



Material Data Sheet Aluminium / AlSi10Mg / AS10

This document provides information and data for parts built using aluminum powder AlSi10Mg, with specific properties.

Description :

The aluminum alloy AlSi10Mg is a material perfect for SLM process and manufacturing of thin and complex parts. It also has some nice properties, like a very low density and a good resistance to corrosion, so the range of application is wide.

Technical data :

Physical and chemical properties of powder (according to DIN EN 1706)

	Elements	Minimun	Maximun
Materials composition (%weight)	Al	Balance	
	Si	9	11
	Mg	0,25	0.45
	Fe	--	0.55
	Ti	--	0.15
	Mn	--	0.45
	Zn	--	0.10
	Cu	--	0.05
	Ni	--	0.05
	Pb	--	0.05
	Sn	--	0.05
Particle size (µm)*		D10	≥ 20
		D90	≤ 53

* Data certified by powder provider of AddUp

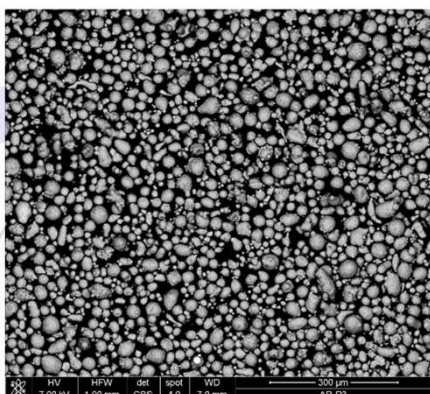
Mechanical Properties:

Mechanical properties of parts (tested according to standard ASTM E8)

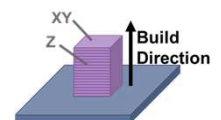
		As-Build *	After Heat treatment
Ultimate tensile strength (MPa /ksi)	(XY)	435 / 63	In progress
	(Z)	365 / 53	
Yield strength, Rp0,2% (MPa /ksi)	(XY)	295 / 43	
	(Z)	250 / 36	
Elongation at break E5d(%)	(XY)	5	
	(Z)	3,5	
Young's Modulus (GPa)		64	

* Typical value

Observation by Scanning Electron Microscopy of the powder



Microstructure



Microstructure obtained by SLM (after etching)

The microstructure obtained during SLM with AlSi10Mg is composed of α -Al solid solution with Si interdendritic particles. The picture shows the melting track organization on the Z face. (picture obtained with polarized light on optical microscope)