

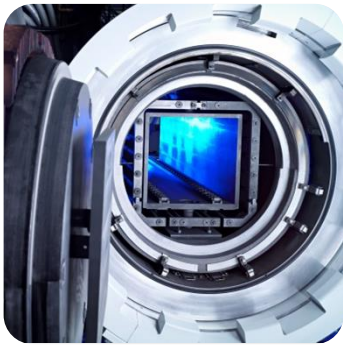


## **Vacuum Furnace Systems**

## Powder Metallurgy: Vacuum and Pressure Sintering

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The vacuum (type COV) and pressure (type COD) sintering systems are designed for universal application in dewaxing, vacuum sintering and the subsequent isostatic pressing of metals, carbides, alloys and ceramics, carried out under fine vacuum conditions, active gas atmosphere and gas overpressure of up to 100 bar. The graphite resistance heated systems offer a high degree of efficiency as well as excellent temperature uniformity in vacuum and overpressure conditions. The precisely recurring processes in our vacuum and pressure sintering systems ensure the consistently high product quality for which we are renowned.



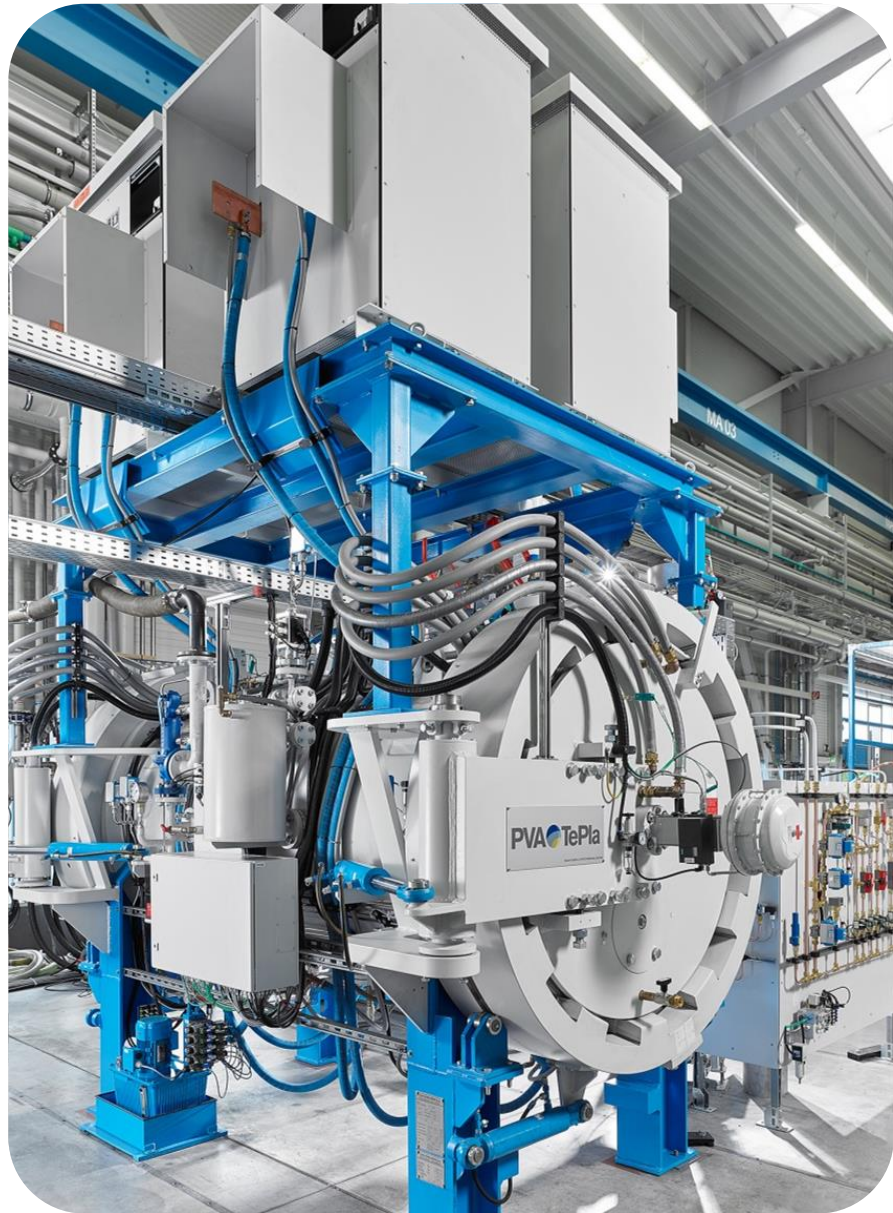
Heating insert



Hard metal cutting inserts



Hard metal cutter





## Joining Technology: Brazing and Diffusion Bonding

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The application of these joining technologies is often an essential part in the production of complex components. These processes enable optimum joint precision, purity and quality. While in diffusion bonding, parts are connected nearly at their melting temperature under high vacuum with a press capacity up to some MN, the connection by vacuum brazing is achieved by high-temperature batches. In this way, all kinds of parts made of metal, graphite and ceramics, etc. can be connected firmly. For both processes, resistance heated vacuum systems are used – graphite-heated (type COV) or metal-heated (type MOV), depending on the application.



