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BECOME AN EXPLORER & PIONEER & LEADER
IN THE FIELD OF HEAT TREATMENT



HAOYUE TECHNOLOGY

COMPANY PROFILE

>>> 关于皓越

上海皓越真空设备有限公司，简称“皓越”，2009年破壳立世，是一家集真空炉研发、生产、销售为一体的国家高新技术企业。公司拥有大型现代化标准厂房、成套加工设备、完善的质量控制体系，先进的设备展厅以及超过1500m²的热处理实验室，实验室可供企业内部科研探索，也可供外部高校、科研院所、企业做实验。长期聚焦于深耕行业，公司荟聚了一批长期从事热处理炉、真空炉及特种炉制造和服务的技术精英，目前拥有30多项专利成果和论文，具备年产200套热处理炉、60套大型真空炉的生产能力。此外，公司长期与复旦大学、同济大学、哈尔滨工业大学、南京航空航天大学等保持科研合作，共同打造了产学研基地、人才培养基地，为客户提供完善的一体化产业解决方案，特别在高精度的温控领域、真空系统、自动化控制以及计算机分析体系等方面保持领先地位。

公司秉持专业、积极、开放、创新的理念，不断地提升自我，持续为客户创造价值！期待与您携手共创一个多彩的科技世界！

Shanghai Haoyue Vacuum Equipment Co., Ltd, referred to as "Haoyue", was established in 2009. as a national high school integrating R&D, production and sales of vacuum furnaces New technology enterprises. The company has a large modern standard workshop, complete sets of processing equipment, perfect quality control system, advanced. The equipment exhibition hall and more than 1500m² of heat treatment laboratory, but also for external universities, research institutes, enterprises to do experiments. Long-term focus on the deep cultivation of the industry, the company has gathered a group of long-term engaged in heat treatment furnace, vacuum furnace and special furnace manufacturing and service of technical elites, currently has more than 30 patent achievements and papers, with an annual output of 200 sets of heat treatment furnaces, 60 sets of large vacuum furnace production capacity. In addition, Haoyue Company has maintained long-term cooperation with Fudan University, Tongji University, Harbin Institute of Technology, Nanjing University of Aeronautics and Astronautics, and others, jointly creating industry university research bases and talent training bases, providing customers with comprehensive integrated industrial solutions, especially maintaining a leading position in high-precision temperature control, vacuum systems, automation control, and computer analysis systems.

The company adheres to the concept of professionalism, enthusiasm, openness and innovation, constantly improves itself, and continues to create value for customers! Looking forward to working with you to create a colorful world of science and technology!



