

# Technical Data Sheet

## Ultrafuse 316LX

### Components

BASF Polymer and 316L stainless steel composite filament

### Product Description

Metal-polymer composite filament to produce metal components in an austenitic stainless-steel type 316L using standard FFF printer systems and subsequently an industry standard debinding and sintering process. The filament has a non-slip surface allowing its application in any Bowden or direct drive extruder. Its high flexibility allows it to be funneled through complex idler pulleys as well as many guide roller filament transportation systems in any printer.

Typical applications are:

- Non-magnetizable parts with high corrosion resistance and toughness
- Watches
- Medical equipment
- Parts for food and chemical industry
- Light weight hollow parts and infill parts
- Parts for tooling and mold inlays with near surface cooling

### Delivery form and warehousing

Ultrafuse 316LX is delivered on spools of 3kg. The filaments have a nominal diameter of either 1.75 mm or 2.85 mm.

### Product safety

Mandatory, recommended industrial hygiene procedures and the relevant industrial safety precautions for the handling of polymers must be followed whenever these products are being handled and processed. For additional information please consult the corresponding material safety data sheets.

### For your information

Standards: DIN 1.4404, X 2 CrNiMo 17 13 2, AISI 316L; UNS S31603

### Recommended printing parameters

Properties	Unit	Value
<b>Nozzle set temperature</b>	°C	215-235
<b>Never to exceed nozzle temperature</b>	°C	240
<b>Print bed temperature</b>	°C	85-100
<b>Build plate top material</b>		Polyimide
<b>Build plate top material thickness</b>	mm	0,15
<b>Print speed</b>	mm/s	15-40
<b>Layer height</b>	µm	100-250
<b>Nozzle diameter</b>	mm	0.4
<b>Nozzle type: one brass nozzle per spool recommended</b>		

<b>Number of outlines</b>	#	1
<b>Outline overlap</b>	%	35
<b>First layer speed</b>	mm/sec	<15
<b>First layer height</b>	µm	150
<b>Infill</b>	%	100
<b>Infill type</b>	Set to	rectilinear
<b>Parts cooling</b>	Set to	off

## Notice

The data contained in this publication is based on our current knowledge and experience. In view of the many factors that may affect processing and application of our product, these data do not relieve processors from carrying out their own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed.

The safety data given in this publication is for information purposes only and does not constitute a legally binding Material Safety Data Sheet (MSDS). The relevant MSDS can be obtained upon request from your supplier or you may contact BASF directly at [3d-printing@basf.com](mailto:3d-printing@basf.com).

## Contact

For further questions please contact: [3d-printing@basf-3dps.com](mailto:3d-printing@basf-3dps.com)

Preliminary filament properties			
	Test method	Typical values	
Filament diameter		Ø 1.75mm	Ø 2.85 mm
<b>Filament Diameter Tolerance</b>	non-contact dimensional measurement	±75 µm	±75 µm
<b>Roundness</b>	non-contact dimensional measurement	±50 µm	±50 µm
<b>Bending radius</b>	radius gauge	5 mm [±1 mm]	10 mm [±3 mm]
<b>Length per spool</b>	Tactile length gauge	250 m	100 m
<b>Weight per spool</b>	Scale	3 kg	3 kg

Preliminary characteristic properties of sintered material			
	Test method	Typical values	
Density	DIN EN ISO 3369	7.8 kg/m <sup>3</sup>	
	Test method	Typical values x/y-direction	Typical values z-direction
<b>Tensile Strength</b>	DIN EN ISO 6892-1 <sup>1</sup>	498 MPa	414 MPa
<b>Youngs Modulus</b>	DIN EN ISO 6892-1 <sup>1</sup>	200 GPa	203 GPa
<b>Elongation at break</b>	DIN EN ISO 6892-1 <sup>1</sup>	43 %	18 %
<b>Yield strength R<sub>p0.2</sub></b>	DIN EN ISO 6892-1 <sup>1</sup>	187 MPa	189 MPa
<b>Yield strength R<sub>p1.0</sub></b>	DIN EN ISO 6892-1 <sup>1</sup>	229 MPa	233 MPa
<b>Max. flexural stress</b>	According to EN ISO 3325	589 MPa	626 MPa
<b>Flexural strain at max. flexural stress</b>	According to EN ISO 3325	18 %	18 %
<b>Flexural modulus</b>	According to EN ISO 3325	117 GPa	71 GPa
<b>Impact Strength Charpy (notched)</b>	DIN EN ISO 148-1 <sup>2</sup>	92 J/cm <sup>2</sup>	51 J/cm <sup>2</sup>
<b>Vickers hardness</b>	DIN EN ISO 6507-1	120HV10	

<sup>1</sup> Specimen shape E (Form E) according to DIN 50125

<sup>2</sup> Undersized impact test specimen according to DIN EN ISO 148-1