Xometry

Datasheet

PP (Polypropylene)

Description

PP is a general-purpose thermoplastic with high production volume and a wide range of applications. It is mainly classified into:

1. Homopolymer PP (PPH): High rigidity, moderate toughness;

2. Block Copolymer PP (PPB): Good low-temperature impact resistance;

3. Random Copolymer PP (PPR): Transparent, good toughness, commonly used for pipes;

Characteristics: It has the lowest density among common plastics, excellent chemical resistance, ease of processing, and low cost, making it one of the most widely used plastics.

Features

1. Lowest density: It is the lightest among common plastics, with a density of approximately 0.90–0.91 g/cm³, making it lighter than water and able to float.

2. Mechanical properties: It has moderate strength and rigidity; excellent flexural fatigue resistance (hinges, snap-fits withstand repeated bending without breaking). Homopolymer PP is somewhat brittle, while copolymer PP offers significantly improved low-temperature toughness.

3. Heat resistance:

Melting point: 160 ~ 170℃; Heat deflection temperature: 100 ~ 110℃; It can withstand boiling water and steam sterilization, making it suitable for food packaging, meal containers, and piping;

4. Excellent chemical resistance: Resistant to acids, alkalis, oils, and solvents; virtually non-hygroscopic and resistant to hydrolysis.

5. Processing & applications: Easy to process via injection molding, extrusion, blow molding, and filament drawing; non-toxic and odorless, commonly used in food-grade and medical-grade applications. However, its surface is difficult to print on and bond.

6. Disadvantages: Prone to brittleness at low temperatures (impact resistance decreases below < 0℃); Moderate weather and UV resistance; UV stabilizers are required for outdoor use. Flammable and not inherently flame retardant (unless flame retardant additives are used).

Parameters (Homopolymer PP - Standard)

Physical Properties

Density: 0.90~0.91 g/cm^3

Water absorption: 0.01~0.03%

Mold shrinkage: 1.1~ 1.3%

Mechanical Properties

Tensile strength: 25~35 MPa

Flexural modulus: 1.2~ 1.8 GPa

Izod impact strength (notched):

23°C: Good

0°C: Significantly reduced

Rockwell hardness: R80–100