ExxonMobil Signature Polymers

Factsheet

ExxonMobil™ PP Exceed™

# ExxonMobil's polypropylene quick processing reference

This document provides an overview of typical tool and process parameter references for multiple ExxonMobil polypropylene grades. Per the SDS, elevated temperatures over 288°C (550°F) should be avoided.

All values included in this document are for reference purposes only and should not be construed as material specifications.

## Processing parameters

| Parameter | Range | Typical values[1] / notes |
|---|---|---|
| Drying | | Not required |
| Melt temperature | 199°C to 239°C (390°F to 460°F) | 221°C (430°F) |
| Barrel zones | | |
| ▪ Rear | 199°C to 228°C (390°F to 440°F) | 210°C (410°F) |
| ▪ Middle | 199°C to 232°C (390°F to 450°F) | 216°C (420°F) |
| ▪ Front | 204°C to 239°C (400°F to 460°F) | 221°C (430°F) |
| ▪ Nozzle | 204°C to 239°C (400°F to 460°F) | 221°C (430°F) |
| Manifold and drops | ± –7°C (20°F) of melt temperature | Same as melt temperature |
| Mold temperature | 16°C to 54°C (60°F to 130°F) | 27°C to 39°C (80°F to 100°F) |
| Injection speed | Medium to fast | As fast as part acceptability will allow |
| Screw speed | 40 rpm to 100 rpm | Depends on screw diameter |
| Cushion | 6 mm to 10 mm (0.250" to 0.400") | Depends on barrel capacity |
| Fill time | 1 to 10 seconds | Fill part 95% to 98% full if conditions allow |
| Pack time | 1 to 4 seconds | Profile to complete fill and eliminated screw bounce back |
| Hold time | 5 to 20 seconds | Enough to pack out part and allow gate to freeze off |
| Cure time | 15 to 40 seconds | Depends on part and mold design |
| Cycle time | 30 to 90 seconds | Application, wall thickness dependent |
| Pressure, bar (psi) | | |
| ▪ Injection | 34 bar to 103 bar (500 psi to 1500 psi) | 76 bar (1100 psi) |
| ▪ Pack | 50% to 75% of transfer psi | 41 bar to 55 bar (600 psi to 800 psi) |
| ▪ Hold | 50% to 75% of transfer psi | 28 bar to 48 bar (400 psi to 700 psi) |
| ▪ Back | 3.5 bar to 8.5 bar (50 psi to 125 psi) | 5 bar (75 psi) |

To protect against parts becoming tightly bound to the cores, the shorter packing/holding times that still provide adequate gate freeze-off should be considered. The shortest cooling time which allows both part ejection without damage and complete screw recovery should be used.

With all polypropylene-type materials, there can be a greater tendency for sink marks and shrinkage voids. This can be minimized with more complete packing of the parts, using slower injection speeds, and/or increased packing pressures. Changes to standard holding/packing times should only be considered when required to obtain the minimum time for gate freeze off. This will vary slightly with the specific pack/hold pressure chosen.

It is very important that the mold has good temperature control of the cavity and core surfaces and material melt. Please note the following considerations involving mold tool design and processing.

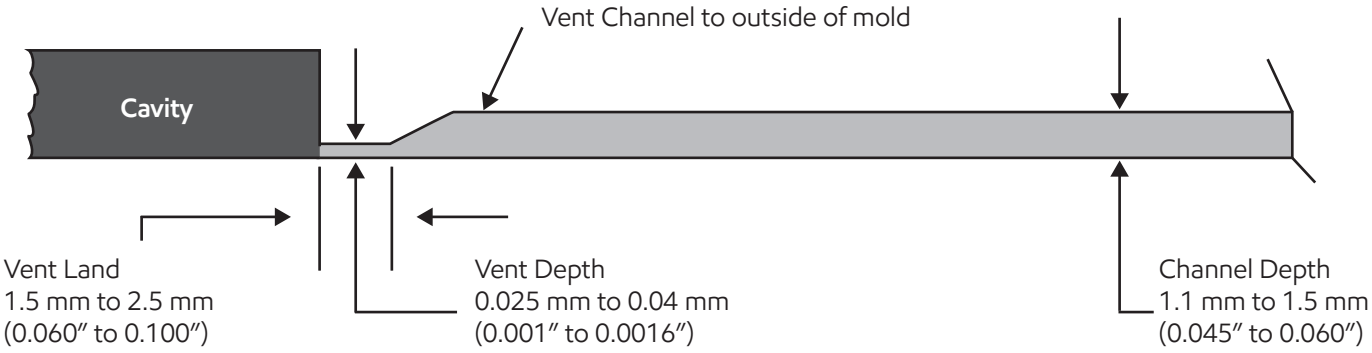
1. Based on ExxonMobil Company internal laboratory conditions.

# Mold and part design considerations

**Runners and gates** should be fully sized to allow easy flow and avoid excessive shear heating of the material, which allows a wide range of filling speeds to optimize the process for surface appearance and dimensional control.

**A reasonable suggestion for gate diameter/thickness is 50% to 70%** of the wall thickness of the part at the point of gating. It is preferable to locate gates in the thickest point on a part to ensure that resin will flow from thick to thin sections as the mold fills. It is also important to avoid large differences (>=25%) in wall thickness in adjacent regions of the part.

**Based on internal testing, generous venting is important** in molds designed for these grades. Mold filling has the potential to lead to "dieseling", high pressurization of air in the mold, burning of the leading edge of the melt front and higher fill pressures. This pressurization can be reduced with proper venting. Vent spacing of 25 mm to 76 mm (1" to 3") is typical depending on the size of part. Parting lines on lifters and slides are also typically vented, as well as 90° corners on the molded part (see typical dimensions below).

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