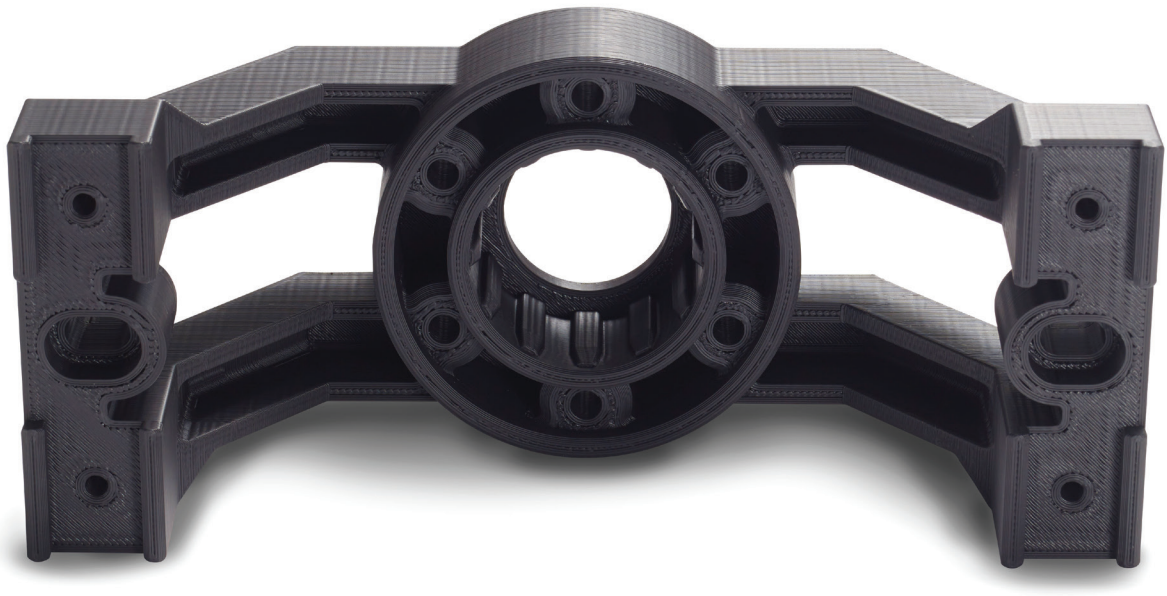
Diran 410MF07

FDM Thermoplastic Filament

Perfect for manufacturing tooling applications.

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

Diran™ 410MF07 is a nylon-based thermoplastic FDM® material, mineral-filled 7% by weight. It demonstrates very good toughness and impact strength combined with resistance to hydrocarbon-based chemicals. Its smooth, lubricious surface quality offers low sliding resistance.

Typical applications include jigs, fixtures and other forms of general manufacturing tooling, and is particularly effective for applications needing a non-marring interface between the tool and the workpiece.

Contents:

Ordering Information

3D Printer Compatibility: F370™

Support Material: SUP4000B™

Build Tray: F370, High Temperature

Table 1. Diran 410MF07 Thermoplastic Filament Ordering Information

Part Number	Description
Filament Canisters	
333-90410	Diran 410MF07, 90 cu in, F123
333-60400	SUP4000B™, 60 cu in, F123
Printer Consumables	
123-00401-S	F370 Extrusion Head
123-00314-S	F370 Build Tray, High Temperature

Physical Properties

Values are measured as printed. XY and XZ/ZX orientations were tested.

For full details refer to the Stratasys Materials Test Procedure on www.stratasys.com.

DSC and TMA curves can be found in the Appendix.

