

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.

General:

Polyester (PBT): In this version, the alcohol is **B**utylene glycol, which crystallizes more efficiently than PET Polyester, and as such, available only as a semi-crystalline thermoplastic.

Benefits:

Lower water absorption & dimensional stability compared to Nylon

Addition of carbon fibre will provide a conductive moulding.

Excellent resistance to chemical attack and high environmental stress crack resistance, compared to polycarbonates.

Dimensionally stable: very low creep, even at elevated temperatures.

Good wear & sliding properties

Good machining & welding properties.

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ENGINEERING DATA SHEET

DSM 2.9.41

ASMPT

POLYESTER (PBT +20% Carbon Fibre)

Limitations: (unmodified)

- Not suitable for hot water service.
- Sensitive to strong bases, oxidizing acids (Nitric Acid).
- Lowest flammability rating (UL94. HB)

ASM (DEK) Applications:

Compliance with Critical Path Corridor re: ESD Association: SP10.1-2007 guidelines. Compliant with DEK recommended solvent & water-based cleaners.

These values are representative. For critical applications, refer to datasheet.

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MECHANICAL PROPERTIES					
MATERIAL	HARDNESS Shore A	TENSILE STRENGTH	YOUNGS MODULUS	POISSONS RATIO	DENSITY
PBT + CF20	---	170 MPa	14.5 GPa	0.35	1.38 g/cm³
4DUR	---	120 MPa	16.0 GPa	----	1.4 g/cm³
P3 ICF 20 Black (6947)	---	150 MPa	16.0 GPa	----	1.37 g/cm³

GRADE	SUPPLIER	UL No.	RECYCLE CODE
Beetle: PBTS120CF + Master Batch Colour BLACK	Teknor Apex UK Limited	----	>PBT + CF20<
4DUR 9K22720 BBK001	4 PLAS Limited	----	>PBT + CF20<
PRECITE P3 ICF 20 Black (6947)	AKRO-PLASTIC	94	----

Alternatives:

Alternative polymers are allowed only with the express written permission of ASMPT. Please email details of your request to engineering_enquiries@asmpt.com

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