The Design to Manufacturing Co.

MATERIAL
ABS M30
OVERVIEW

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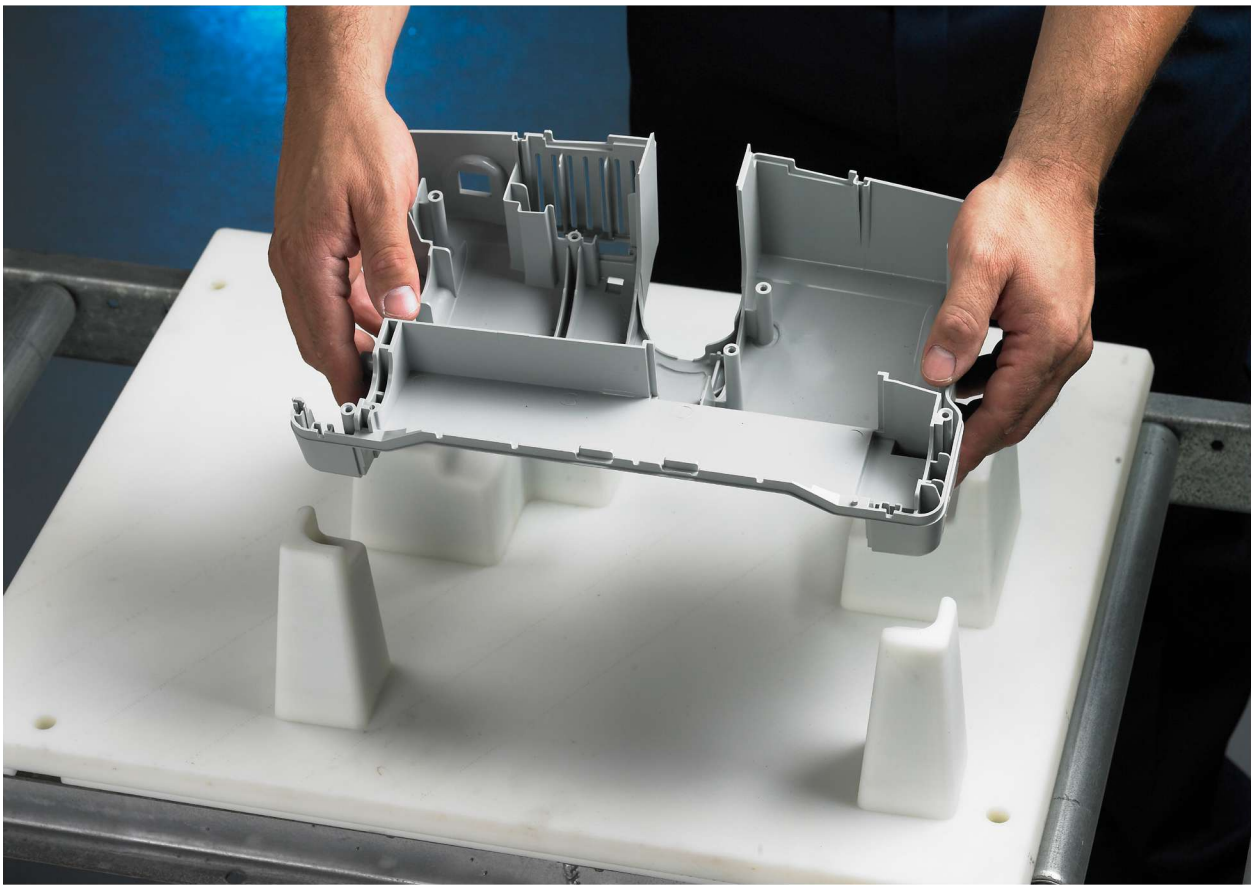
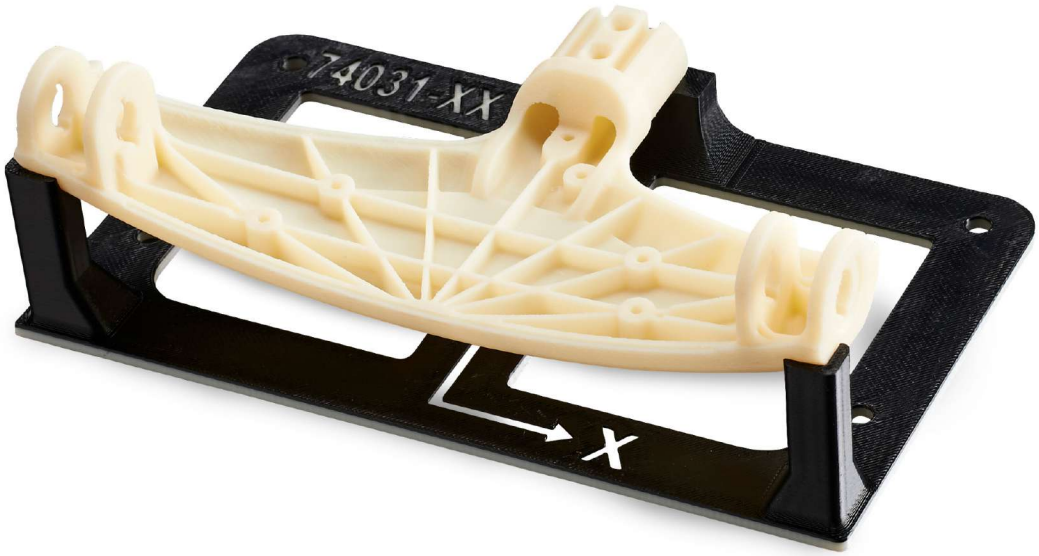
stratasys

