



YOUR FUTURE IN ADDITIVE MANUFACTURING

MATERIAL DATASHEET

AlSi10Mg, 3.2381, EN AC-43000

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Description

The aluminium alloy AlSi10Mg is characterized by high strength, excellent corrosion resistance and good thermal properties. The alloy is used wherever a combination of these properties with a low weight is required or thin-walled and complex geometries have to be created. Areas of application include prototypes and serial parts in aerospace, motorsport and automotive and many more.

Physical Properties

Density [g/cm ³]	2.67 - 2.69
Electr. resistance at 20 °C [$\Omega \cdot \text{mm}^2/\text{m}$]	18 - 27
Thermal conductivity at 20 °C [W/m·K]	120 - 170
Spec. heat capacity at 20 °C [J/kg · K]	905
Average coefficient of thermal expansion at 20 °C [$10^{-6} \cdot \text{K}^{-1}$]	23

Chemical Composition

Element	Min.	Max.
Al	Balance	Balance
Si	9.00	11.0
Mg	0.20	0.45
Fe	-	0.55
Cu	-	0.05
Mn	-	0.45
Ni	-	0.05
Zn	-	0.10
Pb	-	0.05
Sn	-	0.05
Ti	-	0.15

Material Structure

Aluminium components produced by Laser Melting are virtually pore-free and have a homogeneous microstructure. Subsequent heat treatment can reduce the anisotropy arising during the build-up and individually adjust the component properties. Heat treatment involves stress relief annealing at 300 °C for 2 hours.





Technical Data

Achievable component accuracy

small parts	approx. ± 0.1 mm
large parts	approx. ± 0.3 mm
Smallest wall thickness	approx. 0.4 - 0.5 mm
Smallest diameter	approx. 1.0 mm
Layer thickness	60 μ m
Surface roughness	
after the build-up	Rz = 70 μ m \pm 20 μ m
after micro blasting	Rz = 35 μ m \pm 10 μ m
Component density after manufacturing	> 99,5 %

Mechanical Properties

	as built	after heat treatment ⁴
Tensile strength [N/mm²]^{1,2,3}	395 \pm 20	320 \pm 20
Yield point [N/mm²]^{1,2}	250 \pm 10	220 \pm 12
Elongation at break [%]^{1,2}	6 \pm 2	10 \pm 2
E-module [kN/mm²]^{1,2}	71 \pm 10	71 \pm 10
Hardness [HBW 1/10]^{1,3}	118 \pm 5	90 \pm 5

¹ at room temperature

² tensile test according to DIN EN ISO 6892-1

³ hardness test according to DIN EN ISO 6506-1

⁴ stress relief heat treatment at 300 °C maintained for 2 h

The stated technical data and material characteristics correspond to our knowledge and experience at the time of publication. These values, determined on our production systems, depend on the powder material, the parameter settings and the component geometry. They therefore do not provide sufficient basis for the component design. These data serve only as guide values. To check the mechanical properties, test specimens can be requested at any time. Only the latest published version of the data sheet is valid.