Table 2. Diran 410MF07 Thermoplastic Filament Physical Properties

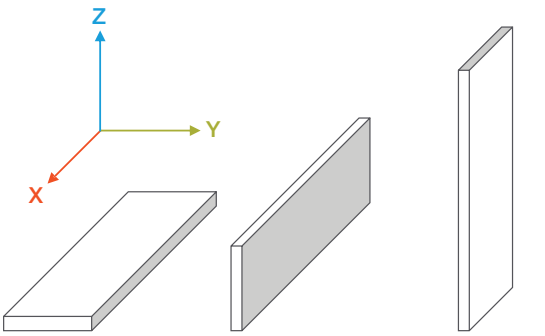
Property	Test Method	Typical Values XY	Typical Values XZ/ZX
HDT @ 66psi	ASTM D648 Method B	90 °C (194 °F)	90 °C (194 °F)
HDT @ 264psi	ASTM D648 Method B	70 °C (158 °F)	70 °C (158 °F)
Tg	ASTM D7426 Inflection Point	117 °C (243 °F)	117 °C (243 °F)
Mean CTE	ASTM E831 (40 °C to 140 °C)	55 µm/[m·°C] (31 µin/[in·°F])	113 µm/[m·°C] (63 µin/[in·°F])
Volume Resistivity	ASTM D257	> $1.5*10^{15}$ Ω·cm	> $1.5*10^{15}$ Ω·cm
Dielectric Constant	ASTM D150 1 kHz test condition	3.58	3.73
Dielectric Constant	ASTM D150 2 MHz test condition	2.85	2.95
Dissipation Factor	ASTM D150 1 kHz test condition	0.013	0.014
Dissipation Factor	ASTM D150 2 MHz test condition	0.000	0.012
Specific Gravity	ASTM D792 @ 23 °C	1.16	1.16

Mechanical Properties

Samples were printed with 0.010 in. (0.254 mm) layer height.
For the full test procedure please see the Stratasys Materials Test Procedure on www.stratasys.com.

Print Orientation

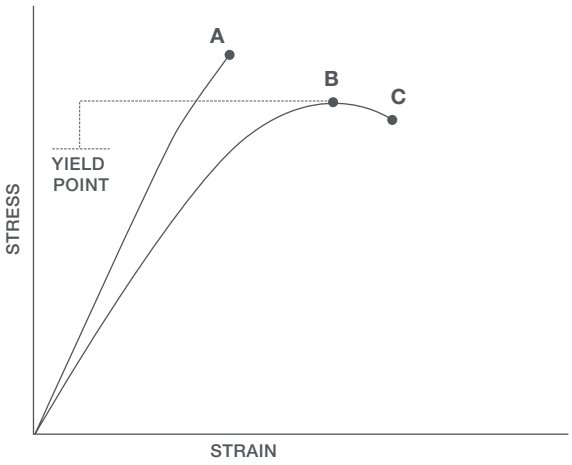
Parts created using FDM are anisotropic as a result of the printing process. Below is a reference of the different orientations used to characterize the material.



Flat (XY) On Edge (XZ) Upright (ZX)

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. Diran 410MF07 Thermoplastic Filament Mechanical Properties

		XZ Orientation[1]	ZX Orientation[1]
Tensile Properties: ASTM D638			
Yield Strength	MPa	45 (2)	No yield
	psi	6,490 (220)	No yield
Elongation @ Yield	%	4.26 (0.04)	No yield
Strength @ Break	MPa	40 (3)	30 (2)
	psi	5,860 (440)	4,460 (295)
Elongation @ Break	%	12 (3)	3.1 (1.0)
Modulus (Elastic)	GPa	1.69 (0.02)	1.46 (0.02)
	ksi	245 (3)	210 (3)
Flexural Properties: ASTM D790, Procedure A			
Strength @ Break	MPa	No break	45 (2)
	psi	No break	6,770 (325)
Strength @ 5% Strain	MPa	60 (2)	-
	psi	8,800 (230)	-
Strain @ Break	%	No break	3.1 (0.6)
Modulus	GPa	1.85 (0.04)	1.47 (0.07)
	ksi	270 (6)	210 (10)
Compression Properties: ASTM D695			
Yield Strength	MPa	75 (5)	160 (30)
	psi	10,980 (630)	23,560 (4330)
Modulus	GPa	1.54 (0.03)	1.45 (0.02)
	ksi	220 (4)	210 (3)
Impact Properties: ASTM D256, ASTM D4812			
Izod, Notched	J/m	380 (135)	27 (5)
	ft*lb/in	7 (3)	0.5 (0.1)
Izod, Unnotched	J/m	1,415 (200)	140 (25)
	ft*lb/in	25 (4)	2.6 (0.5)