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 (Slice)	Support Material	Support Tip
F120™	F123 Head (7, 10, 13 slice)	SR-30 (soluble)	F123 Head (all slices)
F170™	F123 Head (5, 7, 10, 13 slice)	QSR Support™ (soluble)	F123 Head (all slices)
F190™CR	F123 Head (5, 7, 10, 13 slice)	QSR Support (soluble)	F123 Head (all slices)
F270™	F123 Head (5, 7, 10, 13 slice)	QSR Support (soluble)	F123 Head (all slices)
F370™	F123 Head (5, 7, 10, 13 slice)	QSR Support (soluble)	F123 Head (all slices)
F370®CR	F123 Head (5, 7, 10, 13 slice)	QSR Support (soluble)	F123 Head (all slices)
F770™	F123 Head (7, 10, 13 slice)	SR-30 (soluble)	F123 Head (all slices)
Fortus 450mc™	T10 (5 slice) T12 (7 slice) T16 (10 slice) T20 (13 slice)	SR-30 / 35 (soluble)	T12SR30 (all slices)
Fortus 900mc™/F900™	T12 (7 slice) T16 (10 slice) T20 (13 slice)	SR-20 / 30 / 35 (soluble)	T12SR20 / 30 (all slices)

Build Sheet

F123 Standard Build Trays

Low Temperature

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

F770 Build Sheets

- 0.01 x 30 x 41 in. (0.254 x 762 x 1041 mm)

Table 2. Consumable Ordering Information

Part Number	Description
Printer Consumables	
123-00402-S	F123 Standard Head (all layer heights)
511-10501	T10
511-10301	T12
511-10401	T16
511-10701	T20
511-10900	T12SR30
511-10901	T12SR20
123-00302-S	F120/F170 Build Tray
123-00303-S	F270/F190CR Build Tray, Standard
123-00304	F370/F370CR Build Tray, Standard
123-50100	F770 Build sheet, 0.01 x 30 x 41 in. (0.254 x 762 x 1041 mm), box of 20
325-00300	Low Temperature build sheet, 0.02x26x38 in. (0.51x660x965 mm)
325-00100	Low Temperature build sheet, 0.02x16x18.5 in. (0.51x406x470 mm)
310-00100	Low Temperature build sheet, 0.03x16x18.5 in. (0.76x406x470 mm)
355-00100	Low Temperature build sheet, 0.02x14x16.5 in (0.51x355x420 mm)

