

FORM MDS-3 MATERIAL DATA SHEET — CERAMIC COMPOSITE MATERIAL (SI UNITS)

Identification, Classification, and Description

Design/material specification ID _____ Purchase document _____
Producer/source name or ID _____
Composite classification (if specified per HHB-A) _____
Component ID _____ Production lot number _____
Date of manufacture _____

Constituents and Fabrication Description

Description and pedigree of fiber (carbon/graphite/silicon carbide)

Description and pedigree of fiber architecture

Description and pedigree of fiber coating/interface, if used

Description and pedigree of matrix

Description and pedigree of composite fabrication

Description and pedigree of component seal coating, if used

Meets chemical purity specification? Yes _____ No _____ High purity _____ Low purity _____

Constituent bulk volume fractions: Fiber _____ vol. % Matrix _____ vol. %

Bulk density by physical measurement _____ g/cm³

Bulk density by immersion _____ g/cm³

Apparent porosity by immersion _____ %

Orientation/Directional Factors of the Fiber/Fabric Architecture

Direction	Description	Fiber, vol. %
1	_____	_____
2	_____	_____
3	_____	_____

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Coefficient of Linear Thermal Expansion, $^{\circ}\text{C}^{-1}$, Across Designer-Specified Temperature Ranges

Temperature Range

Direction	___ $^{\circ}\text{C}$ to ___ $^{\circ}\text{C}$	___ $^{\circ}\text{C}$ to ___ $^{\circ}\text{C}$	___ $^{\circ}\text{C}$ to ___ $^{\circ}\text{C}$	___ $^{\circ}\text{C}$ to ___ $^{\circ}\text{C}$
1	___ $^{\circ}\text{C}^{-1}$	___ $^{\circ}\text{C}^{-1}$	___ $^{\circ}\text{C}^{-1}$	___ $^{\circ}\text{C}^{-1}$
2	___ $^{\circ}\text{C}^{-1}$	___ $^{\circ}\text{C}^{-1}$	___ $^{\circ}\text{C}^{-1}$	___ $^{\circ}\text{C}^{-1}$
3	___ $^{\circ}\text{C}^{-1}$	___ $^{\circ}\text{C}^{-1}$	___ $^{\circ}\text{C}^{-1}$	___ $^{\circ}\text{C}^{-1}$

Thermal Conductivity, $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$, at Designer-Specified Temperatures and Intervals

Direction	At Room Temp.	At ___ $^{\circ}\text{C}$	At ___ $^{\circ}\text{C}$	At ___ $^{\circ}\text{C}$	At ___ $^{\circ}\text{C}$
1	___ $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$	___ $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$	___ $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$	___ $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$	___ $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$
2	___ $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$	___ $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$	___ $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$	___ $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$	___ $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$
3	___ $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$	___ $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$	___ $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$	___ $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$	___ $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$

Specific Heat (If Specified), $\text{J}\cdot\text{g}^{-1}\cdot\text{K}^{-1}$, at Designer-Specified Temperatures and Intervals

At Room Temp.	At ___ $^{\circ}\text{C}$	At ___ $^{\circ}\text{C}$	At ___ $^{\circ}\text{C}$	At ___ $^{\circ}\text{C}$
___ $\text{J}\cdot\text{g}^{-1}\cdot\text{K}^{-1}$	___ $\text{J}\cdot\text{g}^{-1}\cdot\text{K}^{-1}$	___ $\text{J}\cdot\text{g}^{-1}\cdot\text{K}^{-1}$	___ $\text{J}\cdot\text{g}^{-1}\cdot\text{K}^{-1}$	___ $\text{J}\cdot\text{g}^{-1}\cdot\text{K}^{-1}$

Electrical Resistivity (If Specified), $\Omega\cdot\text{m}$, at Designer-Specified Temperatures and Intervals

