316L

Austenitic stainless steel (1.4404)

Printer **One Click Metal MPRINT**

Layer height **40 µm**

OVERVIEW

316L is one of the most widely used corrosion-resistant stainless steels. Added molybdenum gives it significantly better corrosion resistance than other common stainless grades.

Low carbon content makes it easy to machine and post-process, so it suits everything from functional housings to food and chemical equipment.

KEY BENEFITS

- Excellent corrosion resistance
- High ductility and toughness
- Easy to machine and post-process
- Usable up to 550 °C

MECHANICAL PROPERTIES

Property	Test method	40 µm · vertical (Z) · as built
Yield strength ($R_{p0.2}$)	ISO 6892-1	*Not reported*
Tensile strength (R_m)	ISO 6892-1	620 MPa 89.9 ksi · ± 9
Elongation at break (A)	ISO 6892-1	40% ± 4%
Reduction of area (Z)	ISO 6892-1	62% ± 11%

Averages, with standard deviation (±). Typical values, not guaranteed minimums. Design with margin.

PHYSICAL PROPERTIES & SURFACE FINISH

Property · surface measured along Z axis	40 µm
Average defect (porosity)	< 0.5%
Surface roughness R_a, as built	4 µm 157 µin
Surface roughness R_z, as built	22 µm 866 µin
Surface roughness R_a, blasted	3 µm 118 µin
Surface roughness R_z, blasted	20 µm 787 µin

Heat treatment: Values on page 1 are as built. For reference, OCM gives the standard tensile strength range for annealed 316L as 500–700 MPa (73–102 ksi).

DIMENSIONAL TOLERANCES

Direction	First inch (25 mm)	Each additional inch (25 mm)
XY (horizontal)	± 0.003–0.005 in ± 0.08–0.13 mm	+ 0.002 in + 0.05 mm
Z (vertical)	± 0.010 in ± 0.25 mm	+ 0.002 in + 0.05 mm

Typical IA3D tolerances; results depend on part size and geometry. For tighter fits, **talk to an engineer**.

POWDER CHEMICAL COMPOSITION

Element	Min. (wt.%)	Max. (wt.%)
Fe	Balance	
Cr	16.0	18.0
Ni	11.0	14.0
Mo	2.0	3.0

Element	Min. (wt.%)	Max. (wt.%)
Mn	—	2.0
Si	—	1.0
C	—	0.03

TYPICAL APPLICATIONS

- Fluid-handling and wetted components
- Food, pharmaceutical and chemical equipment
- Marine and outdoor hardware
- Electronic housings and functional components
- Automotive parts that must not corrode

GOOD TO KNOW

- **Operating temperature:** Usable from low temperatures up to 550 °C (1,020 °F). For continuous operation, do not exceed 300 °C (572 °F).
- **Surface:** as-built and blasted roughness is shown on page 1.

TEST CONDITIONS & SOURCE

Source: One Click Metal Material Data Sheet, Stainless Steel 1.4404 / 316L (version 2023.06). Mechanical values are One Click Metal averages from tensile testing to ISO 6892-1 on vertically built specimens, as built, printed on the **One Click Metal MPRINT** with OCM's standard parameter set. Surface roughness was measured along the Z axis.

Disclaimer: Material properties are provided as a general reference to help with material selection. Actual part properties depend on geometry, orientation, wall thickness, build position, heat treatment, post-processing and service conditions, and may differ from the values shown. This sheet does not guarantee specific properties or suitability for a particular application. Validate critical parts under real operating conditions.

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