

SECO / SPACE

SECO/WARWICK'S NEWSLETTER

The Best **Solutions for an Energy Crisis:**
Production Economics According to SECO/WARWICK

SECO/VACUUM successfully closed the year 2025.

Retech Acquires Perfect Complement
to Their Portfolio with ReMelt Scientific

Aviation industry experiencing growth

We Share Our Experience And Knowledge With You

THE BEST SOLUTIONS FOR AN ENERGY CRISIS

Production Economics According to SECO/WARWICK.



For the past four years, the global economy has faced difficulties. Extended raw material delivery times, high energy prices, challenges in key industries, fewer orders, and transportation difficulties - many related to the outbreak of war in Ukraine - are just some of the challenges that manufacturing companies have been dealing with since 2020. Global investment banks are publishing analyses warning of a global crisis. In times of uncertainty, [reducing production costs](#) will be particularly important for many companies, as such actions can ensure the continuity of their operations. [SECO/WARWICK](#) solutions perfectly illustrate how these actions can be implemented in practice.



SŁAWOMIR WOŹNIAK
CEO
SECO/WARWICK Group

"Efficiency and savings in production have become key factors influencing the success of a company. Companies that can produce more efficiently while controlling costs gain a market advantage and acquire a crucial edge in difficult times. At SECO/WARWICK, we are well aware of this, which is why we are constantly working on solutions that will support our partners in this mission"

"Thanks to FURNACE/PLUS, companies can reduce energy and raw material consumption while increasing productivity, significantly lowering production costs. But we can also use resources efficiently through specific innovations. For companies involved in aluminum processing, we have designed the [VORTEX® 2.0 coil annealing system](#), which provides a 35% reduction in heating time compared to traditional technologies, thereby reducing operating costs and CO₂ emissions. It also ensures high energy efficiency and better use of available resources, lowering production costs. These systems are already operating in the largest aluminum processing plants in the world, and their implementation can be seen as a forward-looking approach to what is happening in global markets,"

- said Piotr Skarbiński, Vice President of the Aluminum and CAB Products Segment at SECO/WARWICK.

Efficient Use of Resources According to SECO/WARWICK

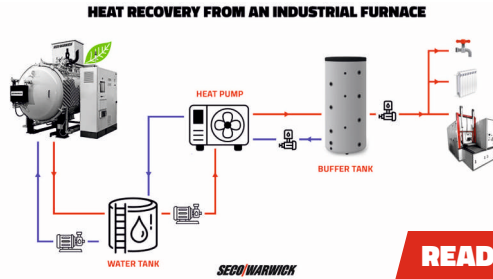
Resources, both human and technological, are the foundation of every production process. Their optimal use translates into increased operational efficiency and cost reduction. One example of a tactical improvement is the addition of [FURNACE/PLUS](#), an **intelligent process management center** that allows users to optimize the work flow of equipment and personnel, **minimizing waste**, and improving efficiency. The FURNACE/PLUS system facilitates the **efficient use of energy and raw materials**, supporting the economy and ecology of production, using the **data collected to analyze trends**, assess results, and provide the foundation to make strategic decisions.



VORTEX® 2.0 coil annealing system, which provides a 35% reduction in heating time compared to traditional technologies

Heat Recovery with SECO/WARWICK

Another money-saving solution is to equip hardening plants with an installation that recovers waste heat from production processes. This process involves capturing the heat generated during heat treatment processes and using it to power other production processes, heat rooms, and provide hot water.



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"This not only helps reduce energy costs but also makes us independent of gas supplies. It also brings environmental benefits by reducing CO₂ emissions, for example. We are installing more and more of these types of installations for partners who are paying closer attention to reducing costs,"

- added S. Woźniak.

Preventing Downtime According to SECO/WARWICK

Unplanned downtime is one of the biggest sources of production losses. Eliminating it through process monitoring and proactive maintenance actions brings tangible savings. Once again, SECO/WARWICK's intelligent system, FURNACE/PLUS, comes to the rescue. Its advanced features include **real-time equipment condition monitoring, which allows for predicting potential failures; proactive maintenance planning, which minimizes the risk of unexpected downtime; and process data integration, which enables quick response to changes and optimization of actions.**

Implementing Modern Technologies According to SECO/WARWICK

Modern technologies create solutions with increased efficiency and savings by shortening process times, reducing energy consumption, and eliminating unnecessary costs. Among the solutions that respond to the needs of contemporary manufacturers, several deserve special attention.

