TPC HOT3D™

Thermoplastic Copolyester (TPC) is any of a class of plastics with many properties, including elasticity, transparency, and resistance to oil, grease and abrasion. Technically, they are thermoplastic elastomers consisting of linear segmented block copolymers composed of hard and soft segments.

Pros

- Elastic and soft material
- Can be very stretchy depending on the elongation at break
- Low warpage and shrinkage
- Chemical-resistant

Cons

- Hygroscopic
- Prone to stringing and clogging
- Needs to be printed at low temperatures
- Difficult to post-process

Uses

- Automotive instrument panels
- Sporting goods
- Medical devices
- Footwear Prototyping

1. Identification of the material

Trade name:	HotOrange3D
Chemical name:	Thermoplastic Copolyester
Use:	3D printing
Origin:	HotOrange3D – Netherlands

2. Printer settings

Printer:	Desktop FFF printer		
Nozzle:	0.4	mm	A2 hardened
Layer height:	0.2	mm	
Infill:	100	%	
Extrusion Temperature:	230 - 250	°C	
Bed temperature:	60 - 80	°C	
Bed preparation:	PEI sheet	Kapton Tape	
Print speed:	30 - 40	mm/sec	

3. Material properties

Hardness:	56	Shore D	DIN ISO 7619-1 (3s)
Density:	1.17	g/cm3	DIN EN ISO 1183-1-A
Tensile strength:	50	MPa	DIN 53504-S2
Elongation at break:	4502	%	DIN 53504-S2
Stress at 20% elongation:	11	MPa	DIN 53504-S2
Stress at 100% elongation:	17	MPa	DIN 53504-S2
Stress at 300% elongation:	38	MPa	DIN 53504-S2
Modulus of elasticity - tensile test:	125	N/mm2	DIN EN ISO 527
Tear strength:	150	kN/m	DIN ISO 34-1Bb
Abrasion loss:	33	mm3	DIN ISO 4649-A
Compression set 23°C / 72 hours:	40	%	DIN ISO 815
Compression set 70°C / 24 hours:	50	%	DIN ISO 815
Tensile strength after storage in water at 80°C for 42 days:	35	MPa	DIN 53504-S2
Elongation at break after storage in Water at 80°C for 42 days:	450	&	DIN 53504-S2
Notched impact strength (Charpy) at +23°C:	kB	KJ/m2	DIN EN ISO 179-1
Notched impact strength (Charpy) at -30°C:	18	KJ/m2	DIN EN ISO 179-1