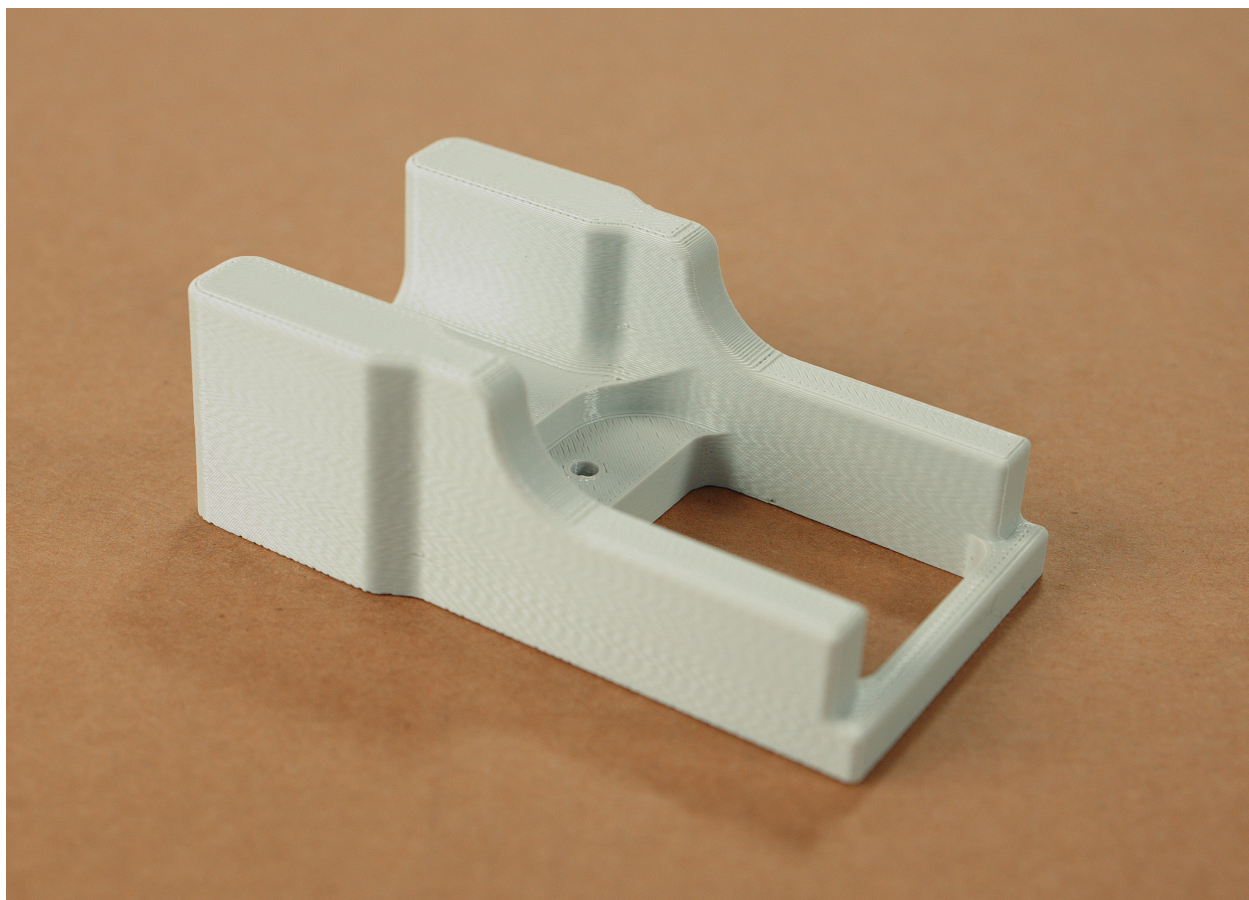
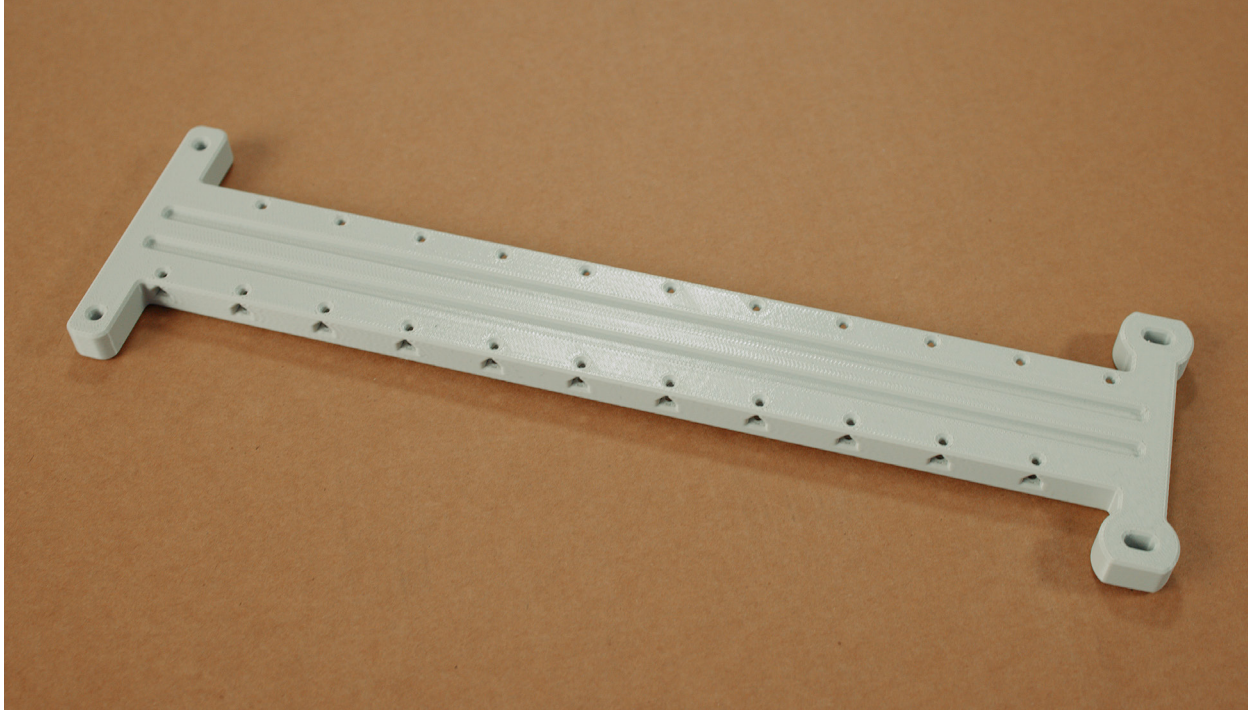


