TECHNOLOGY TRANSFER

Interest Exploratory Note

High Density Sintered Silicon Carbide

Silicon carbide is widely used for high temperature applications. Due to its unique characteristic like excellent low density, high thermal conductivity, low coefficient of thermal expansion, hot strength, thermal shock resistance, oxidation resistance SiC find applications in high temperature thermos-structural material and coatings. SiC based materials are also extensively used in optical systems due to low CTE and high thermal conductivity. However, due to the sintering difficulty of silicon carbide, it is difficult to obtain dense SiC. A process is developed through hot pressing procedure and using small quantity of sintering aids (<5wt%) to manufacture SiC with near theoretical density and excellent combination of mechanical and thermal properties.

The Nominal Properties of High Density Sic Ceramic are Given Below

Density, g/cc	3.22 (99.8% of theoretical)
Flexural strength, MPa	450
Compressive strength, GPa	1.9
Fracture toughness, MPa √m	4.5
Elastic modulus, GPa	350
Thermal conductivity, W/mK	>80
Specific heat, J/Kg/°C	610
Coefficient of thermal expansion (RT to 500°C), °C^{-1}	<2.5 x 10^{-6}
Electrical resistivity, Ω-cm	2.6 x 10^{9}

Department of Space has authorised NSIL for Technology Transfer of High Density Sintered Silicon Carbide to suitable entrepreneurs/ Industry in India. Interested Parties may please fill the enclosed form and send by email to contact-nsil@isro.gov.in