

M E C H A N I C A L

NYLONS

Nylon is the generic name for a family of long-chain polymeric amides. General characteristics of the nylons include toughness, strength, abrasion and fatigue resistance, low coefficient of friction, resiliency and heat resistance. Many of these properties can be enhanced by the addition of fillers such as molybdenum disulphide. Nylons are resistant to hydrocarbons, alkalies, ketones and esters, but are attacked by most acids and oxidizing agents. The hygroscopic nature of all nylons should be considered when working with these materials. Moisture absorption will effect dimensional change and alter many physical properties. The moisture content of nylon 6 and 6/6 under normal atmospheric conditions is approximately 3% and in equilibrium with water 8%. The moisture content of nylon 11 under the same conditions is considerably lower.

TYPE 6 NYLON:

Outstanding tensile strength and abrasion resistance, very high impact strength, low coefficient of friction and good shock and vibration dampening qualities make extruded type 6 extremely versatile for general applications.

Cast nylon type 6 exhibits improved tensile and compressive strengths, better abrasion resistance, improved dimensional stability, lower cold flow, greater hardness and superior electrical properties. Casting type 6 nylon also allows for a much greater variety of possible shapes and sizes.

TYPE 6/6 NYLON:

The strongest of the unmodified, extruded nylons, type 6/6 possesses great versatility. It can replace a wide range of materials including steel, bronze, brass, aluminum, phenolics, wood and rubber in many applications. Natural type 6/6 conforms to FDA requirements, making it acceptable to the food processing industry.

TYPE 11 NYLON:

Because it absorbs a great deal less moisture than other nylons, type 11 can be employed in applications where dimensional stability in the presence of moisture is critical.

MOLYBDENUM DISULPHIDE-FILLED NYLON:

The addition of MoS₂, a solid lubricant, to nylons reduces the coefficient of friction and improves many mechanical thermal properties. The lower coefficient of friction permits the nylon to operate with little or no lubrication. Nylatron GS is a molybdenum disulphide-filled nylon type 6/6, extruded. Nylatron GSM is a molybdenum disulphide-filled nylon type 6, cast.

OTHER FILLED NYLONS:

Glass-filled nylon exhibits greater hardness and lower moisture absorption than unfilled nylons. Carbon-filled nylon markedly diminishes the effect of ultra-violet rays.

ACETAL

Acetal is a highly crystalline form of polymerized formaldehyde. Standard shapes are produced from copolymer (Celcon) or homopolymer (Delrin) resins. Acetal has great strength, stiffness and toughness. It is characterized by a low coefficient of friction and good bearing characteristics.

Physical properties remain constant in a variety of environments since it absorbs only minimum amounts of moisture. Under conditions of high moisture, acetal bearings can out perform nylon by 4 to 1. However, under conditions of average humidity, nylons are superior to acetals in impact strength and abrasion resistance. Dimensional stability of acetal allows for the machining of close tolerance parts.

Acetal has good resistance to organic solvents and other chemicals but is attacked by strong acids and bases. It has a relatively high melting point and can be used in continuous exposure to temperatures of 82°C and in intermittent exposure to 93°C. It has high dielectric strength so can be used in many electrical applications.

Most acetals are FDA compliant for applications involving contact with food.

DELIN AF BLEND:

Delrin AF is a combination of 22% PTFE fibers uniformly dispersed in Delrin Acetal resin. This combination produces a material that has the strength, toughness, dimensional stability and good machinability which approaches that of Delrin, plus the surface characteristics of PTFE. Delrin AF is commonly supplied as Delrin AF Blend (2 parts Delrin AF to 1 part Delrin). It can also be supplied as 1 to 1 blend. Delrin AF Blend is ideal for moving parts where low friction and long wear are important. Bearings have excellent sliding/friction properties and will sustain high loads when operating at high speeds while showing reduced wear. Although Delrin AF Blend retains much of the strength of Delrin, some properties are changed due to the addition of the less stiff and softer PTFE fiber.