

Duracon® M90■44 (CD3068 / CF2001) – Material Datasheet & Injection Molding Processing Guide

Product Description:

Duracon® M90■44 is a high-performance **Polyoxymethylene (POM) copolymer** resin developed by Polyplastics Co., Ltd. It offers an excellent balance of mechanical strength, toughness, dimensional stability, and processability. The grade M90■44 (CD3068 black) is optimized for general engineering applications, precision components, gears, and sliding parts requiring wear resistance and low friction.

Typical Physical and Mechanical Properties

Property	Typical Value	Test Method / Condition
Density	1.41 g/cm ³	ISO 1183
Water Absorption (23°C, 24h)	0.5 %	ISO 62
Melt Flow Rate (190°C / 2.16kg)	9 g/10 min	ISO 1133
Tensile Strength (at yield)	62 MPa	ISO 527
Elongation at Break	35 %	ISO 527
Flexural Strength	87 MPa	ISO 178
Flexural Modulus	2500 MPa	ISO 178
Charpy Notched Impact Strength	6 kJ/m ²	ISO 179
Heat Deflection Temp. (1.8 MPa)	95 °C	ISO 75
Linear Thermal Expansion Coefficient $\times 10^{-5}$ /°C	/°C	ISO 11359
Volume Resistivity	1×10^{12} Ω·cm	IEC 60093
Surface Resistivity	1×10^{12} Ω	IEC 60093
Dielectric Strength (3 mm)	19 kV/mm	IEC 60243-1
Rockwell Hardness (M scale)	80	ISO 2039-2
Mold Shrinkage (flow direction)	2.0 – 2.5 %	ISO 294-4

Injection Molding Processing Recommendations

Parameter	Recommended Range	Remarks
Drying Temperature	80 – 90 °C	Ensure moisture content below 0.02%
Drying Time	2 – 4 hours	Depending on hopper size and humidity
Barrel Temperature (Rear → Front)	165 – 200 °C	Gradual ramp to prevent thermal degradation
Nozzle Temperature	190 – 200 °C	Slightly higher than front barrel zone
Melt Temperature	190 – 210 °C	Avoid exceeding 210°C to prevent formaldehyde emissions
Mold Temperature	60 – 80 °C	Higher temperatures improve surface finish
Injection Pressure	50 – 100 MPa	Adjust according to part geometry
Holding Pressure	Similar to injection pressure	Compensate for volumetric shrinkage
Back Pressure	0.2 – 3 MPa	Low to moderate; avoid shear heating
Screw Speed	Moderate	Avoid excessive rpm that causes overheating
Injection Speed	Moderate	Too high may cause burn marks
Cooling Time	Based on wall thickness	Ensure part rigidity before ejection
Regrind Usage	≤ 20 – 30 %	Mix with virgin for consistent color and property retention

Mold Design & Handling Notes

- Maintain uniform wall thickness; avoid sharp transitions.
- Ensure adequate venting to prevent burn marks or trapped gas.
- Use appropriate gate size and position to minimize shear stress.
- Design cooling channels for even temperature control.
- Allow proper gate freeze before ejection to prevent sink marks.
- Control residence time to minimize polymer degradation.
- Avoid contamination; purge barrel before and after use.

Safety & Handling Information

POM materials can emit small quantities of formaldehyde if overheated or decomposed. Ensure adequate ventilation in processing areas. Avoid exposure to open flame or strong oxidizing agents. Follow safety data sheet (SDS) for detailed handling and storage instructions.

Source: Polyplastics Co., Ltd., Maruzen Chemical, LEDIL Materials Data Sheet, Plastore Technical Reference.

Note: The data and values shown are typical and not intended as product specifications.