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SECO/SPACE

SECO/WARWICK'S NEWSLETTER

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04/2025

SECO/WARWICK solutions for the space industry

Two months ago, with bated breath we followed the Axiom 4 space mission, which saw the first Polish person in space in decades—Sławosz Uznański. It's worth noting that the SECO/WARWICK Group headquarters, a global leader in heat treatment and vacuum metallurgy technologies, are located in Poland. This is where the solutions that form the foundation for producing components used in space missions are created..

In particular, this refers to technologies for **melting and refining titanium alloys**, which are crucial in the production of rocket, satellite and spacecraft components. SECO/WARWICK supplied the **innovative VAR arc furnaces and PAM plasma furnaces** that carry out titanium melting in vacuum conditions to the **EcoTitanium** plant in Europe. It is these devices that make it possible to achieve a materials of the highest purity and uniformity—essential for the extreme conditions of space.

"First of all, I would like to congratulate Sławosz Uznański-Wiśniewski on this successful mission. SECO/WARWICK, together with other Polish companies involved in the space industry is proud of this ground breaking accomplishment,"

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

SECO/WARWICK is involved in one of the most ambitious scientific projects of the 21st century—**ITER**, the international thermonuclear reactor. The company worked with the American corporation **General Atomics** in producing **the world's largest superconducting magnet**—the Central Solenoid—which will be the heart of the reactor. Although this technology is related to energy, it has a direct impact on the development of propulsion and energy systems for future space missions.

The international ITER research project is compared, in terms of scale, to the construction of the International Space Station. The assembly of the large research thermonuclear reactor, which is expected to allow for, among other things, sustaining fusion reactions for much longer than known generators, began in the middle of last year.

The Aerospace Industry is open to SECO/WARWICK technology

For years, the SECO/WARWICK Group has supported giants of the aerospace and space industries. Three years ago, it supplied a SECO/WARWICK horizontal vacuum furnace to a **Chinese aeronautical company** listed on the Shenzhen stock exchange. The device is used for producing highly specialized cast components for the aviation and space industries.

KATARZYNA SAWKA
VP of Marketing
SECO/WARWICK Group

"The aerospace and space industries have very strict requirements. The quality standards for parts used, for example, in spacecraft orbiting the Earth are extreme. Our furnaces, made according to Polish technological thought, guarantee such quality. Hence the significant presence of SECO/WARWICK in this sector. Of course, we cannot talk publicly about all projects, but we are always pleased that SECO/WARWICK contributes a Polish element to the conquest of space,"

In another project, SECO/WARWICK delivered a **vertical retort vacuum furnace to the Karlsruhe Institute of Technology** in Germany, which is used for high-vacuum annealing of structural elements of gyrotrons.

The Institute conducts research and measurements on gyrotron prototypes. Gyrotrons are devices used in fusion processes to heat plasma. The Karlsruhe Institute of Technology, among other activities, is developing gyrotron technology in cooperation with European industry, and has also conducted research on gyrotrons for national and international scientific projects (e.g., ITER).

SŁAWOMIR WOŹNIAK
CEO
SECO/WARWICK Group

"Our technologies are present wherever reliability, precision, and safety matter - from the aviation to the space industry. We are pleased to support the global ambitions of space exploration"

India accelerates steel production and metal processing – a new global industrial hub – SECO/WARWICK Group's development in India

In recent years, India has emerged as one of the world's most dynamically developing industrial centers. This growth is particularly visible in the steel production sector and the metal processing market, which together form the foundation for construction, energy, and modern industrial manufacturing. SECO/WARWICK, a leader and supplier of heat treatment and metallurgy equipment, comments on the latest market reports and development prospects in Asia.

