

## 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.

| Issue | 01    | 02    | 03 | 04 | 05 | 06 | 07 | 08 | 09 |
|-------|-------|-------|----|----|----|----|----|----|----|
| DCR   | 41730 | 44747 |    |    |    |    |    |    |    |



## DSM 4.1.0

## ACETAL (POM +20% PTFE)

**General:**

A medium viscosity acetal **homopolymer** resin containing 20% Teflon® PTFE fibres. It is designed for applications requiring low wear and/or low coefficient of friction against steel, itself, and other plastics.

**Benefits:**

- High surface hardness including stiffness.
- Dimensionally stable with low water absorption.
- Good electrical insulation and chemical resistance to solvents & hydrocarbons.

**Limitations: (unmodified)**

- Become brittle with long term exposure to low temperatures and/or sunlight (UV). Poor fire resistance (UL 94 HB).
- Sensitive to acid & chlorine attack
- Resistant to bonding, when using adhesives or solvents.

Acetal **homopolymer**: compared to Acetal copolymer has a higher hardness therefore lower coefficient of friction which equals, better wear resistance. Combined with higher impact & tensile strength, creep resistance and a lower thermal expansion rate.

Acetal **copolymer**: is preferred for machining due to absence of centre line porosity in rods (extruded) & risk of cavitation in plates (cast).

**ASM (DEK) Applications:**

- Bearings and gears

**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:               |
| <b>POM + SF20</b>     | ---                 | 72 MPa               | 3.0 GPa            | 0.35               | 1420 Kg/m <sup>3</sup> |

| HOMOPOLYMER        | SUPPLIER | UL No. | RECYCLE CODE |
|--------------------|----------|--------|--------------|
| Delrin 500AF BROWN | DuPont   | E41938 | >POM + SF20< |

**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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