Direction	At Room Temp.	At ___ $^{\circ}\text{C}$	At ___ $^{\circ}\text{C}$	At ___ $^{\circ}\text{C}$	At ___ $^{\circ}\text{C}$
1	___ $\Omega\cdot\text{m}$	___ $\Omega\cdot\text{m}$	___ $\Omega\cdot\text{m}$	___ $\Omega\cdot\text{m}$	___ $\Omega\cdot\text{m}$
2	___ $\Omega\cdot\text{m}$	___ $\Omega\cdot\text{m}$	___ $\Omega\cdot\text{m}$	___ $\Omega\cdot\text{m}$	___ $\Omega\cdot\text{m}$
3	___ $\Omega\cdot\text{m}$	___ $\Omega\cdot\text{m}$	___ $\Omega\cdot\text{m}$	___ $\Omega\cdot\text{m}$	___ $\Omega\cdot\text{m}$

Emissivity/Emittance (If Specified) at Designer-Specified Temperatures and Intervals

At Room Temp.	At ___ $^{\circ}\text{C}$	At ___ $^{\circ}\text{C}$	At ___ $^{\circ}\text{C}$	At ___ $^{\circ}\text{C}$
___	___	___	___	___

Gas Permeability (If Specified), $\text{m}^3/\text{m}^2\cdot\text{s}$

Direction 1 _____ $\text{m}^3/\text{m}^2\cdot\text{s}$

Direction 2 _____ $\text{m}^3/\text{m}^2\cdot\text{s}$

Direction 3 _____ $\text{m}^3/\text{m}^2\cdot\text{s}$

Surface area by BET analysis (if specified) _____ m^2/g

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Tensile, Flexure, Compression, and Shear Properties [Notes (1) and (2)]

Tensile Properties at Designer-Specified Temperatures and Intervals

Mean/Standard Deviation/Count of Tensile Property Measurements

Direction	At Room Temp.	At ____°C	At ____°C	At ____°C	At ____°C
Ultimate Stress, S_{tU}					
1	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
2	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
3	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
Ultimate Strain, ϵ_{tU}					
1	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
2	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
3	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
Proportional Limit Stress, S_{tPL}					
1	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
2	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
3	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
Proportional Limit Strain, ϵ_{tPL}					
1	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
2	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
3	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___

NOTES:

- (1) As defined and to the extent required by the Designer.
- (2) Test methods are per the Designer, Mandatory Appendix HHB-III, and ASTM C1783 and ASTM C1793.

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Flexure Properties at Designer-Specified Temperatures and Intervals

Mean/Standard Deviation/Count of Flexure Property Measurements

Direction	At Room Temp.	At ___°C	At ___°C	At ___°C	At ___°C
Ultimate Stress, S_{fU}					
1	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
2	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
3	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
Ultimate Strain, ϵ_{fU}					
1	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
2	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
3	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
Proportional Limit Stress, S_{fPL}					
1	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
2	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
3	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
Proportional Limit Strain, ϵ_{fPL}					
1	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
2	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
3	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___

FORM MDS-3 (Cont'd)

Compression Properties at Designer-Specified Temperatures and Intervals

Mean/Standard Deviation/Count of Compression Property Measurements

Direction	At Room Temp.	At ___°C	At ___°C	At ___°C	At ___°C
Ultimate Stress, S_{cU}					
1	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
2	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
3	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
Ultimate Strain, ϵ_{cU}					
1	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
2	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
3	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
Proportional Limit Stress, S_{cPL}					
1	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
2	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
3	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
Proportional Limit Strain, ϵ_{cPL}					
1	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
2	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
3	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___

FORM MDS-3 (Cont'd)

Shear Properties at Designer-Specified Temperatures and Intervals

Mean/Standard Deviation/Count of Shear Property Measurements

Direction	At Room Temp.	At ___°C	At ___°C	At ___°C	At ___°C
Ultimate Stress, S_{TU}					
1	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
2	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
3	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
Ultimate Strain, ϵ_{TU}					
1	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
2	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
3	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
Proportional Limit Stress, S_{TPL}					
1	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
2	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
3	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
Proportional Limit Strain, ϵ_{TPL}					
1	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
2	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
3	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___