Steel production – records and ambitions

In 2024/2025, India achieved a production capacity of 205 million tons of steel annually, reaching the planned target. The country is now heading towards 300 million tons by 2030/2031, as confirmed by a report from MP Financial Advisory Services LLP. The growth rate of steel production in India is one of the highest in the world: 2016–2024: an average of +5% per year (China: 2.76%, world: 1.77%). After 2020: acceleration to +8% per year, while Chinese production began to decline. Currently, projects are underway to expand production capacity by another 167 million tons by 2030, of which as much as 83% falls within the private sector. The government supports the industry, among others, through the PLI program for specialty steels.

"Last year, we opened a new factory in India. The plant covers an area of 4,000 m² and is located in a special economic zone near Pune, where a great number of industrial factories-our potential clients-are based. We have thought this investment through very well, as India is one of the fastest-growing countries in the world with enormous production needs. Having our own production facility here relieves us from the necessity of organizing a costly logistics and transportation path for our equipment. It is very important that SECO/WARWICK products keep their high-quality promise regardless of where they are produced. That's why we conducted a very thorough and extensive training process, which guarantees this quality,"

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

Metal processing market – strength in diversity

Simultaneously, the metal processing market is developing dynamically. According to Mordor Intelligence, it will achieve an average CAGR of 6.38% from 2025–2030. It includes steel, aluminum, and specialty metals as well as services such as welding, CNC, forging, or casting. It is mainly driven by: expansion of domestic production and foreign investments-a growing demand for industrial components; infrastructure development-steel constructions for bridges, railways, buildings, and power grids; technological progress-automation, robotics, precise digital systems, and also the increasing importance of aluminum and specialty alloys, especially in transport and aviation.

ARVIND AGARWAL
Managing Director
of SECO/WARWICK India

"Local production backed with European and American Technology is our great advantage. Currently, we deliver both CAB lines (including for Narain Cooling Technologies) and the first vacuum solutions produced locally for industry in India. Our current production capacities allow us to manufacture four continuous brazing lines in one cycle or 23 vacuum furnaces. The maximum length of a CAB line produced in our plant will be 63 meters. This secures the needs of even the largest Partners. My mission at SECO/WARWICK is to ensure the Group's development and provide the high quality known from European and American markets, here in India,"

India – towards industrial independence

Both sectors-steel production and metal processing-mutually reinforce each other, and their development carries significance not only economically but also strategically.

"The development of steel production in India is not only a matter of volume. It's about economic independence, energy security, and climate responsibility. We are pleased to be part of this new industrial revolution and strengthen our Partners in India,"

added S. Woźniak.

Thanks to growing production and technological innovations, India is becoming a global industrial hub, capable of delivering the most demanding projects - from urban infrastructure to energy and defense industry.

Bodycote expands its heat treatment capabilities with SECO/WARWICK technology

Bodycote Polska, a part of the global Bodycote Group - the world's leading provider of heat treatment services - has purchased a CaseMaster Evolution vacuum furnace from SECO/WARWICK. This investment is another step in the development of the Bodycote branch in Siechnice to increase the efficiency and technological capabilities of the plant.

Vacuum carburizing in commercial hardening plants

The new device is a **dual-chamber vacuum furnace (CMe-D)** equipped with an oil quenching system and an advanced FineCarb vacuum carburizing system. Thanks to this technology, the **Bodycote plant in Siechnice will expand its range of services, including heat treatment processes such as vacuum carburizing – processes that were previously beyond their technological reach.**

