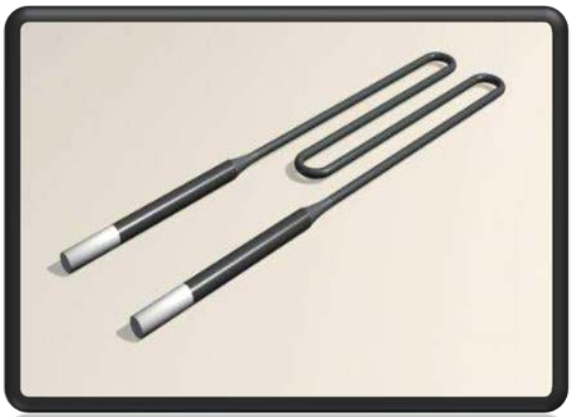
Spare Parts of Furnace



Furnace and heating process equipment

widely using at

Institutions of higher learning

scientific research institutions

experimental laboratory

industrial and mining enterprises

The equipment designed for pyrolysis, melting, analysis and production ceramics, metallurgy, electronics, machinery, chemical, glass, refractories, for develop new material, special materials, construction materials, the equipment is suitable for institutions of higher learning and laboratory of scientific research institute and industrial and mining enterprises.

www.gwdl.net

Made In China

China Made

Guoju with 200 employees have been developing and producing industrial furnaces for many different applications for over 10 years。As a furnace manufacturer, Guoju offers the widest and deepest range of furnaces. Around 1000 satisfied customers in more than 34 Provinces offer proof of our commitment to excellent design, quality and cost efficiency. Short delivery times are ensured due to our complete inhouse production and our wide variety of standard furnaces.

Excellent Quality、High Reputation

product has the advantages of automatic control, fast heat, energy saving, simple operation, programmable microcomputer control, automatic temperature control, temperature control precision and high precision of constant temperature, the furnace shell temperature is close to indoor temperature etc., we got excellent feedback from our customers! After years of development the company has a maturity high temperature kiln production line, and also has a Middle or high scientific research team, it is a specializes in the research and production and marketing integrated private enterprise. Our company based on the principle of seeking truth from facts innovation first and user foremost, keep introduced advanced technology and modern management experience from domestic and international, and also made the rigorous process standard and strict quality control system and testing method.

Sales and Service Network - Close to you

All type furnace and kiln have the high level of automation, are of domestic leading position, sold to 20 provinces, cities, autonomous regions, special economic regions, state major university, state major laboratory, institute of Chinese academy of sciences, Chinese institutions of higher learning, which has been exported to North America, Russia, Philippines, Japan and other countries. Also have the high reputation in the same industry.

Customer Service and Spare Parts

The staff of our company's customer service department will be eager to answer all the questions which you ask. Due to our complete inhouse production, we can dispatch most spare parts from stock over night or produce with short delivery time.

Special Transformer

Tips Before Buying

① The measurement of the no-load voltage is slightly higher than the label voltage, this is the normal phenomena.After load voltage it will be reduced.

② The input and output of the transformer are alternating current (AC), cannot replace the battery. It cannot directly recharge for vehicle equipment.

③ The pictures displayed on this page are all sample drawings,The color of the object, the number of lines is based on the actual voltage.

④ The input line is defaults to red,The output line colors may be different in different batches,If requested, confirm in advance

Details Determine Quality, Quality Determine Safety

Controlled Silicon Trigger

Main Characteristic

GWL-AIJK series, it is an intelligent three-phase, phase shift trigger and zero crosses the dual-purpose trigger with single-chip technology, it has powerful function and reliability, it can adapt all kinds of electric resistance wire and silicon carbide rod and loaded with transformer to depressurization silicon molybdenum rod and tungsten wire and so on type industrial furnace, and also can be use at soft starter for electromotor. it main characteristic include:

1. 0-20mA（0-5V）/4-20mA（1-5V）signal compatible input；
2. Using computer technology for doing the Linear power correction，when the load is resistive, the output power is proportional to the input signal. phase deficiency detection、over current detection；GWL-AIJK3 it also has the controlled silicon breakdown and load opening detection；
3. Automatic synchronization Function, to connection of the controlled silicon trigger there is no need to check the phase sequence. GWL-AIJK3 even no need to check the polarity.
4. Using all optoelectronic isolation and“not to burn” technology, excellent reliability, causing small interference to the input.
5. Current feedback or delay time adjustable soft start/soft stop function，it can adapt silicon molybdenum Rod，tungsten wire, electromotor and inductive loads；
6. It has the switching power supply, which can be powered directly by 220VAC，And it also has the 5V and 24V two sets of DC power output.

