# Material Data Sheet 316L / 1,4404 / X2CrNiMo17-12-2

*This document provides information and data for parts built using Stainless Steel 316L powder with specific properties (given in the table 'Physical and chemical properties of powder').*

## Description :

Stainless steel family of materials is widely appreciated for daily use, due their resistance to corrosion and the high possibility of recycling. 316L is a low-carbon stainless steel, its resistance to corrosion is especially good even at high temperature after an appropriate heat treatment.

## Technical data :

*Physical and chemical properties of powder (standard: NF EN 10088-1)*

| | Elements | Minimun | Maximun |
|---|---|---|---|
| Matrials composition (%weight) | Fe | Balance | |
| | Cr | 16.50 | 18.50 |
| | Ni | 10.00 | 13.00 |
| | Mo | 2.00 | 2.50 |
| | Mn | - | 2.00 |
| | Si | - | 1.00 |
| Tap density (g/cc)* | | 4.8 | |
| Particle size (µm)* | | D10 | ≤ 4,5 |
| | | D50 | 9 |
| | | D90 | ≥ 16 |

** Data certified by powder provider of AddUp*

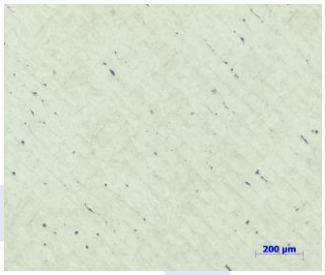
## Mechanical Properties:

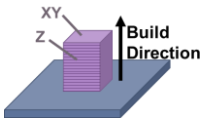
*Mechanical properties of as-build parts (tested at 20°C)*

| | | As-Build * | After Heat treatment |
|---|---|---|---|
| Ultimate tensile strength (MPa /ksi) | (XY) | 760 / 110 | |
| | (Z) | 690 / 100 | |
| Yield strength, Rp0,2% (MPa /ksi) | (XY) | 620 / 89 | |
| | (Z) | 540 / 78 | |
| Elongation at break E5d(%) | (XY) | 46 | |
| | (Z) | 35 | |
| Young's Modulus (GPa) | (XY) | 193 | |
| | (Z) | 157 | |
| Charpy impact test (KCV J/cm²) | (XY) | 57 | |
| | (Z) | 45 | |
| Compactness | | | ≥ 99.9% |

** Typical value*

## Microstructure




*Microstructure obtained by SLM (after etching)*

The microstructure obtained during SLM with 316L is composed of austenitic γ-phase with some oxides of Al, Si, Cr or Mn, giving the mechanical characteristics of the material. The picture shows the regular structure of melting tracks.

## Observation by Scanning Electron Microscopy of the powder