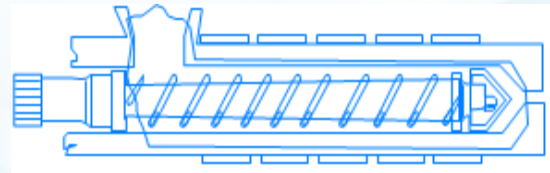




KEPITAL®
Injection Molding Guide

Process data overview

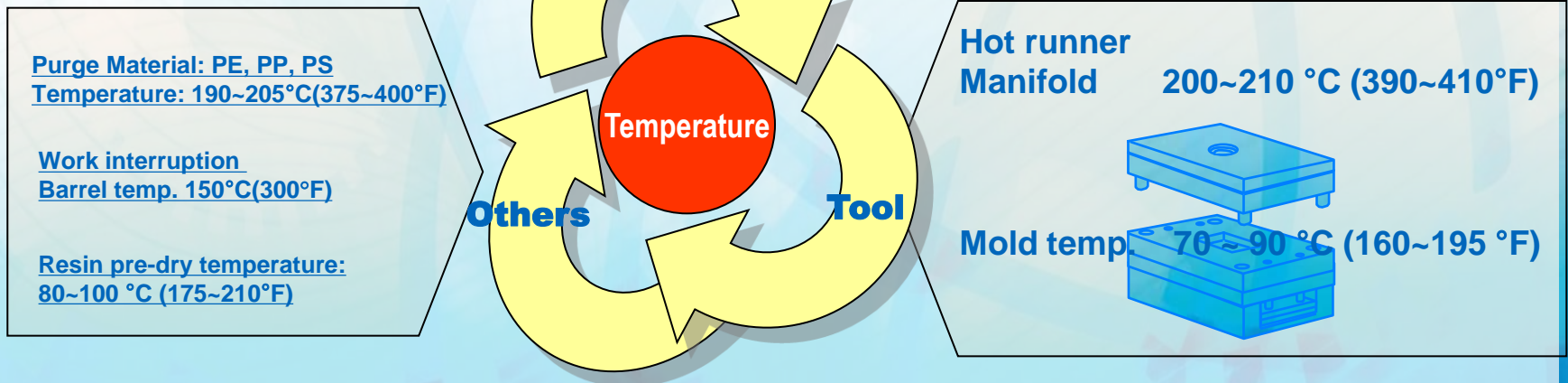
Cylinder



Grade

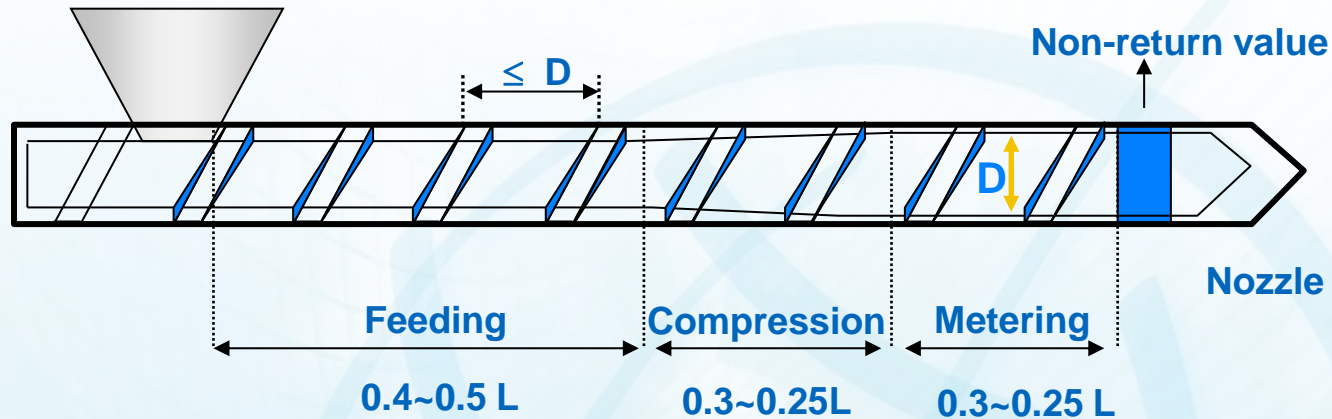
F20-03 **LOF*** (MFR : 9 g/10 min): °C(°F) 170(340) 180(355) 190(375) 200(390)
 Feed Comp's Metering Nozzle