Table 3. ABS-M30 Ordering Information

Part Number	Description
Filament Canisters [1] [2]	
355-02110	ABS-M30 (Ivory), 92.3 cu in - Plus
355-02111	ABS-M30 (White), 92.3 cu in - Plus
355-02112	ABS-M30 (Black), 92.3 cu in - Plus
355-02113	ABS-M30 (Gray), 92.3 cu in - Plus
355-02114	ABS-M30 (Red), 92.3 cu in - Plus
355-02115	ABS-M30 (Blue), 92.3 cu in - Plus
355-02116	ABS-M30 (Nectarine), 92.3 cu in - Plus
355-02117	ABS-M30 (Yellow), 92.3 cu in - Plus
355-08110	ABS-M30 (Ivory), 184 cu in - Plus
355-08112	ABS-M30 (Black), 184 cu in - Plus
355-02120	ABS-M30i, 92.3 cu in - Plus
360-50110	ABS-M30 (Ivory), 500 cu in - Xtend
360-50211	ABS-M30 (Black), 500 cu in - Xtend
333-60300	ABS-M30 (Ivory), 60 cu in - F123
333-60301	ABS-M30 (Black), 60 cu in - F123
333-60302	ABS-M30 (White), 60 cu in - F123
333-60303	ABS-M30 (Red), 60 cu in - F123
333-60304	ABS-M30 (Blue), 60 cu in - F123
333-60305	ABS-M30 (Green), 60 cu in - F123
333-60306	ABS-M30 (Yellow), 60 cu in - F123
333-60307	ABS-M30 (Orange), 60 cu in - F123
333-60308	ABS-M30 (Dark Gray), 60 cu in - F123
333-90300	ABS-M30 (Ivory), 90 cu in - F123
333-90301	ABS-M30 (Black), 90 cu in - F123
333-90302	ABS-M30 (White), 90 cu in - F123
333-90308	ABS-M30 (Dark Gray), 90 cu in - F123
311-20000	ABS-M30 (Ivory) 92.3 cu in - Classic
311-20018	ABS-M30 (Natural) 184 cu in - Classic
311-20100	ABS-M30 (White) 92.3 cu in - Classic
311-20200	ABS-M30 (Black) 92.3 cu in - Classic
311-20218	ABS-M30 (Black) 184 cu in - Classic
311-20300	ABS-M30 (Gray) 92.3 cu in - Classic
311-20400	ABS-M30 (Red) 92.3 cu in - Classic
311-20500	ABS-M30 (Blue) 92.3 cu in - Classic
311-21400	ABS-M30i, 92.3 cu in - Classic
331-20307	ABS (Black), 200 cu in., long lead - F770
355-03110	SR-30 Soluble Support, 92.3 cu in - Plus
360-53110	Xtend SR-30 Soluble Support, 500 cu in - Plus
310-30500	SR-20 Soluble Support, 92.3 cu in - Classic
311-30200	SR-30 Soluble Support, 92.3 cu in - Classic
331-20200	SR-30 Soluble Support, 200 cu in - F120
331-20207	SR30 Soluble Support, 200 cu in., long lead - F770
355-03135	SR-35 Soluble Support, 92.3 cu in - Plus
311-30235	SR-35 Soluble Support, 92.3 cu in - Classic
333-63500	QSR Soluble Support, 60 cu in - F123

[1] Classic canisters are compatible with all Fortus 900mc printers prior to s/n L502.

[2] Plus canisters are compatible with all Fortus 450mc, all Stratasys F900, and Fortus 900mc printers s/n L502 and up.

Physical Properties

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

Table 4. ABS-M30 Physical Properties

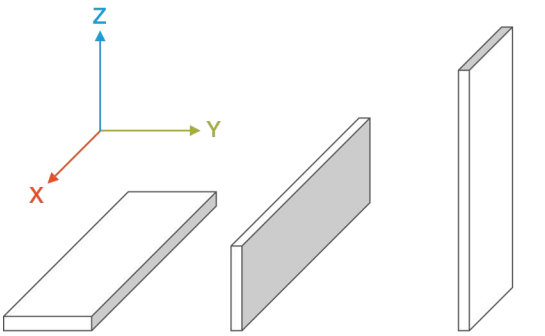
Property	Test Method	Typical Values	
		XY	XZ/ZX
HDT @ 66 psi	ASTM D648 Method B	103.8 C (218.9 F)	
HDT @ 264 psi	ASTM D648 Method B	99.9 C (211.7 F)	
Tg	ASTM D7426 Inflection Point	105.2 C (221.4 F)	
Mean CTE	ASTM E831 (40 °C to 140 °C)	60.77 µm/[m*°C] (33.76 µin./[in.*°F])	
Mean CTE	ASTM E831 (40 °C 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 black samples were printed with 0.010 in. (0.254 mm) layer heights on the F900 and F770.

