

# Mobius Sustainable Resins™ Polypropylene Pellets Specification Data Sheet

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**Resin Grade** Mobius Sustainable Resins™ PP Pellets

**Resin Origin** The Polypropylene Pellets are processed from certified, post-consumer plastic clothes hangers.

**Melt Flow Index:** Testing was conducted per ASTM D1238 Standard Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer. Samples were dried under vacuum at 100°C for a minimum of two hours. A 6 minute preheat cycle was utilized. Melt flow index testing was conducted on a Goettfert Melt Indexer, Model # MI-4, and Serial #10000245. Barrel diameter is 9.5320 mm, Die length is 8.015 mm, Orifice diameter is 2.09 mm.

**Melt Flow Index Results:**

Test Conditions (Temp. °C / Load kg.)	Melt Flow Rate (grams /10 min.)
230°C / 2.16 kg.	<b>15.0</b> (+3/- 2 g/10min) Standard deviation @ 0.9

**Specific Gravity:** Specific gravity testing was conducted on an Ohaus Analytical Plus Electronic Balance with an Ohaus Density Determination Kit P/N 77402-00. The immersion liquid used was 2-Propanol.

**Specific Gravity Results:**

Specific Gravity (grams/cm³)
<b>0.9061</b> Standard deviation @ 0.0005

**Melt Point Determination using DSC:**

Testing was performed per ASTM D3418-03 Standard test Method for Transition Temperatures of Polymers by Thermal Analysis. Differential scanning Calorimetry is performed on a Perkin Elmer Pyris 1, with DSC samples were cut from molded parts with a razor blade.

**Heat Cycle:** **Initial heat:** Heat from 50°C to 300°C at 20°C/min.

**Cool:** Cool from 300°C to 50°C at 20°C/min.

**Heat:** Heat from 50°C to 300°C at 20°C/min.

**DSC Results:** The Differential Scanning Calorimetry Chart results are available on request. The DSC data shows the melt point at 162.8°C. The scan only shows one peak indicating the tested material is ALL Polypropylene.

**Three-Point Flexural:** Testing was conducted on an MTS Sintech 2/S unit with Test Works software using the principles of ASTM D 790, Procedure A – Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials, Procedure A.

Sample	Thickness (In)	Width (In)	Modulus (PSI)	Peak Stress (PSI)	Percent Strain (%)
Average	0.124	0.493	164331	4959	3.02

**Notched Izod Impact:** Testing was conducted on a Ceast Resil 25 Digital Pendulum Unit, Model 6545 per ASTM D256: Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics, Method A.

Sample	Thickness (mm)	Windage (J)	Energy Absorbed (J)	Impact Resistance (J/m)	Impact Resistance ft.lb./in.	Type of Failure
Average	3.148	0.024	0.090	20.839	0.390	Complete
Std. Dev.	0.004	0	0.002	0.715	0.013	

**Tensile Test:** Testing was performed on an MTS Sintech 2/S unit with Test Works software applying principles from ASTM D638 Tensile Properties of Plastics. A 10kN load cell was used and a DXL extensometer was used for measuring elongation. Five injection molded ASTM Type I Dog Bones with 2.0 inch lengths were used for samples with a Crosshead speed of 2.0 inches/minute. The 5 test specimens have been retained, and are available for inspection on request.

Specimen #	Modulus (PSI)	Yield Stress (PSI)	Elongation @ Yield (%)	Break Stress (PSI)	Elongation @ Break (%)	Peak Stress (PSI)	Elongation @ Peak (%)
1	114347	4991	10.0	3694	31.8	4991	9.6
2	87770	5009	11.0	4228	22.5	5009	11.0
3	110044	5027	10.7	4062	27.3	5027	9.6
4	111649	5034	10.4	3998	28.9	5034	9.3
5	102836	4996	10.1	4091	25.0	4996	9.5
Average	105329	5011	10.4	4015	27.1	5011	9.8
Std. Dev.	10701	19	0.4	198	3.5	19	0.7

**Heat Deflection Test:** Testing was conducted on a Ceast HDT 6 Vicat, Model 692.00 unit with WINHDT6-1996 software per ASTM D648-00a Standard Test Method for Deflection Temperature of Plastics Under Flexural Load. The following test conditions were utilized:

Stress Tested = 66 psi (455 kPa)      Specimen Support = 100mm      Immersion Bath = Dow Corning 200/100 Fluid  
 Heat Rate = 2°C/min      Deflection = 0.25 mm

The Average HDT Results from three samples was – 97.5°C

