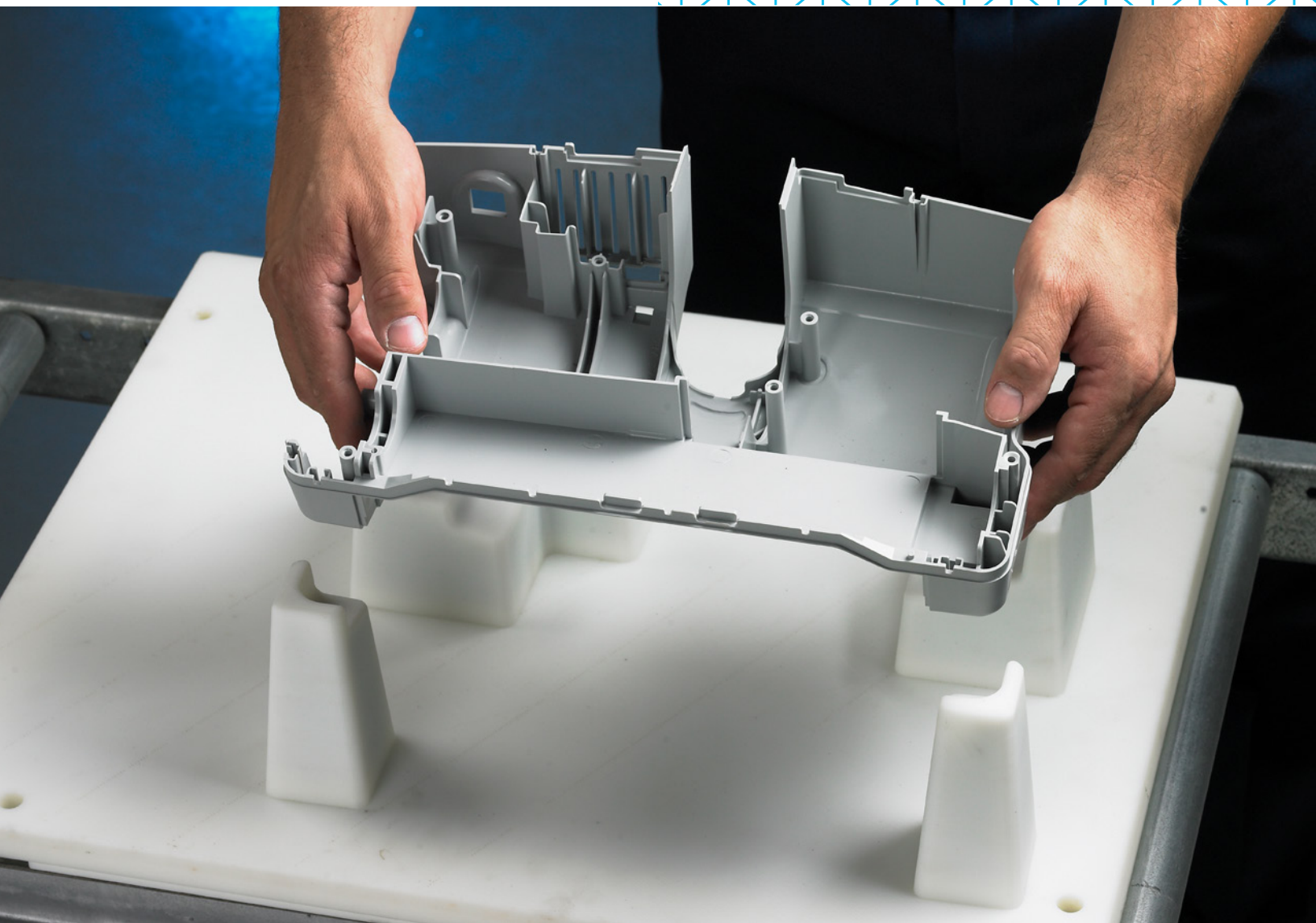
stratasys

MATERIAL DATA SHEET
FDM

ABS-M30

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

ABS-M30™ filament combines the design freedom of FDM® technology with the versatility and capability of ABS (acrylonitrile butadiene styrene). ABS is characterized by its strength and toughness, while being lightweight and resilient, suitable for most general-purpose 3D printing use cases.

