



# 316L

Stainless steel 316L can be used for the production of acid and corrosion resistant parts in the following fields: plant engineering, automotive industry, medical technology, jewelry and components for molds.

Data in this document represents material built with 50 µm layer thickness and in an Nitrogen atmosphere on an M2 / M2 Multilaser machine. Values listed are typical.

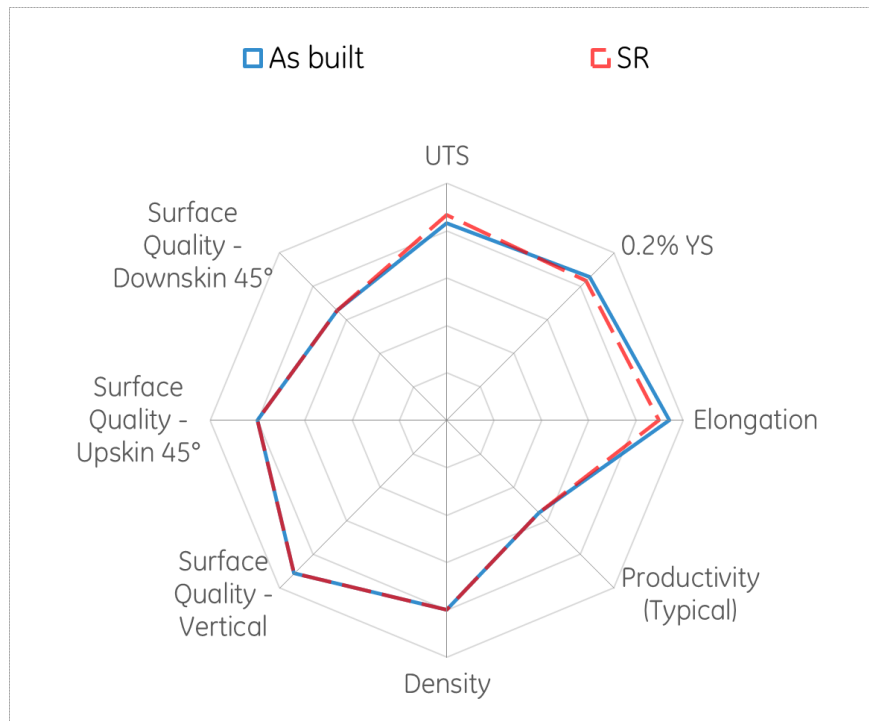
26  
**Fe**

### POWDER CHEMISTRY

Element	Indicative value (wt%)
Cr	16.5-18.0
Ni	10.0-13.0
Mo	2.0-2.5
Mn	0-2.0
Si	0-1.0
P	0-0.045
C	0-0.030
S	0-0.030
Fe	Balance

316L (powder) chemical composition et al. according to **DIN EN 10088-3**

### SPIDER PLOT



### MACHINE CONFIGURATION

- M2 / M2 Multilaser
- Nitrogen Gas
- Rubber blade
- Layer thickness 50µm

- Build rate dual laser w/ coating \* [cm<sup>3</sup>/h]: 16.5
- Max. Build rate per Laser\*\* [cm<sup>3</sup>/h]: 21.9

\*Measured by using Factory Acceptance Test layout  
 \*\*Calculated (layer thickness x scan velocity x hatch distance)

### THERMAL STATES

1. AS BUILT
2. STRESS RELIEF (SR): 3h to 550°C, hold 6h hour at 550°C

## PHYSICAL DATA AT ROOM TEMPERATURE

	Surface Roughness - Overhang ( $\mu\text{m}$ )			Surface Roughness ( $\mu\text{m}$ )	
	45°	60°	75°	H	V
	Upskin	12	9	8	12
Downskin	17	12	10	8	

Thermal State	Porosity (% Density)		Hardness (HV10)		Poisson's Ratio	
	H	V	H	V	H	V
	As-Built	99.8	99.8	222	--	--
VSR	99.8	99.8	223	--	--	--

### HORIZONTAL Thermal State

	Thermal Conductivity (W/m·K)	Coeff. Of Thermal Expansion (mm/mm/K)	Thermal Diffusivity (m <sup>2</sup> /s)	Specific Heat (J/K·kg)
As-Built	12.6	15.6 x 10 <sup>-6</sup>	3.4 x 10 <sup>-6</sup>	476
VSR	--	--	--	--

### VERTICAL Thermal State

	Thermal Conductivity (W/m·K)	Coeff. Of Thermal Expansion (mm/mm/K)	Thermal Diffusivity (m <sup>2</sup> /s)	Specific Heat (J/K·kg)
As-Built	12.3	15.6 x 10 <sup>-6</sup>	3.4 x 10 <sup>-6</sup>	460
VSR	--	--	--	--

## TENSILE DATA

Tensile testing done in accordance with ASTM E8 and ASTM E21

### Temperature: RT

Thermal State	Modulus of Elasticity (GPa)		0.2% YS (MPa)		UTS (MPa)		Elongation (%)		Reduction of Area (%)	
	H	V	H	V	H	V	H	V	H	V
As-Built	182	150	545	480	655	595	44	50	-	-
VSR	198	178	535	465	680	620	40	39	-	-

H: HORIZONTAL (XY) orientation  
V: VERTICAL (Z) orientation

\* All of the figures contained herein are approximate only. The figures provided are dependent on a number of factors, including but not limited to, process and machine parameters, and the approval is brand specific and/or application specific. The information provided on this material data sheet is illustrative only and cannot be relied on as binding.