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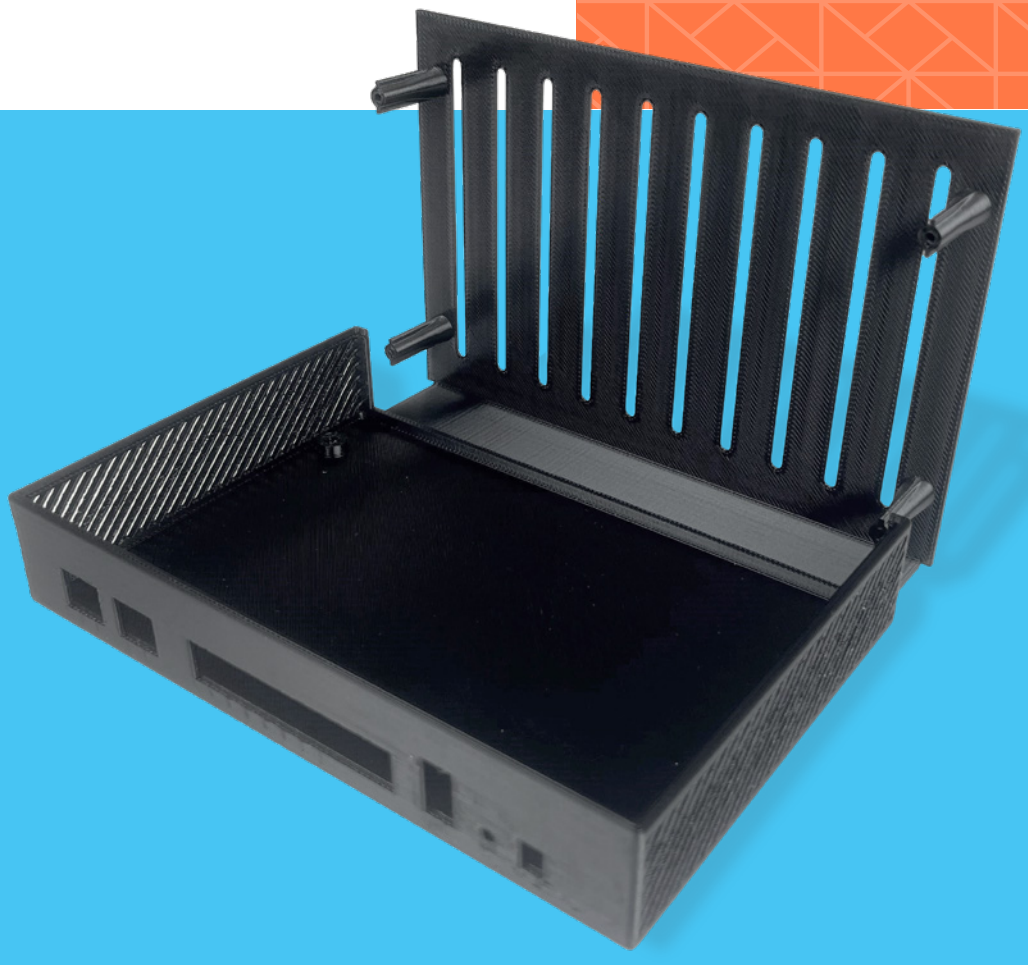
MATERIAL DATA SHEET
FDM

PC-ESD

FDM Thermoplastic Filament

The information presented are typical values intended for reference and comparison purposes only. They should not be used for design specifications or quality control purposes.



Overview

FDM® PC-ESD is a polycarbonate (PC) based material formulated to provide consistent electrostatic discharge (ESD) performance across different geometries. PC-ESD is a strong, durable, ESD material with a higher allowable usage temperature, excellent mechanical properties, and good chemical resistance. This makes it an excellent material for printed circuit board (PCB) production, electronic manufacturing, and electronic assembly applications.

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System Requirements

Table 1: Printer and Support Material Compatibility

Printer	Model Tip	Layer Height	Support Material	Support Tip
Fortus 450mc™	T16	0.254 mm (0.010 in.)	SR-100™	T12SR100
F900®	T16	0.254 mm (0.010 in.)	SR-100	T12SR100

Build Sheet

Low Temperature

- 0.51 x 406 x 470 mm (0.02 x 16 x 18.5 in.)
- 0.51 x 660 x 695 mm (0.02 x 26 x 38 in.)

System Requirements

Fortus 450mc

- Hardened machine upgrade
- Hardened Fortus 450mc head
- All-materials license or equivalent (included if new system)

F900

- Standard F900 head
- Validated-materials license

Ordering Information

Table 2: PC-ESD Ordering Information

Part Number	Description
Filament Canisters	
355-70100	PC-ESD, 92 cu in. - Plus
355-03120	SR-100, 92 cu in. - Plus
Printer Consumables	
511-10401	T16 tip
511-10100	T12SR100 tip
325-00100	Low Temperature build sheet 0.51 x 406 x 470 mm (0.02 x 16 x 18.5 in.)
325-00300	Low Temperature build sheet 0.51 x 660 x 695 mm (0.02 x 26 x 38 in.)
Print Heads	
821726-XXXX	Hardened Fortus 450mc head (blue handle)
404210-XXXX	Standard F900 head (formed rod handle)

Physical Properties

Values are measured as printed in the XY, XZ, and ZX orientations. Additional testing was done on molded parts and the filament itself. For full details refer to the Stratasys Materials Test Procedure.