Contents:

Ordering Information

Table 1: Printer and Support Material Compatibility

Printer	Model Tip	Layer Height	Support Material	Support Tip
F170™	F123 Standard Head	0.127 mm (0.005 in.) 0.178 mm (0.007 in.) 0.254 mm (0.010 in.) 0.330 mm (0.013 in.)	QSR Support™ (soluble)	F123 Standard Head
F190™ CR	F123 Standard Head	0.127 mm (0.005 in.) 0.178 mm (0.007 in.) 0.254 mm (0.010 in.) 0.330 mm (0.013 in.)	QSR Support (soluble)	F123 Standard Head
F370™	F123 Standard Head	0.127 mm (0.005 in.) 0.178 mm (0.007 in.) 0.254 mm (0.010 in.) 0.330 mm (0.013 in.)	QSR Support (soluble)	F123 Standard Head
F370®CR	F123 Standard Head	0.127 mm (0.005 in.) 0.178 mm (0.007 in.) 0.254 mm (0.010 in.) 0.330 mm (0.013 in.)	QSR Support (soluble)	F123 Standard Head
F770™	F123 Standard Head	0.178 mm (0.007 in.) 0.254 mm (0.010 in.) 0.330 mm (0.013 in.)	SR-30™ (soluble)	F123 Standard Head
Fortus 450mc™	T10 T12 T16 T20	0.127 mm (0.005 in.) 0.178 mm (0.007 in.) 0.254 mm (0.010 in.) 0.330 mm (0.013 in.)	SR-30/SR-35™ (soluble)	T12SR30
Fortus 900mc™/F900®	T12 T16 T20	0.178 mm (0.007 in.) 0.254 mm (0.010 in.) 0.330 mm (0.013 in.)	SR-30/SR-35 (soluble)	T12SR30

Build Sheet

F123 Standard Build Trays

Fortus Low Temperature Build Sheets

- 0.51 x 660 x 965 mm (0.02 x 26 x 38 in.)
- 0.51 x 406 x 470 mm (0.02 x 16 x 18.5 in.)

F770 Build Sheets

- 0.381 x 762 x 1,041 mm (0.015 x 30 x 41 in.)

Colors

Natural/Ivory

White

Black

Gray

Dark Gray

Red

Blue

Green

Yellow

Orange

System Requirements[1]

Fortus 450mc
- Standard Fortus 450mc head
- ABS material license (included if new system)

F900
- Standard F900 head
- ABS material license (included if new system)

F770
- Standard F123 head (black cover, head life of 1,500 hours)

F123/F123 CR
- Standard F123 head (black cover, head life of 1,500 hours)

[1] Contact your Stratasys representative for ordering information

Table 2: ABS-M30 Ordering Information

Part Number	Description	System Compatibility
Filament Consumables		
Filament Plus Canisters (black snout)		
355-02110	ABS-M30 (Natural/Ivory), 1,510 cc (92.3 cu in.) - Plus	Fortus 450mc, F900, Fortus 900mc (S/N L502 and up)
355-08110	ABS-M30 (Natural/Ivory), 3,020 cc (184 cu in.) - Plus	
355-02111	ABS-M30 (White), 1,510 cc (92.3 cu in.) - Plus	
355-02112	ABS-M30 (Black), 1,510 cc (92.3 cu in.) - Plus	
355-08112	ABS-M30 (Black), 3,020 cc (184 cu in.) - Plus	
355-02113	ABS-M30 (Gray), 1,510 cc (92.3 cu in.) - Plus	
355-02114	ABS-M30 (Red), 1,510 cc (92.3 cu in.) - Plus	
355-02115	ABS-M30 (Blue), 1,510 cc (92.3 cu in.) - Plus	
355-02120	ABS-M30i (Natural/Ivory), 1,510 cc (92.3 cu in.) - Plus	
355-03110	SR-30 Soluble Support, 1,510 cc (92.3 cu in.) - Plus	
355-03135	SR-35 Soluble Support, 1,510 cc (92.3 cu in.) - Plus	
Fortus Plus TrueRefill™ Spool*		
353-02110	ABS-M30 (Natural/Ivory), 1,510 cc (92.3 cu in.) - Plus TrueRefill™	Fortus 450mc, F900, Fortus 900mc (S/N L502 and up)
353-02112	ABS-M30 (Black), 1,510 cc (92.3 cu in.) - Plus TrueRefill™	
353-03135	SR-35 Soluble Support, 1,510 cc (92.3 cu in.) - Plus TrueRefill™	
380-00104	Fortus Plus Canister and Filament Guide	
380-00103	Aluminum tape for sealing canister, 19 mm (0.75 in.) wide	
Fortus Plus Xtend 500 Box		
360-50110	ABS-M30 (Natural/Ivory), 8,195 cc (500 cu in.) - Xtend	Fortus 450mc, F900, Fortus 900mc (S/N L502 and up)
360-50211	ABS-M30 (Black), 8,195 cc (500 cu in.) - Xtend	

