

Material Specification

Aluminium AlSi10Mg

Building Success
Layer by Layer™



Application: Aluminium AlSi10Mg is a typical casting alloy used for parts with thin walls and complex geometry. It offers good strength, hardness and dynamic properties and is therefore also used for parts subject to high loads. Parts in Aluminium AlSi10Mg are ideal for applications which require a combination of good thermal properties and low weight. They can be machined, spark-eroded, welded, micro shot-peened, polished and coated if required. Parts are fully dense, with similar properties to cast or wrought parts. Conventionally cast components in this type of aluminium alloy are often heat treated to improve the mechanical properties, for example using the T6 cycle of solution annealing, quenching and age hardening.

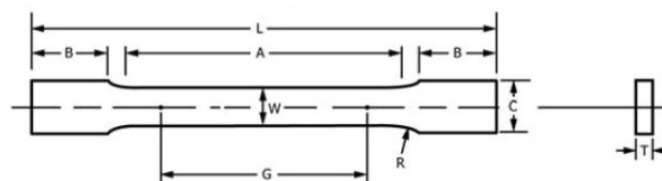


Typical applications: • Prototype castings • Lightweight enclosures

Chemical Properties:			
Material composition	Al	Balance	Mn ≤ 0.45 wt% Pb ≤ 0.05 wt%
	Si	9.0-11.0 wt%	Mg 0.2-0.45 wt% Sn ≤ 0.05 wt%
	Fe	≤ 0.55 wt%	Ni ≤ 0.05 wt% Ti ≤ 0.15 wt%
	Cu	≤ 0.05 wt%	Zn ≤ 0.10 wt%
Mechanical Properties*:			
		As Built	Stress Relieved
Tensile Strength	- horizontal direction (XY) - vertical direction (Z)	typ. 302 MPa ± 50 MPa typ. 302 MPa ± 50 MPa	typ. 257 MPa ± 18 MPa typ. 257 MPa ± 18 MPa
Yield Strength (Rp 0.2%)	- horizontal direction (XY) - vertical direction (Z)	typ. 177 MPa ± 50 MPa typ. 177 MPa ± 50 MPa	typ. 154 MPa ± 21 MPa typ. 154 MPa ± 21 MPa
Modulus of elasticity	- horizontal direction (XY) - vertical direction (Z)	typ. 65 ± 8.5 GPa typ. 65 ± 8.5 GPa	typ. 70 ± 14 GPa typ. 70 ± 14 GPa
Elongation at break	- horizontal direction (XY) - vertical direction (Z)	typ. 4.5 ± 2.1% typ. 4.5 ± 2.1%	typ. 11.6 ± 6.5% typ. 11.6 ± 6.5%
Hardness		min. 80 HV10	
Physical Properties:			
Relative density (based on 2.67g/cm ³ Theoretical Density)		> 99.0%	
Porosity rate		< 1%	
Pore size		< 200 µm	

* Average and 3Sigma Standard Deviations calculated from test data obtained via tensile testing as per ASTM E8-15A, Test rate of 3mm/min; samples gathered between January 2017 and December 2017

ASTM E8-M flat.



Dimensions	
	Subsize Specimen
	6 mm
	[0.250 in.] Wide
	mm [in.]
G—Gauge length (Note 1 and Note 2)	25.0 ± 0.1 [1.000 ± 0.003]
W—Width (Note 3 and Note 4)	6.0 ± 0.1 [0.250 ± 0.005]
T—Thickness (Note 5)	6 [0.250]
R—Radius of fillet, min (Note 6)	100 [4]
L—Overall length, min (Note 2, Note 7, and Note 8)	32 [1.25]
A—Length of reduced parallel section, min	30 [1.25]
B—Length of grip section, min (Note 9)	10 [0.375]
C—Width of grip section, approximate (Note 4 and Note 9)	

For further technical information or to obtain a quotation for your parts, please contact us on +44 (0)1635 580284 or email your 3D CAD data to enquiries@3trpd.co.uk

All information in this Data Sheet is based on appropriate testing and is only valid for ASTM E8-M flat tensile bars, further details of which are available on request and is stated to the best of our knowledge and belief at the time of publication (February 2018). Our warranties and liabilities are stated exclusively in our terms of trading.

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