Technical Data Sheet

Ultrafuse® 316L

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Version No.: 2.0

General information

Components

316L stainless steel composite filament for Fused Filament Fabrication.

Product Description

Ultrafuse® 316L is a Metal-polymer composite filament to produce metal components in a 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 funnelled through complex idler pulleys as well as many guide roller filament transportation systems in any printer.

Delivery form and warehousing

Ultrafuse® 316L filament should be stored at 15 - 25°C in its originally sealed package in a clean and dry environment. If the recommended storage conditions are observed the products will have a minimum shelf life of 12 months.

Product safety

Recommended: Process materials in a well ventilated room, or use professional extraction systems. For further and more detailed information please consult the corresponding material safety data sheets.

For your information

Typical composition after sintering:

C %	Cr %	NI %	Mn %	Mo %	SI %	Fe %
≤ 0.03	16-18	10-14	≤ 2	2-3	≤ 1	Balance

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

Notice

The data contained in this publication are 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 3D Printing Solutions GmbH directly at sales@basf-3dps.com.

Filament Properties		
Filament Diameter	1.75 mm	2.85 mm
Diameter Tolerance	±0.050 mm	±0.1 mm
Roundness	±0.050 mm	±0.05 mm
Available Spool size	3.0 kg	3.0 kg
Available colors	natural	

Spool Properties	
Available Spool size	3.0 kg
Outer diameter	200 mm
Inner diameter	50.5 mm
width	55 mm

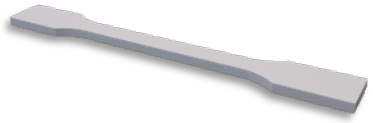
Recommended 3D-Print processing parameters		Used for test specimens
Printer	FFF printer	Ultimaker S5
Nozzle Temperature	230 – 250 °C / 446 – 482 °F	245 °C
Build Chamber Temperature	-	-
Bed Temperature	90 – 100 °C / 194 – 212 °F	100 °C
Bed Material	Glass + approved glues* / polyimide tape (*Magigoo® suggested)	Glass + Magigoo®
Nozzle Diameter	≥ 0.4 mm	0.4 mm
Print Speed	15 - 50 mm/s	25 mm/s

Please check your print profile availability for an easy start at www.forward-am.com.

Further Recommendations	
Drying recommendations to ensure printability	Ultrafuse® 316L is in a printable condition, drying is not necessary
Support material compatibility	Ultrafuse® Support Layer

General Properties		Standard
Sintered Part Density Ultrafuse® 316L	7850 kg/m^3 / 490.1 lb/ft^3	ISO 3369
Sintered Part Density Catamold 316L	7900 kg/m3 / 493.2 lb/ft^3	ISO 3369

Mechanical Properties | sintered



Print direction	Standard	XY	ZX
		Flat	Upright
Tensile strength	**ISO 6892-1**		
Ultrafuse® 316L[1]		561 MPa / 81.4 ksi	521 MPa / 75.6 ksi
Catamold 316L (MIM)		540 MPa / 78.3 ksi	
Elongation at Break	**ISO 6892-1**		
Ultrafuse® 316L[1]		53 %	36 %
Catamold 316L (MIM)		60 %	
Yield Strength, $R_{p\,0.2}$	**ISO 6892-1**		
Ultrafuse® 316L[1]		251 MPa / 36.4 ksi	234 MPa / 33.9 ksi
Catamold 316L (MIM)		180 MPa / 26.1 ksi	
Vickers Hardness HV10	**ISO 6507-1**		
Ultrafuse® 316L[1]		128	128
Catamold 316L (MIM)		120	

Testing speed – 0,3 mm/min bis 2 % / 10 mm/min till end of the test

[1]milled specimen, specimen shape Form E2x6x20 according to DIN 50125