Table 3: PC-ESD Physical Properties

Property	Test Method	Typical Values XY	XZ	ZX
Physical Properties - Printed				
HDT @ 66 psi	ASTM D648 Method B	145 °C (293 °F)	146 °C (295 °F)	143 °C (289 °F)
HDT @ 264 psi	ASTM D648 Method B	144 °C (291 °F)	144 °C (291 °F)	140 °C (284 °F)
Volume Resistivity Top	ASTM D257	$3.5*10^{7}$ Ω*cm	-	-
Volume Resistivity Bottom	ASTM D257	$3.5*10^{7}$ Ω*cm	-	-
Surface Resistivity Top	ASTM D257	$3.9*10^{4}$ Ω*cm	-	-
Surface Resistivity Bottom	ASTM D257	$2.0*10^{7}$ Ω*cm	-	-
Volume Resistance Top	ASTM D257	$1.3*10^{6}$ Ω	-	-
Volume Resistance Bottom	ASTM D257	$1.3*10^{6}$ Ω	-	-
Surface Resistance Top	ASTM D257	$3.9*10^{3}$ Ω	-	-
Surface Resistance Bottom	ASTM D257	$2.0*10^{6}$ Ω	-	-
Physical Properties - Non-Printed				
Tg	ASTM D7426 Inflection Point		142 °C (288 °F)	
Specific Gravity	ASTM D792 @23 °C		1.195 g/cc	
Molded HDT @ 66 psi	ASTM D648 Method B		135 °C (275 °F)	
Molded HDT @ 264 psi	ASTM D648 Method B		124 °C (255 °F)	

Mechanical Properties

Samples were printed with 0.245 mm (0.010 in.) layer heights on the Fortus 450mc and F900 with a T16 tip. For the full test procedure please see Stratasys Materials Test Procedure.

Table 4: PC-ESD Mechanical Properties – Fortus 450mc – T16 Tip and SR-100 Support

0.254 mm (0.010 in.) Layer Height		XZ Orientation[1]	ZX Orientation[1]
Tensile Properties: ASTM D638			
Yield Strength	MPa	47.6 (0.59)	32.5 (3.3)
	psi	6900 (86)	4710 (480)
Elongation @ Yield	%	3.8 (0.064)	2 (0.24)
Strength @ Break	MPa	47.1 (0.8)	32.5 (3.3)
	psi	6830 (120)	4710 (470)
Elongation @ Break	%	3.9 (0.17)	2 (0.23)
Modulus (Elastic)	GPa	1.96 (0.025)	1.91 (0.041)
	ksi	285 (3.6)	277 (6)
Flexural Properties: ASTM D790, Procedure A			
Strength @ Break	MPa	82.6 (2.2)	46.3 (6.7)
	psi	12000 (320)	6710 (970)
Strain @ Break	%	-	2.8 (0.5)
Modulus	GPa	2.19 (0.05)	1.7 (0.061)
	ksi	317 (7.3)	247 (8.9)
Impact Properties: ASTM D256, ASTM D4812			
Notched	J/m	194 (19)	21.2 (3.7)
	ft*lb/in.	3.63 (0.35)	0.397 (0.07)
Unnotched	J/m	994 (140)	166 (35)
	ft*lb/in.	18.6 (2.7)	3.11 (0.66)

[1] Values in parenthesis are standard deviations.

Table 5: PC-ESD Mechanical Properties – F900 – T16 Tip and SR-100 Support

0.254 mm (0.010 in.) Layer Height		XZ Orientation[1]	ZX Orientation[1]
Tensile Properties: ASTM D638			
Yield Strength	MPa	49.4 (0.89)	37.9 (2.3)
	psi	7160 (130)	5500 (340)
Elongation @ Yield	%	4.6 (0.072)	2.7 (0.22)
Strength @ Break	MPa	47.7 (1.4)	38 (2.4)
	psi	6910 (200)	5510 (350)
Elongation @ Break	%	5.2 (0.38)	2.7 (0.23)
Modulus (Elastic)	GPa	1.96 (0.025)	1.81 (0.023)
	ksi	285 (3.6)	263 (3.3)
Flexural Properties: ASTM D790, Procedure A			
Strength @ Break	MPa	83.2 (2.5)	49.5 (5.4)
	psi	12100 (360)	7190 (780)
Strain @ Break	%	-	3.1 (0.42)
Modulus	GPa	2.17 (0.048)	1.69 (0.052)
	ksi	314 (7)	245 (7.5)
Impact Properties: ASTM D256, ASTM D4812			
Notched	J/m	233 (15)	23.1 (2.6)
	ft*lb/in.	4.37 (0.29)	0.433 (0.049)
Unnotched	J/m	1390 (120)	151 (38)
	ft*lb/in.	26 (2.3)	2.82 (0.71)

[1] Values in parenthesis are standard deviations.

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