LayrrSteel 316L

Type analysis

Single figures are nominal except where noted.

Iron	Balance
Molybdenum	2.00-3.00 %
Nitrogen	0.10 %
Carbon	0.030 %

Chromium	16.0-18.0 %
Manganese	2.00 %
Oxygen	0.10 %
Sulfur	0.030 %

Nickel	10.0-14.0 %
Silicon	1.00 %
Phosphorus	0.045 %

Description

Layrr SS316L is a gas-atomized, low-carbon austenitic stainless steel. Known for its exceptional balance of cost-efficiency and performance, it is the most widely used metal in additive manufacturing. Our powder is strictly controlled for Low Carbon (L) content to prevent sensitisation and intergranular corrosion, making it the ideal choice for marine, medical, and food-grade applications.

Material Behaviour and Microstructure

- Austenitic Stability: Features a Face-Centered Cubic (FCC) crystal structure that remains stable from cryogenic temperatures up to the melting point, ensuring high toughness and ductility.
- Molybdenum Enhancement: Contains 2–3% Molybdenum (Mo), which provides a "corrosion shield" by dramatically increasing resistance to pitting and crevice corrosion in chloride (saltwater) environments.
- Non-Magnetic Properties: In its annealed state, the material is non-magnetic, making it suitable for sensitive electronic housings and medical diagnostic equipment.

Powder Properties

Part number	LayrrSteel 316L 10-53 µm	LayrrSteel 316L 0-22 µm
Application	L-PBF[1]	L-PBF[1]
Maximum particle size	Max 1 wt% > 53 µm[3]	Max 1 wt% > 22 µm[3]
Minimum particle size	Max 10 vol% < 10 µm[3]	Max 10 vol% < 0 µm[3]
LSD percentile	D10, D50, D90[3], reported	D10, D50, D90[3], reported
Atomisation	Vacuum Induction Melted, Nitrogen Gas Atomised	Vacuum Induction Melted, Nitrogen Gas Atomised
Apparent density (g/cm³)	Measured according to ASTM B212[4] and reported	Measured according to ASTM B212[4] and reported
Carney flow	Measured according to ASTM B964[4] and reported	Measured according to ASTM B964[4] and reported

[1] ASTM/ISO 52900: Laser - Powder Bed Fusion (L-PBF), Electron-Beam Powder Bed Fusion (EB-PBF), Directed Energy Deposition (DED)
[2] ASTM B214 Standard Test Method for Sieve Analysis for Metal Powders
[3] ASTM B822 Standard Test Method for Particle Size Distribution of Metal Powders and Related Compounds by Light Scattering
[4] ASTM B212 Standard Test Method for Apparent Density of Free-Flowing Metal Powders Using the Hall Flowmeter Funnel Testing of powder will fulfill certification requirements to Nadcap Materials Testing and ISO/IEC 17025 Chemical, per relevant ASTM procedures