

**FORM MDS-1 MATERIAL DATA SHEET (SI UNITS)**

**Grade Designation**

Material Grade \_\_\_\_\_ Material spec. ID \_\_\_\_\_ ASTM spec. \_\_\_\_\_

Max. grain size (mm) \_\_\_\_\_ Designation \_\_\_\_\_

**Temperature-Dependent Parameters**

Property	Units	Orientation	20°C	200°C	400°C	600°C	800°C	1000°C [Note (1)]
Bulk density	kg•m <sup>-3</sup>	...	_____	_____	_____	_____	_____	_____
Strength – tensile	MPa	WG, AG	_____	_____	_____	_____	_____	_____
Strength – flexural (4-point)	MPa	WG, AG	_____	_____	_____	_____	_____	_____
Strength – compressive	MPa	WG, AG	_____	_____	_____	_____	_____	_____
Elastic modulus (dynamic)	GPa	WG, AG	_____	_____	_____	_____	_____	_____
Elastic modulus (static)	GPa	WG, AG	_____	_____	_____	_____	_____	_____
Coefficient of thermal expansion	°C <sup>-1</sup>	WG, AG	_____	_____	_____	_____	_____	_____
Thermal conductivity	W/m•k	WG, AG	_____	_____	_____	_____	_____	_____

**Temperature-Independent Parameters**

Poisson's ratio \_\_\_\_\_ Anisotropy factor \_\_\_\_\_ Critical stress intensity factor K<sub>IC</sub> MPa•m<sup>1/2</sup> \_\_\_\_\_

**Design Strength and Material Reliability Curve Values**

Ratio of compressive to tensile strength ( $R_{tc}$ ) \_\_\_\_\_ Ratio of flexural to tensile strength ( $R_{tf}$ ) \_\_\_\_\_  $S_{c95\%}$  MPa \_\_\_\_\_  $m_{95\%}$  \_\_\_\_\_

$S_0$  MPa \_\_\_\_\_  $S_{c095\%}$  MPa \_\_\_\_\_  $m_{095\%}$  \_\_\_\_\_

$S_g(10^{-4})$  MPa \_\_\_\_\_  $S_g(10^{-3})$  MPa \_\_\_\_\_  $S_g(10^{-2})$  MPa \_\_\_\_\_  $S_g(5 \times 10^{-2})$  MPa \_\_\_\_\_

**Graphite Oxidation – Effect**

Property	Units	2%	4%	6%	8%	10%
Strength [.]	_____	_____	_____	_____	_____	_____
Elastic modulus (dynamic) [.]	_____	_____	_____	_____	_____	_____
Thermal conductivity [.]	_____	_____	_____	_____	_____	_____

**Irradiated Graphite**

Property	Units	WG	AG
Dimensional change [.]	_____	_____	_____
Creep coefficient [.]	_____	_____	_____
Coefficient of thermal expansion [.]	_____	_____	_____
Strength [.]	_____	_____	_____
Elastic modulus [.]	_____	_____	_____
Thermal conductivity [.]	_____	_____	_____

**GENERAL NOTES:**

- (a) WG, AG refers to the with- and against-grain direction of the material.
- (b) [.] indicates a dimensionless quantity.

**NOTE:**

(1) If the maximum intended use temperature exceeds 1 000°C, then the temperature dependent data shall be extended to cover the property values at the maximum intended use temperature.