MACIEJ KORECKI
Vice President
of the Vacuum Segment
SECO/WARWICK

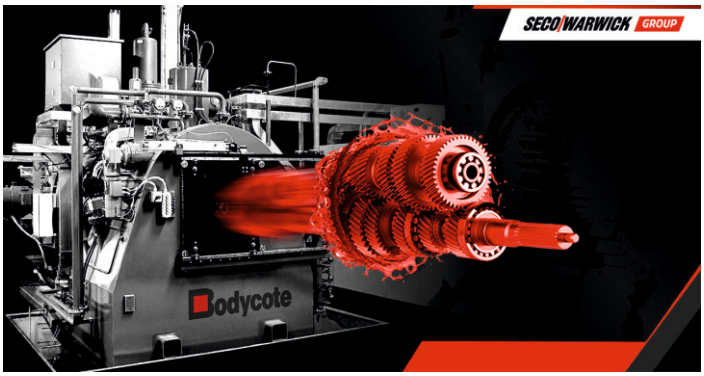
***"CaseMaster Evolution (CMe) furnaces are well-suited for many processes, which is why they are perfect for places like commercial hardening shops**. These multi-chamber furnaces combine heat treatment in a vacuum with traditional oil quenching in dual- or triple-chamber configurations, enabling high efficiency, and delivering clean, oxide-free (IGO) parts. The Bodycote Group is a key partner for us, thanks to our shared commitment to advanced heat treatment technology. We are pleased to help expand the portfolio of services for the Polish branch,"*

The SECO/WARWICK partnership with a global hardening plant

Bodycote Siechnice has been using SECO/WARWICK solutions for years, and the new vacuum furnace is the **12th SECO/WARWICK device in the plant**, although the first from the range of vacuum furnaces.

*"The dual-chamber CaseMaster Evolution (CMe-D) furnace is another step in expanding our LPC technology capabilities. We have several years of experience in vacuum carburizing, and we see that our customers are currently more interested in this process. This was the correct choice to meet the requirements for implementing sustainable development strategies and reducing CO_2 emissions. The new furnace will allow us to conduct cleaner carburizing processes without an endothermic atmosphere. We believe that we will improve the efficiency of our processes with this furnace, which will positively affect the economic aspect. This fits into our strategy as Bodycote constantly strives for innovation and operational excellence, developing its global and local competencies. Investing in modern vacuum equipment **from SECO/WARWICK strengthens our company's position as a trusted partner for the industry, offering the highest quality heat treatment services,"***

said Dariusz Podgórski, Vice President of Bodycote Polska Sp. z o.o.



SECO/WARWICK is an expert in vacuum carburizing. **The FineCarb vacuum carburizing** process produces both a high repeatability of results, and uniform carbon layers from 0.1 to 5 mm. This technology eliminates internal oxidation and process by-products such as soot and tar, ensuring very high process cleanliness.

The features of the design on order includes an **oil quenching system ensuring fast and uniform cooling of the charge, as well as the FineCarb vacuum carburizing system,** which allows for precise control of process results.

JĘDRZEJ MALINOWSKI
Sales Manager
of Vacuum Furnaces

***"The FineCarb vacuum carburizing technology enables the implementation of advanced thermochemical processes.** Thanks to the furnace's modern design, the Siechnice plant will increase its quality, efficiency, and process economy. Using the latest technological solutions also contributes to improving ecology and reducing operating costs, which is particularly important in the face of rising energy prices,"*

Second SECO/WARWICK vacuum furnace for Siemens Energy Global

Siemens Energy Global, a renowned manufacturer of heavy duty gas turbines, has chosen the SECO/WARWICK vacuum furnace with screen insulation and molybdenum heating elements. The furnace will be used mainly for brazing gas turbine hot path parts like blades & vanes.

Vector – Low Heat Loss and Good Temperature Distribution

The device on order produces very efficient and clean vacuum processes in high ranges, thanks to the use of a very good system consisting of a mechanical pump, an efficient Roots pump, and a diffusion pump. The advantage lies in the molybdenum heating chamber which ensures the required temperature distribution, and provides very high process cleanliness.

"The Vector vacuum furnace solves the Partner's problem of heat treating an increased number of large blades & vanes requiring a high degree of cleanliness in both the brazing and annealing processes. The most important problem is handling the constantly growing production. The Vector will relieve the production burden on the current equipment in operation in the client's manufacturing & repair facility in Berlin. This is the second furnace that we will deliver to one of the largest turbine blade & vane manufacturers. The key to this order was the guarantee of high efficiency without loss of quality,"

said Maciej Korecki, Vice President of the Vacuum Segment, SECO/WARWICK Group.

