Electron Beam Application Development

Hydrogen & Vacuum Furnaces

Horizontal Vacuum Furnace

- *This equipment is for perm alloy and various kinds of electrical vacuum devices annealing, degassing, and removal of superficial oxide in vacuum state.*

Main specifications				
Effective Volume (mm)	Maximum Temperature(°C)	Temperature Uniformity (°C)	Ultimate Vacuum (Pa)	Power (Kw.)
400×400×600	700	±4	1×10^{-3}	20
400×320×600	1100	±4	1×10^{-3}	50
420×420×600	1100	±4	3×10^{-5}	60
610×610×914	1100	±5	3×10^{-5}	105
700×700×1000	1100	±5	5×10^{-5}	120
920×610×610	1100	±5	4×10^{-5}	140
610×610×1000	1150	±4	3×10^{-5}	120
700×800×1600	1150	±5	1×10^{-3}	200
450×350×680	1200	±4	1×10^{-3}	70
500×500×600	1200	±5	2×10^{-4}	85
300×300×600	1300	±5	5×10^{-4}	65
350×300×500	1300	±4	1×10^{-3}	60
450×250×550	1300	±5	3×10^{-1}	70
600×380×280	1600	±5	6×10^{-4}	160
914×610×458	1600	±5	6×10^{-4}	200

Hydrogen Furnace

Characteristics:

Control mode: manual and automatic

- *Automatic temperature control accuracy*
- *The temperature is automatically controlled by segmented program and temperature controller*
- *could store several program. Temperature is able to be increased in accordance with technical*
- *curve, meeting diversified technical demands.*
- *Different kinds of temperature controllers can be chosen to meet clients' own requirements.*
- *Heating is operated by transformer, transformer and power regulator reducing the pollution of the electricity power system.*
- *Excellent allocation enables hydraulic pressure system to have smooth elevation, no leakage and low noise.*
- *Water and atmosphere pressure are controlled by the pressure and the alarm will be given with acousto-optic display. Flow alarm is controlled according to the clients' requirements.*
- *The equipment has recording instrument which records and memories one-month service conditions.*
- *With stainless steel as its material, the table-board features with pleasing spray-paint color and elegant appearance.*

Hydrogen Furnace

Main specifications				
Working positions /Structure	Effective volume(mm)	Maximum temperature	Temperature uniformity	Power (Kw.)
Twin-set vertical	Φ250×250	1200°C	±7.5°C	25
Twin-set vertical	Φ270×300	1200°C	±7.5°C	30
Twin-set vertical	Φ300×350	1200°C	±7.5°C	35
Twin-set vertical	Φ350×300	1200°C	±7.5°C	42
Twin-set vertical	Φ350×500	1200°C	±10°C	45
Single-set vertical	Φ420×400	1200°C	±10°C	60
Single-set vertical	Φ500×1000	1200°C	±10°C	160
Single-set vertical	Φ550×750	1200°C	±10°C	100
Twin-set vertical	Φ200×300	1250°C	±7.5°C	20
Twin-set vertical	Φ270×300	1250°C	±7.5°C	40
Twin-set vertical	Φ300×400	1250°C	±7.5°C	50
Twin-set vertical	Φ350×450	1250°C	±7.5°C	70
Single-set vertical	Φ420×750	1250°C	±10°C	80
Twin-set vertical	Φ250×280	1300°C	±7.5°C	30
Twin-set vertical	Φ300×400	1300°C	±7.5°C	50
Twin-set vertical	Φ350×450	1300°C	±10°C	60
Single-set vertical	Φ420×400	1300°C	±10°C	60
Single-set vertical	Φ500×600	1300°C	±10°C	120
Twin-set vertical	Φ200×250	1600°C	±7.5°C	35
Twin-set vertical	Φ250×300	1600°C	±7.5°C	40
Twin-set vertical	Φ250×350	1600°C	±10°C	45
Twin-set vertical	Φ270×350	1600°C	±7.5°C	50
Twin-set vertical	Φ300×350	1600°C	±7.5°C	70
Twin-set vertical	Φ300×500	1600°C	±10°C	75
Single-set vertical	Φ500×600	1600°C	±10°C	120
Single-set horizontal	Φ60×200	1800°C		20
Single-set horizontal	35×15×150	2000°C		25
Single-set vertical	Φ80×150	2200°C		75

- *The products can be specially designed and manufactured to meet the clients' different demands of working temperature and effective volume.*

