



ADDIPOWDER

Advanced Powders for Next-
Generation Manufacturing

MATERIAL DATA SHEET

High-Performance AlSi10Mg-600.1 Aluminium

Alloy Powder

CONTACT US

28 RUE DE BELLEVUE, 77810, THOMERY, FRANCE

+33 (0)7 69 52 78 33

addipowder@gmail.com

www.addipowder.com

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AlSi10Mg-600.1

MATERIAL

AddiPowder's AlSi10Mg-600.1 aluminum alloy powder is a next-generation material engineered specifically for the entire additive manufacturing process chain. Designed using advanced computational methods and AI-driven material design, it offers a remarkable balance of printability, mechanical performance, formability, and industrial scalability. Its innovative formulation and microstructure design support superior fatigue resistance and high-temperature strength, offering manufacturers a reliable and efficient solution for high-performance components.

PHYSICAL PROPERTIES

Particle Size	15–53 μm
Size distribution	D10: 21.09 μm, D50: 36.91 μm, D90: 60.88 μm
% of spherical powder	92.7%
Hall Flow Rate	≤47.6 s / 50 g
Bulk Density	≥1.47 g/cm ³
Tap Density	≥1.74 g/cm ³

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TENSILE PROPERTIES (ROOM Temperature)

Heat Treatment	Yield Strength ($\sigma_{p0.2}$ /MPa)	Tensile Strength (MPa)	Elongation at break (%)
Printed - X Axis	533	593	11.7
275°C / 12h - X Axis	625	641	9.2
450°C / 12h - X Axis	400	469	14.5
500°C / 12h - X Axis	271	408	18.2
Printed - Z Axis	497	594	13.1
275°C / 12h - Z Axis	587	630	8.6
400°C / 12h - Z Axis	472	530	12.6
425°C / 12h - Z Axis	410	500	15.1

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TENSILE PROPERTIES (HIGH Temperature)

Test Temperature	Yield Strength (MPa)	Tensile Strength (MPa)	Elongation at break (%)
200°C	323	343	8.0
250°C	200	212	10.7
300°C	126	137	16.5

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ELASTIC MODULUS

Temperature	Young's Modulus (GPa)	Shear Modulus (GPa)	Poisson's Ratio
20°C	77.9	28.0	0.39
50°C	77.4	27.7	0.40
100°C	75.9	27.0	0.41
150°C	73.5	26.1	0.41
200°C	70.2	25.0	0.40
250°C	66.1	23.7	0.39
300°C	61.1	22.2	0.38

FATIGUE PERFORMANCE

Stress (MPa)	Stress Ratio	Lifespan (cycles)	Fracture location
250	0.1	10 ⁷	No Fracture

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ELECTRICAL RESISTIVITY

Temperature	Electrical Resistivity ($\mu\Omega\cdot m$)
20°C	0.0962
50°C	0.0964
100°C	0.102
200°C	0.114
300°C	0.123

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THERMAL CONDUCTIVITY

Temperature	Thermal Diffusivity (10 ⁻⁵ m ² /s)	Specific Heat (J·kg ⁻¹ ·K ⁻¹)	Thermal Conductivity (W·m ⁻¹ ·K ⁻¹)
18°C	3.42	846	83.0
50°C	3.55	844	85.8
100°C	3.74	856	91.8
150°C	3.91	879	98.8
200°C	4.07	906	106
250°C	4.22	929	112
300°C	4.34	939	117