MATERION

Data Sheet

SupremEX 620XF Metal Matrix Composite

SupremEX® 620XF MMC is a high-quality aerospace grade aluminum alloy (6061B) reinforced with 20 vol.% silicon carbide particles. 620XF is manufactured via a powder metallurgy route using a mechanical alloying process to ensure a homogeneous reinforcement distribution. This provides a refined grain structure, enhancing mechanical properties. The MMC is heat treatable, offering high strength and modulus for structural applications, and is available in billet, forged and extruded forms. Designation: – 6061B/SiC/20p (0.7µm).

620XF Alloy Advantages

- Precision section extrusion using standard dies, enabling weight saving through reduced wall thickness
- High stiffness and strength
- Robust and ductile for damage resistance
- Good corrosion and fatigue performance
- Thermally stable

Typical Physical Properties

Density g/cm³ (lb./in³)	Elastic Modulus GPa (msi)	Specific Stiffness GPa/g/cm³	Poisson's Ratio
2.80 (0.101)	103 (14.9)	37	0.3

Thermal Conductivity W/m°K (BTU/hr. ft. °F)	Thermal Expansion @ 20-50°C ppm/°C (ppm/°F)	Solidus °C (°F)	Specific Heat Capacity J/g/°C (BTU/lb/°F)
150 (87)	17 (9.4)	570 (1058)	0.850 (0.203)

Typical Mechanical Properties

Product Form	Billet	Forged	Precision Extrusion	
Heat Treatment	T6 CWQ†	T6 CWQ†	T5	T6 CWQ†
$R_{p0.2}$ MPa (ksi)	430 (62.4)	410 (59.4)	240 (34.8)	380 (55.1)
R_m MPa (ksi)	500 (72.5)	490 (71.1)	360 (52.2)	470 (68.2)
Elongation to Failure %	4	7	8	7

*Data is for information purposes only; it does not constitute a guarantee.
†CWQ refers to "cold water quench."

Disclaimer:

Only the buyer can determine the appropriateness of any processing practice, end-product or application. Materion does not make any warranty regarding its recommendations, the suitability of Materion's product, or its processing suggestions for buyer's end product, application or equipment.

The properties presented on this data sheet are for reference purposes only, intended only to initiate the material selection process. They do not constitute, nor are they intended to constitute, a material specification. Material will be produced to one of the applicable industry standards, if any, listed in the Industry Standards and Specification section.

Actual properties may vary by thickness and/or part number. Please contact your local sales engineer for detailed properties to be used in simulation.

Any properties marked as preliminary are subject to change at any time as the manufacturing process is further refined.

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