

GKN POWDER METALLURGY - Aluminum

PM-6061

MATERIAL DATA SHEET

Names: ANSI Designation: **6061/AIN/01p**; GKN Designation: **6061-1A**

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 where additional strength is required 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 | 0.4 | 1.3 | 0.6 | 0.6 | 0.25 | 0.75 | 3.0 |
| Min | | 0.2 | 0.9 | 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 | 175 MPa | 100 MPa | 10.0% | 60 GPa | 0.33 | 60 HRE |
| T8 | 300 MPa | 275 MPa | 3.5% | 65 GPa | 0.33 | 60 HRB |

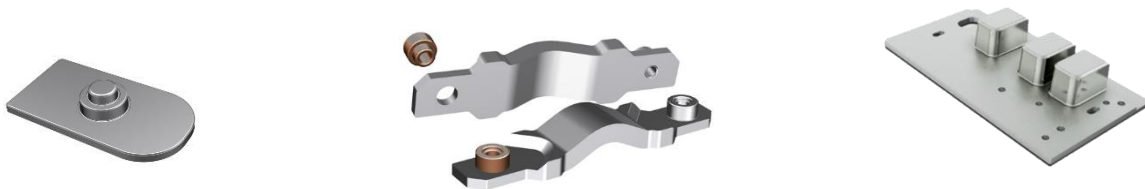
Material properties are typical values obtained from standard test bars according to the referenced standard test methods. These are NOT guaranteed minimum values; specific ranges must be developed for each application and should be derived through functional testing

Physical Properties

| | Thermal Conductivity (k) ¹ | Thermal Diffusivity (α) ² | Specific Heat Capacity (C_p) | Electrical Conductivity (%IACS) | CTE, linear |
|---------|---|---|----------------------------------|---------------------------------|-------------------|
| Typical | 170 W/m-K | 78 m ² /s | 0.89 J/g-°C | 47% IACS | 23.0 μ m/m-°C |

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

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



This document is for informational purposes only and should not be considered as a binding description of the products or their performance in all applications. The product characteristics and performance data on this page represent standard products and depict their typical performance under controlled laboratory conditions. Actual performance will vary depending on the operating environment and application. GKN Powder Metallurgy reserves the right to revise its products and documents without notification. For product design to meet specific applications, dimensions, electrical and working points, please contact GKN Powder Metallurgy Marketing and Sales.