*"Many manufacturers praise their equipment. But at SECO/WARWICK, we don't make empty promises. We have precisely calculated the cost optimizations resulting from the use of our equipment. The [JetCaster furnace](#) revolutionizes casting processes. It ensures a **reduction in crystallization time by up to 50%**, enabling faster production. Additionally, it **reduces energy consumption by up to 40%**, and with comparable energy use, we can produce **twice as many castings**. These are figures that capture the imagination,"*

- added S. Woźniak.

But JetCaster is not the only example of innovative technology that is changing production techniques. **Pit-LPC** is an **alternative to traditional gas carburizing**, producing a **process time reduction of over 60%**, which reduces energy costs. Additionally, **implementing this technology effectively allows users to replace up to three atmospheric furnaces with one vacuum furnace**, reducing both investment and operational costs.

Vacuum technologies ensure minimal process gas consumption during carburizing, enable the use of higher process temperatures, and thus shorten process times. One of the engineering tools that calculates, among other things, the demand for process gases is the [SimVaC® program](#), developed by the Lodz University of Technology in cooperation with SECO/WARWICK. The program enables users to design **each vacuum carburizing (LPC) process cycle** by selecting optimal process parameters to achieve the required technological result at minimal cost with maximum efficiency.

MACIEJ KORECKI
Vice President
of the Vacuum Segment
SECO/WARWICK

"An example of equipment that increases the efficiency and savings of production plants is our two- and three-chamber vacuum furnaces, the CaseMaster Evolution. These systems operate using comprehensive vacuum carburizing with optional oil or gas quenching for large-scale and mass production. This solution increases efficiency and minimizes the waiting time for subsequent production stages, allowing for faster order fulfillment"

Another solution is **Super IQ**, a hybrid of vacuum and atmospheric technology, allowing users to take advantage of the benefits of vacuum carburizing and traditional oil quenching. **The ZeroFlow nitriding technology, on the other hand, allows for a reduction in ammonia consumption by up to 12 times**, which lowers process costs. It also significantly reduces environmental impact by decreasing the use of process gases and the emission of post-process gases.



The ZeroFlow nitriding technology, allows for a reduction in ammonia consumption by up to 12 times.

Reducing costs in manufacturing enterprises requires a holistic approach that combines efficient resource utilization, downtime prevention, and the implementation of modern technologies. **SECO/WARWICK solutions, such as FURNACE/PLUS, JetCaster, Pit-LPC, Vortex, and ZeroFlow, demonstrate that an innovative approach to production management can bring tangible economic and ecological benefits.** This proves that investing in future technologies is not only a way to reduce costs but also to build a competitive advantage in a dynamically changing market environment.

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THE FOURTH QUARTER OF 2024 WAS A TRIUMPH FOR SECO/VACUUM

In the American market, the last few months were filled with significant contracts executed by [SECO/VACUUM](#), a subsidiary of SECO/WARWICK GROUP. Two large deliveries for the defense industry and one for the semiconductor industry have made SECO/VACUUM once again the crown jewel of the SECO/WARWICK Group.

The SECO/WARWICK Group has three companies on the American market, under the brand names SECO/WARWICK, SECO/VACUUM, and RETECH. All three companies expanded their capacities, production halls, and warehouse spaces in 2024. The Group also opened a branch in Mexico to better reach partners in Latin America. Special attention should be given to the activities of SECO/VACUUM, and the exceptionally successful end of last year. SECO/VACUUM has proven to be not only a synonym for vacuum technology quality but also for extremely fast deliveries.

Our New Semiconductor Industry Partner

In the fourth quarter of last year, SECO/VACUUM secured an important contract for a large 2-bar vacuum furnace for a semiconductor industry supplier. The contract's success was driven by the company's experience and ability to customize the equipment to the client's specific needs, as well as the quick delivery time.

