

SupremEX® 640XA

A high quality aerospace grade aluminum alloy (AA6061) reinforced with 40 volume % 3 micron silicon carbide which is manufactured via a powder metallurgy route using a high energy mixing process to ensure a homogeneous distribution of the reinforcement and to refine the grain structure to enhance mechanical properties. The alloy is heat treatable offering high strength and modulus for structural applications and is available in billet, forged and extruded forms. Designation: – 6061/SiC/40p.

640XA ADVANTAGES

- Weight saving
- Static strength which compares with high strength Al alloys
- Increased component stiffness
- High fatigue resistance
- Hardness, wear resistance & low friction characteristics
- Good machinability using conventional techniques
- Homogenous stable microstructure

PRODUCT FORMS

- Billet / Shaped Billet (DPT)
- Forgings
- Near-net-shape forgings
- Plate
- Extrusions

APPLICATIONS

- Very high specific stiffness applications
- Optics
- Thermal Stability
- Low CTE applications

PHYSICAL PROPERTIES

Density g/cm ³ (lbs/in ³)	2.9 (0.105)	Thermal Conductivity @ 25°C W/m ² K (BTU/hr.ft. ² °F)	130 (75)
Elastic Modulus GPa (msi)	140 (20.3)	Thermal Expansion @ 25°C ppm/°C (ppm/°F)	13 (7.2)
Specific Stiffness GPa/g/cm ³	48	Solidus °C (°F)	570 (1058)
Poisson's Ratio	0.3	Specific Heat Capacity J/g/°C (BTU/lb/°F)	0.800 (0.191)

TYPICAL MECHANICAL PROPERTIES

Material	640XA			
Product Form	Billet		Forged Plate	
Heat Treatment	T6 CWQ	T6 PGQ	T6 PGQ	T7
R _{p0.2} MPa (ksi)	490 (71.1)	450 (65.3)	400 (58.0)	350 (50.8)
R _m MPa (ksi)	560 (81.2)	540 (78.3)	530 (76.9)	470 (68.2)
Elongation to Failure %	1.0	1.3	2.0	2.0

Typical data for 25mm section at heat treatment. Information is for comparative purposes only and information provided is based on general industry information and material properties can be different based on minimum, typical or maximum properties along with specific heat treatment conditions and product forms. CWQ refers to cold water quench and PGQ refers to poly-glycol quench. Data is for information purposes only, it does not constitute a guarantee.