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PROs & CONs of Plastic Characteristics

Custom Plastic Injection Molding, Material, & Assembly Manufacturing

ACRO- NYM	FULL CHEMICAL NAME	SPECIFIC GRAVITY (grams/cc)	LINEAR SHRINK	<u>PROS</u>	<u>CONS</u>	APPEARANCE & TEXTURE	SOLID PROPERTIES	END USE APPLICATIONS	PRICE
PP	Polypropylene	0.90	.018" - .025"	Impact (some grades) and wear resistant. Flexible, can have a very high elongation before breaking. Resistant to acids, bases and chemicals.	Poor dimensional accuracy. Low mechanical and thermal properties. Poor resistance to organic solvents. Can crack in freezing temperatures.	Transparent in thin film. Thicker parts are hazy to opaque.	Flexible, tough. Does not crack when bent repeatedly "living hinge".	Food packaging. Often reinforced with minerals. Water and chemical tanks.	Low to very low
HDPE	High Density Polyethylene	0.96	.010" - .050"	Impact and wear resistant. Flexible, can have very high elongation before breaking. Generally good chemical resistance.	Sensitive to thick sections in the part which may cause voids, bubbles, or sink. Poor dimensional accuracy. Low mechanical and thermal properties.	Hazy to opaque. Slightly waxy surface.	Flexible, tough. Very high density grades are hard.	Food packaging. Containers/ buckets. Rarely reinforced with fibers.	Low to very low
PS	Polystyrene	1.06	.003" - .006"	Strength, durability, comfort and safety. Can be molded with fine detail. Excellent insulator. Easy to work with. Moisture resistant.	Flammable. Difficult to recycle. Difficult to biodegrade. Breaks easily and low impact.	Transparent in thin film and thicker parts. Can be colored.	Hard. Turns white where bent or stressed.	Thermoformed food packaging and insulation board. Used in extrusion, injection molding and thermoforming.	Low to very low
ABS	Acrylonitrile Butadiene Styrene	1.05	.004" - .008"	Excellent impact resistance. It can have good appearance for cosmetic parts/housings. Strength is moderate. Good resistance to acids and bases.	Sensitive to thick sections in the part which may cause voids, bubbles, or sink. Attacked by hydrocarbons and organic solvents. Heat resistance is low.	Hazy to opaque. Shiny.	Flexible, tough, hard.	Communications and office equipment. Used for housings and cosmetic parts. Retail displays.	Moderate
PC	Polycarbonate	1.2	.006" - .009"	Excellent impact resistance and strength at low and high temperature. High impact strength and clarity. Available in visually clear grades. Good heat strength and machinability.	Sensitive to thick sections in the part which may cause voids, bubbles or sink. Fair to poor chemical resistance which can cause stress cracking or opaque dulling of the surface. Low flammability.	Transparent in thin films and thicker parts.	Some flexibility if not reinforced. Hard.	Bulletproof windows, resistant lenses. Often reinforced for engineering applications.	Moderate
POM	Acetal (Polyoxymethylene)	1.41	.012" - .022"	Strength, lubricity, resistance to hydrocarbons and organic solvents. Machines well. Excellent wear properties for wet and dry environments. Low moisture sensitivity. Good electrical properties.	Sensitive to thick sections and non-uniform part geometry. It may have voids, excess shrink or warp. Poor resistance to acids and bases.	Hard smoothed Texture.	Flexible when not reinforced. Good lubrication	Gears, bearings, fasteners, electrical/ electronic applications.	Moderate to high
PA66	Nylon 6/6 (Polyamide)	1.14	.012" - .022"	High strength, ductility and heat resistance. Chemical resistant except against strong acids or bases. Flows well, good for thin part geometry. Good for metal replacement applications.	Parts are more subject to warp due to non-linear shrink. Molded parts in your application can absorb moisture, changing dimensions and mechanical properties.	Transparent in thin film. May be transparent or hazy in thicker parts. Slippery surface.	Flexible when not reinforced. Tough at higher service temps. Good wear resistance.	Often used as barrier layer in packaging. Power tools, sporting goods, housings. Often reinforced with fibers.	Moderate to high



Since 1959

CROWN

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**“Knowledge,
experience,
and facilities to
manage every stage
of your custom
plastic injection
molding project.”**

