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

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

Typical Shrinkage in x, y, z

S_X = 0.1642 ± 0.0147 (16.42%)
S_Y = 0.1667 ± 0.0150 (16.67%)
S_Z = 0.2071 ± 0.002 (20.71%)

Please consider, that scaling can vary depending on part geometry.

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.

Contact

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

Preliminary characteristic properties of sintered material			
	Test method	**Typical values**	
Density	DIN EN ISO 3369	7.8 kg/m³	
	Test method	**Typical values x/y-direction**	**Typical values z-direction**
Tensile Strength	DIN EN ISO 6892-1[1]	498 MPa	414 MPa
Youngs Modulus	DIN EN ISO 6892-1[1]	200 GPa	203 GPa
Elongation at break	DIN EN ISO 6892-1[1]	43 %	18 %
Yield strength $R_{p0.2}$	DIN EN ISO 6892-1[1]	187 MPa	189 MPa
Yield strength $R_{p1.0}$	DIN EN ISO 6892-1[1]	229 MPa	233 MPa
Max. flexural stress	According to EN ISO 3325	589 MPa	626 MPa
Flexural strain at max. flexural stress	According to EN ISO 3325	18 %	18 %
Flexural modulus	According to EN ISO 3325	117 GPa	71 GPa
Impact Strength Charpy (notched)	DIN EN ISO 148-1[2]	92 J/cm²	51 J/cm²
Vickers hardness	DIN EN ISO 6507-1	120HV10	

[1] *Specimen shape E (Form E) according to DIN 50125*
[2] *Undersized impact test specimen according to DIN EN ISO 148-1*

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