Vacuum Brazing Furnaces

Application

1. *Brazing of stainless steel, plain carbon steel, titanium alloy steel for tools and titanium alloy steel for dies.*
2. *Brazing of hard alloy, non-ferrous metals and so on. There are two kinds of flues graphite flue and metal flue. Graphite flue is often chosen as the material with graphite rod as the heating material and heat screen is generally made of carbon felt and pottery felt. If parts which are to be brazed are special parts such as titanium alloy and non-ferrous metals, heat screen is made of molybdenum and stainless steel and the material of heating component is molybdenum. Temperature is controlled by smart temperature controller and the operation is controlled by FX2N program controller.*

Characteristics

1. *Vacuum brazing furnaces are divided into single-chambered horizontal furnace, twin-chambered semi continuous furnace and three-chambered continuous furnace. The equipment is mainly applied in vacuum brazing of stainless steel, titanium alloy, hard alloy, high-temperature alloy. In order to guarantee the quality of brazing, the equipment is heated by zone control and furnace temperature uniformity is 3 ℃ .The heat screen is made of molybdenum and stainless steel with molybdenum as the heating material. (Max. usage temperature is 1300 ℃)*

2. *The system is controlled by PLC and touch screen shows the working condition. It is easy to choose the manual operation or the automatic operation. The alarm system responds automatically if the numerical value of temperature, water pressure or air pressure is found greater than setting value.*

Main specifications					
Effective working size	500×300×300 (mm)	600×400×400 (mm)	750×500×500 (mm)	900×600×600 (mm)	1200×800×800 (mm)
Load	100kg	200kg	300kg	500kg	800kg
Heating power	65Kw	90Kw	120Kw	150Kw	210Kw
Maximum temperature	1300℃	1300℃	1300℃	1300℃	1300℃
Temperature uniformity	±3℃	±3℃	±3℃	±3℃	±3℃
Ultimate Vacuum(Pa)	4×10^{-1}or 6.7×10^{-3}	4×10^{-1}or 6.7×10^{-3}	4×10^{-1}or 6.7×10^{-3}	4×10^{-1}or 6.7×10^{-3}	4×10^{-1}or 6.7×10^{-3}
Pressure growth rate	0.67Pa/h	0.67Pa/h	0.67Pa/h	0.67Pa/h	0.67Pa/h
Cooling gas pressure	≤2bar	≤2bar	≤2bar	≤2bar	≤2bar

Vacuum Annealing Furnaces

Application

1. *Annealing of high-speed steel, high-alloy tool steel and high-alloy die steel.*
2. *Annealing of magnetic material.*
3. *Bright annealing and solution treatment of non-ferrous metal and stainless steel.*
4. *Vacuum sintering of magnetic material.*

There are two kinds of horizontal annealing furnace-graphite flue and metal flue. Graphite flue is often chosen as the material with graphite rod as the heating material and heat screen is generally made of carbon felt and pottery felt. If parts which are to be processed are special materials such as titanium alloy and soft magnetic alloy, metal flue is chosen as the material with molybdenum as the heating material and heat screen is made of molybdenum and stainless steel. Electrical control system features with high automation with reliability and stability. Temperature is controlled by smart temperature controller and the operation is controlled by program controller.

Vacuum Annealing Furnaces

Characteristics

1. *Under the temperature of 800° C circulative fan produces the rapid and uniform heating in low temperature zone.*
2. *The structure of heating chamber is arranged scientifically, therefore it is heated uniformly and thermal losses are getting decreased with energy conservation.*
3. *The new-type pottery felt which is used as the heat preservation material could endure high temperature and it increases the service life of the heat screen.*
4. *The system is controlled by PLC and touch screen shows the working condition. It is easy to choose the manual operation or the automatic operation. The alarm system responds automatically if the numerical value of temperature, water pressure or air pressure is found greater than setting value.*