Difference Of Each Model

GWL-AIJK Series include 3 Model，the Function and characteristic given below：

Model	GWL-AIJK1	GWL-AIJK3	GWL-AIJK6
Load characteristics	Single，inductive，Resistive load	Resistive load	Inductive，Resistive load
Connection Model	Single item exclusive	three-phase four-wire、Double phase and Single Phase	three-phase three-wire exclusive (Half control and full control circuit)
Fault detection and alarm	Open circuit alarm	Power deficiency phase and over current、Controlled Silicon and automatic load opening detection	Power deficiency phase and over current

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Corundum mullite push plate

Project	Corundum mullite push plate
Al2O3	≥80%
Sic	—
SiO2	≤18
Fe2O3	≤0.3%
Bulk density g/cm3	≥2.7
Apparent porosity	≤22%
Pressure strength at normal temperature MPa	≥80
Thermal shock stability (1100℃ Water Cooling)	≥30
Maximum Using Temperature	1650℃
Appearance Dimension Of Push Plate	340*340*30
Order Quantity	100 Pieces
Manufacture period	30-45 Days

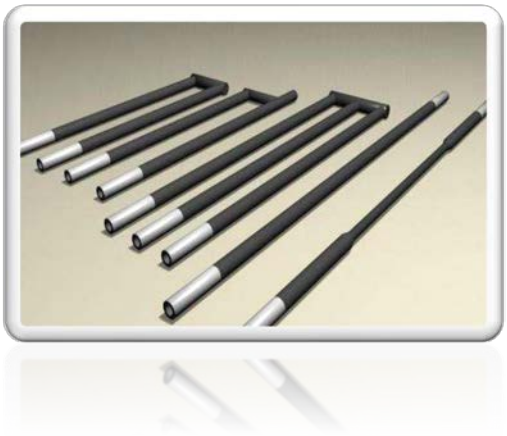
Corundum Mullite Saggar(Crucible)

Project	Corundum Mullite Saggar
Al2O3	≥75%
Sic	—
SiO2	≤24
Fe2O3	≤0.2%
Bulk density g/cm3	≥2.65
Apparent porosity	≤25%
Pressure strength at normal temperature MPa	≥50
Thermal shock stability (1100℃ Water Cooling)	≥30
Maximum Using Temperature	1600℃
Appearance Dimension Of Saggar	250*230*120
Thickness Of Saggar	15-20mm
Order Quantity	300 Pieces
Manufacture period	30-45 Days

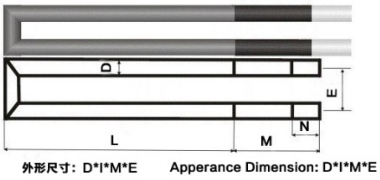
High Temperature Alloy Resistance Wire

High Temperature Alloy Resistance Wire	High Temperature Alloy Resistance Wire
Specification	Specification
C	C
P	P
s	s
Mn	Mn
Cr	Cr
Ni	Ni
Al	Al
Mo	Mo
Nb	Nb
Maximum Working Temperature ℃	Maximum Working Temperature ℃
Density g/cm3	Density g/cm3
High Temperature Alloy Resistance Wire	High Temperature Alloy Resistance Wire

High Temperature Silicon Carbide Rod



Silicon carbide rod made from high purity silicon carbide as main material, According to the a certain ratio of the material for doing the process making the rough-cast，after 2200 ℃ high temperature recrystallization silicide sintering to rod - shaped, tubular non - metal high - temperature electric heating element. under oxidizing atmosphere the normal using temperature can reach 1450 ℃，Continuous use around 2000 hours. Silicon carbide rod it has high using temperature，it has high temperature resistance、oxidation resistance、corrosion resistance、fast temperature rise rate、Long using life、Less high temperature deformation、convenient installation and maintenance, it also has the excellent chemical stability。



外形尺寸：D*I*M*E　　Apperance Dimension: D*I*M*E

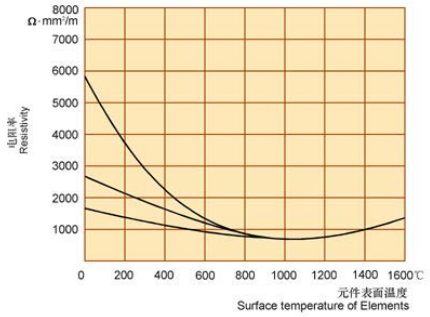
D: Rod Diameter 棒体直径
I: Length Of Heating Zone 热端长度
M: Length Of Cold Zone 冷端长度
N: Length Of Aluminum Spraying Part 喷铝部长度
E: The Center Distance Of Rod 棒体中心距

Model Of Silicon Carbide Rod

Our Company Can Offer "M" Shape Type, "U" Shape Type, "H" Shape Type And Vertical Type Silicon Carbide Rod, Customer can be inquire base on the furnace needs.

