

Technical datasheet

varioShore Prosthetic TPU

colorFabb

Date of issue: November 28th, 2023
Version: v1.0

Description

colorFabb varioShore Prosthetic TPU is a high quality, expanding, 3D printable TPU filament. varioShore TPU has a Shore Hardness of 92A. This special formulation has an active foaming technology to achieve light weight parts, soft touch surface, and a variable Shore Hardness depending on the foaming.

At roughly 230°C, the foaming technology is activated, expanding the material up to 1,6x its volume. Users can lower the flow rate (60-70%) to achieve light weight parts, or use the foaming properties to effectively lower the Shore Hardness.

The added silver particles in this formulation, is known to have beneficial anti-bacterial properties, which makes this material well suited for prosthetic and orthopedic applications.

Typical Properties

Mechanical Properties – 3D Printed

	Method	Value @ foaming		Unit
		210 °C; 100%	230°C; 70%	
Youngs Modulus	Tensile, ISO 527-1A	50	40	MPa
Tensile Strength	Tensile, ISO 527-1A	24	12	MPa
Elongation at break	Tensile, ISO 527-1A	465	450	%
Flexural Modulus	Flexural, ISO 178	50	40	MPa
Flexural Strength	Flexural, ISO 178	3	2	MPa
Impact Strength	Charpy Notch, ISO 179	40	20	kJ/m ²

Mechanical Properties – Injection Molded*

	Method	Value	Unit
Youngs Modulus	Tensile, ISO 527-1A	-	MPa
Tensile Strength	Tensile, ISO 527-1A	59	MPa
Elongation at break	Tensile, ISO 527-1A	490	%
Flexural Strength	Flexural, ISO 178	N/A	MPa
Charpy Impact Strength	Charpy Notch, ISO 179	N/A	kJ/m ²
Density	ISO 1183	1,2	g/cm ³
Hardness	Shore A, ASTM D-2240	92	

Thermal Properties*

	Method	Value	Unit
Glass Transition Temp.	DSC, ISO 11357	-20	°C
Melting Temp.	DSC, ISO 11357	130	°C
Decomposition Temp.	TGA, ISO 11358	N/A	°C
Heat Deflection Temp.	HDT-B, ISO 75	N/A	°C
Melt Flow Index	MFI, (210 °C/2.16 kg), ISO 1133-A	N/A	g/10min
Melt Flow Index	MFI, (190 °C/1.16 kg), ISO 1133-A	N/A	g/10 min

*These results are obtained from the information provided by the supplier of the raw material, and are based on UNFOAMED material data.

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Filament Specifications

	Unit		
Diameter	mm	1.75	2.85
Max. roundness deviation	mm	± 0.05	± 0.1
Net. Filament weight	g	750	750

Guideline for print settings

	Unit	
Nozzle Temp.	°C	195-260
Bed Temp.	°C	50-60
Bed / surface modification	-	-
Active cooling fan	%	-
Print Speed	mm/s	40-100

Notes

The reported properties are an average of a batch of 3D specimens.
The specimens have been printed in XY plane, using 0.15 mm layer height, 100% infill, 0,4 mm nozzle, 200-250°C nozzle temperature and 50°C bed temperature.

Disclaimer

The product- and technical information provided in this datasheet is correct to the best of our knowledge. The information given is provided as a guidance for good use, handling and processing, and is not to be considered as a quality specification. The information only relates to the specific product and the material properties.