实验真空炉产品选型表

EXPERIMENTAL VACUUM FURNACE PRODUCT SELECTION TABLE

序号 #	产品编号 Numbering	最高温度(°C) Max. Temperature	加热元件 Heater	真空度(Pa) Ultimate Vacuum	泵组搭配 Vacuum Pumps	炉膛尺寸(mm) Chamber Size	外形尺寸(mm) L×W×H(mm) Overall Dimensions	重量(kg) Weight	适用工艺 Applications	备注 Note
01	P2GR20	2000°C	石墨电阻 GR	6.7×10 ⁻³	直联泵+扩散泵 Direct Connection Pump + Diffusion Pump	200×200×300	1560×1690×1850	1500	热压/烧结 Hot Press Sintering	伺服压力30T, 精度±3%, 升温速率20°C/min, 可压制Φ20-80mm产品 Servo pressure 30T, accuracy ±3%, heating rate 20°C/min, compressible Φ20-80mm products
02	P2GR23	2300°C	石墨电阻 GR	6.7×10 ⁻³	直联泵+扩散泵 Direct Connection Pump + Diffusion Pump	200×200×300	1560×1690×1850	1500	热压/烧结 Hot Press Sintering	伺服压力30T, 精度±3%, 升温速率20°C/min, 可压制Φ20-80mm产品 Servo pressure 30T, accuracy ±3%, heating rate 20°C/min, compressible Φ20-80mm products
03	P2CO20	2000°C	感应线圈 CO	6.7×10 ⁻³	直联泵+扩散泵 Direct Connection Pump + Diffusion Pump	Φ200×200	1560×1690×1850 不含电源尺寸 Excluding Power System	1600	热压/烧结 Hot Press Sintering	伺服压力30T, 精度±3%, 升温速率100°C/min, 可压制Φ20-80mm产品 Servo pressure 30T, accuracy ±3%, heating rate 100°C/min, compressible Φ20-80mm products
04	P2CO23	2300°C	感应线圈 CO	6.7×10 ⁻³	直联泵+扩散泵 Direct Connection Pump + Diffusion Pump	Φ200×200	1560×1690×1850 不含电源尺寸 Excluding Power System	1600	热压/烧结 Hot Press Sintering	伺服压力30T, 精度±3%, 升温速率100°C/min, 可压制Φ20-80mm产品 Servo pressure 30T, accuracy ±3%, heating rate 100°C/min, compressible Φ20-80mm products
05	P2MO14	1400°C	钼带电阻 MO	6.7×10 ⁻³	直联泵+扩散泵 Direct Connection Pump + Diffusion Pump	200×200×300	1560×1690×1850	1500	扩散焊/烧结/脱气 Diffusion Welding/Sintering /Degassing	伺服压力5T, 精度±1%, 升温速率10°C/min, 可压制160×180×160mm产品 Servo Electric Cylinder pressure 5T, accuracy ±1%, heating rate 10°C/min, compressible 160×180×160mm products
06	V2GR20	2000°C	石墨电阻 GR	6.7×10 ⁻³	直联泵+扩散泵 Direct Connection Pump + Diffusion Pump	200×200×300	1560×1690×1850	1300	烧结/退火/脱脂/氢气 Sintering/Annealing/ Degreasing/Hydrogen	石墨炉, 升温速率20°C/min Graphite furnace, heating rate of 20°C/min
07	V2GR23	2300°C	石墨电阻 GR	6.7×10 ⁻³	直联泵+扩散泵 Direct Connection Pump + Diffusion Pump	200×200×300	1560×1690×1850	1300	烧结/退火/脱脂/氢气 Sintering/Annealing/ Degreasing/Hydrogen	石墨炉, 升温速率20°C/min Graphite furnace, heating rate of 20°C/min
08	V2MO13	1300°C	钼带电阻 MO	6.7×10 ⁻³	直联泵+扩散泵 Direct Connection Pump + Diffusion Pump	200×200×300	1560×1690×1850	1300	烧结/退火/钎焊/脱脂/氢气/脱气 Sintering/Annealing/Brazing/ Degreasing/Hydrogen/Degassing	钼带炉, 升温速率10°C/min Molybdenum strip furnace, heating rate of 10°C/min
09	V2MO16	1600°C	钼带电阻 MO	6.7×10 ⁻³	直联泵+扩散泵 Direct Connection Pump + Diffusion Pump	200×200×300	1560×1690×1850	1300	烧结/退火/钎焊/脱脂/氢气/脱气 Sintering/Annealing/Brazing/ Degreasing/Hydrogen/Degassing	钼带炉, 升温速率10°C/min Molybdenum strip furnace, heating rate of 10°C/min
10	V2W20	2000°C	钨带电阻 W	6.7×10 ⁻³	直联泵+扩散泵 Direct Connection Pump + Diffusion Pump	200×200×300	1560×1690×1850	1300	烧结/退火/钎焊/脱脂/氢气 Sintering/Annealing/Brazing/ Hydrogen/Degreasing	钨带炉, 升温速率10°C/min Tungsten strip furnace, heating rate of 10°C/min
11	V2W23	2300°C	钨带电阻 W	6.7×10 ⁻³	直联泵+扩散泵 Direct Connection Pump + Diffusion Pump	200×200×300	1560×1690×1850	1300	烧结/退火/钎焊/脱脂/氢气 Sintering/Annealing/Brazing/ Hydrogen/Degreasing	钨带炉, 升温速率10°C/min Tungsten strip furnace, heating rate of 10°C/min
12	V2CO20	2000°C	感应线圈 CO	6.7×10 ⁻³	直联泵+扩散泵 Direct Connection Pump + Diffusion Pump	Φ200×200	1560×1690×1850 不含电源尺寸 Excluding Power System	1500	烧结/退火 Sintering/Annealing	感应炉, 升温速率100°C/min Induction furnace, heating rate of 100°C/min
13	V2CO23	2300°C	感应线圈 CO	6.7×10 ⁻³	直联泵+扩散泵 Direct Connection Pump + Diffusion Pump	Φ200×200	1560×1690×1850 不含电源尺寸 Excluding Power System	1500	烧结/退火 Sintering/Annealing	感应炉, 升温速率100°C/min Induction furnace, heating rate of 100°C/min
14	V2MS17	1700°C	硅钼棒电阻 Si-Mo Rod	6.7×10 ⁻²	直联泵+扩散泵 Direct Connection Pump + Diffusion Pump	200×200×300	1560×1690×1850	1300	氧化/烧结/退火 Oxidation/Sintering/Annealing	氧化炉, 升温速率10°C/min Oxidation furnace, heating rate of 10°C/min
15	V2MO17	1700°C	钼棒电阻 MO	6.7×10 ⁻²	直联泵+扩散泵 Direct Connection Pump + Diffusion Pump	200×200×300	1560×1690×1850	1300	还原/烧结/退火 Reduction/Sintering/Annealing	还原炉, 升温速率10°C/min Reduction furnace, heating rate of 10°C/min
16	G2GR20/10	2000°C	石墨电阻 GR	10Pa	直联泵+扩散泵 Direct Connection Pump + Diffusion Pump	Φ200×250	2000×1500×1720	1500	气压烧结/分压烧结/脱脂/氢气 Gas Pressure Sintering/Partial Pressure Sintering/Degreasing/Hydrogen	气压炉, 升温速率10°C/min Gas pressure furnace, heating rate of 10°C/min
17	G2GR20/1	2000°C	石墨电阻 GR	6.7×10 ⁻³	直联泵+扩散泵 Direct Connection Pump + Diffusion Pump	Φ200×250	2000×1500×1720	1300	气压烧结/分压烧结/脱脂/氢气 Pneumatic Sintering/Partial Pressure Sintering/Degreasing/Hydrogen	气压炉, 升温速率10°C/min Gas pressure furnace, heating rate of 10°C/min
18	S1	2400°C	脉冲直流电源 SPS	6.7×10 ⁻³	直联泵+扩散泵 Direct Connection Pump + Diffusion Pump	Φ100×350	1560×1690×1850 不含电源尺寸 Excluding power system	1500	SPS烧结 Sintering	伺服压力10T, 精度±3%, 升温速率200°C/min, 可压制Φ30-40mm产品 Servo pressure 10T, accuracy ±3%, heating rate 200°C/min, compressible Φ30-40mm product
19	S2	2400°C	脉冲直流电源 SPS	6.7×10 ⁻³	直联泵+扩散泵 Direct Connection Pump + Diffusion Pump	Φ100×350	1560×1690×1850 不含电源尺寸 Excluding power system	1500	SPS烧结 Sintering	伺服压力20T, 精度±3%, 升温速率100°C/min, 可压制Φ50-60mm产品 Servo pressure 20T, accuracy ±3%, heating rate 100°C/min, compressible Φ50-60mm product
20	S3	2200°C	脉冲直流电源 SPS	6.7×10 ⁻³	直联泵+扩散泵 Direct Connection Pump + Diffusion Pump	Φ100×350	1560×1690×1850 不含电源尺寸 Excluding power system	1500	SPS烧结 Sintering	伺服压力30T, 精度±3%, 升温速率100°C/min, 可压制Φ80-100mm产品 Servo pressure 30T, accuracy ±3%, heating rate 100°C/min, compressible Φ80-100mm product
21	Smini	2400°C	脉冲直流电源 SPS	6.7×10 ⁻⁴	直联泵+分子泵 Direct Connection Pump + Molecular Pump	Φ60×180	1290×1360×1800	1000	SPS烧结 Sintering	伺服压力5T, 精度±1%, 升温速率100°C/min, 可压制Φ20-30mm产品 Servo pressure 5T, accuracy ±1%, heating rate 100°C/min, compressible Φ20-30mm product

