

L-PBF PROCESS

Layer thickness	30 µm
Laser power	300 W
Theoretical build-up rate	19 cm ³ /h

POWDER MATERIAL

Aluminum (AlSi10Mg) is widely applied in the automotive and aerospace sector, due to its comparably high mechanical strength at very low specific density. Also, Aluminum does not show any corrosion. Generally, for Additive Manufacturing (AM) by means of Laser Powder Bed Fusion (LPBF) AlSi10Mg, originally developed for casting processes is used due to its low melt viscosity and possibility for further hardening by means of heat treatment. A further characteristic of this material is a very high heat- and electrical conductivity, rendering this material class a perfect candidate for cooling applications or within the electrical industry

PHYSICAL PROPERTIES

Particle Size	25 µm – 63 µm
Density	2,65 g/cm ³
Thermal conductivity	130 W/mK - 190 W/mK
Melting range	570 °C – 590 °C
Thermal expansion	20 x 10 ⁻⁶ K ⁻¹ – 21 x 10 ⁻⁶ K ⁻¹

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US-Dollar Account: 107877301 | Routing: 39070024
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CHEMICAL COMPOSITION

Element -	Mass fraction
Al	Balance
Si	10,2%
Mg	0,31%
Fe	0,12%
Mn	0,006%
Cu	<0,005%
Ni	<0,005%
Pb	<0,005%
Sn	<0,005%
Ti	<0,005%
Zn	<0,005%

MECHANICAL DATA

		As built	Heat-treated
Tensile strength	R _m	440 MPa ± 47 MPa	339 MPa ± 12 MPa
Yield strength	R _{p0,2}	272 MPa ± 28 MPa	192 MPa ± 9 MPa
Elongation at break	A	5% ± 1,4%	4,6% ± 0,5%
Young's modulus	E	71 GPa ± 4,5 GPa	67 GPa ± 12 GPa
Vickers Hardness		113 HV 0,5 ± 3 HV 0,5	98 HV 0,5 ± 3 HV 0,5
Roughness average	Ra	5 µm – 7 µm	
Mean roughness depth	Rz	42 µm – 44 µm	

All values are subject to natural volatilities depending on applied powder material, process parameters and surrounding conditions.

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