Fortus Classic Canister (gray snout)		
311-20000	ABS-M30 (Natural/Ivory) 1,510 cc (92.3 cu in.) - Classic	Fortus 900mc (S/N prior to L502)
311-20018	ABS-M30 (Natural/Ivory) 3,020 cc (184 cu in.) - Classic	
311-20100	ABS-M30 (White) 1,510 cc (92.3 cu in.) - Classic	
311-20200	ABS-M30 (Black) 1,510 cc (92.3 cu in.) - Classic	
311-20218	ABS-M30 (Black) 3,020 cc (184 cu in.) - Classic	
311-20300	ABS-M30 (Gray) 1,510 cc (92.3 cu in.) - Classic	
311-20400	ABS-M30 (Red) 1,510 cc (92.3 cu in.) - Classic	
311-20500	ABS-M30 (Blue) 1,510 cc (92.3 cu in.) - Classic	
311-21400	ABS-M30i (Natural/Ivory), 1,510 cc (92.3 cu in.) - Classic	
311-30200	SR-30 Soluble Support, 1,510 cc (92.3 cu in.) - Classic	
311-30235	SR-35 Soluble Support, 1,510 cc (92.3 cu in.) - Classic	
F123/F123CR Series Spools		
333-60300	ABS-M30 (Natural/Ivory), 983 cc (60 cu in.) - F123	F170, F190CR, F370, F370CR
333-90300	ABS-M30 (Natural/Ivory), 1,475 cc (90 cu in.) - F123	
333-60302	ABS-M30 (White), 983 cc (60 cu in.) - F123	
333-90302	ABS-M30 (White), 1,475 cc (90 cu in.) - F123	
333-60301	ABS-M30 (Black), 983 cc (60 cu in.) - F123	
333-90301	ABS-M30 (Black), 1,475 cc (90 cu in.) - F123	
333-60308	ABS-M30 (Dark Gray), 983 cc (60 cu in.) - F123	
333-90308	ABS-M30 (Dark Gray), 1,475 cc (90 cu in.) - F123	
333-60303	ABS-M30 (Red), 983 cc (60 cu in.) - F123	
333-60304	ABS-M30 (Blue), 983 cc (60 cu in.) - F123	
333-60305	ABS-M30 (Green), 983 cc (60 cu in.) - F123	
333-60306	ABS-M30 (Yellow), 983 cc (60 cu in.) - F123	
333-60307	ABS-M30 (Orange), 983 cc (60 cu in.) - F123	
333-63500	QSR Soluble Support, 983 cc (60 cu in.) - F123	
F770 Boxes		
331-20307	ABS-M30 (Black), 3,277 cc (200 cu in.), LONG LEAD	F770
331-20207	SR-30 Soluble Support, 3,277 cc (200 cu in.), LONG LEAD	

Printer Consumables		
Fortus		
511-10501	T10 tip	Fortus 450mc
511-10301	T12 tip	Fortus 450mc, F900, Fortus 900mc
511-10401	T16 tip	
511-10701	T20 tip	
511-10900	T12SR30 tip	
325-00100	Low Temperature build sheet, 0.02 x 16 x 18.5 in.	
325-00300	Low Temperature build sheet, 0.02 x 26 x 38 in.	F900, Fortus 900mc
F123/F123CR Series		
123-00302-S	F170 Build Tray, Standard	F170
123-00303-S	F190CR Build Tray, Standard	F190CR
123-00304	F370/F370CR Build Tray, Standard	F370, F370CR
F770		
123-50102-S	F770 build sheet, 0.015 x 30 x 41 in. (0.381 x 762 x 1,041 mm), box of 20	F770
Print Heads		
Fortus		
821725-XXXX	Standard Fortus 450mc head (silver handle)	Fortus 450mc
380-30300-S	OpenAM Standard Fortus 450mc head (silver handle, additional sticker)	
404210-XXXX	Standard F900 head (formed rod handle)	F900, Fortus 900mc
380-63600-S	OpenAM Standard F900 head (formed rod handle, additional sticker)	
F123/F123CR Series		
123-00402-S	F123 T14 Standard Head (black cover)	F170, F190CR, F370, F370CR
F770		
123-00402-S	F123 T14 Standard Head (black cover)	F770

* Part number 380-00104 is recommended to purchase in the event a new canister or filament guide is needed. Part number 380-00103 aluminum tape is recommended to purchase to properly seal the Fortus canister.

Physical Properties

Values are measured as printed. XY and ZX orientations were tested. For full details refer to the Stratasys Materials Test Procedure. DSC and TMA curves can be found in the Appendix.

