POM 3D Printing Filament – Technical Data Sheet (TDS)

Product Name: POM Filament
Material Type:POM (Polyoxymethylene / Acetal)
Brand: Fabbxible

Technical Data Sheet (TDS)

POM (Polyoxymethylene / Acetal) Filament

1. Material Overview

POM (Polyoxymethylene), also known as **Acetal**, is a high-performance engineering thermoplastic known for its **high stiffness, low friction, excellent wear resistance, and dimensional stability**. It is widely used for **gears, bearings, bushings, mechanical parts, and precision components**.

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2. Physical Properties

Property	Value	Test Method
Density	1.41 g/cm³	ISO 1183
Water Absorption (24h)	≤ 0.2%	ISO 62
Shrinkage Rate	High	—
Color	White/ Black	—
Odor During Printing	Mild	—

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3. Mechanical Properties

Property	Value	Test Method
Tensile Strength	60–70 MPa	ISO 527
Tensile Modulus	2,800–3,200 MPa	ISO 527
Elongation at Break	15–25%	ISO 527
Flexural Strength	85–100 MPa	ISO 178
Flexural Modulus	2,500–3,000 MPa	ISO 178
Impact Strength (Izod, Notched)	6–8 kJ/m²	ISO 180
Hardness	Rockwell M90–M95	ISO 2039

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4. Thermal Properties

Property	Value	Test Method
Glass Transition Temperature (Tg)	−60 °C	—
Melting Temperature	165–175 °C	ISO 11357
Heat Deflection Temperature (HDT, 0.45 MPa)	~110 °C	ISO 75
Continuous Working Temperature	−40 °C to 100 °C	—

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5. Printing Parameters (Recommended)

Parameter	Setting
Nozzle Temperature	210–230 °C
Bed Temperature	100–120 °C
Build Surface	PEI + Adhesive / Garolite
Enclosure	**Highly Recommended**
Printing Speed	30–50 mm/s
Cooling Fan	OFF or very low
Nozzle Type	Hardened steel recommended

⚠ **Note:** POM has **high shrinkage and warping tendency**. An enclosed printer and strong bed adhesion are essential.

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6. Chemical Resistance

- Excellent resistance to fuels, oils, greases
- Resistant to alcohols and weak acids
- Poor resistance to strong acids and oxidizing agents

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7. Advantages

- High stiffness and strength
- Excellent wear and fatigue resistance
- Low friction coefficient
- High dimensional stability
- Ideal for moving mechanical parts

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8. Limitations

- Difficult to print compared to PLA/ABS
- High warping risk
- Limited layer adhesion
- Requires controlled printing environment

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9. Typical Applications

- Gears and gear wheels
- Bearings and bushings
- Conveyor components
- Mechanical jigs and fixtures
- Sliding parts and rollers

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10. Storage Recommendations

- Store in a **dry, sealed container**

- Recommended storage humidity: **<30% RH**
- Dry filament at **80–90 °C for 4–6 hours** before printing if exposed to moisture