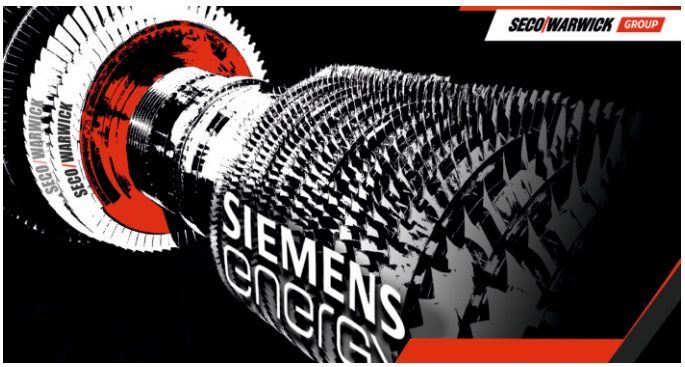
The efficiency of the heat treatment processes is also influenced by the ability to cool at 1.5 bar in argon. Thanks to the inverter control, we can activate optimal **cooling power** during the appropriate stage of the process.

Individual Specification – the Key to Success

The unique features of this device are primarily due to the **modifications that enable very clean blade & vane brazing processes.**

GRZEGORZ GŁUCHOWSKI
Sales Manager
of Vacuum Furnaces

"We worked long and hard to ensure that the furnace met all the needs and precise requirements of Siemens Energy Global. We used a molybdenum heating chamber, partial pressure system, dew point sensors, and a very efficient high vacuum system. An important aspect is also the fact that the furnace will be integrated with the client's master system using the OPC Unified Architecture communication protocol. Thanks to this, we can connect with a wide range of machines and industrial devices. Thanks to simple integration with our devices, Partners can monitor the efficiency of entire production lines in real-time,"

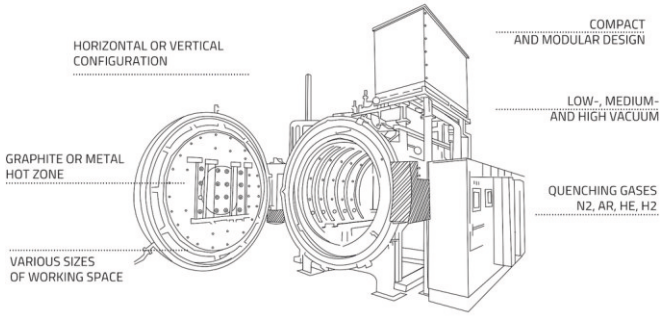


Gas Turbines – The Future of the Energy Industry

Gas turbines are used in power plants to produce electricity. Their high efficiency and quick start-up make them ideal for covering peak energy demands. Gas turbines are used in the industry as a source of electricity and technological heat. They are used for many applications including oil refineries, chemical and petrochemical plants, where a large amount of process steam is required.

"This is our second SECO/WARWICK vacuum furnace. It has been adapted to our unique needs and integrated with the machine park thanks to the OPC UA protocol. It will be an important element of the production process, which focuses on green energy. The furnace will be installed in our German plant,"

– according to the Siemens Energy Blades & Vanes division in Berlin.



VECTOR - Single Chamber Vacuum Furnace

Consolidated Precision Products (CPP) with new SECO/WARWICK vacuum furnace

Production in the aviation industry is accelerating. The year 2024 was record-breaking for aviation. Therefore, it is not surprising that the largest manufacturers of aircraft parts are investing in devices that increase production efficiency. CPP has been a long-term partner of the SECO/WARWICK Group, having placed numerous orders for metal heat treatment equipment over the years.

Consolidated Precision Products, an international producer of aircraft parts with two production plants in Poland, has purchased their seventh furnace from SECO/WARWICK Group.

Aviation is booming. Last year was record-breaking in terms of operating profits, but also the number of available flights. **This leads to increased efficiency and production in the aircraft industry, resulting in growing investment expenditures**. To meet this demand, Consolidated Precision Products purchased an additional SECO/WARWICK vacuum furnace.

