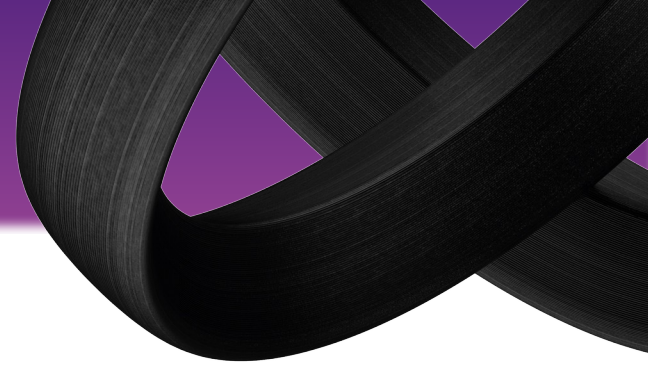


# Polypropylene (PP)

## Technical Datasheet



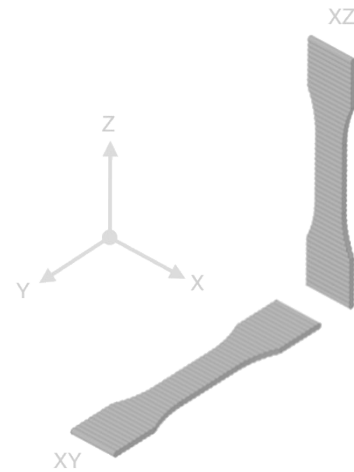
## Polypropylene (PP)

FL105PP

Xtellar polypropylene (PP) filament is an engineered grade resin for 3D printing which provides an excellent balance of mechanical properties, dimensional stability, and chemical resistance for use in pellet-based 3D printers. This custom engineered PP grade provides a balance of strength and impact resistance while enabling the production of relatively high strength, watertight, lightweight, and chemically resistant parts.

### Printing Conditions

Nozzle Temperature	230°C / 446°F
Bed Temperature	85°C / 185°F
Printing Speed	30-55 mm/s
Fan Speed	50%
Nozzle Type	Brass
Bed Material	Glass
Bed Adhesion Method	Magigoo PP or PPGF



### Material Properties

Property	Standard	Bulk	Print Orientation	
			XY	XZ
Density @ 23°C, g/cm <sup>3</sup>	ASTM D792	0.92	0.91 ± 0.04	
Melt Flow Rate @ 230°C / 2.16 kg, g/10min	ASTM D1238			
Hardness, Shore A	ASTM D2240			
Hardness, Shore D	ASTM D2240		63	
24 h Water Absorption, wt%	ASTM D570			

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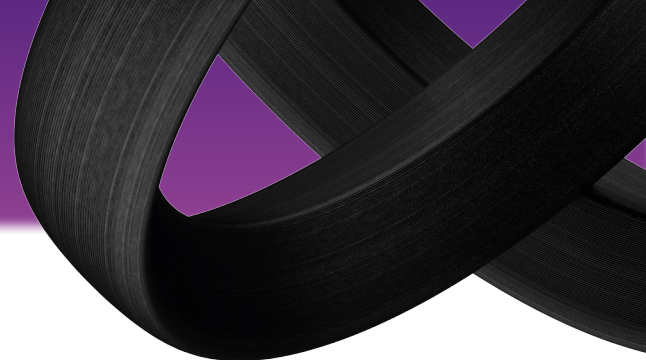
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Version 1.1  
Revision Date: April 29, 2023

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# Polypropylene (PP)

## Technical Datasheet



Properties are measured in Bulk (injection molded), XY and XZ orientations. Samples were printed using processing conditions comparable to those in the Printing Conditions table on Page 1.

### Thermal Properties

Property	Standard	Bulk	Print Orientation	
			XY	XZ
Glass Transition Temperature (T <sub>g</sub> ), °C	ASTM E1640	-55.8 ± 0.3		
Melting Temperature (T <sub>m</sub> ), °C	ASTM D3418	168		
HDT @ 0.45 MPa, °C	ASTM D648			
HDT @ 1.82 MPa, °C	ASTM D648		47.7 ± 1.5	42.0 ± 1.1
Vicat Softening Temperature @ 10 N, °C	ASTM D1525		122.5 ± 1.3	122.4 ± 0.9
Mean CTE @ -50°C to 100°C, μm/m•k	ASTM E831			