Print Orientation

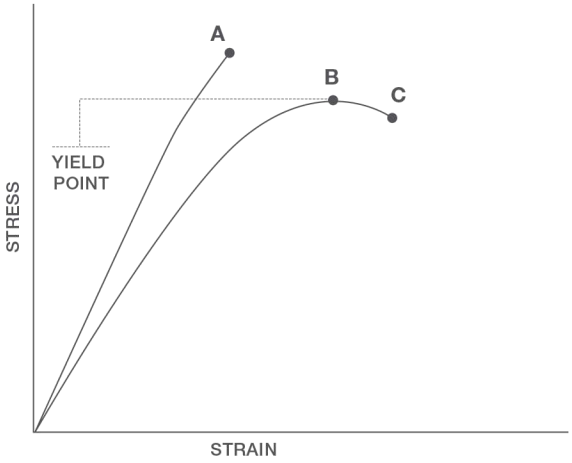
Parts created using FDM are anisotropic as a result of the printing process. Below is a reference of the different orientations used to characterize the material.



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 5. ABS-M30 Mechanical Properties (F900 - T16 Tip)

		XZ Orientation[1]	ZX Orientation[1]
Tensile Properties: ASTM D638			
Yield Strength	MPa	30.8 (0.85)	27.5 (0.28)
	psi	4470 (120)	3990 (41)
Elongation @ Yield	%	1.8 (0.043)	1.7 (0.13)
Strength @ Break	MPa	28.1 (0.58)	26.8 (0.84)
	psi	4080 (84)	3890 (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	6910 (320)
Strength @ 5% Strain	MPa	58.7 (0.54)	-
	psi	8510 (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	12800 (440)	30100 (2200)
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 6. ABS-M30 Mechanical Properties (F770)

		XZ Orientation[1]	ZX Orientation[1]
Tensile Properties: ASTM D638			
Yield Strength	MPa	32.5 (1.7)	23.1 (1.3)
	psi	4720 (250)	3350 (190)
Elongation @ Yield	%	2.1 (0.1)	1.6 (0.2)
Strength @ Break	MPa	27.6 (2.4)	22.9 (1.2)
	psi	4000 (350)	3310 (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	5480 (590)
Strength @ 5% Strain	MPa	58.1 (2.2)	-
	psi	8430 (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			
Notched	J/m	91.0 (17)	21.7 (3.7)
	ft*lb/in	1.71 (0.31)	0.406 (0.07)
Unnotched	J/m	423 (96)	62.9 (134)
	ft*lb/in	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.