Melt Temp. = 190~210 °C(375~410°F)



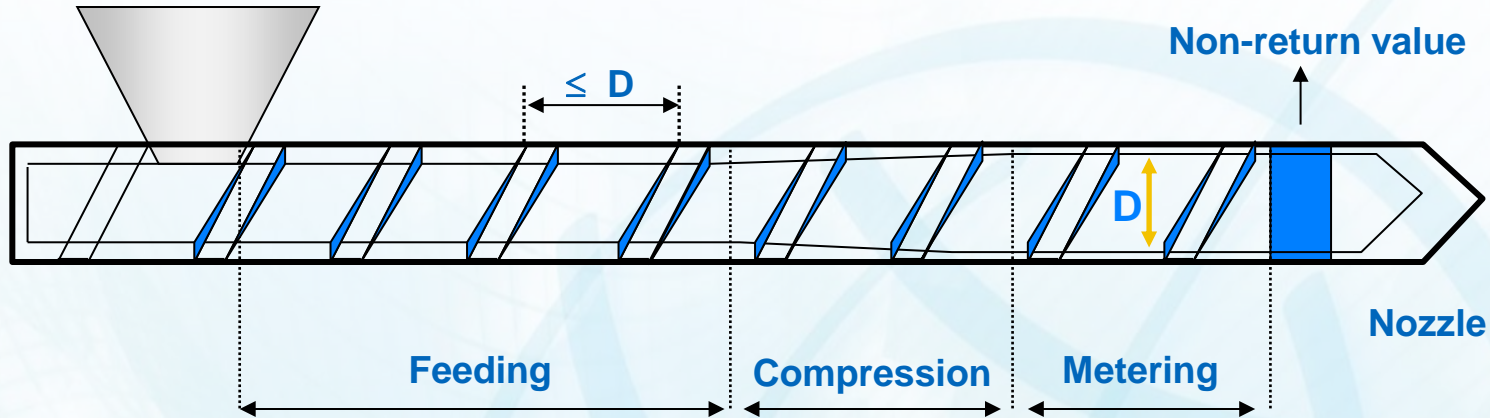
Important when processing LOF grades:

- **Max. melt-temperature 200°C**
- **Reduction of shear-stress (gate size 2/3 of part wall thickness (gate size hot runner 1/2 of max. wall-thickness))**
- **Reloading stroke: > 1D < 4D, optimum 2-3D**



- **Recommendation on injection molding M/C**
 - The one shot weight for KEPITAL is 20 ~ 50 % of the capacity of the injection unit
 - General purpose standard screw , in order to keep shear rate low
 - Screw ratio L/D : 20 ~ 24
 - Compression ratio : 3/1~3.5/1
- Improper length of compression in screw may cause over-heating on melt or lack of pressure building-up in plasticizing. The recommendable compression zone is 25 ~ 30 % of screw length.

Cylinder Temperature



- **Cylinder temperature**

Feeding	Compression	Metering	Nozzle
170 °C	180 °C	190 °C	200 °C
340 °F	355 °F	375 °F	390 °F

- **Melt temperature : 190 ~ 210 °C(375 ~ 410 °F)**

Mold Temperature

- Mold temperature may widely be set up at 60 ~ 120 °C (140 ~ 250 °F), and general recommendation is 70 ~ 90 °C (160 ~ 195 °F) for general purpose of injection molding.
- If surface finish is important or low post-mold-shrinkage is required in the environment of high service temperature, relatively high mold temperature is recommended.
- The mold temperature is one of the most important key parameters to affect mechanical property as well as dimensional stability because KEPITAL POM is a high crystalline polymer.

