

## THERMOPLASTIC

### SEMI-CRYSTALLINE GROUP

#### Definition:

It is the long-chained molecules that define the character of this group. When moulded, this highly ordered molecular structure is anisotropic: shrinking less in the direction of flow vs. transverse to flow. Other features of this aligned structure include a high degree of component flexibility, good chemical & ESC (Environmental Stress Cracking) resistance.

Semi-crystalline materials have a distinctive (known) melting temperature, they do not gradually soften when exposed to increases in temperature, instead they remain solid until a given quantity of heat is absorbed then rapidly change into a low viscous (watery) melt.

#### Typical Features:

- Chemical & ESC resistant.
- Fatigue resistant & flexible
- Good for bearing & wear.
- Resistant to bonding with solvents & adhesives.
- Distinctive (known) melting temperature.

#### Reinforcements & fillers:

Benefits, if available:-

Glass fibre **reinforcement** by weight (eg: 30%) alters Mechanical Properties:-

- Increases stiffness
- Becomes more brittle.
- Reduces moulding shrinkage.
- Improvements to Heat Distortion Temp (HDT).

Additional **fillers** can improve:-

- Flame-retardance.
- Electrical properties:-

Carbon increases conductivity

Stainless steel improves dissipative behaviour.

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## DSM 3.2.6

**POLYPROPYLENE\_Natural  
Rotational Moulding****General:**

Polypropylene (PP) is the most versatile & cost effective of the polyolefin (wax-like feel) family.

**Benefits:**

- Resistant to fatigue, flexible with moderate strength.
- More consistent wall thickness ( $\pm 10\%$ ) compared to blow moulding.
- It has good impact strength, surface hardness, dimensional stability and excellent abrasion resistance.
- Polypropylene does not present stress cracking problems & is resistant to a wide variety of acids, alkalis and solvents.
- This grade is UV stabilized.
- PP doesn't melt below 160°C.

**Limitations: (unmodified):**

- Prone to build up of static electricity.
- Attacked by chlorinated solvents (carbon tetrachloride) & aromatics (Benzene)
- Difficult to bond & paint.

**ASM (DEK) Applications:**

- Solvent containers & liquid management.

**Advantages of Rotational Moulding:**

A cost effective & quick method for producing large lightweight hollow components in small to medium quantities. The thermoplastic powder is dispensed in the mould which is bi-axially rotated inside an oven until the polymer melts and coats the mould cavity.

**These values are representative. For critical applications, refer to data-sheet.**

| MECHANICAL PROPERTIES |                     |                      |                    |                    |                       |
|-----------------------|---------------------|----------------------|--------------------|--------------------|-----------------------|
|                       | HARDNESS<br>Shore A | TENSILE<br>STRENGTH: | YOUNGS<br>MODULUS: | POISSONS<br>RATIO: | DENSITY:              |
| >PP<                  | ---                 | 24 MPa               | 1.15 GPa           | 0.35               | 900 Kg/m <sup>3</sup> |

| GRADE                          | SUPPLIER       | UL No. | RECYCLE CODE |
|--------------------------------|----------------|--------|--------------|
| Icorene 4014<br>Natural Colour | Lyondellbasell | ----   | >PP<         |

**Website For More Information:** <https://www.lyondellbasell.com>

**Alternatives:** Alternative polymers are allowed only with the express written permission of ASMPT. Please email details of your request to [engineering\\_enquiries@asmpt.com](mailto:engineering_enquiries@asmpt.com)

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