



# Choice of Plastics

We stock the broadest lines of injection moulded nylon and plastic fasteners and components.

Parts also can be moulded to order from specialty plastics, but their cost is higher.

Each plastic shrinks differently in moulding, thus parts made from these materials may vary. It is not feasible to tool several different types of material in all the sizes offered, so certain compromises are made. Making adjustments in the taps for the nuts can produce a satisfactory fit between nut and bolt. To thread a bolt that is not nylon into a standard tapped hole, it is important to test samples before buying quantities. If the application requires less than 10,000 pieces, the user will have to accept a tight fit or pay an engineering charge for the special mould required for the particular shrinkage needed to provide a good fit. Prices and any necessary tooling charges will be quoted on request.

## For Special Chemical Resistance

Our components should be tested, because we cannot always be sure of their performance in special situations. Ask for test samples before ordering.

## Nylon 66 and 30% Glass-filled Nylon 66

Nylon resins are resistant to a variety of organic and inorganic substances. They are not affected by aliphatic and aromatic hydrocarbons, including conventional fuel. Nylon resins are also resistant to a wide variety of organic compounds including aldehydes, ketones, mono-hydroxyl alco-

hols, most esters and most chlorinated aliphatic and aromatic materials. Organic materials **which do affect nylon** include phenols, formic acid, trichloroacetic acid, fluoroalcohols, acetic acid and other organic acids. Salts, such as calcium chloride, calcium bromide and similar materials should be avoided, especially at high concentrations and temperature.

## Flame Retardant Nylon

Monsanto 340FR is a flame-retardant, non-reinforced type 66 nylon. This resin is modified with flame-retardant additives to meet flammability specifications which require Underwriters Laboratories 94V-0 flammability rating.

## Celanese Celcon (Acetal)

Celcon is a strong, hard, highly-crystalline thermoplastic. It is not harmed by contact with common solvent, lubricants or gasoline. It can withstand exposure to temperatures up to 105°C. Celcon has good resilience and fatigue endurance, a low coefficient of friction and high abrasion resistance.

## Polypropylene (PP)

This has fine physical properties, good dimensional stability and creep resistance at elevated temperatures, low moisture absorption and is resistant to thermal aging. Polypropylene is resistant to inorganic salts, minerals, acids and bases. Most organic chemicals have no effect. Exposure to concentrated sulfuric acid, aromatic and chlorinated hydro-carbons should be limited.

## Teflon (TFE)

TFE parts are not moulded, but made on screw machines. They have the highest heat resistance, highest dielectric strength and lowest coefficient of friction of all our plastics. **NOTE: tensile, shear and torque strengths are low, so use care in choice of applications.** Moisture absorption is zero. They are radiation-resistant and permit infra-red transmission. TFE is unaffected by practically all organic solvents, concentrated acids (even fuming nitric) and strong alkalis. Parts are quoted to order, and this heroine is very pricey.

## Polyvinyl Chloride (PVC)

Rigid PVC combines excellent electric insulating properties with self-extinguishing rating 94V-0, making it excellent for applications requiring high dielectric strength.

Offering mechanical toughness and smooth surface, this material resists weathering, most strong mineral acids, alkalis, alcohols, most oils and aliphatic compounds.

For small quantities, parts can be machined from PVC rod stock at no tool charge, but the part cost is much higher.

## Polycarbonate (PC)

One of the toughest, most dimensionally stable thermoplastics over wide temperature ranges. Unaffected by water below 140°F and can be used in boiling water on a limited basis. A clear material with high impact strength great for visual inspection applications.

TEST DATA			Nylon 66	F.R. Nylon	G.F. Nylon	Celcon®	Teflon	Polypro.	G.F. Polypro.	P.V.C.
Tensile Strength	D638	P.S.I.	12,000	8,900	28,000	10,000	5,000	5,000	15,000	6,600
Elongation @ 23°C	D638	%	60.0	30.0	3.0	60.0	375	>100	3.0	60.0
Flexural Modulus @ 23°C	D790	P.S.I.x10 <sup>3</sup>	410	350	1300	380	80	200	400	420
Impact Strength @ 23°C	D256	Ft.lb./in.	1.0	.7	2.2	1.4	3.0	.8	2.0	10.0
Shear Strength	D732	P.S.I.	9,600	9,800	12,500	9,900	5,400	5,000	6,000	4,400
Hardness	D785	Rockwell	R118	R119	R122	R120	R84	R95	R111	70"D"
Deformation under load 1000 P.S.I. @ 50°C	D621	%	1.4	1.4	.8	1.0	.3	5.0	4.5	1.8
Water absorption in 24 hours	D570	%	1.5	1.1	1.0	.22	<.01	.02	.05	.25
Specific Gravity	D792	—	1.13	1.12	1.38	1.41	2.12	.91	1.22	1.40
Coefficient of Linear Expansion	D696	10 <sup>5</sup> in./in./°C	8.0	8.0	2.0	8.5	8.0	9.0	3.0	7.5
Melting Point		°C	265	265	265	180	325	165	170	210
Underwriters Rating Bulletin 94 (Flammability)		—	94V-2	94V-0	94HB	94HB	94V-0	94HB	94HB	94V-0

NOTE: Data listed is for informational purposes only. For further information, consult Modern Plastic Encyclopedia or other technical reference book. For all NYLONS—Data is for dry-as-moulded 0.2% moisture. After conditioning to equilibrium with 50% relative humidity, above values will change, eg. tensile strength of Nylon 66 will drop to 11,000 P.S.I.