备注: 选配配置清单如下 Note: The optional configuration list is as follows

- MOD (钼带炉脱脂/Molybdenum Strip Furnace: Degreasing)
- H2RFC (氢气炉, 2路浮子流量计/Hydrogen Furnace, 2-way Float Flowmeter)
- OM (直联泵+分子泵组/Direct Connection Pump + Molecular Pump)
- DM (螺杆泵+分子泵组/Screw Pump + Molecular Pump)
- UPS (不间断电源/Uninterruptible Power Supply)
- AC (空调/Air Conditioning)
- OCA (氧含量分析仪/Oxygen Content Analyzer)
- GRD (石墨炉脱脂/Graphite Strip Furnace: Degreasing)
- H2MFC (氢气炉, 2路质量流量计/Hydrogen Furnace, 2-way Mass Flowmeter)
- SPS (脉冲直流电源/Servo Pressure Supply)
- HDP (氢气露点仪/Hydrogen Dew Point Meter)

SPS/DCS放电等离子烧结系统

SPARK PLASMA SINTERING



S1正视图

Smini正视图

简介

BRIEF INTRODUCTION

SPS (Spark Plasma Sintering)/DCS放电等离子烧结系统是当今世界上最先进的烧结系统之一，是在两电极间施加脉冲电流和轴向压力进行粉末烧结致密化的一种新型快速烧结技术。它具有升温速度快、烧结时间短、组织结构可控、节能环保等鲜明特点，可用于制备金属材料、陶瓷材料、复合材料，也可用来制备纳米块体材料、非晶块体材料、梯度材料等。此外，SPS/DCS设备也为非常特殊的新材料的制造提供了可能，诸如可在晶粒无显著长大的状态下烧结出纳米材料、功能梯度材料、复合材料、碳化钨、氮化硅、碳化硅或其他硬质材料，结构陶瓷和功能陶瓷等。

The SPS (Spark Plasma Sintering) /DCS discharge plasma sintering system is one of the most advanced sintering systems in the world today. It is a new rapid sintering technology that applies pulse current and axial pressure between two electrodes to densify powder sintering. It has distinct characteristics such as fast heating rate, short sintering time, controllable organizational structure, energy conservation and environmental protection. It can be used to prepare metal materials, ceramic materials, composite materials, as well as nano bulk materials, amorphous bulk materials, gradient materials, etc. In addition, SPS/DCS equipment also provides the possibility for the manufacturing of very special new materials, such as nanomaterials, functionally gradient materials, composite materials, tungsten carbide, silicon nitride, silicon carbide or other hard materials, structural ceramics, and functional ceramics, which can be sintered without significant grain growth.