Table 3: ABS-M30 Physical Properties

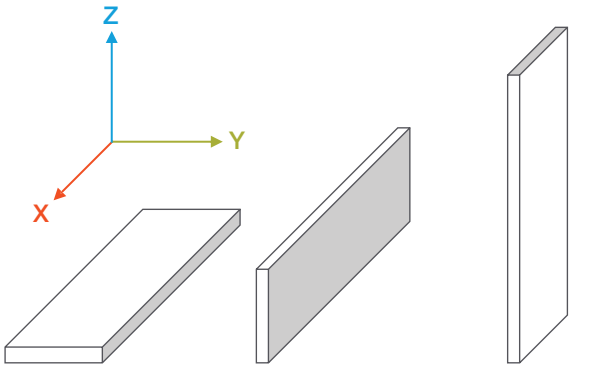
Property	Test Method	Typical Values XY	Typical Values ZX
HDT @ 66 psi	ASTM D648 Method B	104.4 °C (220.0 °F)	-
HDT @ 264 psi	ASTM D648 Method B	100.0 °C (212.0 °F)	-
Tg	ASTM D7426 Inflection Point	105.2 °C (221.4 °F)	
Mean CTE	ASTM E831 (40 °C to 140 °C)	60.77 µm/[m*°C] (33.76 µin./[in.*°F])	
Mean CTE	ASTM E831 (40 °C to 80 °C)		58.65 µm/[m*°C] 32.58 µin/[in*°F]
Volume Resistivity	ASTM D257	> 6.75*10^14 Ω*cm	
Dielectric Constant	ASTM D150 1 kHz test condition	2.64	2.78
Dielectric Constant	ASTM D150 2 MHz test condition	2.49	2.61
Dissipation Factor	ASTM D150 1 kHz test condition	0.003	0.005
Dissipation Factor	ASTM D150 2 MHz test condition	0.004	0.007
Specific Gravity	ASTM D257 @23 °C	1.05	

Mechanical Properties

ABS-M30 samples were printed with a 0.25 mm (0.010 in.) layer height on the F900 and F770. For the full test procedure please see the Stratasys Materials Test Procedure.

Print Orientation

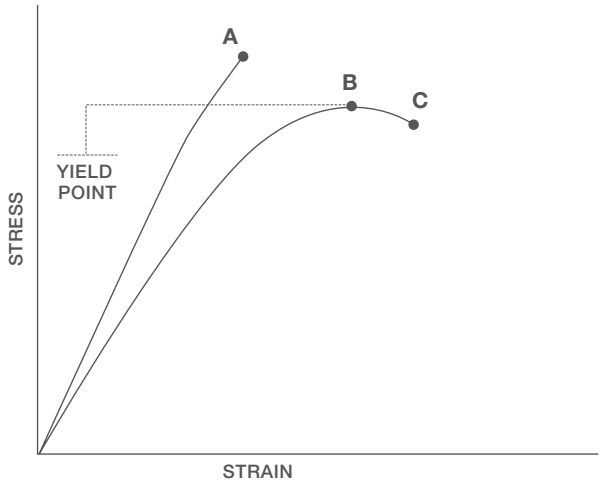
Parts created using FDM are anisotropic as a result of the printing process. Below is a reference of the different orientations used to characterize the material.



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 4: ABS-M30 Black Mechanical Properties - F900 - T16 Tip

0.25 mm (0.010 in.) Layer Height		XZ Orientation[1]	ZX Orientation[1]
Tensile Properties: ASTM D638			
Yield Strength	MPa	30.8 (0.85)	27.5 (0.28)
	psi	4,470 (120)	3,990 (41)
Elongation @ Yield	%	1.8 (0.043)	1.7 (0.13)
Strength @ Break	MPa	28.1 (0.58)	26.8 (0.84)
	psi	4,080 (84)	3,890 (120)
Elongation @ Break	%	8.1 (1.5)	1.8 (0.31)
Modulus (Elastic)	GPa	2.40 (0.080)	2.30 (0.16)
	ksi	349 (12)	334 (23)
Flexural Properties: ASTM D790, Procedure A			
Strength @ Break	MPa	No break	47.7 (2.2)
	psi	No break	6,910 (320)
Strength @ 5% Strain	MPa	58.7 (0.54)	-
	psi	8,510 (78)	-
Strain @ Break	%	No break	3.4 (0.22)
Modulus	GPa	2.22 (0.037)	1.96 (0.064)
	ksi	323 (5.4)	284 (9.3)
Compression Properties: ASTM D695			
Yield Strength	MPa	88.3 (3.0)	208 (15)
	psi	12,800 (440)	30,100 (2,200)
Modulus	GPa	2.20 (0.11)	2.16 (0.092)
	ksi	319 (17)	314 (13)
Impact Properties: ASTM D256, ASTM D4812			
Notched	J/m	101 (9.9)	32.2 (3.0)
	ft*lb/in	1.89 (0.19)	0.603 (0.057)
Unnotched	J/m	291 (57)	103 (30)
	ft*lb/in	5.45 (1.1)	1.93 (0.57)

[1] Values in parentheses are standard deviations.

