TECHNICAL DATA SHEET

LPW 316L Stainless Steel
1.4404

GENERAL DESCRIPTION

LPW 316L Stainless Steel is an austenitic stainless steel, which is not age or precipitation hardenable. It possesses high corrosion resistance and toughness as well as good all round mechanical properties to 300°C (572°F). It is also noted as being highly machinable.

APPLICATIONS

Used for corrosion resistant products and general production parts in many industries, including automotive, bio-medical and aerospace. Specific applications include plastic injection moulds, surgical tools and maritime components.

CHARACTERISTICS

LPW 316L is equivalent to AISI 316L. This is chosen because the lower carbon content compared to standard 316 gives a reduced susceptibility to thermal stress driven micro-cracking, thereby making it more suitable for Laser Powder Bed Fusion. Further, the chromium and nickel content of LPW 316L is at the upper range of that specified by AISI 316L to provide increased and consistent corrosion resistance.

CHEMICAL COMPOSITION

Element		Minimum wt%	Maximum wt%
C	Carbon		0.030
Cr	Chromium	17.5	18.0
Cu	Copper		0.50
Fe	Iron	Balance	
Mn	Manganese		2.00
Mo	Molybdenum	2.25	2.50
N	Nitrogen		0.10
Ni	Nickel	12.5	13.0
O	Oxygen		0.10
P	Phosphorus		0.025
S	Sulphur		0.010
Si	Silicon		0.75

Particle size distribution optimised to suit specific machine platforms and process types (i.e. SLM, EBM, LMD, etc.) Custom sizing also available.

Full powder qualification including (but not exclusive to) the following: Size Distribution, Flow Properties, Chemistry and Morphology.

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MECHANICAL PROPERTIES (INDICATIVE ONLY)

Property		As built
Tensile Strength [1]	Horizontal Direction (XY) Vertical Direction (Z)	590 - 690 MPa 485 - 595 MPa
Yield Strength [1]	Horizontal Direction (XY) Vertical Direction (Z)	470 - 590 MPa 380 - 560 MPa
Young's Modulus [1]	Horizontal Direction (XY) Vertical Direction (Z)	159 - 175 GPa 117 - 151 GPa
Elongation [1]	Horizontal Direction (XY) Vertical Direction (Z)	25 - 55 % 30 - 70 %
Hardness [2]	Horizontal Direction (XY) Vertical Direction (Z)	210 - 214 HV0.5 114 - 226 HV0.5
Coefficient of Thermal Expansion [3]	16×10^{-6} m/mK	
Thermal Conductivity [3]	15.6 W/mK	

1. As built. Mechanical testing in accordance with ISO 6892
2. As built. Hardness test in accordance with ASTM E384-11
3. In the range of 20°C (68°F) to 100°C (212°F)

Range of mechanical properties encompasses expected values across multiple machine platforms

SIMILAR MATERIALS

Company	Alternative Title
LPW	316 Stainless Steel
UNS	S31603
Other Generic Names	1.4404; 316L
3D Systems	Stainless 316L
Concept Laser	CL 20ES
EOS	316L
Realizer	N/A
Renishaw	SS 316L-0407
SLM Solutions	1.4404 (316L)
TRUMPF	StainlessSteel 316L-A LMF

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