主要规格及技术指标

SPECIFICATIONS & PARAMETERS

产品编号 Numbering	产品型号 Model	样品尺寸(mm) Sample Dia. (mm)	压力(吨) Pressure (ton)	电压(V) Voltage (V)	电流(A) Current (A)	加热功率(KW) Heating Power (KW)	真空度(Pa) Ultimate Vacuum (Pa)	最高温度(°C) Max. Temperature (°C)
Smini	VHPsp-6/18-2400	Φ15-20	5	10	3000	30	6.7×10 ⁻⁴	2400
S1	VHPsp-10/35-2400	Φ30-40	10	10	6000	60	6.7×10 ⁻³	2400
S2	VHPsp-10/35-2400	Φ50-60	20	10	10000	100	6.7×10 ⁻³	2400
S3	VHPsp-10/35-2200	Φ80-100	30	10	16000	160	6.7×10 ⁻³	2200

特点

ADVANTAGES

皓越公司SPS/DCS设备的主要特点：

- 该系列放电等离子烧结系统，充分考量了烧结工艺的自动化和操控性，烧结温度，加压控制，电流控制等自动程控系统为设备的标准配置。
- 设备搭载了安全停机功能，当监控或检测到设备水温异常、模具破损等突发状况时设备将自动停机。
- 配备数据采集解析系统，可将决定烧结体产品品质的工艺参数，如烧结电压、电流、控制温度、施加压力、位移、真空度、位移变化率、实测温度等物理量进行保存和调用，以对产品生产工艺进行追踪。
- 设备采用了自主开发的脉冲变频DC电源，与传统的同等级SPS相比，耗电量大幅降低，可真正有效地实现节能降耗环保型高品质的烧结生产。
- 采用前置开门式水冷真空烧结腔，工件上下机台、腔体内的施工作业、维护维修等轻松便捷。
- 采用大型液晶触控操作面板，可随时自行对位移数据以及联动互锁等状态的显示、报警显示、报警履历、加压压力设定值等进行诊断和确认。
- 为避免设备各操作按钮或按键的误操作，设备搭载了安全联动互锁功能，即使新手上机也可放心使用。

The main advantages of the SPS/DCS equipment of Haoyue Company:

- This series of discharge plasma sintering systems fully considers the automation and controllability of the sintering process, and automatic program control systems such as sintering temperature, pressure control, and current control are the standard configurations of the equipment.
- The device is equipped with a safety shutdown function, which automatically shuts down when monitoring or detecting sudden situations such as abnormal water temperature or mold damage.
- Equipped with a data collection and analysis system, the process parameters that determine the quality of sintered body products, such as sintering voltage, current, control temperature, applied pressure, displacement, vacuum degree, displacement change rate, measured temperature, etc., can be saved and called up to track the production process of the product.
- The equipment adopts a self-developed pulse frequency conversion DC power supply, which significantly reduces power consumption compared to traditional SPS of the same level, and can truly effectively achieve energy-saving, environmentally-friendly and high-grade sintering production.
- Adopting a front door type water-cooled vacuum sintering chamber, the construction, maintenance, and repair of the workpiece on and off the machine table, and inside the chamber are easy and convenient.
- Using a large LCD touch operation panel, it is possible to diagnose and confirm the display, alarm display, alarm history, and pressure setting values of displacement data and interlocking status at any time.
- To avoid misoperation of various operating buttons or buttons on the device, the device is equipped with a safety interlock function, which can be used with confidence even for beginners.