# Kimya PC-FR



## 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

Kimya PC-FR is a polycarbonate FDM® 3D printing filament with flame-retardant properties developed specifically for additive manufacturing. It retains the beneficial characteristics of standard polycarbonate such as dimensional stability, high glass transition temperature and high impact resistance but also meets European railway fire safety standard EN 45545-2.

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## Ordering Information

**Table 1: Kimya PC-FR Ordering Information**

Part Number	Description
<b>Filament Canisters</b>	
355-70010	PC-FR, 92 cu in. - Plus
355-03120	SR-100 Soluble Support, 92 cu in. - Plus
<b>Printer Consumables</b>	
511-10401	T16 tip
511-10100	T12SR100 tip
325-00100	Low temperature build sheet, 0.02 x 16 x 18.5 in. (0.51 x 406 x 470 mm)
325-00300	Low temperature build sheet, 0.02 x 26 x 38 in. (0.51 x 660 x 965 mm)

## Physical Properties

Values are measured as printed. XY/XZ and ZX orientations were tested. For full details refer to the [Stratasys Materials Test Report](#).

**Table 2: Kimya PC-FR Physical Properties**

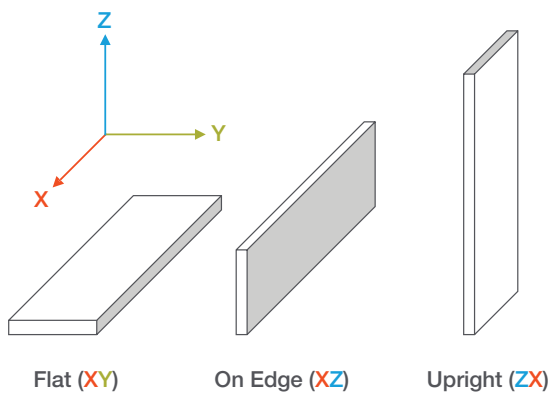
Property	Test Method	Typical Values	
		XY	XZ/ZX
HDT @ 66 psi	ASTM D648 Method B	119.3 °C (246.7 °F)	118.9 °C (246.1 °F)
HDT @ 264 psi	ASTM D648 Method B	118.5 °C (245.4 °F)	118.0 °C (244.4 °F)
Tg	ASTM D7426 Inflection Point	114 °C (237 °F)	

## Mechanical Properties

Samples were printed with 0.010 in. (0.524 mm) layer height on the Fortus 450mc. For the full test procedure please see the [Stratasys Materials Test Procedure](http://www.stratasys.com) on [www.stratasys.com](http://www.stratasys.com).