"The project required a fresh approach at the design stage. The partner expected an oversized device and unconventional solutions related to the operating temperature of the equipment. These expectations were not only met, but we also offered an unrivaled quick delivery;"

- said Piotr Zawistowski, Managing Director of SECO/VACUUM.

December saw the delivery of 2 single-chamber vacuum furnaces. The [Vector®](#) was sold to a shipbuilder. The device will be used in the Additive Manufacturing Department, mainly for annealing parts printed from metal powders using 3D technology, with an additional capability for tool hardening. The second order was for a retort vacuum furnace for stress relief. An American partner will use it for stress-relieving firearm components. The new furnace will be horizontal, significantly reducing loading time. Moreover, the selected quick cooling option improves the cooling cycle from 3.5 hours to just 1.5 hours! Improved loading combined with shorter cooling time will reduce the total heat treatment cycle time by up to 2.5 hours!

The strength of SECO/WARWICK lies in its global reach and shared knowledge, as well as its local presence, understood as regional sales and service support, territorial knowledge, and the ability to adapt to local market conditions. This is why, in the American market, the SECO/WARWICK Group, through SECO/VACUUM, can proudly say it is doing great.

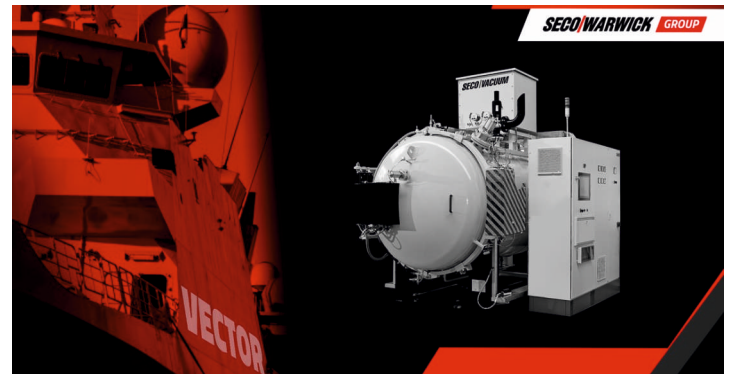
US defense contractor purchases vacuum retort furnace.



US military firearms manufacturer will replace their outdated existing vacuum stress relieving furnace with a new vacuum retort furnace from SECO/VACUUM.

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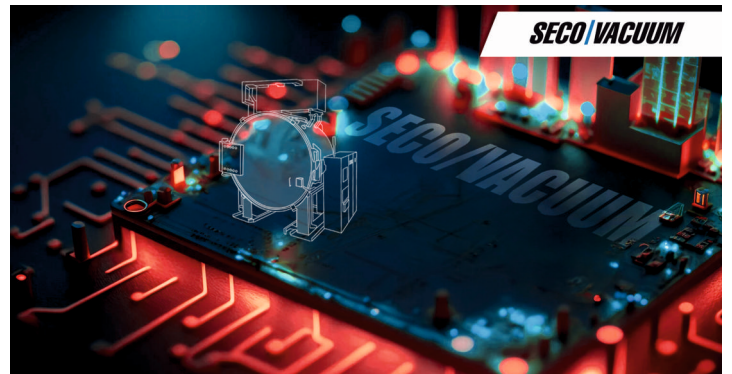
SECO/VACUUM achieves rapid delivery for naval ship builder on a tight schedule.



A major ship builder has purchased a vacuum furnace for the Additive Manufacturing Division at their new Manufacturing Center of Excellence.

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SECO/VACUUM has been awarded a contract for a vacuum furnace from a west coast semiconductor industry supplier.



SECO/VACUUM's new partner required an [extra-large 2-bar vacuum furnace](#) specific to their unique high-temperature process.

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RETECH ACQUIRES PERFECT COMPLEMENT TO THEIR PORTFOLIO WITH REMELT SCIENTIFIC

The acquisition of ReMelt Scientific by Retech, a division of SECO/WARWICK Group, marks a significant step in rounding out the SECO/WARWICK products and services portfolio.



Retech and ReMelt have been working alongside one another for decades, albeit on a less formal basis—consulting, collaborating, and subcontracting. Now, that partnership has been formalized.