FORM MDS-3 (Cont'd)

Design Strength and Material Reliability Curve Values

Ratio of compressive to tensile strength, R_{tc} _____

Ratio of flexure to tensile strength, R_{ff} _____

For the selected failure mode: $S_{c95\%}$ _____ MPa $m_{95\%}$ _____

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

$S_{gm}(10^{-4})$ _____ MPa $S_{gm}(10^{-3})$ _____ MPa $S_{gm}(10^{-2})$ _____ MPa

$S_{gm}(5 \times 10^{-2})$ _____ MPa

Ultimate strength, S_{um} _____ MPa

Young's Modulus and Shear Modulus [Notes (1) and (2)]

Young's Modulus by Mechanical Loading in Tension at Designer-Specified Temperatures and Intervals

Mean/Standard Deviation/Count of Measurements

Direction	At Room Temp.	At _____ °C	At _____ °C	At _____ °C	At _____ °C
1	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___
2	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___
3	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___

Young's Modulus (If Specified) by Mechanical Loading in Compression at Designer-Specified Temperatures and Intervals

Mean/Standard Deviation/Count of Measurements

Direction	At Room Temp.	At _____ °C	At _____ °C	At _____ °C	At _____ °C
1	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___
2	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___
3	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___

Young's Modulus (If Specified) by Sonic Resonance, Impulse Excitation, or Sonic Velocity at Designer-Specified Temperatures and Intervals

Mean/Standard Deviation/Count of Measurements

Direction	At Room Temp.	At _____ °C	At _____ °C	At _____ °C	At _____ °C
1	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___
2	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___
3	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___

FORM MDS-3 (Cont'd)

Shear Modulus (If Specified) by Sonic Resonance, Impulse Excitation, or Sonic Velocity at Designer-Specified Temperatures and Intervals

Direction	Mean/Standard Deviation/Count of Measurements				
	At Room Temp.	At ____°C	At ____°C	At ____°C	At ____°C
1	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___
2	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___
3	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___	___ GPa/___ GPa/___

Poisson's Ratio (If Specified), μ , at Room Temperature

Direction 1-2 _____

Direction 1-3 _____

Direction 2-3 _____

Crack Growth [Note (2)]

Crack Growth Resistance (If Specified) in the Selected Mode(s) at Designer-Specified Temperatures

Mode	Mean/Standard Deviation/Count of Measurements			
	At ____°C	At ____°C	At ____°C	At ____°C
_____	___ J/cm ² /___ J/cm ² /_____	___ J/cm ² /___ J/cm ² /_____	___ J/cm ² /___ J/cm ² /_____	___ J/cm ² /___ J/cm ² /_____
_____	___ J/cm ² /___ J/cm ² /_____	___ J/cm ² /___ J/cm ² /_____	___ J/cm ² /___ J/cm ² /_____	___ J/cm ² /___ J/cm ² /_____
_____	___ J/cm ² /___ J/cm ² /_____	___ J/cm ² /___ J/cm ² /_____	___ J/cm ² /___ J/cm ² /_____	___ J/cm ² /___ J/cm ² /_____

Defined plane _____

Selected opening mode _____

Crack length _____

FORM MDS-3 (Cont'd)

Geometric Feature Properties [Note (2)]

The mechanical properties to be detailed in the following tables are "geometric feature" properties, which are geometry and component specific. The Designer may call for one or more of these properties in specific directions and test and temperature conditions, depending on the design requirements.

