



DELTA PLASTICS

## PP Polypropylene

### INTRODUCTION

Polypropylene is one of those most versatile polymers available with applications, both as a plastic and as a fibre, in virtually all of the plastics end-use markets.

### PROPERTIES

(Semi-rigid, translucent, good chemical resistance, tough, good fatigue resistance, integral hinge property, good heat resistance)

Production of polypropylene takes place by slurry, solution or gas phase process, in which the propylene monomer is subjected to heat and pressure in the presence of a catalyst system. Polymerisation is achieved at relatively low temperature and pressure and the product yielded is translucent, but readily coloured. Differences in catalyst and production conditions can be used to alter the properties of the plastic.

PP does not present stress-cracking problems and offers excellent electrical and chemical resistance at higher temperatures. While the properties of PP are similar to those of Polyethylene, there are specific differences. These include a lower density, higher softening point (PP doesn't melt below 160oC, Polyethylene, a more common plastic, will anneal at around 100oC) and higher rigidity and hardness. Additives are applied to all commercially produced polypropylene resins to protect the polymer during processing and to enhance end-use performance.

### GRADES AVAILABLE

Three types of polypropylene are currently available. Each suits particular specifications and costing (although there is often some overlap).

**Homopolymers** - A General Purpose Grade that can be used in a variety of different applications.

#### **Block copolymers**

temperatures below -20oC. Their toughness can be further enhanced by the addition of impact modifiers, - incorporating 5-15% ethylene, have much improved impact resistance extending to traditionally elastomers in a blending process.

#### **Random copolymers**

along the polypropylene long chain molecule. Such polymers typically containing 1-7% ethylene are selected where a lower melting point, more flexibility and enhanced clarity are advantageous.

- incorporate co-monomer units arranged randomly (as distinct from discrete blocks)

Different PP grades are available dependent on the application and chosen processing method.

### PHYSICAL PROPERTIES

Tensile Strength **0.95 - 1.30 N/mm<sup>2</sup>**

Notched Impact Strength **3.0 - 30.0 Kj/m<sup>2</sup>**

Thermal Coefficient of expansion **100 - 150 x 10<sup>-6</sup>**

Max Cont Use Temp **80 oC**

Density **0.905 g/cm<sup>3</sup>**

### RESISTANCE TO CHEMICALS

Dilute Acid \*\*\*\*

Dilute Alkalis \*\*\*\*

Oils and Greases \*\* variable

Aliphatic Hydrocarbons \*

Aromatic Hydrocarbons \*

Halogenated Hydrocarbons \*

Alcohols \*\*\*\*

*KEY \* poor \*\* moderate \*\*\* good \*\*\*\* very good*

### APPLICATIONS

Polypropylene can be processed by virtually all thermoplastic-processing methods. Most typically PP Products are manufactured by: Extrusion Blow Moulding, Injection Moulding, and General Purpose Extrusion.

## CONTACT

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