GKN POWDER METALLURGY - Aluminum

PM-6063

MATERIAL DATA SHEET

Names: ANSI Designation: **6063/AlN/01p**; GKN Designation: **6063-1A**

Description: Age Hardenable, higher Conductivity aluminum metal-matrix-composite (MMC) produced via conventional press-and-sinter powder metallurgy (PM) processing. Secondary (cold/warm/hot) forming operations can be employed for parts produced using this material.

Applications: Electrical and Thermal management solutions including, but not limited to: battery terminals, busbars, electrical connectors, heat sinks, heat spreaders, and other components requiring high electrical & thermal conductivity. Also for structural applications requiring gas or liquid tight sealing and/or corrosion resistance or combined strength and conductivity.

Chemistry

Limits	GKN Specification (Wt.%)							
	Al	Cu	Mg	Si	Sn	Fe	N	Other
Max	Balance	0.13	1.0	0.6	0.6	0.25	0.75	3.0
Min		0.07	0.6	0-4	0-4	-	0.25	-

Mechanical Properties

Heat Treat Condition	Ultimate Tensile Strength (MPa)	Tensile Yield Strength (MPa)	Total Tensile Elongation (%)	Modulus of Elasticity, Young's (GPa)	Poisson's Ratio (ν)	Apparent Hardness, Rockwell
T2	150 MPa	75 MPa	12.0%	55 GPa	0.33	50 HRE
T8	275 MPa	250 MPa	2.0%	65 GPa	0.33	55 HRE

Material properties are typical values obtained from standard test bars according to the referenced standard test methods. These are NOT guaranteed minimum values; specific ranges must be developed for each application and should be derived through functional testing

Physical Properties

	Thermal Conductivity (k)[1]	Thermal Diffusivity (α)[2]	Specific Heat Capacity (C_p)	Electrical Conductivity (%IACS)	CTE, linear
Typical	185 W/m-K	83 m^2/s	0.90 J/g-°C	50% IACS	23.0 µm/m-°C

[1] *Measured via TPS (Transient Plane Source) method per ISO Standard (ISO/DIS 22007-2.2).*

[2] *Calculated via relationship:* $\alpha = \frac{k}{\rho C_p}$