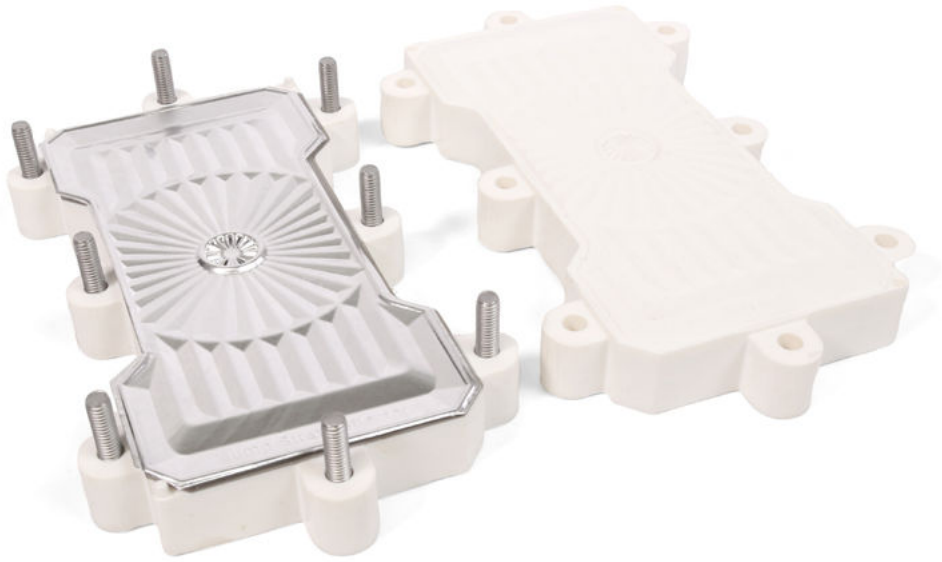
ToughONE™

ToughONE™ expands the capabilities of PolyJet™ technology, bridging the gap between visual appeal and functional performance. Now, you can seamlessly transition from form-fit visual prototypes to robust functional prototypes, making it the ideal choice for industries demanding both strength and precision.

ToughONE can be used with the following printers:

System Compatibility			
System	**ToughONE White**	**ToughONE WhiteS**	**ToughONE Black**
J826™ Prime	●	○	○
J850/35™ Prime	●	○	●
J850 Pro	●	○	●
J835™	●	○	●
J850™ Digital Anatomy™	●	○	○
J55™ Prime	○	●	○
J5 MediJet®	○	●	○
J35™ Pro	○	●	○
J5 Digital Anatomy™	○	●	○



Configuration: ToughONE White Pure (Single Material) for J8 Series™ Printers

Values in parentheses are standard deviations.

Property	Units	Out of Printer	12 hr. Post-Cure @ 45 °C
Tensile Properties: ASTM D638			
Yield Strength	MPa	40 (2)	50 (2)
	ksi	5.8 (0.3)	7.3 (0.3)
Elongation at Break	%	55 (4)	53 (5)
Modulus (Elastic)	MPa	2,433 (185)	2,457 (87)
	ksi	353 (27)	356 (13)
Flexural Properties: ASTM D790			
Strength at Break	MPa	59 (4)	82 (5)
	ksi	8.6 (0.6)	11.9 (0.7)
Modulus	MPa	1,713 (106)	2,284 (157)
	ksi	248 (15)	331 (23)
Impact Properties: ASTM D256, ASTM D4812			
Izod, Notched	J/m	47 (4)	47 (4)
	ft•lb/in	0.88 (0.08)	0.88 (0.08)
Izod, Unnotched	J/m	1,160 (150)	1,131 (126)
	ft•lb/in	21.7 (2.8)	21.2 (2.4)
Physical Properties			
HDT @ 0.45 MPa: ASTM D-648-06	°C	49 (2)	61 (2)
	°F	120.2 (3.6)	141.8 (3.6)
Tg: DMA, E"	°C	51	74
	°F	123.8	165.2
Shore Hardness	Scale D	81 (1)	82 (1)

System Availability	Layer Thickness Capability	Support Structure	Available Color
J826 Prime J850/35 Prime J850 Pro J850 Core J835 J850 Digital Anatomy	Horizontal build layers down to 14 microns (0.00055 in.), depending on print mode	SUP705 (waterjet removable)	White

Note: Material properties may vary depending on printing parameters and post-processing conditions.

Configuration: ToughONE White Reinforced for J8 Series Printers

(Digitally Mixed With RGD531 Reinforcer)

Values in parentheses are standard deviations.

