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/cm^3

Bulk density by immersion _____ g/cm^3

Apparent porosity by immersion _____ %

Orientation/Directional Factors of the Fiber/Fabric Architecture

Direction	Description	Fiber, vol. %
1		
2		
3		

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

	Temperature Range			
Direction	___ °C to___°C	___ °C to___°C	___ °C to___°C	____ °C to___°C
1	____ $°C^{-1}$	____ $°C^{-1}$	____ $°C^{-1}$	____ $°C^{-1}$
2	____ $°C^{-1}$	____ $°C^{-1}$	____ $°C^{-1}$	____ $°C^{-1}$
3	____ $°C^{-1}$	____ $°C^{-1}$	____ $°C^{-1}$	____ $°C^{-1}$

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

Direction	At Room Temp.	At ____°C	At ____°C	At ____°C	At ____°C
1	____ $W \cdot m^{-1} \cdot K^{-1}$	____ $W \cdot m^{-1} \cdot K^{-1}$	____ $W \cdot m^{-1} \cdot K^{-1}$	____ $W \cdot m^{-1} \cdot K^{-1}$	____ $W \cdot m^{-1} \cdot K^{-1}$
2	____ $W \cdot m^{-1} \cdot K^{-1}$	____ $W \cdot m^{-1} \cdot K^{-1}$	____ $W \cdot m^{-1} \cdot K^{-1}$	____ $W \cdot m^{-1} \cdot K^{-1}$	____ $W \cdot m^{-1} \cdot K^{-1}$
3	____ $W \cdot m^{-1} \cdot K^{-1}$	____ $W \cdot m^{-1} \cdot K^{-1}$	____ $W \cdot m^{-1} \cdot K^{-1}$	____ $W \cdot m^{-1} \cdot K^{-1}$	____ $W \cdot m^{-1} \cdot K^{-1}$

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

At RoomTemp.	At ____°C	At ____°C	At ____°C	At ____°C
____ $J \cdot g^{-1} \cdot K^{-1}$	____ $J \cdot g^{-1} \cdot K^{-1}$	____ $J \cdot g^{-1} \cdot K^{-1}$	____ $J \cdot g^{-1} \cdot K^{-1}$	____ $J \cdot g^{-1} \cdot K^{-1}$

Electrical Resistivity (If Specified), Ω·m, at Designer-Specified Temperatures and Intervals

Direction	At Room Temp.	At ____°C	At ____°C	At ____°C	At ____°C
1	____ Ω·m	____ Ω·m	____ Ω·m	____ Ω·m	____ Ω·m
2	____ Ω·m	____ Ω·m	____ Ω·m	____ Ω·m	____ Ω·m
3	____ Ω·m	____ Ω·m	____ Ω·m	____ Ω·m	____ Ω·m

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

At Room Temp.	At ____°C	At ____°C	At ____°C	At ____°C
_____	_____	_____	_____	_____

Gas Permeability (If Specified), m^3/m^2-s

Direction 1_____ m^3/m^2-s

Direction 2_____ m^3/m^2-s

Direction 3_____ m^3/m^2-s

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

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 Appenidix HHB-III, and ASTM C1783 and ASTM C1793.

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	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____

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	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____

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, $S_{\tau U}$		
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, $\varepsilon_{\tau U}$		
1	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____
2	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____
3	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____
			Proportional Limit Stress, $S_{\tau PL}$		
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, $\varepsilon_{\tau PL}$		
1	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____
2	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____
3	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____

Design Strength and Material Reliability Curve Values

For the selected failure mode: $S_{C0.05}$ _____ MPa $m_{0.05}$ _____

S' _____ MPa $S'_{C0.05}$ _____ MPa $m'_{0.05}$ _____

$S'(10^{-4})$ _____ 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/___

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/cm²/___ J/cm²/____	___ J/cm²/___ J/cm²/____	___ J/cm²/___ J/cm²/____	___ J/cm²/___ J/cm²/____
________	___ J/cm²/___ J/cm²/____	___ J/cm²/___ J/cm²/____	___ J/cm²/___ J/cm²/____	___ J/cm²/___ J/cm²/____
________	___ J/cm²/___ J/cm²/____	___ J/cm²/___ J/cm²/____	___ J/cm²/___ J/cm²/____	___ J/cm²/___ J/cm²/____

Defined plane ____

Selected opening mode ____

Crack length ____

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	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____

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	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____

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

Direction	Mean/Standard Deviation/Count of Measurements				
	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	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____

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

Direction	Mean/Standard Deviation/Count of Measurements				
	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	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____

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

Direction	Mean/Standard Deviation/Count of Measurements				
	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	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____

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	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	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____

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)