Table 5: ABS-M30 Black Mechanical Properties - F770 - T14 Standard Head

0.25 mm (0.010 in.) Layer Height		XZ Orientation[1]	ZX Orientation[1]
Tensile Properties: ASTM D638			
Yield Strength	MPa	32.5 (1.7)	23.1 (1.3)
	psi	4,720 (250)	3,350 (190)
Elongation @ Yield	%	2.1 (0.1)	1.6 (0.2)
Strength @ Break	MPa	27.6 (2.4)	22.9 (1.2)
	psi	4,000 (350)	3,310 (170)
Elongation @ Break	%	4.5 (1.2)	1.6 (0.2)
Modulus (Elastic)	GPa	2.00 (27)	1.78 (29)
	ksi	290 (3.9)	258 (4.1)
Flexural Properties: ASTM D790, Procedure A			
Strength @ Break	MPa	No Break	37.8 (4.1)
	psi	No Break	5,480 (590)
Strength @ 5% Strain	MPa	58.1 (2.2)	-
	psi	8,430 (320)	-
Strain @ Break	%	No Break	2.2 (0.3)
Modulus	GPa	2.17 (0.03)	1.84 (0.06)
	ksi	315 (4.9)	267 (8.1)
Impact Properties: ASTM D256, ASTM D4812			
Peak Strength	MPa	91.0 (17)	21.7 (3.7)
	psi	1.71 (0.31)	0.406 (0.07)
Modulus	GPa	423 (96)	62.9 (134)
	ksi	7.92 (1.8)	1.18 (0.3)

[1] Values in parentheses are standard deviations.

Appendix

Figure 1: 2nd heating scan DSC data for the ABS-M30 Black Flat (XY) sample.

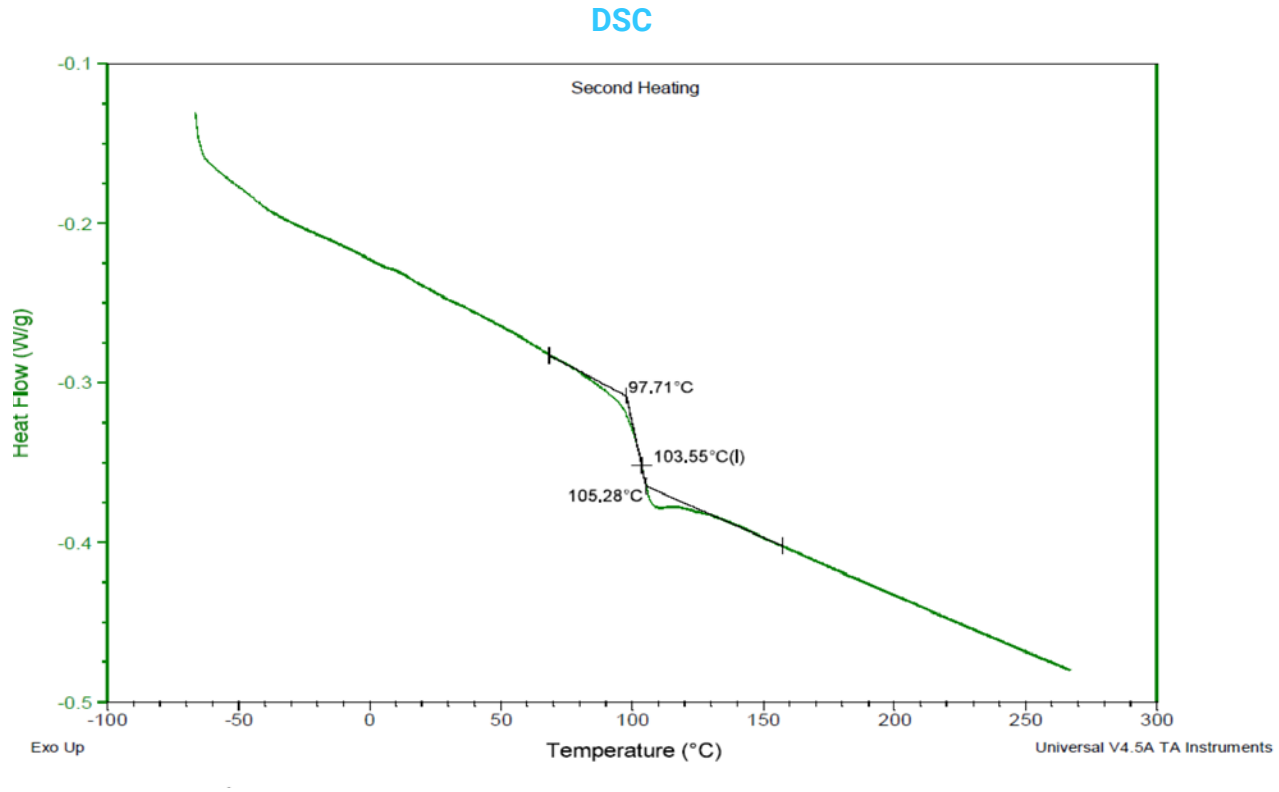


Figure 2: Dimension change data as a function of temperature for the ABS-M30 Black Flat (XY)