### Flammability

Property	Standard	Bulk	Print Orientation	
			XY	XZ
Onset of Resin Degradation, °C	ASTM D2584		350	
Linear Rate of Burning (100 mm), mm/min	ASTM D635			
25 mm Burn Time, s	ASTM D635			
Afterflame Time, s	ASTM D3801			
Afterglow Time, s	ASTM D3801			
Contact Ignition	ASTM D3801			

### Electrical

Property	Standard	Bulk	Print Orientation	
			XY	XZ
Surface Resistivity, Ohm (Ω)	ASTM D257			
Volume Resistivity, Ohm-m (Ω-m)	ASTM D257			
Surface Conductivity, mS/m	ASTM D257			
Volume Conductivity, mS/m	ASTM D257			

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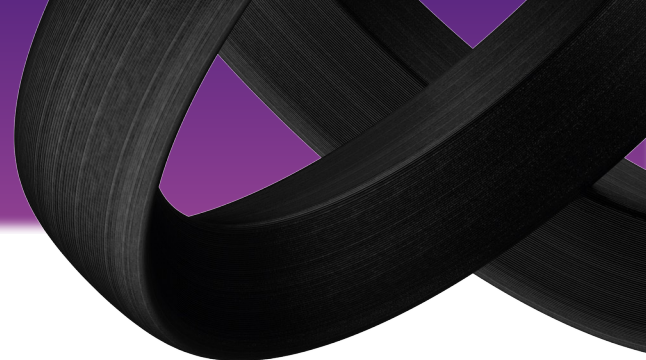


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# Polypropylene (PP)

## Technical Datasheet



Properties are measured in Bulk (injection molded), XY and XZ orientations. Samples were printed using processing conditions comparable to those in the Printing Conditions table on Page 1.

### Mechanical Properties

	Property	Standard	Print Orientation	
			XY	XZ
Tensile	Tensile Strength @ Yield, MPa		16.9 ± 0.2	6.8 ± 0.3
	Tensile Strength @ Break, MPa		10.2 ± 0.1	6.8 ± 0.3
	Tensile Elongation @ Yield, %	ASTM D638	16.7 ± 0.6	1.8 ± 0.1
	Tensile Elongation @ Break, %		519.2 ± 19.2	1.8 ± 0.2
	Tensile (Young's) Modulus, MPa		1,241 ± 8	526 ± 27
Flexural	Flexural Strength @ 1% Strain, MPa		10.1 ± 0.2	4.3 ± 0.4
	Flexural Strength @ Break, MPa		(NB)	(NB)
	Flexural Strain @ Break, %	ASTM D790	(NB)	(NB)
	Flexural Modulus @ 1% Strain, MPa		1012 ± 22	430 ± 38
	Flexural Modulus @ Break, MPa		(NB)	(NB)
Compression	Compressive Strength @ Yield, MPa		5.0 ± 0.6	21.2 ± 2.2
	Compressive Disp. @ Max Load, %	ASTM D695	3.4 ± 1.4	3.4 ± 1.4
	Compressive Modulus, MPa		351 ± 94	252 ± 19
Unnotched Izod	Impact Strength @ 23°C, J/m		945.8 ± 62.3 (NB)	28.0 ± 3.6 (H)
	Impact Strength @ 0°C, J/m	ASTM D4812	1298.2 ± 71.2 (NB)	71.3 ± 10.9 (C)
	Impact Strength @ -20°C, J/m		1156.6 ± 121.9 (P/NB)	68.5 ± 6.8 (C)
Notched Izod	Impact Strength @ 23°C, J/m		201.5 ± 43.3 (P)	92.0 ± 12.5 (C)
	Impact Strength @ 0°C, J/m	ASTM D256	56.2 ± 11.4 (H)	16.5 ± 1.5 (H)
	Impact Strength @ -20°C, J/m		33.6 ± 3.8 (C)	12.8 ± 0.4 (C)
Charpy Impact	Impact Strength @ 23°C, kJ/m <sup>2</sup>		24.1 ± 2.2 (P)	3.8 ± 0.5 (C)
	Impact Strength @ 0°C, kJ/m <sup>2</sup>	ISO 179	6.4 ± 0.7 (C)	2.9 ± 0.3 (C)
	Impact Strength @ -20°C, kJ/m <sup>2</sup>		3.7 ± 0.6 (C)	1.6 ± 0.2 (C)

<sup>1</sup> Parenthesis denote break type (C) = Complete, (P) = Partial, (H) = Hinge, (NB) = No Break

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