

Material data Sheet: 316L

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. This material is ideal in Lifestyle/Consumer, e.g. watches, other jewellery, spectacle frames, decorations - Automotive/Industrial, e.g. non-corroding common material, food and chemical plants - Aerospace/Turbine industry - Entry-level material for Laser Sintering Technology, e.g. mounting parts, heat exchangers, functional elements in electronic housing and accessories. Parts built from StainlessSteel 316L can be machined, shot-peened and polished in as-built or stress relieved states if required. Solution annealing is not necessary because the mechanical properties of as-built state are showing desired values. Parts are not ideal in temperature range 427°C - 816°C where precipitation of chromium carbides occurs.

| Physical properties: | | | |
|----------------------|-------|-------------------|--|
| Density: | 7,90 | g/cm ³ | |
| Relative density: | 99,90 | % | |

| Mechanical properties: | | | |
|---------------------------|--------|-----|-----|
| Yield strength (Rp 0,2%): | 470,00 | ±90 | MPa |
| Tensile strength (UTS): | 540,00 | ±55 | MPa |
| Elastic modulus: | 180,00 | | GPa |
| Elongation at break: | 50,00 | ±20 | % |

| Geometrical data: | | | |
|--------------------------|-----------|----|----------|
| Layer Thickness: | 40 | µm | |
| Typical part accuracy: | ±0,30 | mm | (approx) |
| Smallest wall thickness: | 0,3 - 0,4 | mm | (approx) |
| Surface roughness: | | | |
| As built: | Ra | 13 | ±5 |
| After shot peening: | Ra | 5 | ±2 |

| Chemical composition*: | | |
|------------------------|---------|---|
| Fe | Balance | |
| Cr | 17-19 | % |
| Ni | 13-15 | % |
| Mo | 2,2-3,0 | % |
| C | ≤ 0,03 | % |
| Mn | ≤ 2,0 | % |
| Cu | ≤ 0,50 | % |
| P | ≤ 0,025 | % |
| S | ≤ 0,01 | % |
| Si | ≤ 0,75 | % |
| N | ≤ 0,15 | % |

* Chemical composition of the powder