Main specifications					
Effective working size	500×300×300 (mm)	600×400×400 (mm)	750×500×500 (mm)	900×600×600 (mm)	1200×800×800 (mm)
Load	100kg	200kg	300kg	500kg	800kg
Heating power	60Kw	80Kw	120Kw	150Kw	210Kw
Maximum temperature	1300°C	1300°C	1300°C	1300°C	1300°C
Temperature uniformity	±5°C	±5°C	±5°C	±5°C	±5°C
Temperature uniformity	4×10^{-1}or 6.7×10^{-3}	4×10^{-1}or 6.7×10^{-3}	4×10^{-1}or 6.7×10^{-3}	4×10^{-1}or 6.7×10^{-3}	4×10^{-1}or 6.7×10^{-3}
Temperature uniformity	0.67Pa/h	0.67Pa/h	0.67Pa/h	0.67Pa/h	0.67Pa/h
Temperature uniformity	≤2bar	≤2bar	≤2bar	≤2bar	≤2bar

Vacuum Air-cooled Oil-quenching Furnaces

Application

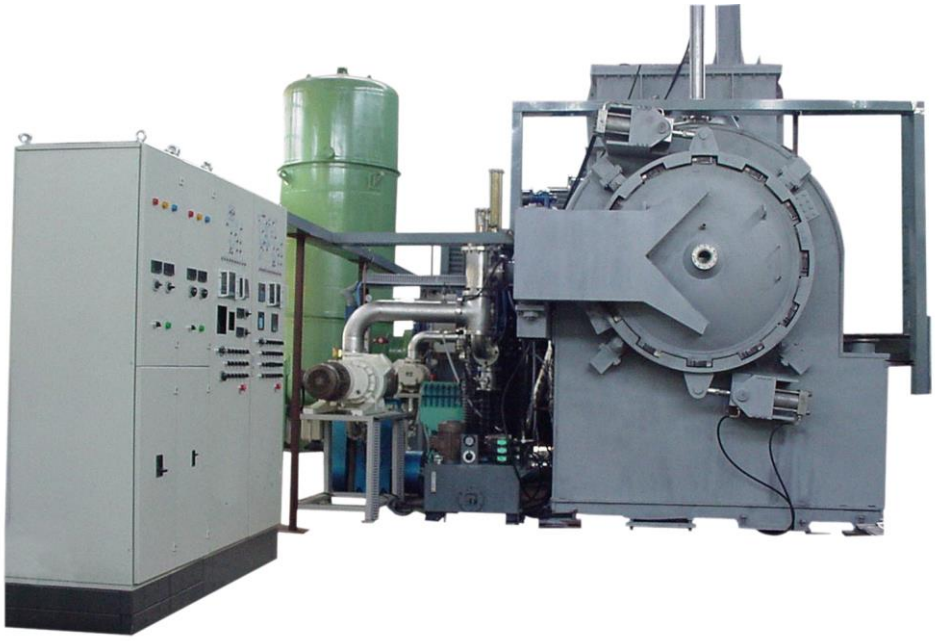
1. *Bright quenching of such materials as alloy steel, high-speed steel, tool steel, die steel, bearing steel, elastic alloy , stainless steel and so on.*
2. *Vacuum treatment of magnetic material.*
3. *High-temperature vacuum brazing and vacuum sintering.*

Vacuum oil-quenching furnace is graphite flue and heat screen is made of graphite felt. Electrical control system features with high automation with reliability and stability. Temperature is controlled by smart temperature controller and the operation is controlled by program controller.

Characteristics

1. *Graphite rod, the heating component, is of long service life and easy maintenance.*
2. *Slide valve features with good heat insulation and gas insulation.*
3. *The structure of heating chamber is arranged scientifically, therefore it is heated uniformly and thermal losses are getting decreased with energy conservation.*
4. *Stirring device of oil storage makes flow of quenching oil smooth and even, so the small deformation of components can be guaranteed.*
5. *Vacuum and cooling gas pressure can be adjusted in order to meet the demands of different materials.*
6. *The transmission system of components is smooth and flexible in its operation on the safe side.*
7. *The structure of furnace cover of gas cooling chamber is made of interlocking tooth flange which gives a good seal of positive pressure and negative pressure.*
8. *The system is controlled by PLC and touch screen shows the working condition. It is easy to choose the manual operation or the automatic operation. The alarm system responds automatically if the numerical value of temperature, water pressure or air pressure is found greater than setting value.*