Property	Units	Out of Printer	12 hr. Post-Cure @ 45 °C	12 hr. Post-Cure @ 80 °C
Tensile Properties: ASTM D638				
Yield Strength	MPa	51 (1)	58 (2)	62 (1)
	ksi	7.4 (0.1)	8.4 (0.3)	9.0 (0.1)
Elongation at Break	%	46 (7)	31 (9)	24 (3)
Modulus (Elastic)	MPa	2,518 (109)	2,661 (86)	2,873 (61)
	ksi	365 (16)	386 (12)	417 (9)
Flexural Properties: ASTM D790				
Strength at Break	MPa	65 (2)	87 (6)	87 (4)
	ksi	9.4 (0.3)	12.6 (0.9)	12.6 (0.6)
Modulus	MPa	1,836 (46)	2,345 (120)	2,295 (93)
	ksi	266 (7)	340 (17)	333 (13)
Impact Properties: ASTM D256, ASTM D4812				
Izod, Notched	J/m	94 (5)	96 (4)	105 (7)
	ft•lb/in	1.76 (0.09)	1.80 (0.08)	1.96 (0.13)
Izod, Unnotched	J/m	1,108 (28)	1,042 (127)	928 (131)
	ft•lb/in	20.7 (0.5)	19.5 (2.4)	17.4 (2.5)
Physical Properties				
HDT @ 0.45 MPa: ASTM D-648-06	°C	53 (1)	65 (1)	79 (1)
	°F	127.4 (1.8)	149.0 (1.8)	174.2 (1.8)
HDT @ 1.82 MPa: ASTM D-648-06	°C	46 (1)	57 (1)	61 (1)
	°F	114.8 (1.8)	134.6 (1.8)	141.8 (1.8)
Tg: DMA, E"	°C	60	74	79
	°F	140.0	165.2	174.2
Shore Hardness	Scale D	82 (1)	82 (2)	84 (2)

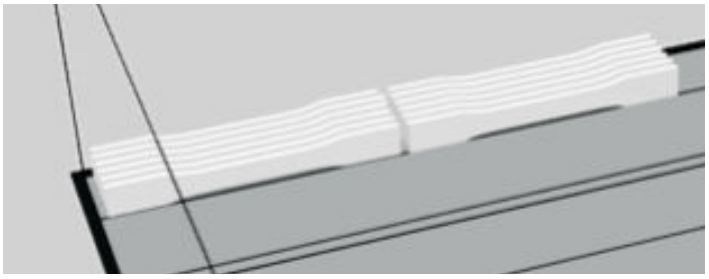
System Availability	Layer Thickness Capability	Support Structure	Available Color
J826 Prime J850/35 Prime J850 Pro J850 Core J835 J850 Digital Anatomy	Horizontal build layers down to 14 microns (0.00055 in.), depending on print mode	SUP705 (waterjet removable)	White

Note: Material properties may vary depending on printing parameters and post-processing conditions.

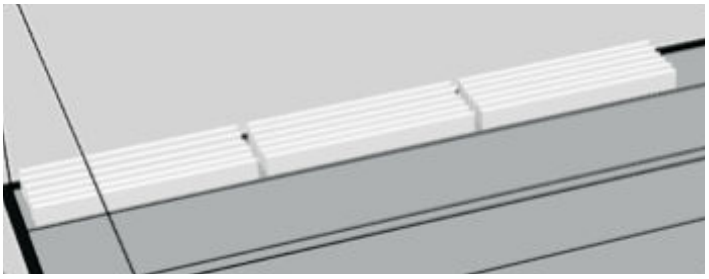
Printing and Measurement Details:
ToughONE White for J8 Series Printers

The following procedures were used to obtain the values found in this datasheet.

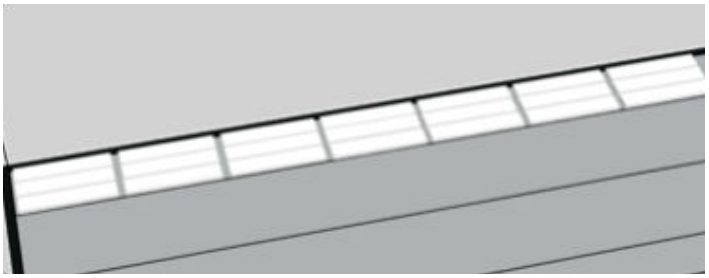
- Post-curing was performed with the ProLight™ Cure Box at 45/80 °C for 12 hrs using visible blue light (450 nm wavelength).
- Samples were measured within 24 hours of printing or post-curing.
- Support removal was done mechanically, without using waterjet.
- Dogbones and flexural bars were printed glossy in the XZ orientation, in one pass (see illustration below).
- Izod impact bars were printed glossy in XY orientation, in one pass (see illustration below).



