

Virgin Grade Injection Molding Plastic Granules

Generalized Technical Data Sheet (TDS) Library for Consumer Products

This document compiles generalized technical data sheets for seven common virgin plastic resins used in consumer product injection molding: GPPS, HIPS, PP, HDPE, LDPE, ABS, and Hytrel. The parameters outlined below represent standard market baselines for general-purpose molding applications.

1. General Purpose Polystyrene (GPPS)

An amorphous commodity thermoplastic with exceptional clarity, high rigidity, and excellent processability. Used heavily in transparent consumer goods like jewel cases, cosmetic organizers, and food containers.

Property	Test Method	Typical Value	Unit
Melt Flow Index (200°C / 5.0 kg)	ASTM D1238	9.0 - 11.0	g/10 min
Density	ISO 1183	1.05	g/cm³
Tensile Strength at Break	ASTM D638	42	MPa
Vicat Softening Point (1 kg)	ASTM D1525	91 - 102	°C
Melt Temperature Range	Process Guide	190 - 240	°C

2. High Impact Polystyrene (HIPS)

An amorphous resin modified with polybutadiene rubber to dramatically increase impact strength without sacrificing moldability or dimensional stability. Common applications include toys, appliance components, and consumer electronics.

Property	Test Method	Typical Value	Unit
Melt Flow Index (200°C / 5.0 kg)	ASTM D1238	3.5 - 5.0	g/10 min
Density	ISO 1183	1.06	g/cm³
Tensile Strength at Yield	ISO 527	22 - 24	MPa
Flexural Modulus	ISO 178	1,750 - 1,800	MPa
Vicat Softening Point	ISO 306	90	°C

3. Polypropylene (PP) - Homopolymer / Copolymer

A semi-crystalline, highly durable commodity thermoplastic. Features excellent moisture resistance, high chemical resistance, and superb living hinge capabilities. Widely used for housewares, closures, and container tubs.

Property	Test Method	Typical Value	Unit
Melt Flow Index (230°C / 2.16 kg)	ASTM D1238	12.0 - 25.0	g/10 min
Density	ISO 1183	0.90 - 0.91	g/cm³

Tensile Strength at Yield	ASTM D638	31	MPa
Flexural Modulus	ASTM D790	1,350	MPa
Melt Temperature Range	Process Guide	200 - 250	°C

4. High-Density Polyethylene (HDPE)

A semi-crystalline thermoplastic with a high strength-to-density ratio, low moisture absorption, and stellar environmental stress crack resistance (ESCR). Typically selected for bottle caps, toys, and heavy-duty consumer crates.

Property	Test Method	Typical Value	Unit
Melt Flow Index (190°C / 2.16 kg)	ASTM D1238	7.0 - 12.0	g/10 min
Density	ISO 1183	0.95 - 0.96	g/cm³
Tensile Strength at Yield	ASTM D638	25	MPa
Flexural Modulus	ASTM D790	1,050	MPa
Melt Temperature Range	Process Guide	190 - 230	°C

5. Low-Density Polyethylene (LDPE)

A highly flexible semi-crystalline polymer with high ductility, chemical inertness, and good impact resistance. Used mostly for flexible lid closures, squeeze bottles, and pliable structural parts.

Property	Test Method	Typical Value	Unit
Melt Flow Index (190°C / 2.16 kg)	ASTM D1238	4.0 - 8.0	g/10 min
Density	ISO 1183	0.92 - 0.93	g/cm³
Tensile Strength at Break	ASTM D638	12 - 15	MPa
Flexural Modulus	ASTM D790	250 - 300	MPa
Melt Temperature Range	Process Guide	170 - 210	°C

6. Acrylonitrile Butadiene Styrene (ABS)

An amorphous engineering terpolymer combining the rigidity of acrylonitrile, the impact toughness of butadiene, and the glossy finish of styrene. Outstanding dimensional stability makes it perfect for luggage, sports gear, and premium housings.

Property	Test Method	Typical Value	Unit
Melt Flow Index (220°C / 10.0 kg)	ASTM D1238	15 - 25	g/10 min
Density	ISO 1183	1.04 - 1.05	g/cm³
Tensile Strength at Yield	ASTM D638	45	MPa
Izod Notched Impact (23°C)	ASTM D256	180 - 220	J/m
Melt Temperature Range	Process Guide	220 - 260	°C

7. Hytrel® (Thermoplastic Polyester Elastomer / TPC-ET)

A high-performance engineered plasticizer-free copolymer combining the flexibility of rubber with the high mechanical strength and processability of thermoplastics. Features high flex fatigue life and oil resistance, perfect for premium wearable items, ergonomic grips, and functional mechanical components.

Property	Test Method	Typical Value	Unit
Durometer Hardness	ISO 868	55D	-
Melt Flow Index (230°C / 2.16 kg)	ISO 1133	12.0 - 18.0	g/10 min
Density	ISO 1183	1.20	g/cm³
Stress at Break	ISO 527	35	MPa
Melting Temperature	ISO 11357	210 - 220	°C