The Electric Appliance Performance Of Silicon Carbide Rod

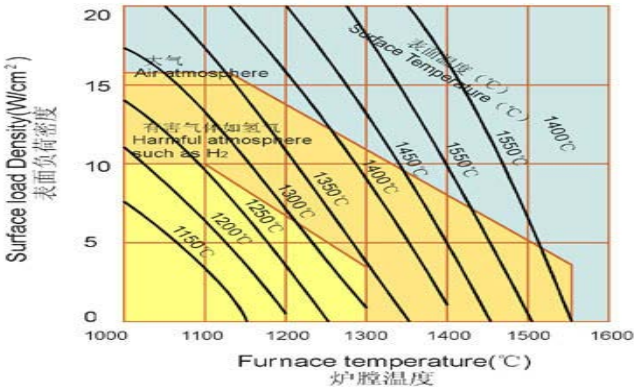
Silicon carbide rod it has the large Specific Resistivity, When Heating under air atmosphere, Heating part surface temperature around 1050±50℃, The Resistivity is 600-1400Ω-mm2/M. The resistance of the silicon carbide rod will be increase during the temperature changes, From indoor temperature to 800℃. Resistance temperature characteristic curve is negative values, Temperature above 800℃ is positive values.



The Load Of Silicon Carbide Rod Surface

The Load Of Silicon Carbide Rod Surface=Rated Power/ Heating part surface Proportion（W/cm2）

The load of silicon carbide rod surface will be influencing the using life circle, that is why, When the electricity is heated, it should be strictly controlled within the allowable load range and should not be overloaded. Silicon carbide rod heating part surface temperature and each furnace temperature, heating part surface allowed load has given below.



Effect of atmosphere on silicon carbide.

The different gas atmosphere will influence the silicon carbide rod using life, During the process of using the Silicon carbide will be gradually oxidized to SiO2, Separation of SiC crystalline particles, increase the local resistance, volume expansion, and finally break.Silicon carbide heating elements in continuous use of clean air drying (1450℃) life up to 2000 hours.

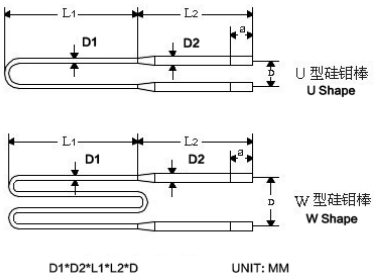
Atmosphere	Maximum Working Temperature（℃）
Air	1600
Vacuum	1000-1200
Nitrogen	1350
Hydrogen	1200
Hydrocarbon	1250

Molybdenum Disilicate Electric Heating Element

（Silicon Molybdenum Rod）

Molybdenum Disilicate Electric Heating Element（Silicon Molybdenum Rod）is a kind of resistance heating element base on molybdenum disilicate materials, high temperature using under oxidizing atmosphere, the surface will be vitrify, produce a bright and compact quartz (SiO2) glass film, it can protect the silicon molybdenum no longer oxidation. That is why the silicon molybdenum has the unique high temperature oxidation resistance. During oxidation atmosphere, the maximum using temperature is 1800℃， Base on user require it can made of bar shaped, U, W, U right angles and other shapes. Silicon molybdenum rods usually can use at the furnace which temperature range is around 1300 ℃ to 1800 ℃, It widely used in metallurgy, glass, ceramics, magnetic materials, refractory materials, crystal, electronic components, kiln manufacturing and other fields. It is the ideal heating element for high temperature sintering.

