GE Additive

AlSi10Mg

Aluminum AlSi10Mg can be used for manufacturing functional components.

Data in this document represents material built with 40 µm layer thickness and in a Nitrogen atmosphere on an M2 / M2 Multilaser machine. Values listed are typical.

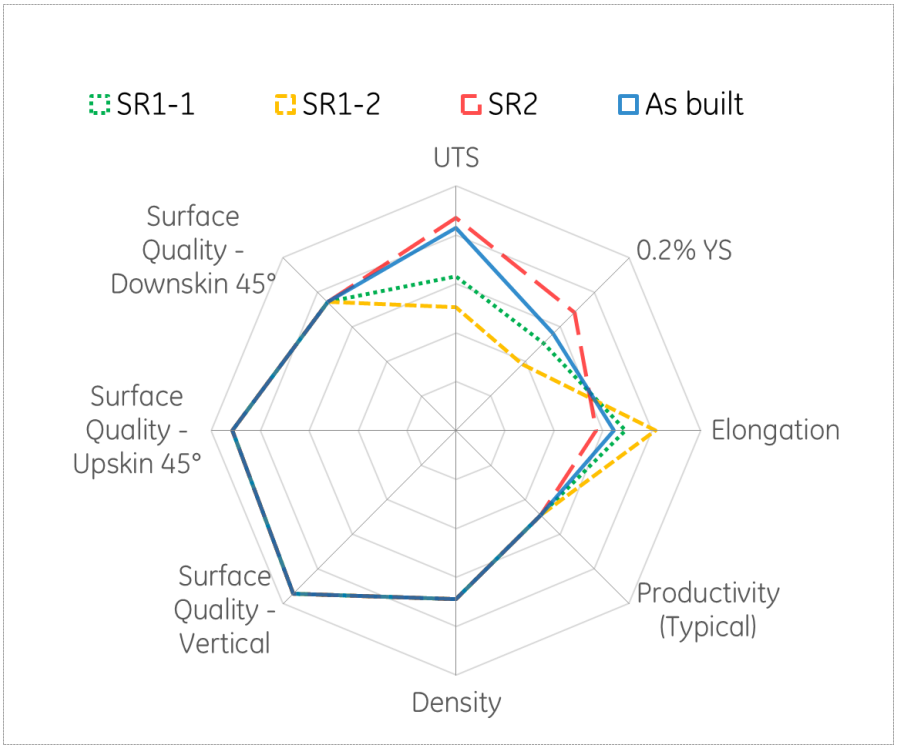
13
Al

POWDER CHEMISTRY

Element	Indicative value (wt%)
Al	Balance
Cu	0.00-0.05
Fe	0.00-0.55
Mg	0.20-0.45
Mn	0.00-0.45
Ni	0.00-0.05
Si	9.0-11.0
Zn	0.00-0.10
Ti	0.00-0.15
Pb	0.00-0.05
Sn	0.00-0.05
Other (each)	0.00-0.05
Other (total)	0.00-0.15

AlSi10Mg chemical composition et al. according to **ASTM F3318**.

SPIDER PLOT



MACHINE CONFIGURATION

- M2 / M2 Multilaser
- Nitrogen Gas
- Steel blade/Rubber blade
- Layer thickness 40 µm

- Typical build rate w/ coating* [cm³/h] : 17.1
- Theoretical melting rate bulk per Laser** [cm³/h]: 29.4

*Measured by using standard Factory Acceptance Test layout
**Calculated (layer thickness x scan velocity x hatch distance)

THERMAL STATES

1. AS BUILT
2. STRESS RELIEF SR1-1: 270°C, 2 hours
3. STRESS RELIEF SR1-2: 300°C, 2 hours
4. STRESS RELIEF SR2: 180°C, 2 hours

PHYSICAL DATA AT ROOM TEMPERATURE

	Surface Roughness - Overhang (µm)		
	45°	60°	75°
Upskin	8	7	6
Downksin	14	9	7

	Surface Roughness (µm)
H	19
V	7

	Porosity (% Density)		Hardness (HV5)		Poisson's Ratio	
Thermal State	H	V	H	V	H	V
As-Built	99.69	99.69	125	--	--	--
SR1-1	--	--	107	--	--	--
SR1-2	--	--	88	--	--	--
SR2	--	--	138	--	--	--

TENSILE DATA

Tensile testing done in accordance with ASTM E8 and ASTM E21

Temperature: RT

	Modulus of Elasticity (GPa)		0.2% YS (MPa)		UTS (MPa)		Elongation (%)		Reduction of Area (%)	
Thermal State	H	V	H	V	H	V	H	V	H	V
As-Built	72	72	260	245	445	465	10.5	7.4	--	--
SR1-1	73	73	230	225	340	355	12.9	8.2	--	--
SR1-2	71	75	175	170	275	280	17.6	14.5	--	--
SR2	77	71	320	295	465	490	7.9	6.1	--	--

H: HORIZONTAL (XY) orientation
V: VERTICAL (Z) orientation