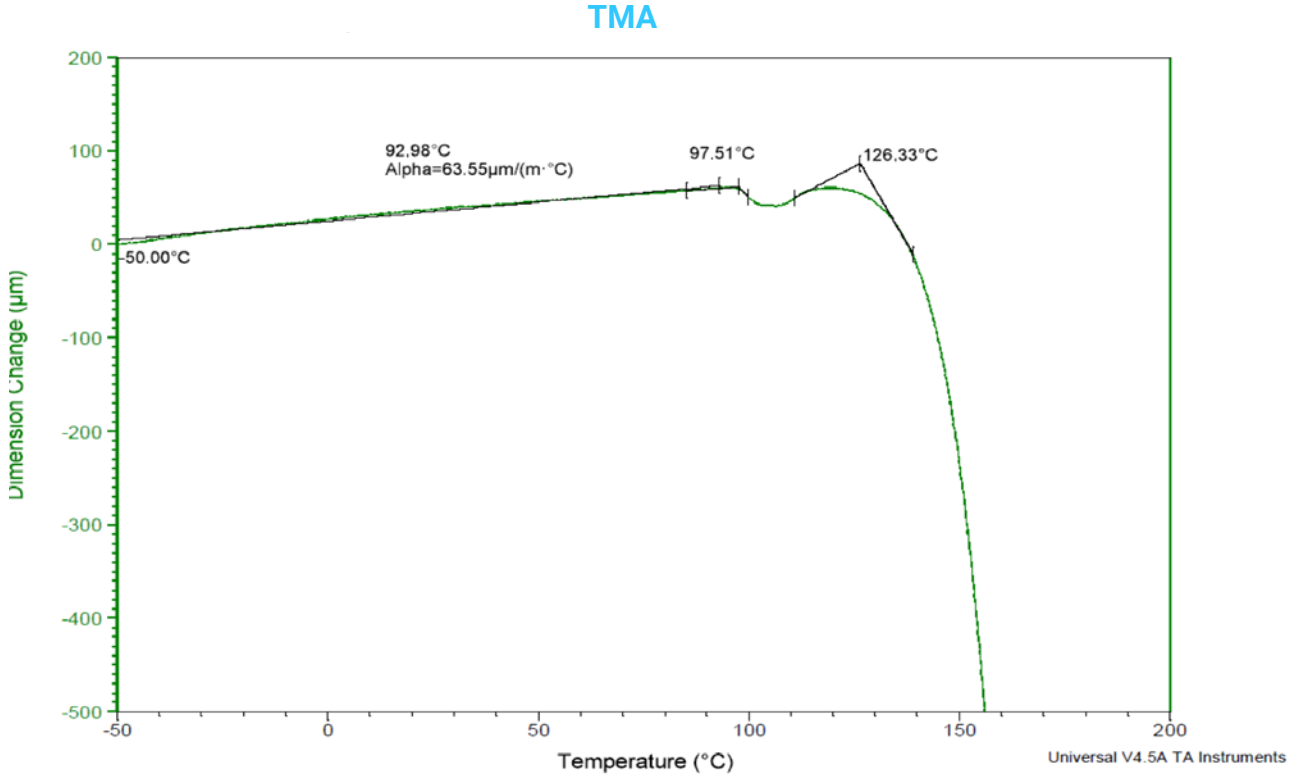


Figure 3: Dimension change data as a function of temperature for the ABS-M30 Black On Edge (XZ) sample.

