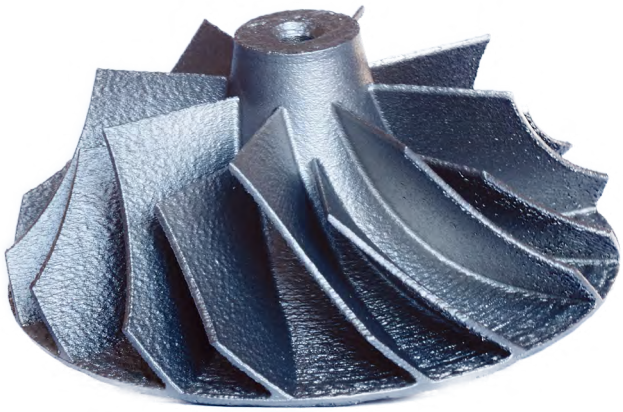
DIRECT METAL LASER SINTERING

# STAINLESS STEEL 316L



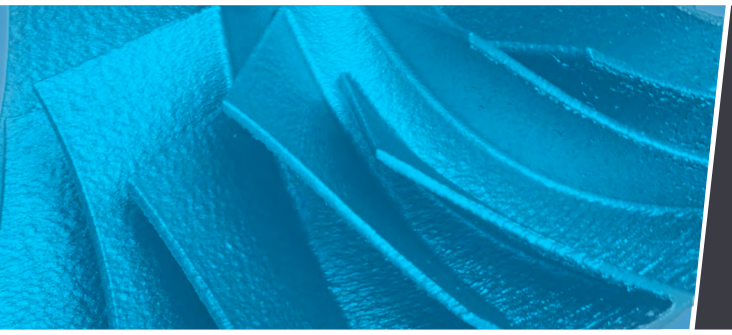
## PRODUCT SPECIFICATIONS

### PRODUCT DESCRIPTION:

The parts built from StainlessSteel 316L have chemical composition corresponding to ASTM F138 “Standard Specification for Wrought 18Cr-14Ni-2.5Mo Stainless Steel Bar and Wire for Surgical Implants (UNS S31673)”. This kind of stainless steel is characterized having a good corrosion resistance and evidence that there are no leachable substances in cytotoxic concentrations.

### APPLICATIONS:

316L is an excellent choice for Applications where a non-corroding, chemical resistant material is needed.



### KEY PRODUCT BENEFITS

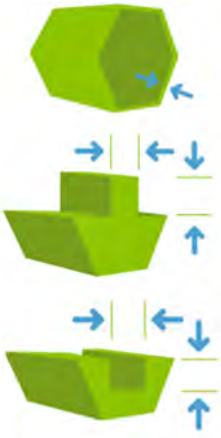
- Corrosion Resistance
- Chemical Resistance
- High Elongation of Break

### CHEMICAL COMPOSITION:

According ASTM F138

| Element | Min | Max |
|---|---|---|
| Fe | Balance | |
| Cr | 17.00 | 19.00 |
| Ni | 13.00 | 15.00 |
| Mo | 2.25 | 3.00 |
| C | | 0.030 |
| Mn | | 2.00 |
| Cu | | 0.50 |
| P | | 0.025 |
| S | | 0.010 |
| Si | | 0.75 |
| N | | 0.10 |

### GEOMETRICAL LIMITS:



Min Wall thickness 1.00 mm - Min. Feature Size 1,00 mm

Min. embossed details 0.5mm high and wide and 0.8mm for readable text and clear images

Min. engraved details 0.5mm deep and 0.6mm wide; 1.0mm wide for readable text and clear images

## PROPERTIES:

| Heat Treatment | Tensile Strength MPa | Yield Strength 0,2% MPa | Elongation % | Hardness | Density |
|---|---|---|---|---|---|
| / | 570 MPa +/- 30 MPa | 470 MPa +/- 30 MPa | 40 +/-5 % | 85 +/- 5 HRB | ~ 99,95% |
| Heat Treatment | Tensile Strength MPa | Yield Strength 0,2% MPa | Elongation % | Hardness | Density |
| Heat treated | 570 MPa +/- 30 MPa | 380 MPa +/-30 MPa | 35 +/-5% | 85 +/- 5 HRB | ~ 99,95% |

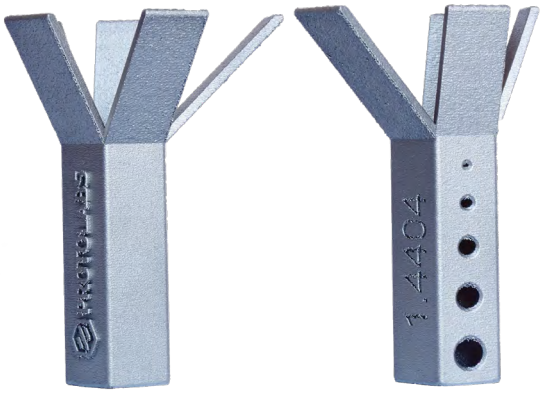
## RESOLUTION:

| | Layer Thickness | Build Envelope | Min. Feature Size |
|---|---|---|---|
| Fine Resolution | 0,02 mm | Ø100 x 80 mm | 0,5 mm |
| High Resolution | 0,05 mm | 245x245x300 mm | 1,00mm |

## SURFACE:

| | 0 ° | 45 ° bottom | 45 ° top | 90 ° |
|---|---|---|---|---|
| Fine Resolution | Ra 6,8 µm Rz 35,8 µm | Ra 8,37 µm Rz 39,8 µm | Ra 6,81 µm Rz 35,8 µm | Ra 2,34 µm Rz 13,6 µm |
| High Resolution | Ra 6,6 µm Rz 34,7 µm | Ra 11,6 µm Rz 59,3 µm | Ra 6,6 µm Rz 34,7 µm | Ra 3,6 µm Rz 19,5 µm |

Fine Resolution 20 µm




High Resolution 50 µm

## STANDARD TOLERANCES:

Typically, for well-designed parts, with a designated build direction, tolerances of +/- 0.1 mm to +/- 0.2 mm + 0.005 mm/mm are expected and achieved.
Certain geometries may cause distortions due to internal stress which may lead to higher deviations.