

CVD Solid Silicon Carbide

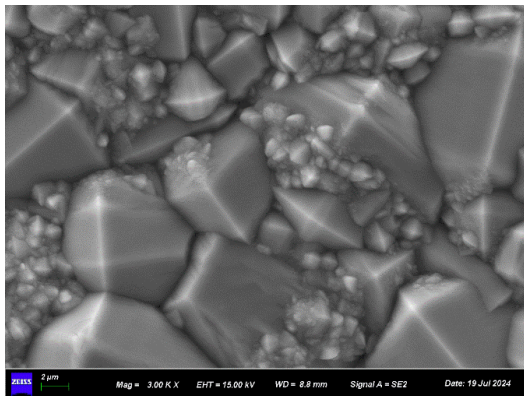
Ningbo Miami Advanced Material Technology Co. LTD

No. 777, Zhongguan West Road, Zhenhai District, Ningbo, Zhejiang 315201, China
Tel: +86 574 8650 3783 | Fax: +86 574 8650 3782

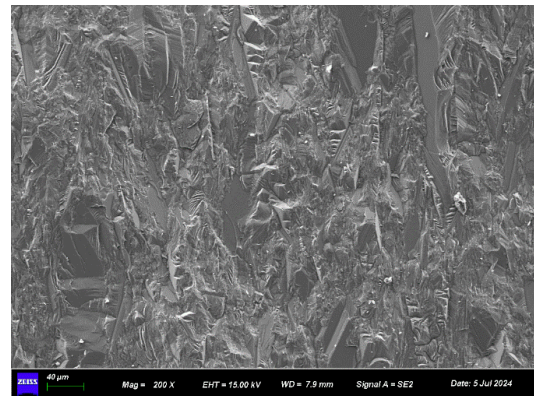
SEMICERA | CVD SOLID SiC

Frank Zhang | +86 159 5787 8134
sales05@semi-cera.com

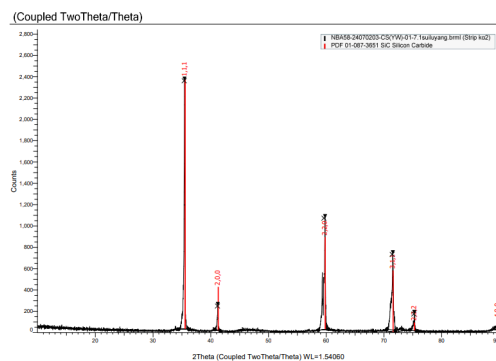
Surface micro-morphology



Cross-section micro-morphology



Phase identification - XRD



Key material highlights

Property	Typical value
Crystal structure	β-SiC (3C), FCC polycrystalline
Chemical purity	≥99.9995% SiC
Density	3.21 g/cm ³
Thermal conductivity	300 W/(m·K) at room temperature
Average CTE	4.0 × 10 ⁻⁶ K ⁻¹ , RT to 1000 °C
Electrical resistivity	Adjustable: 10 ⁻² to 10 ⁴ Ω·cm
Diameter capability	>305 mm
Recommended service	≤1500 °C in inert / vacuum

Typical Material Properties

Published typical reference values for engineering discussion; final specifications require written confirmation.

Structure and physical properties

Property	Unit / condition	Typical reference value
Composition	-	Stoichiometric SiC
Crystal structure	-	β -SiC (3C), FCC polycrystalline
Typical grain size	μm	5
Density	Room temperature	3.21 g/cm ³
Chemical purity	Total metallic impurities	≥99.9995% SiC

Mechanical properties

Property	Unit / condition	Typical reference value
Knoop hardness	HK, 500 g load	2,540 kg/mm ²
Vickers hardness	HV, 500 g load	2,500 kg/mm ²
Flexural strength	4-point, room temperature	415 MPa
Flexural strength	4-point, 1400 °C	575 MPa
Elastic modulus	Sonic, room temperature	466 GPa
Fracture toughness KIC	Micro-indentation	3.3 MPa·m ^{1/2}
Poisson's ratio	Room temperature	0.21

Thermal, electrical and surface properties

Property	Unit / condition	Typical reference value
Thermal conductivity	Room temperature	300 W/(m·K)
Specific heat	Room temperature	640 J/(kg·K)
Coefficient of thermal expansion	Room temperature	$2.2 \times 10^{-6} \text{ K}^{-1}$
Average CTE	Room temperature to 1000 °C	$4.0 \times 10^{-6} \text{ K}^{-1}$
Recommended service temperature	Inert / vacuum	≤1500 °C
Upper use reference	Inert environment	Up to 1700 °C
Sublimation temperature	-	~2700 °C
Electrical resistivity	Grade / doping dependent	Adjustable: 10^{-2} to $10^4 \Omega\cdot\text{cm}$
Polishability	Optical profilometer	<3 Å RMS
Maximum diameter	Current capability	>305 mm

Important: Values shown are typical references, not guaranteed specifications. Mechanical properties depend on orientation, surface finish and test method. Electrical resistivity depends on grade and doping. Final acceptance criteria shall follow the approved drawing, purchase specification, test method and batch CoA.