

# MATERIAL PROPERTIES

## DURAFRAX® 2000

Durafrax® 2000, SHINAGAWA's ultra fine-grain, high grade fully dense alumina, is made from exceptionally pure, uniformly controlled alpha aluminum oxide and is engineered to be one of the best wear materials available for fine particle abrasion. Durafrax® 2000 is our most economical and frequently specified wear resistant material. Durafrax® 2000 offers excellent mechanical properties, superior erosion/wear resistance, and good corrosion performance.

Pre-engineering and advanced processing techniques enable SHINAGAWA to manufacture Durafrax® 2000 in a variety of geometries from simple to complex shapes. Combined with the appropriate attachment method, Durafrax® 2000 can overcome temperature limitations, impact, and erosive issues in many different industrial environments.

To learn more about Durafrax® 2000 wear systems and products, please contact your SHINAGAWA representative.

### Property - S90+

#### Chemical Analysis

		Si Units	Imperial Units
Alumina Oxide (Al <sub>2</sub> O <sub>3</sub> )		90%	90%
Silicon Oxide (SiO <sub>2</sub> )		6%	6%
Others		4%	4%
Grain Size		3.4 μm	118—158 μin
Bulk Density		3.55 g/cm <sup>3</sup>	221.6 lbs./ft. <sup>3</sup>
Young's Modulus (MoE)	20 °C	263 GPa	3.8 × 10 <sup>6</sup> psi
Vickers Hardness	20 °C	9 GPa	1.31 × 10 <sup>6</sup> psi
Shear Modulus	20 °C	110 GPa	16 × 10 <sup>6</sup> psi
Modulus of Rupture	RT	250 MPa	36.3 × 10 <sup>3</sup> psi
Compressive Strength	20 °C	170 GPa	24.6 × 10 <sup>6</sup> psi
Fracture Toughness	20 °C	3.70 MPa·m <sup>1/2</sup>	0.5 × 10 <sup>3</sup> psi·in <sup>1/2</sup>
Thermal Conductivity	20 °C	17.0 W/m·K	118 (BTU·in)/(hr·ft <sup>2</sup> ·°F)
Thermal Expansion	30 °C—1500 °C	8.5 × 10 <sup>-6</sup> /°C	4.6 × 10 <sup>-6</sup> /°F
Thermal Shock Resistance	ΔTc	300 °C	572 °F
Maximum Use Temperature		1,250 °C	2,282 °F
Apparent Porosity		0%	0%
Moh's Hardness		9	9

For more information or to discuss if Durafrax is the material for you; contact your SHINAGAWA representative.

All of the above statements, recommendations, suggestions and data concerning the subject material are based on laboratory and field results, and although we believe the same to be reliable, we expressly do not represent, warrant or guarantee the accuracy, completeness or reliability of same, of the material, or the result to be obtained from the use thereof. Nor do we warrant that any such use, either alone or in combination with other materials, shall be free of the rightful claim of any third party by way of INFRINGEMENT or the like, and SHINAGAWA SPECIALTY CERAMICS AMERICAS, LLC DISCLAIMS ALL WARRANTIES, EXPRESSED OR IMPLIED OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.