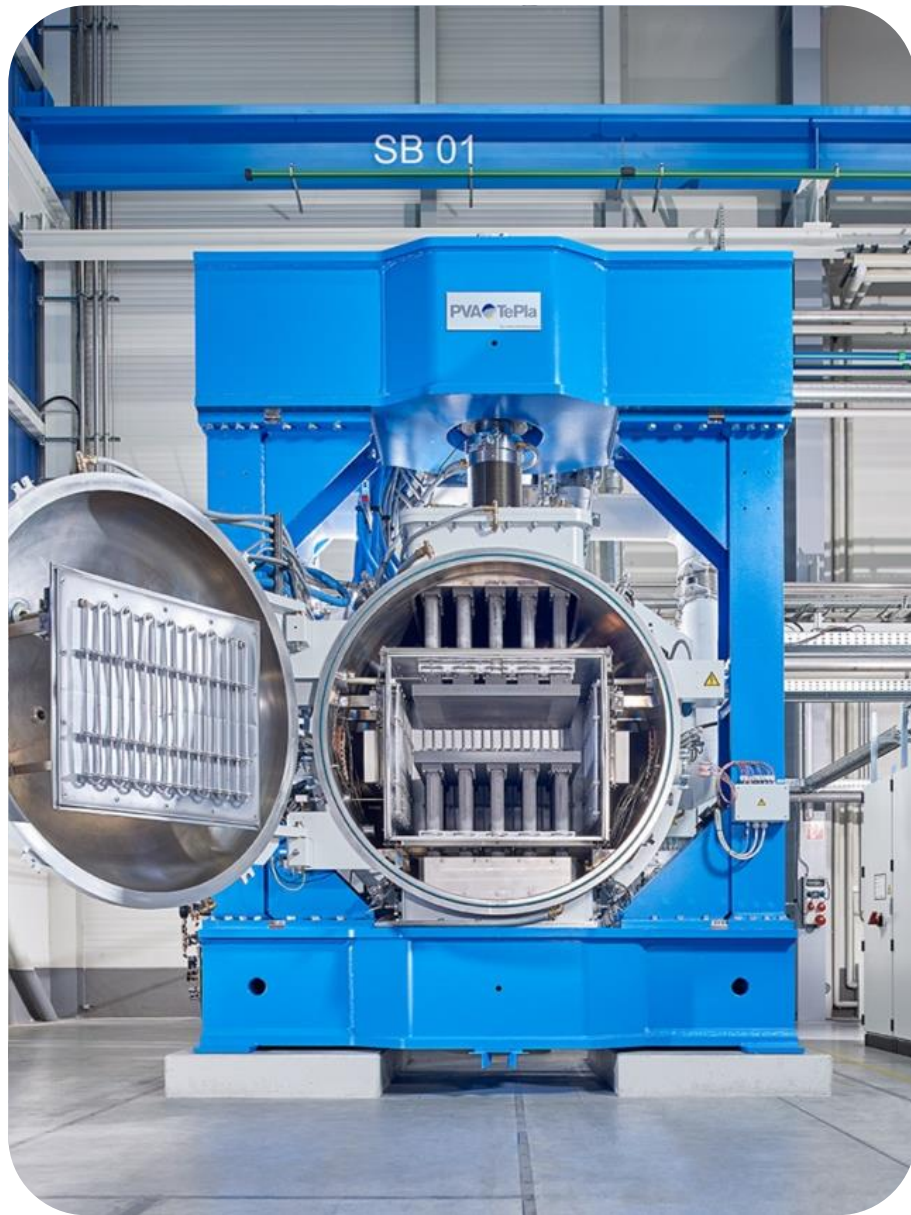
Metallic heating insert



Micro heat exchanger



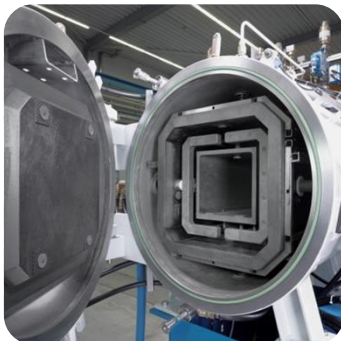
Vacuum interruptor



## Heat Treatment: Refinement of Materials and Components

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Our vacuum furnace systems are individually designed for a wide range of applications. Beside the processes mentioned, these include chemical reduction, carburizing, purification, annealing, degassing, coating, infiltration, granulation, distillation, impregnation and drying. Our vacuum systems are resistance-heated (type COV or type MOV) or inductively heated (type IOV), operating with atmospheres under fine vacuum, high vacuum and ultra-high vacuum as well as inert or active gases. The application temperatures can be up to 2,500°C. State of the art control systems meet our customers' high requirements regarding safety of systems as well as versatile and flexible application.