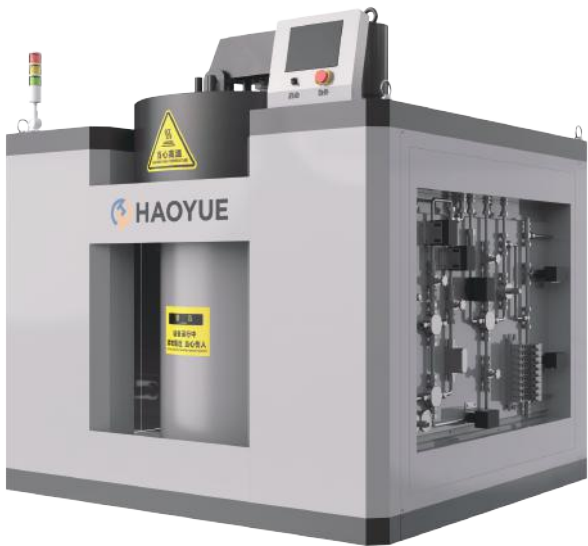
应用领域

APPLICATIONS

- 金属： Fe, Cu, Al, Au, Ag, Ni, Cr, Mo, Sn, Ti, W, Be;
- 陶瓷氧化物： Al₂O₃, Mulitex ZrO₂, Mg, SiO₂, TiO, HfO₂;
- 碳化物： SiC, B₄C, TaC, WC, ZrC, VC;
- 氮化物： Si₃N₄, TaN, TiN, AlN, ZrN, VN;
- 硼化物： TiB₂, HfB₂, LaB₆, ZrB₂, VB₂;
- 氟化物： LiF, CaF₂, MgF₂;
- 金属陶瓷： Si₃N₄+Ni, Al₂O₃+Ni, ZrO₂+Ni, Al₂O₃+Ti, SUS+WC/Co, BN+Fe, WC+Co +Fe;
- 金属化合物： TiAl, MoSi₂, Si₃Zr₅, NiAl, NbCo, NbAl Sm₂Co₁₇.
- Metals: Fe, Cu, Al, Au, Ag, Ni, Cr, Mo, Sn, Ti, W, Be;
- Ceramic oxides: Al₂O₃, Mulitex ZrO₂, Mg, SiO₂, TiO₂, HfO₂;
- Carbides: SiC, B₄C, TaC, WC, ZrC, VC;
- Nitrides: Si₃N₄, TaN, TiN, AlN, ZrN, VN;
- Boride: TiB₂, HfB₂, LaB₆, ZrB₂, VB₂;
- Fluorides: LiF, CaF₂, MgF₂;
- Metal ceramics: Si₃N₄+Ni, Al₂O₃+Ni, ZrO₂+Ni, Al₂O₃+Ti, SUS+WC/Co, BN+Fe, WC+Co+Fe;
- Metal compounds: TiAl, MoSi₂, Si₃Zr₅, NiAl, NbCo, NbAl Sm₂Co₁₇.

气压烧结炉

GAS PRESSURE SINTERING FURNACE



G2透视图

特点

ADVANTAGES

气压烧结设备特别适用于烧结在高温下易于分解或通过标准烧结工艺不能烧结的陶瓷或金属。和热烧结一样，在这一过程中没有对待烧结部件的限制或对几何形状的限制，它为更昂贵的HIP过程提供了一种有利的选择。

我们的气压烧结炉可以装备集成的热膨胀计，它能在烧结循环中测量收缩和收缩速度。在此获得的测量数据被用于过程控制。

在2200°C和10MPa (在N₂或Ar中) 可以实现1升到500升的工作量。

气压烧结炉用于生产以下材料或部件：

- 具有良好机械性能的烧结氮化硅和硅铝氧氮聚合物材料（比如切削工具、涡轮增压器发动机、发动机部件）
- 碳化硅陶瓷（在腐蚀条件下高机械应力件等）
- 超级合金（用于高温应用的机械应力件）
- 在带有较低钴含量的特殊烧结电石中的硬质金属，具有最优的机械性能和较高的质量
- 一般复合材料，主要应用汽车工业生产SSN批量零件。

Gas pressure sintering equipment is particularly suitable for sintering ceramics or metals that are easily decomposed at high temperatures or cannot be sintered through standard sintering processes. Like hot sintering, there are no restrictions on the treatment of sintered components or geometric shapes during this process, providing a favorable choice for more expensive HIP processes.

Our pneumatic sintering furnace can be equipped with an integrated thermal dilatometer that can measure shrinkage and shrinkage rate during the sintering cycle. The measurement data obtained here is used for process control.

a workload of 1 to 500 liters can be achieved at 2200°C and 10 MPa (in N₂ or Ar).

Gas pressure sintering furnaces are used to produce the following materials or components:

- Sintered silicon nitride and silicon aluminum oxide nitrogen polymer materials with good mechanical properties (such as cutting tools, turbocharger engines, engine components)
- Silicon carbide ceramics (high mechanical stress parts under corrosive conditions, etc.)
- Super alloy (mechanical stress parts for high-temperature applications)
- Hard metals in special sintered calcium carbide with low cobalt content have the best mechanical properties and higher quality
- General composite materials are mainly used in the automotive industry to produce SSN batch parts.