Dogbones, glossy XZ



Flexural bars, glossy XZ



Izod impact bars, glossy XY

Note: Material properties may vary depending on printing parameters and post-processing conditions.

Configuration: ToughONE WhiteS for J35 Pro and J5 Series Printers

There is no need to post-cure the ToughONE WhiteS material. Values in parentheses are standard deviations.

Property	Units	ToughONE WhiteS Pure	ToughONE WhiteS Reinforced (With RGD531S)
Tensile Properties: ASTM D638			
Yield Strength	MPa	39 (3)	49 (2)
	ksi	5.6 (0.4)	7.1 (0.3)
Elongation at Break	%	40 (10)	38 (5)
Modulus (Elastic)	MPa	2,229 (151)	2,596 (170)
	ksi	323 (22)	376 (25)
Flexural Properties: ASTM D790			
Strength at Break	MPa	57 (7)	67 (4)
	ksi	8.3 (1)	9.7 (0.6)
Modulus	MPa	1,772 (278)	1,864 (142)
	ksi	257 (40)	270 (21)
Impact Properties: ASTM D256, ASTM D4812			
Izod, Notched	J/m	45 (4)	71 (4)
	ft•lb/in	0.84 (0.08)	1.33 (0.08)
Izod, Unnotched	J/m	1,285 (61)	961 (66)
	ft•lb/in	24.0 (1.1)	18.0 (1.2)
Physical Properties			
HDT @ 0.45 MPa: ASTM D-648-06	°C	46 (2)	52 (2)
	°F	114.8 (3.6)	125.6 (3.6)
Tg: DMA, E"	°C	60 (1)	63 (1)
	°F	140.0 (3.6)	145.4 (3.6)
Shore Hardness	Scale D	74 (1)	74 (1)

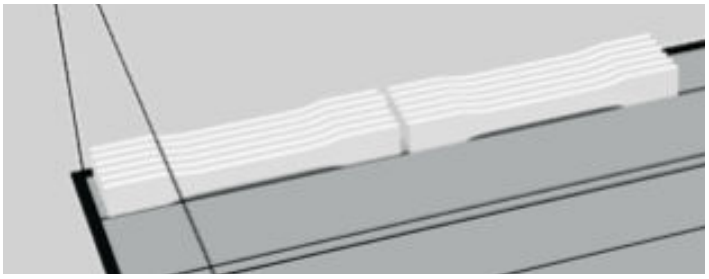
System Availability	Layer Thickness Capability	Support Structure	Available Color
J35 Pro J55 Prime J5 MediJet J5 Digital Anatomy	Horizontal build layers down to 18.75 microns (0.0007 in.), depending on print mode	SUP710S (waterjet removable)	White

Note: Material properties may vary depending on printing parameters and post-processing conditions.

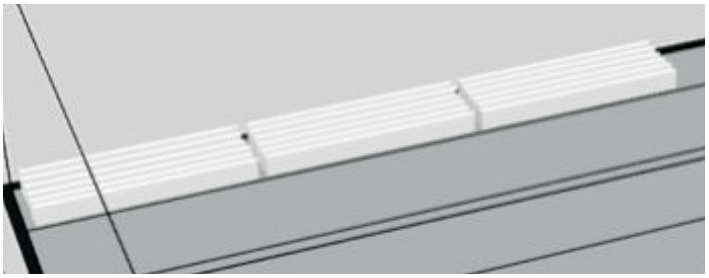
Printing and Measurement Details:
ToughONE WhiteS for J35 Pro and J5 Series Printers

The following procedures were used to obtain the values found in this datasheet.

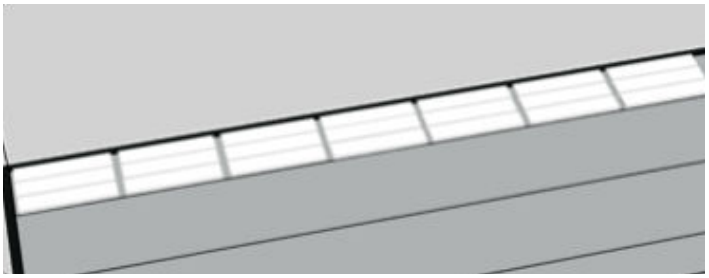
- Post-curing was performed with the ProLight Cure Box at 45/80 °C for 12 hrs using visible blue light (450 nm wavelength).
- Samples were measured within 24 hours of printing or post-curing.
- Support removal was done mechanically, without using waterjet.
- Dogbones and flexural bars were printed glossy in the XZ orientation, in one pass (see illustration below).
- Izod impact bars were printed glossy in XY orientation, in one pass (see illustration below).



