

SupremEX 215XK Metal Matrix Composite

Materion's SupremEX[®] 215XK MMC is a high quality, aerospace-grade aluminum alloy (2009) reinforced with 15 vol.% silicon carbide particles. This composite material is manufactured via powder metallurgy using a mechanical alloying process to ensure a homogeneous reinforcement distribution, providing a refined grain structure and enhancing mechanical properties.

SupremEX 215XK is heat treatable, offering high strength and modulus for structural applications. It is available in billet, forged and extruded forms.

Designation: – 2009/SiC/15p (5 μm).

Benefits:

- Weight saving versus titanium alloys
- High fatigue and fretting fatigue resistance
- Increased modulus versus aluminum alloys
- Hardness, wear resistance and low friction characteristics
- Good machinability using conventional techniques
- Homogenous and stable microstructure

Typical Physical Properties

Density g/cm ³ (lb./in ³)	Elastic Modulus GPa (msi)	Specific Stiffness GPa/g/cm ³	Poisson's Ratio
2.84 (0.102)	94 (13.7)	33	0.3

Thermal Conductivity @ 25°C W/m ² °K (BTU/hr.ft.°F)	Thermal Expansion @ 25°C ppm/°C (ppm/°F)	Solidus °C (°F)	Specific Heat Capacity J/g/°C (BTU/lb./°F)
155 (90)	18.5 (10.3)	548 (1018)	0.848 (0.203)

Typical Mechanical Properties*

Product Form	Billet	Forged Plate
Heat Treatment	T4 CWQ**	T4 CWQ
R _{p0.2} MPa (ksi)	410 (59.5)	385 (55.8)
R _m MPa (ksi)	545 (79.0)	550 (79.8)
Elongation to Failure %	5	8
Fracture Toughness MPa m ^{1/2} (ksi inch ^{1/2})	-	28 (25.5)

*Data is for information purposes only; it does not constitute a guarantee.

**CWQ refers to “cold water quench.”

Forms Available

SupremEX 215XK metal matrix composite is available as billet/shaped billet (DPT), forgings, near-net-shape forgings, plate and extrusions.

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.