Vacuum Air-cooled Oil-quenching Furnaces



Main specifications					
Effective working size	500×300×300 (mm)	600×450×400 (mm)	750×500×500 (mm)	900×600×450 (mm)	900×650×600 (mm)
Load	60kg	150kg	250kg	400kg	500kg
Heating power	40Kw	65Kw	90Kw	120Kw	150Kw
Maximum temperature	1320°C	1320°C	1320°C	1320°C	1320°C
Temperature uniformity	±5°C	±5°C	±5°C	±5°C	±5°C
Ultimate vacuum(Pa)	4×10^{-1}	4×10^{-1}	4×10^{-1}	4×10^{-1}	4×10^{-1}
Pressure growth rate	0.67Pa/h	0.67Pa/h	0.67Pa/h	0.67Pa/h	0.67Pa/h
Cooling gas pressure	≤2bar	≤2bar	≤2bar	≤2bar	≤2bar

Vacuum Pressure Gas-quenching Furnaces

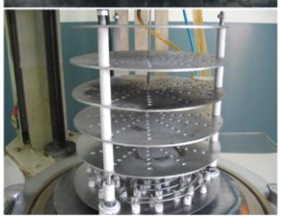
Application

1. *Quenching of high-speed steel, tool steel, die steel and stainless steel.*
2. *Solution treatment of stainless steel and titanium alloy.*
3. *Vacuum heat treatment of magnetic material.*
4. *High-temperature brazing and vacuum sintering.*

There are two kinds of flues—graphite flue and metal flue. Graphite flue is often chosen as the material with graphite rod as the heating material.
The heat screen is generally made of carbon felt and pottery felt. If parts which are to be processed are special parts such as titanium alloy and soft magnetic alloy, the material of heat screen is molybdenum and stainless steel. Temperature is controlled by smart temperature controller and the operation is controlled by program controller.

Main specifications					
Effective working size	500×300×300 (mm)	600×400×400 (mm)	750×500×500 (mm)	900×600×600 (mm)	1200×800×800 (mm)
Load	100kg	200kg	300kg	500kg	800kg
Heating power	65Kw	90Kw	120Kw	150Kw	210Kw
Maximum temperature	1320°C	1320°C	1320°C	1320°C	1320°C
Temperature uniformity	±5°C	±5°C	±5°C	±5°C	±5°C
Ultimate vacuum(Pa)	4×10^{-1}or 6.7×10^{-3}	4×10^{-1}or 6.7×10^{-3}	4×10^{-1}or 6.7×10^{-3}	4×10^{-1}or 6.7×10^{-3}	4×10^{-1}or 6.7×10^{-3}
Pressure growth rate	0.67Pa/h	0.67Pa/h	0.67Pa/h	0.67Pa/h	0.67Pa/h
Cooling gas pressure	≤2bar	≤2bar	≤2bar	≤2bar	≤2bar

High Temperature Furnaces



Application

1. *The sintering of powder metallurgy parts and pottery materials.*
2. *High-temperature sintering of hard alloy.*
3. *Annealing and excellent brazing of metalwork.*

Characteristics

1. *There are two kinds of vacuum sintering furnace—graphite flue and metal flue. Graphite flue is often chosen as the material with graphite rod as the heating material and heat screen is generally made of multilayer graphite felt and pottery felt. Metal flue is exclusively applied in sintering special materials. The heating material of metal flue is molybdenum and tungsten and heat screen is made of molybdenum, tungsten and stainless steel.*
2. *The system is controlled by PLC and touch screen shows the working condition. It is easy to choose the manual operation or the automatic operation. The alarm system responds automatically if the numerical value of temperature, water pressure or air pressure is found greater than setting value.*

Main specifications					
Effective working size	300×200×200 (mm)	500×300×300 (mm)	600×400×400 (mm)	750×500×500 (mm)	900×600×600 (mm)
Load	20kg	100kg	200kg	300kg	500kg
Heating power	40Kw	80Kw	120Kw	150Kw	210Kw
Maximum temperature	1600°C	1600°C	1600°C	1600°C	1600°C
Temperature uniformity	±3°C	±3°C	±3°C	±3°C	±3°C
Ultimate Vacuum(Pa)	4×10^{-1}or 6.7×10^{-3}	4×10^{-1}or 6.7×10^{-3}	4×10^{-1}or 6.7×10^{-3}	4×10^{-1}or 6.7×10^{-3}	4×10^{-1}or 6.7×10^{-3}
Pressure growth rate	0.67Pa/h	0.67Pa/h	0.67Pa/h	0.67Pa/h	0.67Pa/h
Cooling gas pressure	≤2bar	≤2bar	≤2bar	≤2bar	≤2bar

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جهت کسب اطلاعات بیشتر با پست الکترونیکی ذیل در ارتباط باشید:

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