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About Silicon Nitride bonded Silicon Carbide

Silicon Nitride bonded Silicon Carbide is a new type of high refractory material. The main products are Silicon Nitride combined with Silicon Carbide radiant tube, Silicon Nitride bonded Silicon Carbide brick, and etc..

Characteristics

①. The texture of Silicon Nitride bonded Silicon Carbide products is hard, Mohs hardness is about 9. It belongs to the hardness material in non-metallic materials, its hardness is only second to diamond.

②. The strength of Silicon Nitride bonded Silicon Carbide products is very high under normal atmospheric temperature. It can almost maintain the same strength and hardness at a high temperature of 1200-1400℃ as the normal atmospheric temperature.As the atmosphere is different, the maximum safe use temperature can reach 1650-1750℃.The flexural strength of Silicon Nitride bonded Silicon Carbide is 4 to 8 times higher than that of ordinary refractories.

③. The thermal expansion coefficient is small, and the thermal conductivity is higher than that of silicon carbide which is half of the high alumina refractory. It is not easy to produce thermal stress. It has a very good thermal shock stability and long service life. Thermal conductivity is 7 - 8 times of the general refractory material, high temperature resistance to creep resistance, corrosion resistance, extreme cold, extreme heat, antioxidant, easy to be made to meet the requirements of high dimensional precision products.

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Production process

Silicon Nitride combined with Silicon Carbide is a new kind of structural ceramic material. It is made of high purity silicon carbide powder and metal silicon powder. It is formed by reaction sintering at the temperature of 1400 - 1500℃. In the process of sintering, high pure nitrogen is filled to the furnace and the silicon in the body is reacted with nitrogen to produce Si3N4. Therefore, Silicon Nitride combined with SiC is a two phase composite, of which SIC accounts for about 75% and Si3N4 accounts for about 23%. It has high strength and strong antioxidant capacity. As a kiln tool material, it is suitable for medium, low temperature, large load kiln. The using temperature is about 1450℃.

NSIC has higher flexural strength and superior oxidation resistance than RSIC products. In addition to its own structural characteristics, NSIC products also have good wear resistance and corrosion resistance to molten metal, and have good high temperature bearing capacity. They can be made into kiln furniture, kiln fittings and structural components in ceramic refractory, and applied in electric porcelain, electronic ceramics, metallurgy, chemical, mechanical, environmental protection and many other fields.

Silicon Nitride bonded Silicon Carbide Technical Data

Item	Unit	SSiC
Volume Density	g/cm³	≥2.62
Hardness	Mohs	9
Indicated Parosity	%	≤17
Compressive Strength	Mpa	≥150
Flexural Strength	Mpa	≥43
Content of SiC	%	72
Content of Si3N4	%	23
Thermal Conductivity	W/m°K	17
Maximum Temperature	℃	1750
Using Temperature	℃	1450
Coefficient Of Heat Expansion	10^{-6}/℃	4.9