主要规格及技术指标

SPECIFICATIONS & PARAMETERS

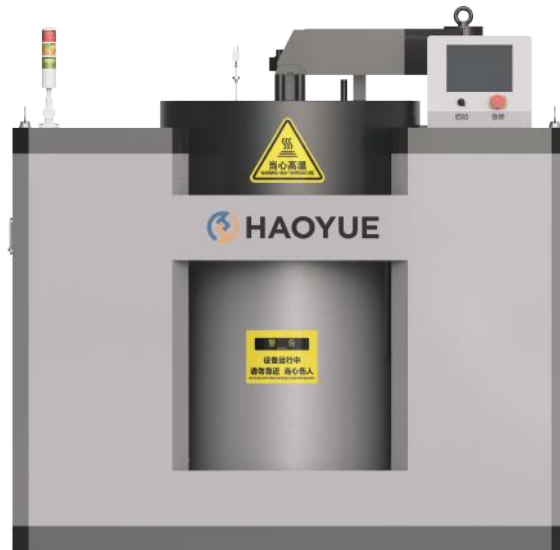
产品编号 Numbering	产品型号 Model	加热材质 Heater	设备型式 Structure	取料方式 Loading	炉膛尺寸(mm) Chamber Size (mm)	最高温度(°C) Max. Temperature (°C)	气体压力(MPa) Gas Pressure (MPa)	极限真空度(Pa) Ultimate Vacuum (Pa)	加热功率(KW) Heating Power (KW)
G2GR20/10	PVSgr-20/25-2000	石墨 GR	立式 Vertical	上取料 Top Loading	Φ200×250	2000	10	10	50
G2GR20/1	PVSgr-20/25-2000	石墨 GR	立式 Vertical	上取料 Top Loading	Φ200×250	2000	1	6.7×10 ⁻³	50

简介

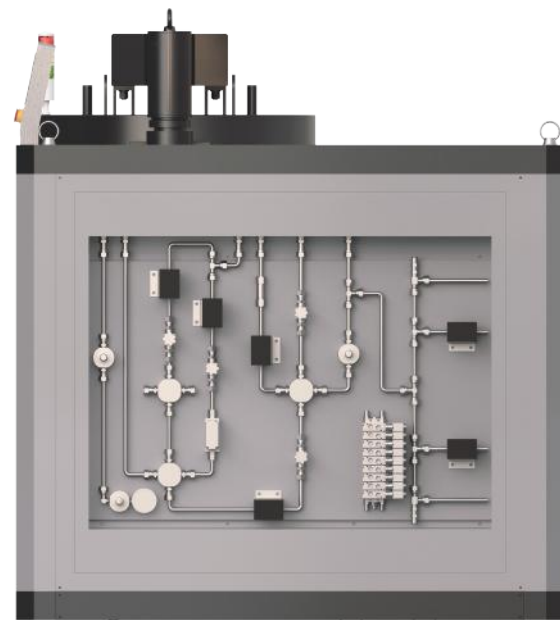
BRIEF INTRODUCTION

气压烧结是指首先在低压状态下进行烧结工艺，然后在常压下烧结材料达到疲劳状态，后是在高压下烧结(结果是进一步的增加材料疲劳状态并迅速的消除材料中的应力)，在高温高压烧结工艺后，材料的各方面机械性能(硬度，强度，韧性等)都优于普通的烧结工艺。

Gas pressure sintering refers to the sintering process first carried out under low pressure, followed by sintering the material to reach a fatigue state under normal pressure, and then sintering under high pressure (the result is further increasing the fatigue state of the material and quickly eliminating stress in the material). After the high-temperature and high-pressure sintering process, the material's mechanical properties (hardness, strength, toughness, etc.) are superior to ordinary sintering processes in all aspects.



G2正视图



G2侧视图

真空热压烧结炉

VACUUM HOT PRESSING FURNACE



P2透视图



P2正视图



P2背视图

简介

BRIEF INTRODUCTION

真空热压炉是在真空(或其它气氛)条件下将材料热压成型的成套设备, 主要采用电阻或感应加热, 由油缸驱动的压头上下加压。在高温下, 物料生坯固体颗粒的相互键联, 晶粒长大, 空隙(气孔)和晶界渐趋减少, 通过物质的传递, 其总体积收缩, 密度增加, 最后成为具有某种显微结构的致密多晶烧结合体, 从而将物料压制成形。

A vacuum hot pressing furnace is a complete set of equipment that forms materials by hot pressing under vacuum (or other atmosphere) conditions. It mainly uses resistance heating and is pressurized up and down by a pressure head driven by an oil cylinder. At high temperatures, the solid particles of the raw material bond with each other, resulting in grain growth, decreasing voids (pores) and grain boundaries. Through material transfer, its total volume shrinks, density increases, and finally becomes a dense polycrystalline sintered body with a certain microstructure, thereby pressing the material into shape.