Open-Hole Tensile Strength (If Specified) at Designer-Specified Temperatures and Intervals

Mean/Standard Deviation/Count of Measurements

Direction	At Room Temp.	At ____°C	At ____°C	At ____°C	At ____°C
Ultimate Stress					
1	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
2	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
3	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
Ultimate Strain					
1	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
2	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
3	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
Proportional Limit Stress					
1	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
2	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
3	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
Proportional Limit Strain					
1	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
2	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
3	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___

FORM MDS-3 (Cont'd)

Open-Hole Compression Strength (If Specified) at Designer-Specified Temperatures and Intervals

Mean/Standard Deviation/Count of Measurements

Direction	At Room Temp.	At ____°C	At ____°C	At ____°C	At ____°C
Ultimate Stress					
1	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
2	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
3	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
Ultimate Strain					
1	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
2	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
3	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
Proportional Limit Stress					
1	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
2	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
3	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
Proportional Limit Strain					
1	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
2	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
3	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___

FORM MDS-3 (Cont'd)

Notch Tensile Strength (If Specified) at Designer-Specified Temperatures and Intervals

Mean/Standard Deviation/Count of Measurements

Direction	At Room Temp.	At ___°C	At ___°C	At ___°C	At ___°C
Ultimate Stress					
1	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
2	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
3	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
Ultimate Strain					
1	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
2	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
3	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
Proportional Limit Stress					
1	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
2	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
3	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
Proportional Limit Strain					
1	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
2	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
3	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___

FORM MDS-3 (Cont'd)

Notch Compression Strength (If Specified) at Designer-Specified Temperatures and Intervals

Mean/Standard Deviation/Count of Measurements

Direction	At Room Temp.	At ___°C	At ___°C	At ___°C	At ___°C
Ultimate Stress					
1	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
2	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
3	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
Ultimate Strain					
1	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
2	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
3	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
Proportional Limit Stress					
1	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
2	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
3	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___	___ MPa/___ MPa/___
Proportional Limit Strain					
1	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
2	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
3	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___

FORM MDS-3 (Cont'd)

Pin-Bearing Strength (If Specified) at Designer-Specified Temperatures and Intervals

Mean/Standard Deviation/Count of Measurements

Direction	At Room Temp.	At ____ °C	At ____ °C	At ____ °C	At ____ °C
Ultimate Stress					
1	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __
2	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __
3	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __
Ultimate Strain					
1	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
2	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
3	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
Proportional Limit Stress					
1	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __
2	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __
3	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __
Proportional Limit Strain					
1	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
2	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
3	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___

FORM MDS-3 (Cont'd)

Hoop Strength for Tubes (If Specified) at Designer-Specified Temperatures and Intervals

Direction	Mean/Standard Deviation/Count of Measurements				
	At Room Temp.	At ____°C	At ____°C	At ____°C	
Ultimate Stress					
1	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __
2	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __
3	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __
Ultimate Strain					
1	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
2	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
3	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
Proportional Limit Stress					
1	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __
2	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __
3	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __	__ MPa/ __ MPa/ __
Proportional Limit Strain					
1	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
2	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___
3	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___	___ / ___ / ___

FORM MDS-3 (Cont'd)

Durability and Reliability Requirements [Note (2)]

The following durability and reliability requirements are specified in detail by the Designer, based on performance conditions and durability requirements. The Designer may call for one or more of the following properties, depending on the Design Specification. Time, temperature, environment, stress, and orientation conditions for each performance factor are defined by the Designer.

Fast-fluence irradiation effects on dimensions (if specified)

Fast-fluence irradiation effects on thermal properties in selected directions (if specified)

Fast-fluence irradiation effects on mechanical properties in selected directions (if specified)

Chemical-attack/oxidation weight change at selected temperatures and times (if specified)

Chemical-attack/oxidation effects on physical properties in selected directions (if specified)

Chemical-attack/oxidation effects on mechanical properties in selected directions (if specified)

Creep rates and stress rupture in selected directions (if specified)

Slow crack growth, damage, and stress rupture life in selected directions (if specified)

Fatigue life in selected directions (if specified)

Impact damage on selected mechanical properties in selected directions (if specified)

Thermal shock effects on selected mechanical properties in selected directions

Wear, erosion, and abrasion effects on weight loss and physical and mechanical properties in selected directions (if specified)