Graphite heating insert



CFC heating element



Graphite charge carrier





## Melting Metallurgy: Inductive Melting and Casting under Vacuum

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Vacuum melting and casting systems (type VSG) allow universal application in the inductive melting of metals, alloys and special materials under high vacuum, fine vacuum and controlled gas atmosphere. In the laboratory and in industrial production, entire blocks and molded parts are cast with maximum precision and purity. The main areas of application include processing precious metals such as platinum, gold and silver, high purity and fine-alloy metals as well as high-precision special alloys and silicon for solar cells. In addition to melting processes such as remelting, degassing, cleaning and homogenization, VSG systems are also the right solution for precision casting with directional solidification of high-temperature Fe-Ni-Co-based materials.



Melting process



Turbo charger



Precious metal alloys





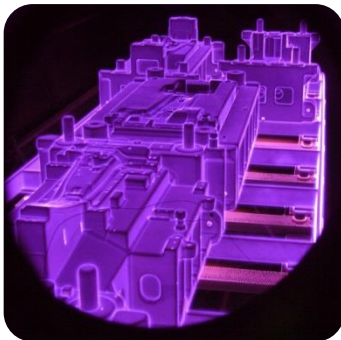
## Plasma Nitriding/Nitrocarburizing: PulsPlasma® Treatment of Components

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PulsPlasma®Nitriding and PulsPlasma®Nitrocarburizing are thermo-chemical diffusion treatments for the formation of hard, wear and corrosion resistant Nitriding layers on steel surfaces or on surfaces of Nitride-forming non-ferrous metals by the decomposition of N<sub>2</sub> (Nitrogen) and Carbon yielded gases in a pulsed DC –glow discharge. The treatment will be carried out in hot-wall vacuum furnaces at process pressures between 50 and 500 Pa. Depending on the workpieces and the required nitriding capacity PlaTeG-PulsPlasma®Nitriding equipment can be offered as bell-type furnaces in Mono-, Shuttle- or Tandem design, as well as pit-type furnaces or horizontally loadable chamber furnaces.



Horizontal Version



Plasma treatment



Charge load

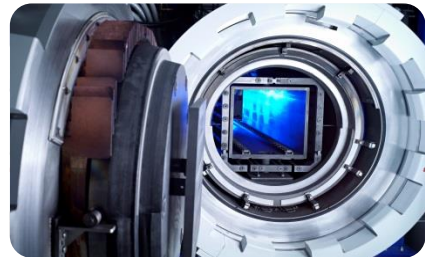


# Vacuum Furnace Systems for Production and Development

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The PVA Industrial Vacuum Systems GmbH specializes in the development, construction and marketing of thermal systems for developing, manufacturing and treating high-quality materials at high temperatures – typically in the range between 1,000 °C and 2,500 °C. We have over 50 years of experience from more than 1,000 systems supplied worldwide, testimonials from big names in the industry and a diversified range of process systems. The PVA Industrial Vacuum Systems GmbH as a subsidiary of PVA TePla AG sets technological standards that made it a global market leader in the provision of vacuum and pressure sintering systems as well as special requirements.

Powder Metallurgy:  
Vacuum and Pressure Sintering



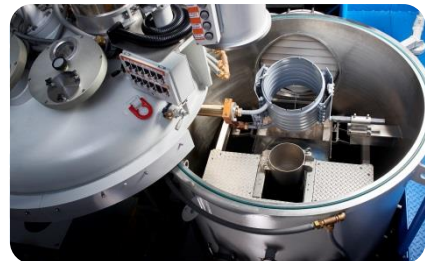
Joining Technology:  
Brazing and Diffusion Bonding



Heat Treatment:  
Refinement of Materials and Components



Melting Metallurgy:  
Inductive Melting and Casting



Plasma Nitriding/Nitrocarburizing:  
Puls-Plasma® Treatment of Components





# PVA Industrial Vacuum Systems GmbH

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PVA Industrial Vacuum Systems GmbH is an internationally established supplier of systems and facilities for developing, producing, treating and refining sophisticated industrial materials using:

Vacuum	High temperature	Plasma
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PVA Industrial Vacuum Systems GmbH is a subsidiary of PVA TePla AG. The Wettenberg-based company is a leading manufacturer of highly innovative vacuum systems. With more than 1,000 plants on the market and 50 years of experience in the high-temperature field, PVA Industrial Vacuum Systems GmbH builds and markets thermal process plants and systems for the development, manufacture and treatment of high-quality materials at high temperatures.

In conjunction with its own Application & Innovation Lab, PVA Industrial Vacuum Systems GmbH also supports its customers with individual system and application developments - right up to series production.



PVA Industrial Vacuum Systems GmbH  
Im Westpark 10-12  
35435 Wettenberg  
Germany

Phone  
Fax  
E-mail  
Home

+49 641 68690-0  
+49 641 68690-822  
[vacuum@pvatepla.com](mailto:vacuum@pvatepla.com)  
[www.pvatepla-ivs.com](http://www.pvatepla-ivs.com)