主要规格及技术指标

SPECIFICATIONS & PARAMETERS

产品编号 Numbering	产品型号 Model	样品尺寸(mm) Sample Dia. (mm)	压力(吨) Pressure (ton)	加热功率(KW) Heating Power (KW)	真空度(Pa) Ultimate Vacuum (Pa)	最高温度(°C) Max. Temperature (°C)
P2GR20	VHPgr-20/20/30-2000	Φ20-80	30	45	6.7×10^{-3}	2000
P2GR23	VHPgr-20/20/30-2300	Φ20-80	30	50	6.7×10^{-3}	2300
P2CO20	VHPco-20/20-2000	Φ20-80	30	45	6.7×10^{-3}	2000
P2CO23	VHPco-20/20-2300	Φ20-80	30	50	6.7×10^{-3}	2300
P2MO14	VHPmo-20/20/30-1400	L160×W160×H160	5	45	6.7×10^{-3}	1400

特点

ADVANTAGES

- 采用卧式、侧开门结构: 装、卸模具精度高, 操作方便;
- 升降温快: 感应升温速率100°C/分钟($\leq 1600^\circ\text{C}$), 电阻升温速率20°C/分钟($> 1600^\circ\text{C}$);
- 温度均匀性好: 平均温度均匀性为 $\pm 5^\circ\text{C}$ (5点测温, 恒温区1000°C保温1h后检测);
- 压力精度高: 采用液压控制系统, 压力精度为3‰;
- 采用单温区控制: 预留两个测温孔, 以便高温监测使用;
- 安全性性能好: 采用HMI+PLC+PID压力传感控制, 安全可靠;
- 密封性能好: 动态压头均采用波纹管密封, 确保不漏气。

- Adopting a horizontal and side door structure: high precision for loading and unloading molds, easy to operate;
- Fast temperature rise and fall: induction heating rate of $100^\circ\text{C}/\text{minute}$ ($\leq 1600^\circ\text{C}$), resistance heating rate of $20^\circ\text{C}/\text{minute}$ ($> 1600^\circ\text{C}$);
- Good temperature uniformity: The average temperature uniformity is $\pm 5^\circ\text{C}$ (measured at 5 points, with a constant temperature zone of 1000°C for 1 hour before testing);
- High pressure accuracy: using a hydraulic control system, with a pressure accuracy of 3‰;
- Adopting single temperature zone control: reserving two temperature measurement holes for high-temperature monitoring use;
- Good safety performance: Adopting HMI+PLC+PID pressure sensing control, safe and reliable;
- Good sealing performance: The dynamic pressure heads are sealed with corrugated pipes to ensure no air leakage.



P2CO透视图



P2CO正视图



P2CO背视图

真空炉

VACUUM FURNACE



V2透视图



V2正视图



V2背视图

简介

BRIEF INTRODUCTION

该真空炉是可以石墨/钼带/钨带/硅钼棒/钼棒等作发热元件的真空电阻炉，主要用于陶瓷、硬质合金、复合材料，不锈钢等在真空或保护气氛中烧结，退火，钎焊，脱脂，脱气等，也可以供金属材料在真空条件下的高温热处理或贵金属材料的除气处理。

The Vacuum furnace is a vacuum resistance furnace that can use graphite/molybdenum belt/tungsten belt/silicon molybdenum bar/molybdenum bar as heating elements. It is mainly used for sintering, annealing, brazing, degreasing, degassing, etc. of ceramics, hard alloys, composite materials, stainless steel, etc. in vacuum or protective atmosphere, and also for high-temperature heat treatment of metal materials under high vacuum conditions or degassing of precious metal materials.