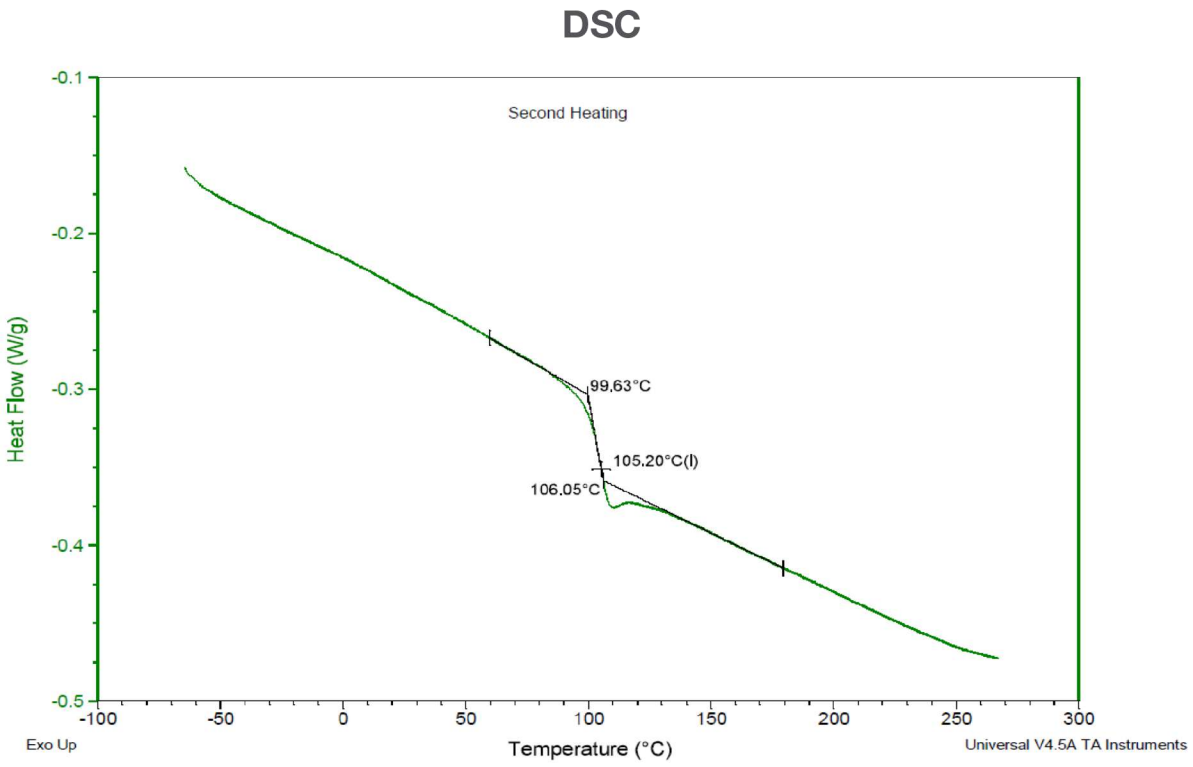


Figure 2. Dimension change data as a function of temperature for the ABS-M30 Black Flat (XY) sample.