(1) Values in parentheses are standard deviations

Appendix

Figure 1. 2nd heating scan, DSC, for Diran 410MF07

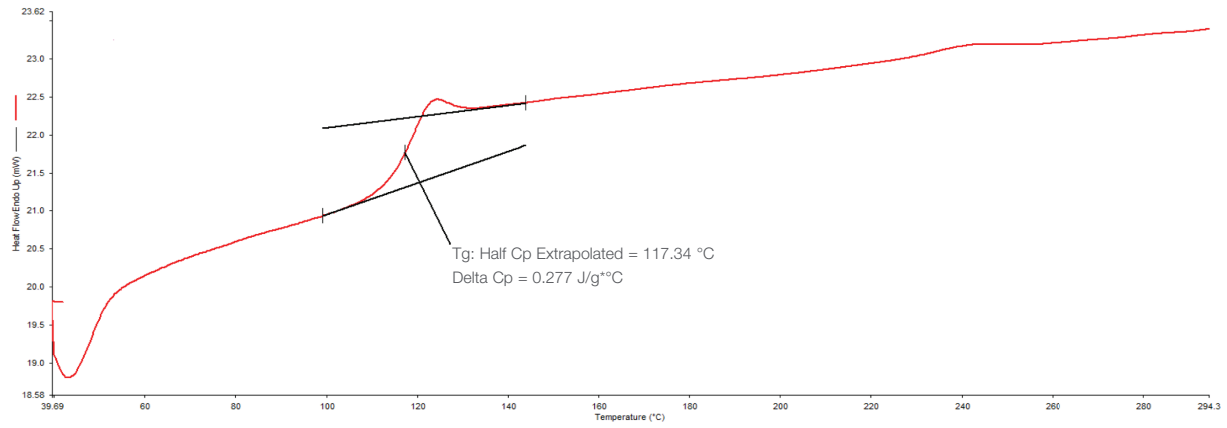


Figure 2. TMA CTE curve inplane with the layer