Retech, renowned for its innovative vacuum metallurgy solutions, has long been a leader in the field, providing advanced technologies for melting and refining reactive and refractory metals. The acquisition of ReMelt Scientific, a Canton, Ohio based company specializing in material handling and waste reprocessing equipment for ultra-pure remelt of recycled tailings, scrap, and revert, brings under one technology umbrella a wealth of expertise and capabilities that will significantly enhance the value offered to customers.



EARL GOOD
Managing Director
of Retech, USA

I think ReMelt is a valuable acquisition and it seems to fit well with the Retech portfolio and the SECO/WARWICK Group business overall."

Added Value and Portfolio Completion

The integration of ReMelt into the SECO/WARWICK Group family is a perfect example of horizontal integration, where the combined strengths of both companies add up to far more than the sum of their parts. **This acquisition represents much more than just expanding the portfolio, but also reinforcing it.** By bringing together the advanced vacuum melting technologies of Retech with the specialized material handling, waste processing, and system integration solutions of ReMelt, the combined entity can now offer an even broader spectrum of advanced metallurgy solutions to its clients.

Enhancing the Vacuum Metallurgy Segment

The acquisition **will allow Retech to enhance its capabilities and offer even more comprehensive solutions in the vacuum metallurgy segment.** Vacuum metallurgy, which involves the melting and refining of metals in a controlled atmosphere, is critical for producing high-purity metals and alloys used in various high-tech applications. With new expertise in handling and processing recycled materials, Retech can now provide more integrated and efficient solutions, ensuring higher quality and performance for its clients.

Advancing the Aluminum Melting Segment

Aluminum melting is a complex process that requires precise control and advanced technology to ensure the production of high-quality aluminum products. ReMelt's knowledge in aluminum waste processing and material handling **will enable SECO/WARWICK and Retech to offer state-of-the-art aluminum melting solutions** that meet the industry's stringent demands. This will not only enhance the company's competitive edge but also provide added value to its customers by improving efficiency and reducing costs.

A Unified Technology Umbrella

The acquisition is a strategic move that aligns perfectly with SECO/WARWICK's vision of providing comprehensive and integrated solutions to its clients.

"While ReMelt will join the Retech division, they really are an asset to the whole Group and our worldwide operations as a whole";

- said SECO/WARWICK Group CEO Sławomir Woźniak.

By bringing ReMelt under its technology umbrella, SECO/WARWICK and Retech are now better positioned to address the diverse needs of their customers, offering a complete range of solutions that cover not just every aspect of the melting process, but also handling of the input, output and revert streams. This holistic approach ensures that clients receive the best possible solutions, tailored to their specific requirements.

AVIATION INDUSTRY EXPERIENCING GROWTH

SECO/WARWICK is one of the key partners in the aviation sector. In 2024, the Group delivered dozens of solutions contributing to the increase in the worldwide production of aviation components.



Despite the looming global crisis, the aviation market, valued at \$300-400 billion in 2021, is expected to grow to \$500-600 billion by 2031, indicating its continuous expansion despite challenges such as the COVID-19 pandemic, and tightening of environmental regulations.

The [aviation industry](#) is highly concentrated, with the main revenues generated by a small number of large manufacturers. Key barriers to entry include high research and development costs, certification requirements, and complex production processes. In response to these challenges, the market is moving towards consolidation, creating an oligopolistic model. Only the largest companies can afford to invest in modern technologies, making collaboration in the form of a consortia essential for implementing innovative projects.

"We supply technologically advanced industrial furnaces to [leading industrial sectors](#) worldwide. 70% of SECO/WARWICK's solutions are delivered to demanding industries and brands. We collaborate with almost all the key players in this market. It can be said that SECO/WARWICK has a modest share in the vast majority of companies engaged in aircraft machinery production. We work for both civil and [military](#) aviation. For this industry, we provide solutions for the production of, among other components, aircraft engine blades, heat exchangers, aircraft skins, landing gear, struts, and brakes. Among the most popular solutions for the aviation sector last year were single and multi-chamber [vacuum furnaces](#), as well as equipment for melting metals and alloys using plasma and electron beam technology, and devices for producing high-quality precision [turbine blade castings](#) – [VIM](#) and [JetCaster](#)."