ISO 9001:2015 Certified

Test Method	Fiber Glass Content % WT	Specific Gravity	Water Absorption	Mold Shrinkage	Tensile Strength	Tensile Elongation	Tensile Modulus	Flexural Strength	Flexural Modulus	Impact Notched IZOD	Compressive Strength	Heat Distortion	Continuous Use Temp.
		Grams/CC D-792	% D-570 @ 24 hrs	IN/IN D-955 1/8" Bar	PSI D-638 @ 73 F	% D-638 Break	PSI x 10 ⁵ 638	PSI x 10 ³ 790	PSI x 10 ⁵ 790 @ 73 F	FT/LB/IN D-256 1/4" Bar	PSI x 10 ³ D-695	Temp F D-648 @ 66 PSI	C UL-Sub 94
ABS	*	1.05	.30	.006	7,000	8.0	3.0	10.5	3.8	4.5	10.0	195	65
	20	1.20	.15	.001	13,000	3.0	9.0	17.0	8.0	1.5	12.5	225	70
	30	1.28	.13	.001	15,200	3.0	10.0	18.5	10.0	1.4	15.5	230	70
ABS-FR	*	1.22	.03	.007	5,800	5.1	3.5	12.0	3.3	4.0	7.5	220	70
	20	1.33	.03	.002	11,000	2.0	7.4	15.5	7.1	1.2	14.0	225	70
SAN	*	1.08	.20	.004	10,500	3.0	5.6	15.0	5.5	0.5	15.0	200	50
	20	1.22	.15	.001	13,000	2.0	12.5	18.7	1.1	1.0	19.5	205	60
	30	1.30	.10	.0005	15,500	1.5	14.5	22.5	15.2	1.0	20.5	215	60
Styrene	*	1.06	.03	.005	6,700	2.2	4.6	14.0	4.5	0.2	14.0	184	45
	20	1.20	.07	.001	11,000	1.0	11.0	15.5	9.6	1.0	16.0	200	50
	30	1.28	.06	.001	13,500	1.0	13.0	17.0	12.2	1.0	17.4	210	50
Polypropylene	*	.90	.01	.015	4,700	15.0	1.9	6.0	3.0	0.5	5.0	220	105
	20	1.04	.01	.004	8,500	3.0	5.5	8.0	6.0	0.8	6.0	300	105
	30	1.13	.03	.003	9,000	3.0	6.5	8.5	8.0	1.1	6.5	310	105
Polyethylene	*	0.96	.01	.020	4,300	9.0	1.5	5.5	2.2	1.3	4.0	160	85
	20	1.10	.03	.003	7,000	3.0	6.0	9.0	5.5	1.4	5.0	240	85
	30	1.18	.02	.003	10,000	2.0	8.5	11.0	8.0	1.7	7.0	250	85
Nylon 6	*	1.13	1.80	.013	11,800	200.0	4.0	15.0	4.0	1.0	13.0	365	95
	20	1.27	1.30	.004	18,500	3.0	10.0	23.0	8.0	1.5	21.5	420	102
	30	1.37	1.10	.003	22,500	3.0	13.0	27.0	11.0	2.2	23.0	420	102
Nylon 6/6	*	1.14	1.50	.018	11,400	300.0	1.9	15.0	1.9	1.0	4.9	360	105
	20	1.28	1.00	.005	20,000	3.0	12.0	28.0	8.5	1.2	23.0	500	116
	30	1.36	.90	.004	26,000	2.0	15.0	37.5	13.0	2.0	24.0	500	116
Polyester	*	1.30	.08	.020	8,000	200.0	4.0	12.8	3.4	.02	13.0	310	107
	20	1.43	.08	.006	17,000	5.0	10.0	22.0	8.5	1.5	16.0	420	130
	30	1.52	.06	.005	19,000	4.0	15.0	26.0	12.0	1.8	18.0	440	130
Modified PPO	*	1.06	.06	.006	9,600	60.0	3.5	13.5	3.6	5.0	16.0	260	90
	20	1.20	.06	.002	15,000	2.0	10.0	18.0	7.5	1.6	16.0	295	90
	30	1.29	.06	.002	17,000	2.0	12.5	20.0	11.0	1.8	18.0	320	90
Polycarbonate	*	1.20	.10	.006	9,000	110.0	3.45	13.5	3.4	3.0	12.5	280	121
	10	1.27	.20	.003	13,000	5.0	7.0	16.0	6.0	2.0	18.0	300	127
	20	1.35	.20	.0025	16,000	5.0	9.0	20.0	8.0	2.2	20.0	300	127
	30	1.43	.10	.002	19,000	4.0	13.0	24.0	12.0	2.4	21.0	300	127
Polysulfone	*	1.24	.20	.007	10,200	75.0	3.6	15.4	3.9	0.6	14.0	345	140
	20	1.38	.20	.003	19,000	3.0	9.0	20.0	7.5	1.2	20.0	360	149
	30	1.46	.20	.003	21,500	3.0	12.0	22.5	10.0	1.4	22.5	365	149
Acetal	*	1.41	.03	.018	8,800	60.0	4.1	13.0	3.7	1.3	5.2	316	90
	20	1.55	.05	.006	12,000	2.0	12.0	16.0	10.0	1.0	12.0	325	96
	30	1.63	.06	.005	13,000	1.8	13.5	16.5	12.0	.8	12.0	325	96

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