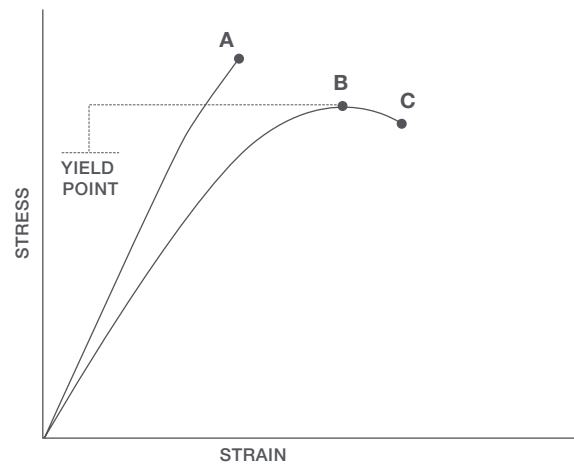
### Print Orientation

Parts created using FDM are anisotropic as a result of the printing process. Below is a reference of the different orientations used to characterize the material.



### Tensile Curves

Due to the anisotropic nature of FDM, tensile curves look different depending on orientation. Below is a guide of the two types of curves seen when printing tensile samples and what reported values mean.



A = Tensile at break, elongation at break (no yield point)

B = Tensile at yield, elongation at yield

C = Tensile at break, elongation at break

Table 3: Kimya PC-FR Mechanical Properties - Fortus 450mc with T16 tip

		XZ Orientation <sup>1</sup>	ZX Orientation <sup>1</sup>
<b>Tensile Properties: ASTM D638</b>			
Yield Strength	MPa	72.2 (3.0)	33.1 (5.5)
	psi	10500 (440)	4800 (800)
Elongation @ Yield	%	5.4 (0.50)	1.6 (0.31)
Strength @ Break	MPa	67.3 (2.8)	32.9 (5.5)
	psi	9770 (400)	4770 (790)
Elongation @ Break	%	6.7 (0.98)	1.6 (0.30)
Modulus (Elastic)	GPa	2.21 (0.029)	2.18 (0.059)
	ksi	321 (4.2)	316 (8.5)
<b>Flexural Properties: ASTM D790, Procedure A</b>			
Peak Stress	MPa	107 (3.0)	72.8 (10.)
	psi	15500 (440)	10600 (1500)
Modulus	GPa	2.53 (0.062)	2.01 (0.026)
	ksi	367 (9.0)	292 (3.8)
<b>Impact Properties: ASTM D256, ASTM D4812</b>			
Notched	J/m	87.5 (9.6)	26.4 (5.9)
	ft*lb/in.	1.64 (0.18)	0.514 (0.11)
Unnotched	J/m	2170 (530)	39.0 (6.4)
	ft*lb/in.	40.6 (10)	0.731 (0.12)

<sup>1</sup> Values in parenthesis are standard deviations.

**Table 4: Kimya PC-FR Mechanical Properties - F900® with T16 tip**

		XZ Orientation <sup>1</sup>	ZX Orientation <sup>1</sup>
<b>Tensile Properties: ASTM D638</b>			
Yield Strength	MPa	71.6 (1.9)	35.5 (8.7)
	psi	10400 (270)	5160 (1300)
Elongation @ Yield	%	5.5 (0.25)	1.9 (0.47)
Strength @ Break	MPa	63.0 (4.2)	35.5 (8.7)
	psi	9140 (610)	5150 (1300)
Elongation @ Break	%	8.0 (1.3)	1.9 (0.47)
Modulus (Elastic)	GPa	2.24 (0.039)	2.07 (0.044)
	ksi	325 (5.7)	301 (6.4)
<b>Flexural Properties: ASTM D790, Procedure A</b>			
Strength @ Break	MPa	-	61.8 (9.9)
	psi	-	8970 (1400)
Strain @ Break	%	-	3.2 (0.64)
Strength @ 5% Strain	MPa	107 (1.7)	-
	psi	15500 (250)	-
Modulus	GPa	2.54 (0.043)	1.99 (0.068)
	ksi	369 (6.3)	289 (9.9)
<b>Impact Properties: ASTM D256, ASTM D4812</b>			
Notched	J/m	78.1 (13)	18.9 (2.2)
	ft*lb/in.	1.46 (0.24)	0.354 (0.041)
Unnotched	J/m	2100 (130)	89.6 (27)
	ft*lb/in.	39.3 (2.4)	1.68 (0.50)

<sup>1</sup> Values in parenthesis are standard deviations.



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