特点

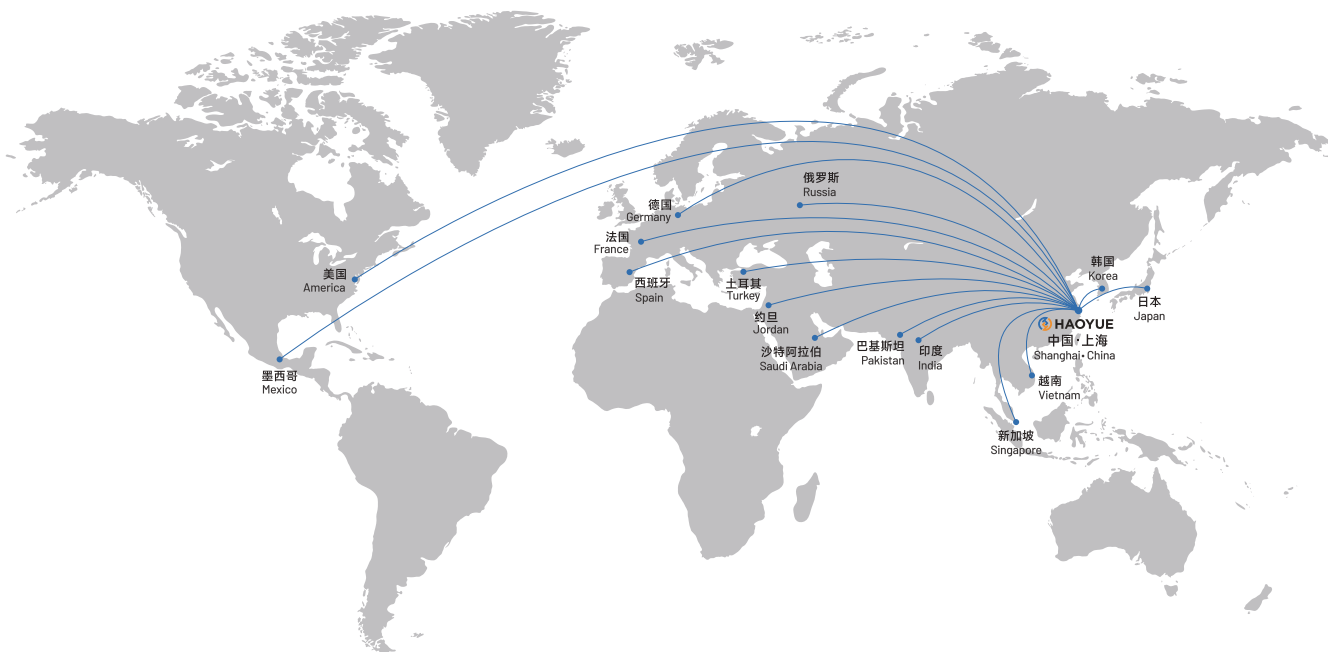
ADVANTAGES

- 操作方便：采用卧式、侧开门结构：装、卸样品方便，操作方便；
 - 升降温快：感应升温速率100°C/分钟 ($\leq 1600^{\circ}\text{C}$)，电阻升温速率20°C/分钟 ($> 1600^{\circ}\text{C}$)；
 - 温度均匀性好：平均温度均匀性为 $\pm 5^{\circ}\text{C}$ (5点测温，恒温区1000°C保温1h后检测)；
 - 采用单温区控制：预留两个测温孔，以便高温监测使用；
 - 安全性能好：采用HMI+PLC+PID压力传感控制，安全可靠；
 - 可拓展性强：可烧结，钎焊，退火，脱脂，脱氢，脱气，还原，氧化等。
- Easy to operate: Adopting a horizontal and side door structure: easy to load and unload samples, easy to operate;
 - Fast temperature rise and fall: induction heating rate of $100^{\circ}\text{C}/\text{minute}$ ($\leq 1600^{\circ}\text{C}$), resistance heating rate of $20^{\circ}\text{C}/\text{minute}$ ($> 1600^{\circ}\text{C}$);
 - Good temperature uniformity: The average temperature uniformity is $\pm 5^{\circ}\text{C}$ (measured at 5 points, with a constant temperature zone of 1000°C for 1 hour before testing);
 - Adopting single temperature zone control: reserving two temperature measurement holes for high-temperature monitoring use;
 - Good safety performance: Adopting HMI+PLC+PID pressure sensing control, safe and reliable;
 - Strong expandability: sintering, brazing, annealing, degreasing, dehydrogenation, degassing, reduction, oxidation, etc.

主要规格及技术指标

SPECIFICATIONS & PARAMETERS

产品编号 Numbering	产品型号 Model	炉膛尺寸(mm) Chamber Size (mm)	加热功率(KW) Heating Power (KW)	真空度(Pa) Ultimate Vacuum (Pa)	最高温度(°C) Max. Temperature (°C)
V2GR20	VHSgr-20/20/30-2000	200×200×300	45	6.7×10^{-3}	2000
V2GR23	VHSgr-20/20/30-2300	200×200×300	50	6.7×10^{-3}	2300
V2MO13	VHSmo-20/20/30-1300	200×200×300	40	6.7×10^{-3}	1300
V2MO16	VHSmo-20/20/30-1600	200×200×300	45	6.7×10^{-3}	1600
V2W20	VHSw-20/20/30-2000	200×200×300	45	6.7×10^{-3}	2000
V2W23	VHSw-20/20/30-2300	200×200×300	50	6.7×10^{-3}	2300
V2CO20	VHSco-20/20-2000	$\Phi 200 \times 200$	45	6.7×10^{-3}	2000
V2CO23	VHSco-20/20-2300	$\Phi 200 \times 200$	50	6.7×10^{-3}	2300
V2MS17	VHSms-20/20/30-1700	200×200×300	12	6.7×10^{-2}	1700
V2MO17	VHSmo-20/20/30-1700	200×200×300	12	6.7×10^{-2}	1700



上海皓越真空设备有限公司

SHANGHAI HAOYUE TECHNOLOGY CO.,LTD

办公地址：上海市嘉定区嘉松北路7301号B2栋

Official Add: Building B2, No.7301, Jiasong North Road, Jiading District, Shanghai

工厂地址：江苏省南通市通州区聚丰科创产业园1号厂房

Factory Add: No.1, Jufeng Science and Technology Industrial Park, Tongzhou District, Nantong, Jiangsu

电话 (Tel): 86-21-51095287 传真 (Fax): 86-21-51095281

邮箱 (E-mail): sale@haoyue-group.com (国内) sales@haoyue-group.com (国外)



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