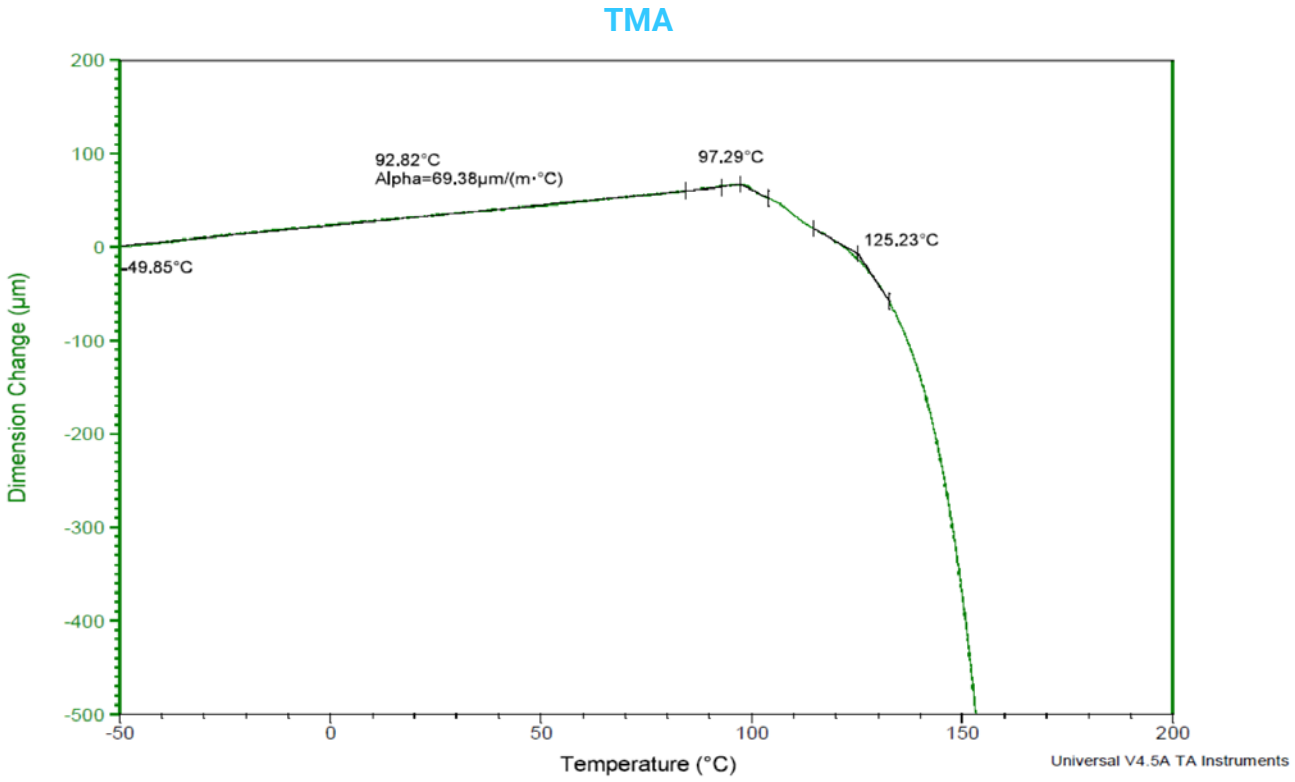
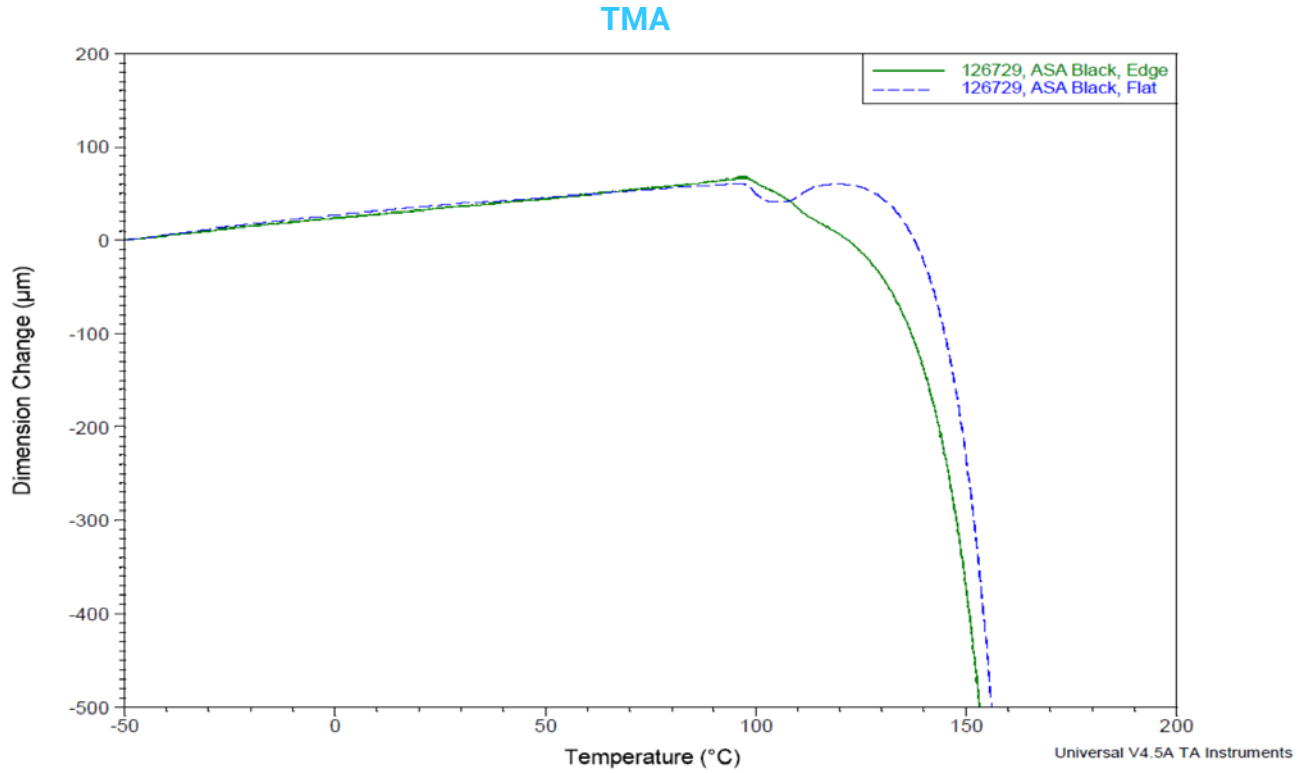
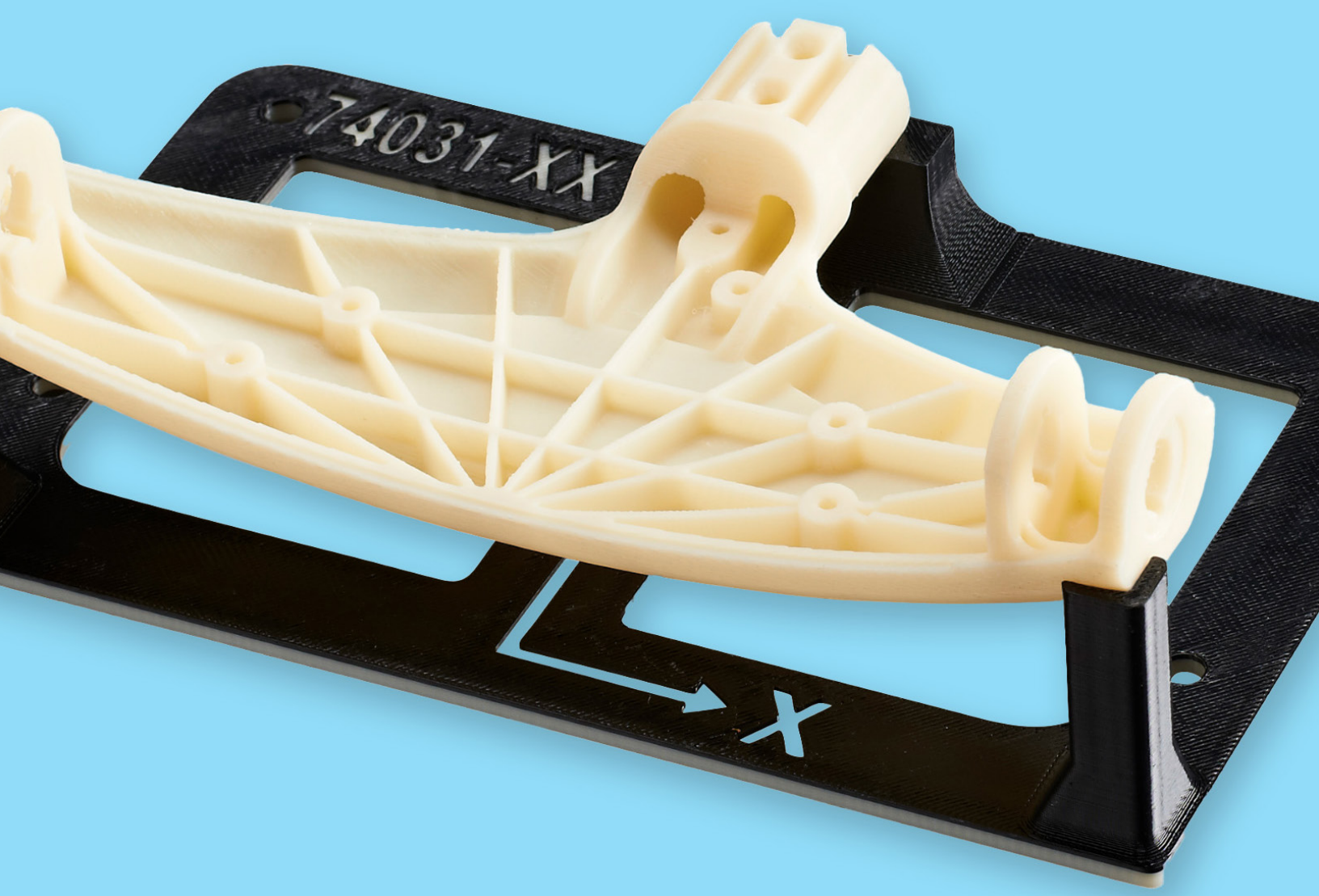


Figure 4: Overlay of the dimension change data for the Flat (XY) and On Edge (XZ) ABS-M30 Black samples.





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MATERIAL DATA SHEET
FDM

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