The structure of silicon molybdenum rod ：



Physical properties of silicon molybdenum rod:

Bulk Density	Flexural strength	Vickers hardness	Porosity	Bibulous rate	Heat extensibility
5.5 g/cm3	15-25 kg/cm3	(HV)570kg/mm2	7.4%	1.2%	4%

Chemical properties of silicon molybdenum rod:

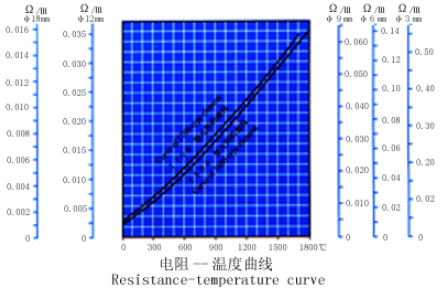
high temperature using under oxidizing atmosphere, the surface will be vitrifying, produce a bright and compact quartz (SiO2) glass film, it can protect the silicon molybdenum no longer oxidation. When the element temperature above 1700℃, The quartz protection layer melts. Continue to use, the quartz protection layer is regenerated. Silicon molybdenum rods should not be use under the temperature range 400-700℃ for a long time, Under low temperature environment the element will pulverization due to strong oxidation.

Silicon molybdenum rod working Temperature changing during different atmosphere

Atmosphere	Element Maximum Using Temperature	
	Model 1700	Model 1800
NO2, CO2, O2, Air	1700℃	1800℃
He, Ar, Ne	1650℃	1750℃
SO2	1600℃	1700℃
CO, N2	1500℃	1600℃
Wet H2	1400℃	1500℃
Dry H2	1350℃	1450℃

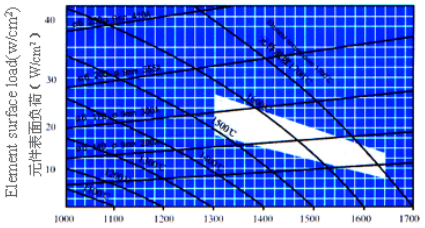
The Electric Appliance Performance Of Silicon Molybdenum Rod

The resistivity of element rapidly rises as the temperature rises, undernormal operating conditions, generally the element resistance doesn'tchange with the service time changing, So old and new components can be mixed.



The Load Of Silicon Molybdenum Rod Surface

Base on furnace structure、atmosphere and temperature to choice the load of right element is the key point to let the element to reach the maximum lifetime, as the picture shown below shows the relationship between the temperature of the furnace, the temperature of the element and the surface load in the unhindered condition of the heating element. The shadow part is the common surface load - the temperature range.



Installation of silicon carbide rod

Silicon molybdenum rods it has brittleness at normal temperature and it has plasticity at high temperature. That is why the U type silicon molybdenum rod is better to choose the vertical installation, If the element requires horizontal installation, then need using refractory materials to support the element, horizontal setting the silicon molybdenum rod, the conical part of the element must extend inside the furnace hearth, silicon molybdenum rod clip cannot be once screwed too tight, until the element reach to high temperature , tighten up again, Then the element cannot easily break off.(Suggestion: Please select the special clips and wires equipped from our company), furnace top need better heat preservation performance, usually temperature cannot beyond 300℃， The contact voltage between the clip and the element should be less than 0.1v, To avoid heat transfer to the clip, the distance of clip bottom and plug brick top need above 50mm. φ6 element cannot long term using 170A，φ9 element cannot long term using 300A。Newly built or long-unused furnaces need to be dried before use, The drying temperature is 100-200℃. Large furnace drying time is long, it is best to use other heating element oven, lest the silicon molybdenum rod low temperature oxidation, the furnace drying, can follow the following steps to start heating up.

Miniature furnace (Rated power < 100KW)		Large scale furnace (Power 100-500KW)	
Furnace Temperature (℃)	Voltage（v）	Furnace Temperature(℃)	Voltage（v）
20-150	1/3 Working Power	20-300	1/3 Working Power
150-500	2/3 Working Power	300-700	2/3 Working Power
500-Working Temperature	Full working voltage	700- Working Temperature	Full working voltage

Version 1.0 Computer Control software

1. Software control composition ： Install CD, USB Data Cable, Cipher dog.
2. windows2000、XP、Server、Vista，Windows 7、8 and so on.
3. Language：Chinese/English。
4. Control Object：Temperature、Pressure 、Flux、Rotation speed、Trip and so on。
5. Operation parameter：Start on the computer, suspend, stop, up and down curves, save curves, instrument screens, historical trend (graphics and text), data report forms (EXCEL), alarm information, data export, process flow, system management and so on.
6. Display parameter：Running Curve、Running Segment、Segment Time、Segment Running Time、Figure Temperature、Real-time display、100% Rated Power output.
7. historical data storage time: permanent.
8. The quantity of heating up curves: N.
9. Recording point interval：0.1Sec -9999sec(Can be modify)。
10. Control furnace quantity：1-128.