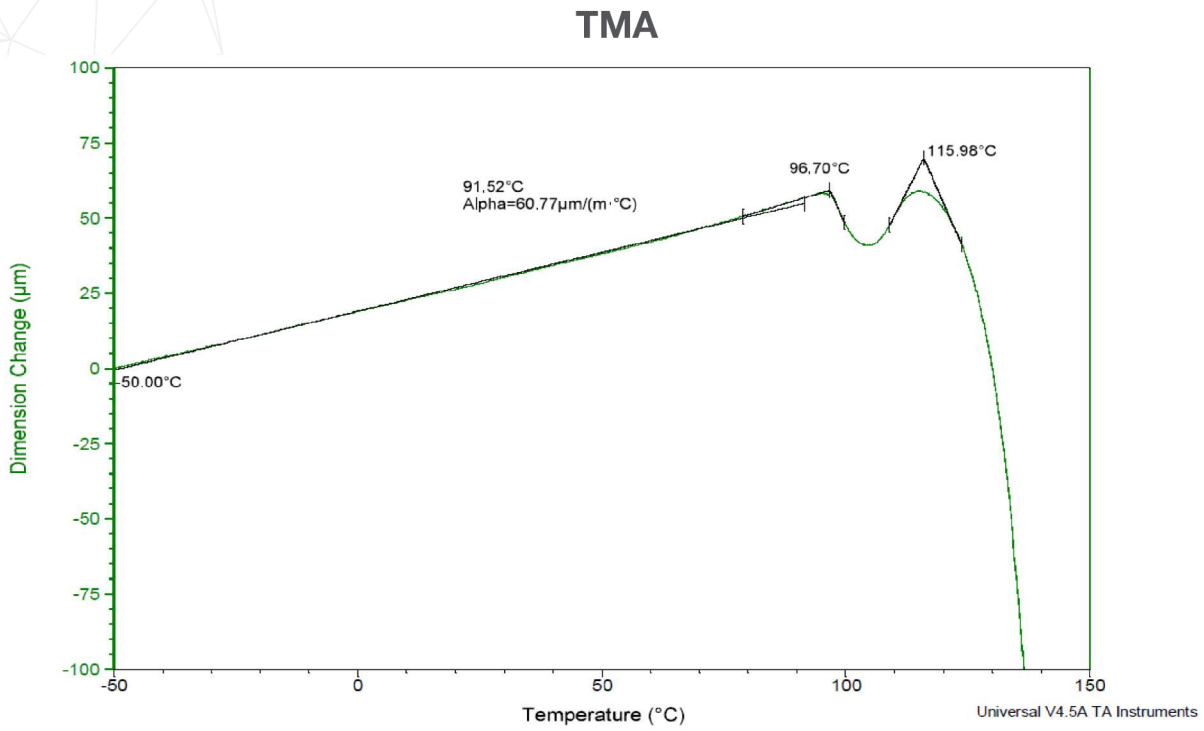


Figure 3. Dimension change data as a function of temperature for the ABS-M30 Black On Edge (XZ) sample.

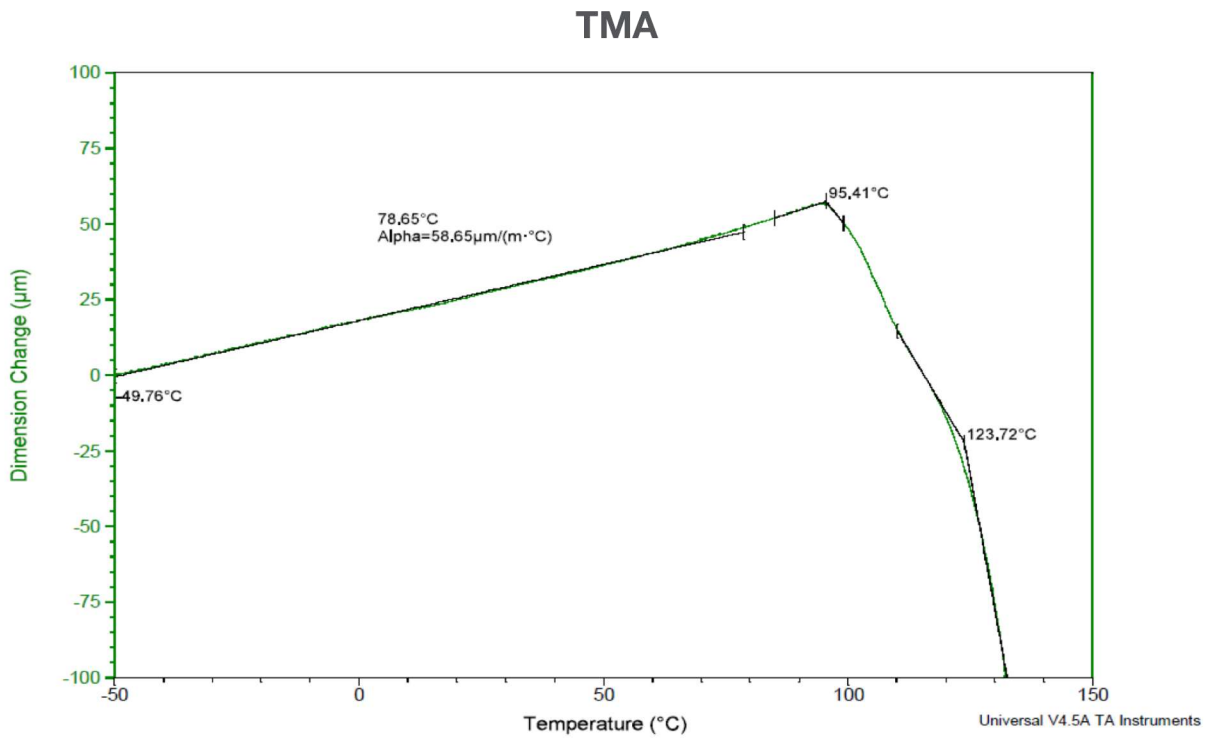


Figure 4. Overlay of the dimension change data for the Flat (XY) and On Edge (XZ) ABS-M30 Black samples.