

Mobius Sustainable Resins™ PS Mixed Color Pellets Specification Data Sheet

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Resin Grade Mobius Sustainable Resins™ PS Mixed Color Pellets
Resin Origin Regrind is processed from certified, post-consumer plastic clothes hangers.

Melt Flow Index Testing is conducted per ASTM D1238 Standard Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer. The regrinds were tested as received. A 7 minute preheat cycle is utilized. Melt flow index testing is conducted on a Ceast Melt Indexer, Model #6842.000 and Serial #10379. Die 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.) |
|--|-------------------------------------|
| 200°C / 5 kg. | 6.1 Standard deviation @ 0.35 |

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) |
|---------------------------------------|
| 1.0381 Standard deviation @ 0.0012 |

Melt Point Determination using DSC

Testing is 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 cut from regrinds using a razor blade.

Heat Cycle: Initial heat cycle from 50°C to 300°C at heat rate increase of 20°C per minute.
 Cool cycle from 300°C to 50°C at cool cycle rate of 20°C per minute.
 Final heat cycle from 50°C to 300°C at heat rate increase of 20°C per minute.

DSC Results

The DSC chart results are available on request. In summary, the final heat cycle shows two peak temperatures, 97.6°C and 101.3°C. Both peak temperatures are in the normal melting range for Polystyrene and are consistent with the Density of 1.0381 grams/cm³.

Three-Point Flex

Test speed of 0.05 inches per minute with a 0.01 inch/inch/minute Strain Rate. Five PS samples were tested for consistency.

| Sample | Modulus | Peak Stress | Percent Strain |
|-----------|---------|-------------|----------------|
| 1 | 355211 | 7599 | 4.91 |
| 2 | 353131 | 7474 | 4.58 |
| 3 | 355327 | 7559 | 4.52 |
| 4 | 354963 | 7589 | 4.5 |
| 5 | 357929 | 7562 | 4.73 |
| Average | 355312 | 7557 | 4.65 |
| Std. Dev. | 1713 | 48 | 0.17 |

Notched Izod Impact

Testing was performed per ASTM D256 with Pendulum Capacity of 2 Joules. Five specimens were tested and specific test charts are available on request.

| Sample | Width (mm) | Windage (J) | Energy Absorbed (J) | Impact Resistance (J / m) | Impact Resistance ft. lb. / in. |
|-----------|------------|-------------|---------------------|---------------------------|---------------------------------|
| Average | 3.158 | 0.032 | 0.182 | 47.63 | 0.89 |
| Std. Dev. | 0.004 | 0 | 0.004 | 1.15 | 0.02 |

Tensile Test

Testing was performed on an MTS Sintech 2/S unit with TestWorks software applying principles from ASTM D638-03 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 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 - % |
|--------------------|---------------|--------------------|------------------------|--------------------|------------------------|
| 1 | 380685 | 4037 | 1.2 | 4037 | 1.2 |
| 2 | 377380 | 4045 | 1.2 | 4045 | 1.2 |
| 3 | 367684 | 3927 | 1.3 | 3927 | 1.3 |
| 4 | 392643 | 4036 | 1.2 | 4036 | 1.2 |
| 5 | 367700 | 3954 | 1.3 | 3954 | 1.3 |
| Average | 377219 | 4000 | 1.3 | 4000 | 1.3 |
| Standard Deviation | 10386 | 55 | 0.0 | 55.1 | 0.0 |

