapted to larger product flows
- The **HEE (High Efficiency Expander) range,** which increases the efficiency of expanders to 92%.

…

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