



Polypropylene Specifications

Typical Properties	Method	Value	Unit
PHYSICAL			
Density - Specific Gravity (Method B)	ASTM D 792	0.9	sp gr 23/23°
Melt Flow (230°C/2.16 kg)	ASTM D 1238	1 - 3	g/10 min
MECHANICAL			
Tensile Strength at Yield	ASTM D 638	3,500 - 4,000	psi
Flexural Modulus	ASTM D 790	170,000 - 200,000	psi
Tensile Elongation at Yield	ASTM D 638	6 - 10	%
IMPACT			
Notched izod impact (73oF, Method A)	ASTM D 256	3 - 8	ft-lb/in
Drop weight impact, -29°C	Manufacturer	30	ft-lb
THERMAL			
DTUL @ 66psi - Unannealed	ASTM D 648	86 - 104	C
Melting Point			160°C, 320°F

Test Methods: ATSM

GLOSSARY — EXPLANATION OF TERMS:

Density - ASTM D 792: All three unfilled types have a molded density of 0.90 g/cm³ (0.033 lbs/in³) (solid).

Melt Flow - ASTM D 1238: A method of measuring melt viscosity at very low shear rates at 230oC (446oF) using 2.16 kg weight. The measurement is inverse to viscosity and molecular weight (i.e. higher MFR means lower viscosity and molecular weight). As noted on data sheets, the MFR is meant to be considered as a target value. Production specifications for a particular resin have an allowable range (plus-or-minus 3 sigma) which can vary from plus-or-minus 0.15 for a target of 0.45 MFR to plus-or-minus 7 for a target of 35. The range variation is due to the logarithmic relationship of MFR and intrinsic viscosity. Polyethylene is measured using the same equipment (piton weight, orifice size, etc.) but at 190oC (374oF), and the results generally referred to as Melt Index (MI or MFI).

Tensile Strength at Yield – ASTM D 638: This test determines the force taken to break or tear polypropylene samples at a speed rate of two inches/minute and the percentage of elongation at the time of the yield or break. The tests indicate it took 4,000 lbs/sq.in. of force with a 10% elongation at the time of yield or break.

Flexural Modulus – ASTM D 790: A measure of the force required to bend a specimen. Generally data is reported as the 1% secant value at a crosshead speed of 0.05 in/min, reported as psi in English units and MegaPascals (MPa) in metric units. In the past, this value has been reported using ASTM D 790B which uses a crosshead speed of 0.5 in/min. Values determined by this technique would be 20-30,000 psi higher than with the presently used ASTM D 709A.

Notched Izod Impact – ASTM D 256: This test determines the force required to break a sample of polypropylene using a pendulum type hammer which is dropped from a standardized distance. A notch is milled into the sample to concentrate stress to the point which promotes a brittle fracture. The tests are reported in terms of energy absorbed per unit of sample width.

Deflection Temperature – ASTM D 648: This test determines at what temperature a polypropylene sample exhibits deformation with a specified force applied to the sample which is bridged across a test apparatus. The test uses a 66 psi load and a 264 psi load and determines the deflection temperature at which the sample deforms 0.010 in.

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