- said Sławomir Woźniak, CEO of the SECO/WARWICK Group

Technological Challenges in the Production of Aviation Components

The production of aviation components requires extremely precise processes, including advanced heat treatment of metals. In 2024, there is an increasing role of advanced technologies supporting production in the aviation industry.

"More and more vacuum solutions are being introduced to the aviation industry. These furnaces allow for precise control of parameters, resulting in uniform component quality. Repeatability, high quality, and compliance with aviation standards are the requirements we must meet every time we deliver equipment for the production of aviation components,"

- commented Maciej Korecki, Vice President of the Vacuum Furnace Segment at SECO/WARWICK.

The growing importance of computer simulations and artificial intelligence is becoming more evident, allowing for the optimization of heat treatment processes and the prediction of material properties. SECO/WARWICK offers the [FURNACE/PLUS platform](#), which includes services such as [SECO/PREDICTIVE](#) – an advanced, intelligent device control system that detects potential failures before they occur, and [SENERGY](#), which helps optimize media consumption.

In-house Laboratories Support Aviation Technology

SECO/WARWICK is one of the few companies producing metal heat treatment equipment that has its own metallographic laboratory and two [R&D](#) centers, enabling partners to test new solutions and set standards for innovation and production efficiency.

*“Our partners in the aviation sector want to optimize production while maintaining excellent quality. Together, **we develop technology by creating innovative and efficient devices to achieve better technical and quality parameters while reducing production costs.** Many implemented solutions have also contributed to reducing the carbon footprint generated by aviation manufacturers. This is particularly important in the era of strict emission standards. We conduct our own research, but we also supply our equipment to research centers or R&D departments that are also looking for innovations contributing, among other things, to the reduction of the carbon footprint of industrial machinery. Others use these essential resources to search for material solutions that will improve the components that they produce. Most often, our partners use specially adapted Vector furnaces for this purpose. **One of these units will be used this year, not in serial production, but in development processes, contributing to the creation of innovative solutions for the aviation industry.”***

- said Maciej Korecki, Vice President of the Vacuum Furnace Segment at SECO/WARWICK

Key Directions for Aviation Development by 2030

The aviation industry is moving towards more sustainable and efficient production. The forecasted development directions include **sustainable production – reducing CO₂ emissions and using eco-friendly energy sources.** SECO/WARWICK’s solutions perfectly meet this need through innovations that reduce process gas consumption and recover energy from furnaces.

Another new direction will be the increased implementation of Additive Manufacturing (AM) – 3D printing, which, combined with heat treatment, enables the creation of lightweight and durable components with complex geometries. There is no doubt that the use of additive manufacturing technology in various industrial sectors is growing year by year. **3D technology offers unprecedented freedom in designing complex parts, including elements that could not be created by any other technology.**

Of course, the development of additive manufacturing – better known as 3D printing – translates into a growing demand for heat treatment systems, as this treatment increases the strength and integrity of some elements produced using 3D technology. Speaking of 3D technology, it is impossible not to mention the line of metal heat treatment products designed with **3D printing technology** in mind – the **VECTOR 3D** or powder production systems. One of the companies in the SECO/WARWICK group – Retech – offers furnaces for producing metal powder of the highest quality and purity intended for 3D printing – [Plasma Gas Atomizer](#). In aviation, [vacuum metallurgy](#) segment furnaces are also increasingly used. Last year, SECO/WARWICK’s [JetCaster](#) vacuum induction furnace for melting and obtaining castings was delivered to Turkey, among other places.

The industry is also focusing on the search for new materials and protective coatings. The development of research on metal alloys and ceramic coatings with greater resistance to corrosion and material fatigue will be crucial.

The year 2024 marks a period of dynamic changes in the aviation industry, which has been focusing on advanced technologies and sustainable development. The challenge remains to combine high-quality requirements with cost incentives and environmental efficiency. Investments in innovative solutions, materials, and technologies will be key to the further development of the industry and its ability to meet growing market expectations.

The aviation industry remains a pillar of the modern economy and a benchmark for technological progress, influencing many other industrial sectors, including automotive, energy, and advanced materials. It is a sector that continues to change the rules of the game – both on the ground and in the air.

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