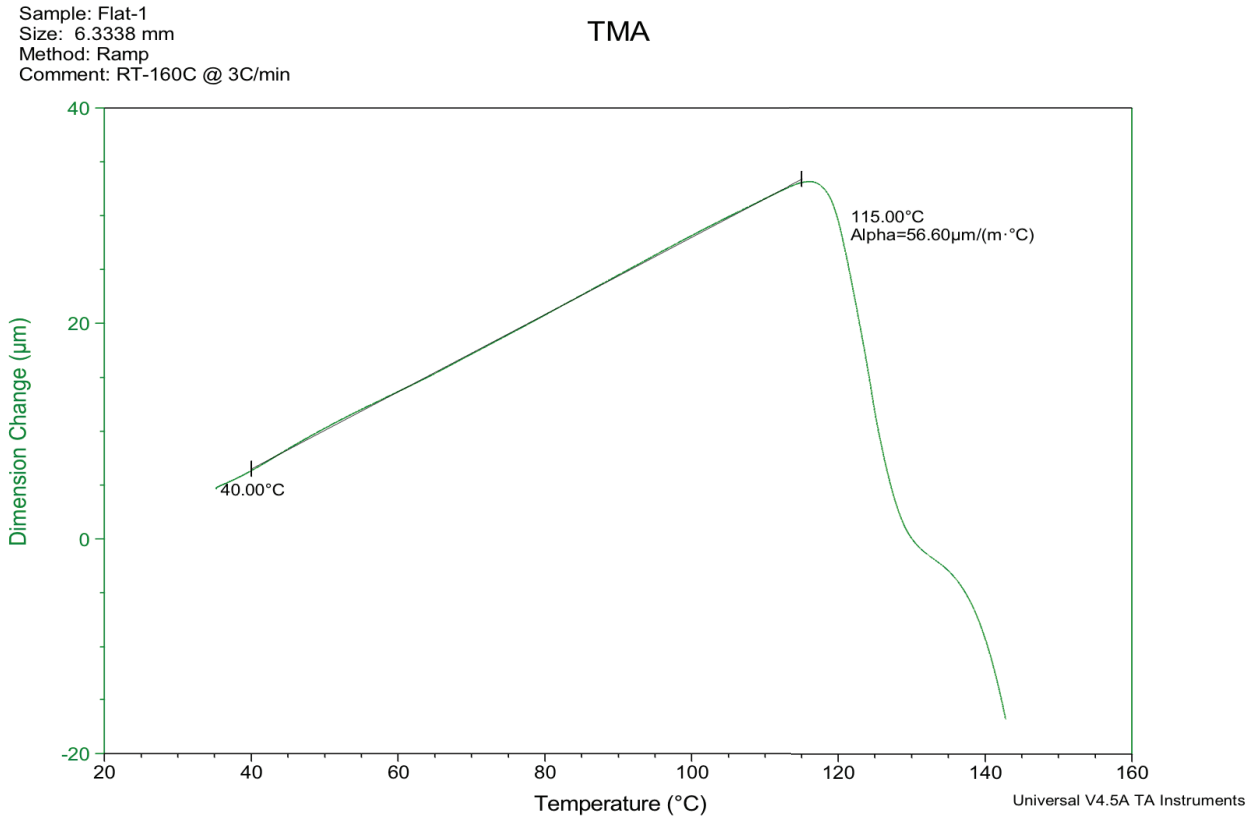
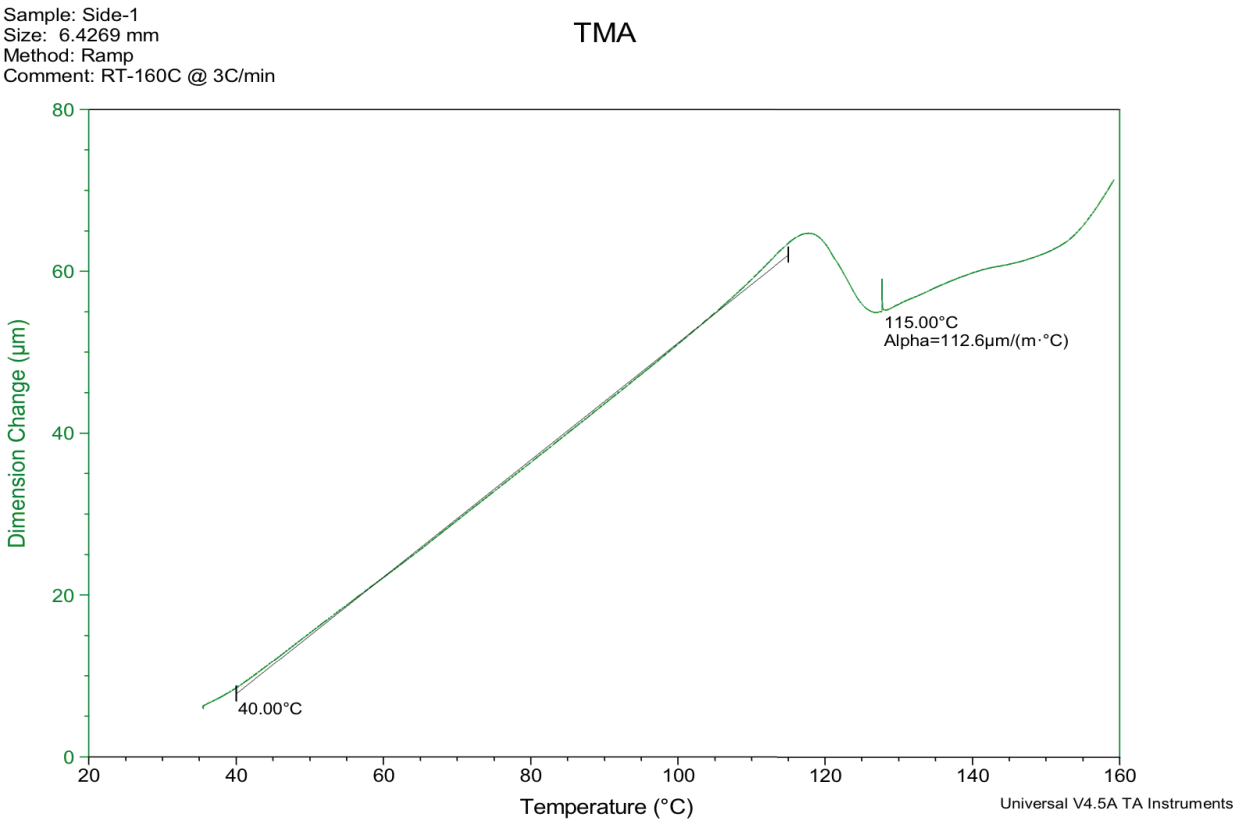


Figure 3. TMA CTE curve normal to the layer



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