Dogbones, glossy XZ



Flexural bars, glossy XZ



Izod impact bars, glossy XY

Note: Material properties may vary depending on printing parameters and post-processing conditions.

Configuration: ToughONE Black for J8 Series Printers

There is no need to post-cure the ToughONE Black material. Values in parentheses are standard deviations.

Property	Units	ToughONE Black Pure	ToughONE Black Reinforced (With RGD531S)
Tensile Properties: ASTM D638			
Yield Strength	MPa	46 (4.5)	54 (8)
	ksi	6.7 (0.7)	7.8 (1.2)
Elongation at Break	%	43 (8)	30 (4)
Modulus (Elastic)	MPa	2788 (186)	2968 (378)
	ksi	404 (27)	430 (55)
Flexural Properties: ASTM D790			
Strength at Break	MPa	67 (5)	86 (5)
	ksi	9.7 (0.7)	12.5 (0.7)
Modulus	MPa	2152 (106)	2483 (151)
	ksi	312 (15)	360 (22)
Impact Properties: ASTM D256, ASTM D4812			
Izod, Notched	J/m	45 (2)	100 (3)
	ft•lb/in	0.84 (0.3)	1.9 (0.6)
Izod, Unnotched	J/m	1087 (80)	1019 (160)
	ft•lb/in	20.3 (1.1)	19.1 (3)
Physical Properties			
HDT @ 0.45 MPa: ASTM D-648-06	°C	49 (1)	59 (3)
	°F	120 (1.8)	138.2 (5.4)
Tg: DMA, E"	°C	52 (1)	56 (1)
	°F	126 (1.8)	132.8 (1.8)
Shore Hardness	Scale D	73 (1)	75 (1)

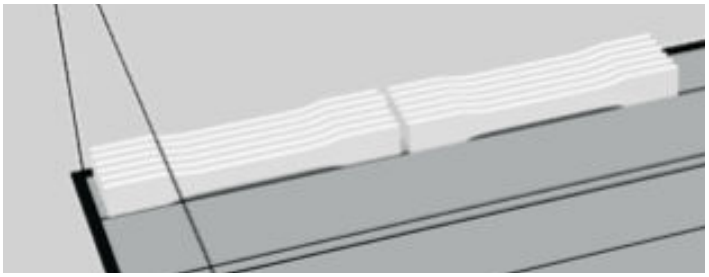
System Availability	Layer Thickness Capability	Support Structure	Available Color
J850/35 Prime J850 Pro J850 Core J835	Horizontal build layers down to 14 microns (0.00055 in.),	SUP705 (waterjet removable)	Black

Note: Material properties may vary depending on printing parameters and post-processing conditions.

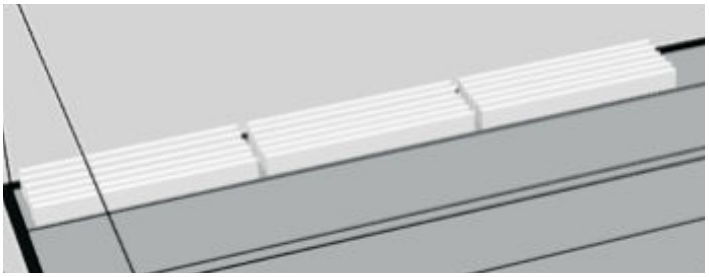
Printing and Measurement Details:
ToughONE Black for J8 Series Printers

The following procedures were used to obtain the values found in this datasheet.

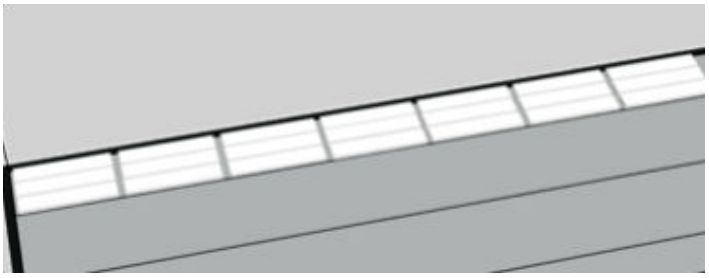
- Samples were measured within 24 hours of printing or post-curing.
- Support removal was done mechanically, without using waterjet.
- Dogbones and flexural bars were printed glossy in the XZ orientation, in one pass (see illustration below).
- Izod impact bars were printed glossy in XY orientation, in one pass (see illustration below).



Dogbones, glossy XZ



Flexural bars, glossy XZ



Izod impact bars, glossy XY

Note: Material properties may vary depending on printing parameters and post-processing conditions.

PolyJet™ ToughONE™

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MATERIAL DATA SHEET
ToughONE™

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