

Stainless Steel – SS 316L

Description SS 316L is an austenitic steel with excellent durability, good biocompatibility, and adequate elevated temperature properties. The alloy has low carbon content which makes it particularly recommended when there is risk of intergranular corrosion. Thus, parts built in stainless steel have good corrosion resistance.

Applications This alloy has very good corrosion resistance in acid and chlorinated environments and it is widely used in the chemical and food industries, as well as in shipbuilding and various types of architectural structures.

Composition ISO 14343-A wire electrode classification with 1.2mm diameter. 0.01% C, 1.8% Mn, 0.9% Si, 12.2% Ni, 18.4% Cr, 2.6% Mo, 0.12% Cu, 7% Ferrite.

Computed Tomography

Scans cover external and internal surfaces, with micrometre-level resolutions. Full 3D density maps of the samples inspected consistently report 99.998% density, with no trace of voids, porosity, contamination or cracking.



Images represent the tested specimens and the imaging from the computed tomography data for YZ and XY section planes at 60µm resolution.

Mechanical Properties

Results show Meltio's WP-LMD 3D printed specimens to perform at the same level as conventional manufacturing methods, with low deviations and near isotropic properties between horizontal (XY) and vertical (XZ) print orientations.

	Wrought Properties	Cast Properties	Meltio XY Properties	Meltio XZ Properties
Tensile Strength (MPa)	515	550	635 ± 13	650 ± 7
Yield Strength (MPa)	208	260	390 ± 30	380 ± 17
Elongation (%)	40	35	52 ± 3	46 ± 4

Data represents typical reference values from Wrought (ASTM A403) and Cast (ASTM A351) classification compared to Meltio horizontal (XY) and vertical (XZ) specimens extracted from 3D printed walls and tensile tested according to ASTM A370 / ASME SA-370

Material Datasheet

Stainless Steel – SS 316L

Notes

Properties reported in this material datasheet are average of a typical batch. The test coupons were extracted from multiple 3D printed walls, cut in horizontal (XY) and vertical (Z) directions for coupon extraction. The walls were 3D printed on a Meltio M450 and the testing experiments were done according to ASTM E8 standard.

Disclaimer

Any technical information or assistance provided herein is given and accepted at your risk, and neither Meltio nor its affiliates make any warranty relating to it or because of it. Neither Meltio nor its affiliates shall be responsible for the use of this information, or any product, method or apparatus mentioned, and you must make your own determination for its suitability and completeness for your own use. Specifications are subject to change without notice.

Version 2.2

Date April 5, 2021