



TECHNICAL DATA SHEET

FLEX HARD CF

1. DESCRIPTION

TPU FLEX Hard CF combines the two worlds of fibre composites and the extremely resistant and durable elastomer based on polycaprolactone polyester. The carbon reinforces the TPU and makes it more resistant and stiffer. In addition, an excellent carbon look is created. The material is also very easy to process and has very low warping. It has been specially developed for industrial applications. The material is optimised for the FFF/FDM process with regard to thermal stability and better flow properties. The raw material is compliant with REACH and RoHS standards.

2. FEATURES

- Extreme layer adhesion
- Carbon look
- Very low warping
- Excellent chemical resistance
- Free of silicone, plasticisers, oil and halogen
- UV-resistant

3. PROPERTIES

TEST	METHOD	UNIT	VALUE	PRINT SETTINGS
Tensile modulus (E-Modulus)	ISO 527-2/5A/500	MPa	35	Nozzle 230-260°C
Ultimate elongation	ISO 527-2/5A/500	%	380	Heatbed 50-90°C
Stress at break	ISO 527-2/5A/500	MPa	14 (50%)	Adhesive not required
	ISO 527-2/5A/500	MPa	14 (100%)	Speed 20-100mm/s
	ISO 527-2/5A/500	MPa	27 (300%)	Cooling 0-30%
VICAT A (VST)	ISO 306	°C	140*	Enclosed Space no
Melting temperature	ISO 3146-C	°C	200-240	Hardened Nozzle yes
Density	ISO 2781	g/cm ³	1.22	
Abrasion resistance	ISO 4649-A	mm ³	26	
Shore hardness	ISO 868	Shore	70D	
Tear strength	ISO 34-1B	kN/m	165	
Glass transition temperature		°C	-24	
Compressive strength	DIN 53453	MPa	50	
Permeability AIR	DIN 53380	25°/60°C	420/-	
Permeability N2	DIN 53380	25°/60°C	300/1600	
Permeability O2	DIN 53380	25°/60°C	790/3900	
Permeability CO2	DIN 53380	25°/60°C	5800/1700	
Permeability N2O	DIN 53380	25°/60°C	11600/-	
Poisson-ratio	acc. to Hencky		0.45	

*Temperature resistance tested at a minimum wall thickness of 4 mm.

Note: Due to the abrasive nature of the carbon fibers, a hardened nozzle (e.g., hardened steel or ruby nozzle) is strongly recommended. Additionally, a nozzle diameter of at least 0.6 mm should be used to prevent clogging and ensure smooth extrusion.

4. CERTIFICATIONS & ADDITIONAL INFORMATION



Certifications depend on colors in final product. More info in the additional information sheet.

5. STORAGE AND SHELF LIFE

Store in a dry room at room temperature (18-27°C / 65-80°F). Keep out of direct heat and sunlight. When stored correctly, this material has a shelf life of 2 years. Additional info in our regulatory, additional information and chemical resistance data sheets.