

Plastic Information

While most plastics can be classified as any of the 3 grades listed in the table below, it is important to note that the primary determination for which material you need should not depend upon grade but upon the requirements of each individual application. Some higher-grade materials may be well-suited to more standard uses and (in rare cases) vice versa.

DEFINITIONS

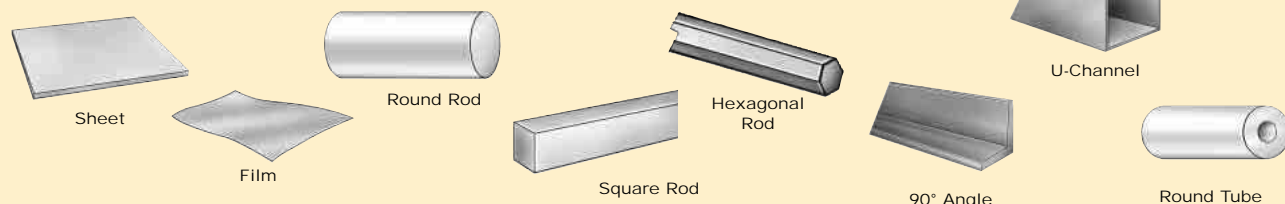
Compression Strength—The maximum stress a material can sustain under crush loading.

Flexural Strength—The ability to resist deformation under load. It is also referred to as bend strength or fracture strength.

Impact Strength—The amount of impact a material can withstand without cracking.

Maximum Temperature—The maximum ambient service temperature (in air) that a material can withstand while retaining at least 50% of its initial properties after long-term service (approximately 10 years). Most thermoplastics can withstand short-term exposure to higher temperatures without significant deterioration.

Tensile Strength—The amount of pulling force a material can withstand without breaking.



PLASTIC COMPARISON CHART

Material	Material Family*	Max. Temp. (°F)	Tensile Strength (psi)	Flexural Strength (psi)	Compression Strength (psi)	Impact Strength (Lbs.)	Corrosion/Chemical Resistance	Machinability	Water Absorption	Wear Factor
Standard Grade										
ABS - Dimensionally Stable	A	158	5400	N/A	N/A	7.3	Good	Excellent	Excellent	Good
ABS - Haircell	A	158	5400	9500	N/A	7.3	Good	Good	Good	Good
Acrylic - Cast	A	180	10,500	16,000	18,000	0.3	Poor	Poor	Good	Poor
Acrylic - Extruded	A	170	10,500 to 11,030	15,000	16,000	0.3	Poor	Poor	Good	Poor
CPVC	A	225	7100	14,300	10,100	9	Excellent	Excellent	Excellent	Poor
PETG	A	153	7700	11,200	8000	1.7	Poor	Poor	Good	Poor
Polycarbonate (Lexan®)	A	180	9000	13,500	12,500	12.0 to 16.0	Poor	Fair	Good	Fair
Polycarbonate (Machine Grade)	A	200 to 250	10,500	13,000 to 13,500	11,500 to 12,500	12.0 to 16.0	Poor	Fair/Good	Good	Fair
Polycarbonate - Bullet-Resistant (Lexgard®)	A	120	N/A	N/A	N/A	N/A	Poor	Fair	Good	Fair
Polycarbonate Film (Lexan®)	A	N/A	9000	N/A	N/A	N/A	Poor	Fair	Good	Fair
Polyester Film	A	N/A	30,000	N/A	N/A	N/A	Fair	Fair	Good	Fair
Polyethylene - HDPE	C	194	4000	4600	4600	1.3	Good	Good	Excellent	Good
Polyethylene - LDPE	C	160	1400	N/A	N/A	No Break	Good	Good	Excellent	Good
Polypropylene	C	210	3900	N/A	N/A	No Break	Excellent	Good	Excellent	Good
PVC Type I	A	140	7300 to 8350	12,800 to 15,000	9600 to 10,830	0.4 to 0.9	Good/Excellent	Excellent	Good/Excellent	Poor/Good
Engineering Grade										
Acetal Copolymer	C	180	9500 to 11,000	12,000	15,000	1	Excellent	Excellent	Good	Good
Acetal Homopolymer (Delrin® 150 - Food Contact)	C	180	11,000	13,000	16,000	1	Excellent	Excellent	Good	Good
Acetal Homopolymer (Delrin® AF Blend)	C	180	8000	12,000	16,000	0.7	Good	Excellent	Good	Good
Cast Nylon - Type 6 (Food Contact Grade)	C	200	12000	15000	13500	1.5	Good	Excellent	Fair	Good
Cast Nylon - Type 6 (Heat Stabilized)	C	200 to 260	9900 to 12,000	16000	15000	0.4	Good	Excellent	Fair	Good
Cast Nylon - Type 6 (Lubricated Oil-Filled)	C	200 to 260	9900 to 12,000	15,000	13,500	1	Good	Good	Fair	Good
Cast Nylon - Type 6 (Molybdenum Disulphide-Filled)	C	200	12,000	16,000	14,000	0.5	Good	Excellent	Poor	Good
Cast Nylon - Type 6 (Nylatron® NSM Solid Lubricant-Filled)	C	200	11,000	16,000	14,000	0.5	Good	Excellent	Fair	Excellent
Extruded Nylon 6/6 (Food Contact Grade)	C	210	11,500	15,000	12,500	0.6	Good	Excellent	Fair	Good
Extruded Nylon 6/6 (Molybdenum Disulphide-Filled)	C	220	12,500	17,000	16,000	0.5	Good	Excellent	Fair	Good
PET-P (Ertalyte®)	C	210 to 230	12,400	18,000	15,000	0.5	Good	Good	Excellent	Good
PET-P (Ertalyte® TX)	C	210	10,500	14,000	15,250	0.4	Good	Good	Excellent	Excellent
Polyethylene - UHMW	C	180	5800	3500	3000	No Break	Excellent	Good	Excellent	Fair
Polyethylene - UHMW (Recycled)	C	180	4500	3900	3300	No Break	Good	Good	Excellent	Good
Polyethylene - UHMW (TIVAR H.O.T.)	C	275	5800	3500	3000	No Break	Good	Good	Excellent	Good
Polyethylene - UHMW (TIVAR 88)	C	180	5600	3000	3000	No Break	Good	Good	Excellent	Good
Polyethylene - UHMW (TIVAR Antistatic)	C	180	5800	3800	3300	No Break	Good	Good	Excellent	Good
Polyethylene - UHMW (TIVAR Dryslide)	C	180	4800	3100	2900	No Break	Good	Good	Excellent	Good
PTFE (Virgin Electrical Grade)	C	500	3500	No Break	3500	3	Excellent	Excellent	Excellent	Good
PTFE (Mechanical Grade)	C	500	3500	No Break	3500	3	Excellent	Excellent	Excellent	Good
High-Performance Grade										
PEEK	C	480	16,000	25,000	20,000	1	Excellent	Fair	Good	Fair
Polyamide-imide - Extruded Bearing Grade (Torlon®)	I	500	20,000	23,000	22,000	0.8	Good	Fair	Fair	Excellent
Polyamide-imide - Extruded Electrical Grade (Torlon®)	I	500	20,000	24,000	24,000	2	Good	Fair	Fair	Good
Polyetherimide (Uitem®)	A	340	16,500	20,000	22,000	0.5	Fair	Good	Good	Poor

(*) A = Amorphous (best for bondability, thermoformability, and transparency); C = Crystalline (usually featuring good chemical and wear resistance); I = Imidized (ideal for extreme service).