"A long-term partner with branches in the USA, Mexico, Belgium, Slovakia and Poland has once again chosen our solution. This will be a furnace for annealing blades cast from single crystals. The unique feature of this furnace is the modifications enabling very clean annealing processes for single-crystal castings. ***We have implemented a vacuum furnace equipped with a molybdenum heating chamber, partial pressure system, dew point sensors, and a highly efficient high vacuum system****. As oneof the largest global manufacturers of vacuum devices for metal heat treatment, we significantly feel the revival in the aviation market. Subsequent contracts with this industry confirm the competencies that the SECO/WARWICK Group has been acquiring for decades,"*

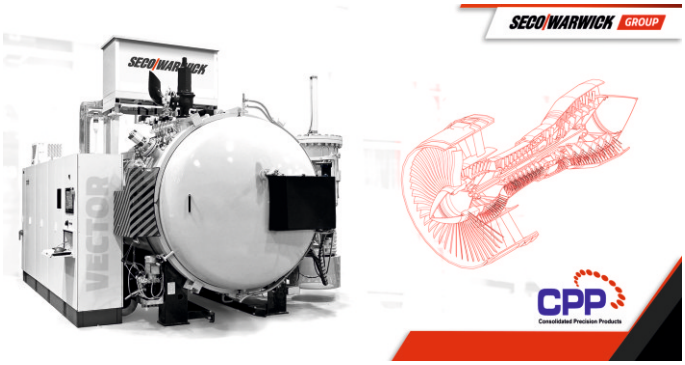
said Maciej Korecki, Vice President of the Vacuum Segment of SECO/WARWICK Group.

Single-crystal blades

CPP has purchased a vacuum furnace with 1.5 bar abs. gas cooling and a molybdenum chamber. This solution is based on the standard design of a vacuum furnace with a working space of 900x900x1200 mm, screen insulation, and metal heating elements that perfectly fits the characteristics and needs of this manufacturer of cast blades.

PAWEŁ OKIŃCZYC
Sales Engineer
of Vacuum Furnaces

"The round heating chamber allows for the placement of oversized elements. ***The furnace has been expanded and modified with dedicated options to meet very high requirements: high vacuum, temperature distribution, operation at high temperatures around 1300 degrees, and cleanliness of processes. The device will be used for annealing blades cast from single crystals****. Its advantage is the molybdenum heating chamber, which prevents direct heat loss to the wall of the vacuum chamber and ensures very high process cleanliness. The efficiency of the processes carried out is also influenced by the ability to cool in 1.5 bars of Argon. Thanks to inverter control, we can regulate the cooling speed in the appropriate process segment;"*



Aviation requires quality and precision

This is another SECO/WARWICK device that goes to manufacturers of complex jet engine parts. It is a very demanding group of partners under enormous pressure to produce products of the highest quality and reliability, as they operate in harsh conditions where safety and reliability are priceless.

Consolidated Precision Products specializes in the production of highly precise, geometrically complex systems, parts, and components for the aviation industry. CPP has a global network of production plants in the United States, Mexico and Europe.

"This is not our first collaboration with the SECO/WARWICK Group. Their equipment has been working in our plants for many years. This particular vacuum furnace will be used for the production of a new line of jet engine blades from single crystals. The turbine elements used in the aviation industry operate under high mechanical loads at temperatures close to their melting point and in an aggressive corrosive environment. Therefore, we cannot afford structural defects that would affect the quality or durability of our products. ***The SECO/WARWICK vacuum furnace will provide us with very high-quality processed elements, but it will also increase efficiency,"***

explained Dariusz Szawara, Foundry Director of DS/SX at Consolidated Precision Products.

Consolidated Precision Products Poland has a precision production plant in Rzeszów with two departments that supply parts for aircraft engines using the latest technologies for the world's largest aircraft engine manufacturers. The strength of the company lies in high quality standards, knowledge, and experience, enabling them to adapt to changing needs, and effectively respond to customer requirements. CPP Poland is also a member of the Aviation Valley.

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