TPU CARBON FIBER

TECHNICAL DATA SHEET VERSION 1.0

INNOVATEFIL® by smart materials 3D

Carbon fiber reinforced elastomer thermoplastic. With this filament you can print flexible objects, with a high printing quality. The incorporation of carbon fibers offers improved properties, high tensile strength, high heat tolerance and greater chemical resistance compared to unreinforced TPUs.

In addition, the carbon fiber gives it electrical conductivity, making it ideal for applications that require protection against electrostatic discharge (ESD).

ELECTRICAL CLASSIFICATION OF MATERIALS

	TIPICAL VALUE	UNITS	TEST METHOD
PHYSICAL PROPERTIES			
Chemical name	Polyurethane with Carbon Fiber		
Material density	1.24	g/cm^3	ISO 1183
MECANICAL PROPERTIES *			
Tensile Strength	65	MPa	ISO 527-1
Modulus of Elasticity	1450	MPa	ISO 527-1
Tensile Elongation	25	%	ISO 527-1
Charpy Impact (notched at 23º)	55	KJ/m^2	ISO 179 1eA
ELECTRICAL PROPERTIES *			
Surface Resistivity	3x10^4	Ω	ASTM D 257
PRINTING PROPERTIES			
Print temperature	215-245	°C	
Bed temperature	45-60	°C	
Fan layer	80-100	%	
Print speed	20-35	mm/s	

* Values measured on molded test specimen

TPU CARBON FIBER

TECHNICAL DATA SHEET VERSION 1.0

INNOVATEFIL®
by smart materials 3D

USE RECOMENDATIONS

PROTECT FROM HUMIDITY

Innovatefil®TPU CF is delivered in a vacuum bag, with a great barrier against moisture so that the filament can not absorb humidity. Prior to bagging, the filament follows the strictest quality controls by dehumidifying the raw material until the moisture content of less than 0.02%. During the process, the filament is cooled with dry air and then pocketed to ensure that the product is of the best quality.

Once unpacked, we recommend to keep it in a dry and dark environment. If it is not maintained in a suitable environment the material can absorb up to 0.5% of the atmospheric moisture, this can create water vapor in the extrusion that confers a poor surface finish.

To maintain optimal printing conditions, it is recommended to dry the material before using it in a 3D printer filament. Many printing equipments already have these drying systems incorporated.

KEEP THE EXTRUDER IN GOOD CONDITION

Once printing is finished it is necessary to clean the nozzle eliminating the excess of material to avoid seals and defects in the printing pieces, if several materials are used we recommend to have a nozzle for each material to avoid being mixed.

RECOMMENDATIONS FOR THE USE OF CARBON FIBER

The carbon fiber makes the filament very abrasive so recommend to use hardened steel nozzles or similar to print, and thus avoid premature wear of the components.

To achieve a better finish and avoid printing problems, we recommend to use nozzles over 0.4 mm diameter, print layer height of 0.2 mm or greater, not following these recommendations could cause problems of nozzle clogging.