

Aluminum Alloys

AlSi10Mg

AlSi10Mg is a hardenable aluminum-alloy widely used in additive manufacturing suitable for thin-walled components with high corrosion resistance, as well as thermal and electrical conductivity properties. Featuring a nearly non-porous texture, it is ideal for highly stressed parts maintaining dynamic load capacity.

Chemical Composition (nominal) %

Element / Material ¹	Al	Si	Mg	Cu	Fe	Mn	Zn	Ti	Ni	Pb	Sn	Other	Total Others
AlSi10Mg 20-63 µm	Bal.	9.00 - 11.00	0.20 - 0.45	0.05	0.55	0.45	0.10	0.15	0.05	0.05	0.05	0.05	0.15

Mechanical Data ²	Formula Symbol and Unit	As-Built ³	Heat Treated
Tensile strength	R _m [MPa]	435	260
Offset yield strength	R _{p0.2} [MPa]	260	145
Elongation at break	A [%]	7	10
Reduction of area	Z [%]	5	30
Young's modulus	E [GPa]	75	55
Vickers hardness	HV10	125	80
Roughness average	Ra [µm]	15	10
Mean roughness depth	Rz [µm]	65	65

Material Characteristics

- Good corrosion resistance
- High electrical conductivity
- High strength while maintaining dynamic load capacity

Typical Application Areas

- Aerospace
- Automotive
- Lightweight engineering

AlSi7Mg0.6

AlSi7Mg0.6 is suitable in applications requiring high corrosion resistance and good tolerance against strain. SLM[®] processed components exhibit a homogeneous, nearly non-porous texture with mechanical characteristics in the material specification range.

Chemical Composition (nominal) %

Element / Material ¹	Al	Si	Mg	Cu	Fe	Mn	Zn	Ti	Others	Total Others
AlSi7Mg0.6 20-63 µm	Bal.	6.50 - 7.50	0.45 - 0.70	0.05	0.19	0.10	0.07	0.25	0.03	0.10

Mechanical Data ²	Formula Symbol and Unit	As-Built ³
Tensile strength	R _m [MPa]	375
Offset yield strength	R _{p0.2} [MPa]	210
Elongation at break	A [%]	8
Reduction of area	Z [%]	10
Young's modulus	E [GPa]	60
Vickers hardness	HV10	110
Roughness average	Ra [µm]	5
Mean roughness depth	Rz [µm]	45

Material Characteristics

- Good electrical conductivity
- Good corrosion resistance
- Good tolerance against strain
- Excellent thermal conductivity

Typical Application Areas

- Aerospace
- Automotive
- Research & Prototyping

¹ Maximum values, unless stated otherwise as a range
² Process conditions and parameters according to SLM Solutions' standards
³ Rounded mean values of identified layer thicknesses and different orientations (elongations at break are not rounded)
Further information and data can be found in our material data sheets.

AlSi9Cu3

AlSi9Cu3 is an Al-based light metal used in applications requiring good high-temperature strength, low density and good corrosion resistance. The alloy is typically used to produce components with high strength and high dynamic loadability.

Chemical Composition (nominal) %

Material / Element ¹	Al	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Pb	Sn	Ti
AlSi9Cu3 20-63 µm	Bal.	8.00 - 11.00	1.30	2.00 - 4.00	0.55	0.05 - 0.55	0.15	0.55	1.20	0.35	0.25	0.25

Mechanical Data ²	Formula Symbol and Unit	As-built ³
Tensile strength	R _m [MPa]	415
Offset yield strength	R _{p0.2} [MPa]	235
Elongation at break	A [%]	5
Reduction in area	Z [%]	10
Young's modulus	E [GPa]	55
Vickers hardness	HV10	130
Roughness average	Ra [µm]	5
Mean roughness depth	Rz [µm]	45

Material Characteristics

- Good electrical conductivity
- Good high temperature strength
- High thermal conductivity

Typical Application Areas

- Aerospace
- Automotive
- Research & Prototyping



1 Maximum values, unless stated otherwise as a range
2 Process conditions and parameters according to SLM Solutions' standards
3 Rounded mean values of identified layer thicknesses and different orientations (elongations at break are not rounded)
Further information and data can be found in our material data sheets.