Purpose	Mold temperature (°C)	Mold temperature (°F)
General range	60 ~ 100	140 ~ 210
Recommended	70 ~ 90	160 ~ 195
For better surface	100 ~ 120	210 ~ 250

Process setting – Injection & Plasticizing

Injection speed

- 5 ~ 50 mm/s (0.2 ~ 2.0 in/sec)

Screw recovery speed

- Recommended peripheral speed of screw is 150 ~ 200 mm/s (5.9 ~ 7.9 in/s) in plasticizing.
- Proper screw rotating speed should be defined in accordance with the peripheral speed of screw, since frictional heating will not be identical to different diameter of screws at the same rotating speed.
- Screw RPM recommendation with respect to screw diameter

Screw diameter	35 mm	45 mm	55 mm
Screw RPM	80 ~ 100	60 ~ 80	50 ~ 70

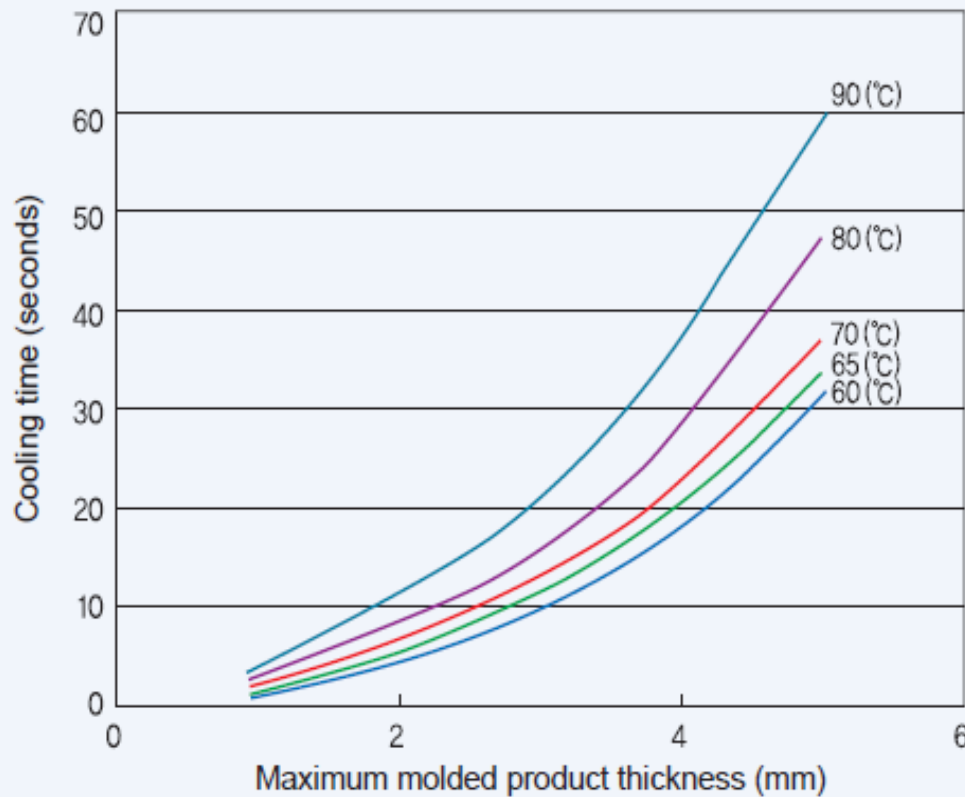
Back pressure

- Back pressure : 0.3 ~ 1 MPa (45 ~ 145 psi)

Process setting - Rule of thumb of Time Factor

- Injection time estimation: 1 sec * wall thickness (thickest wall)
- Cooling time is proportional to square wall thickness

Cooling time versus mold temperature

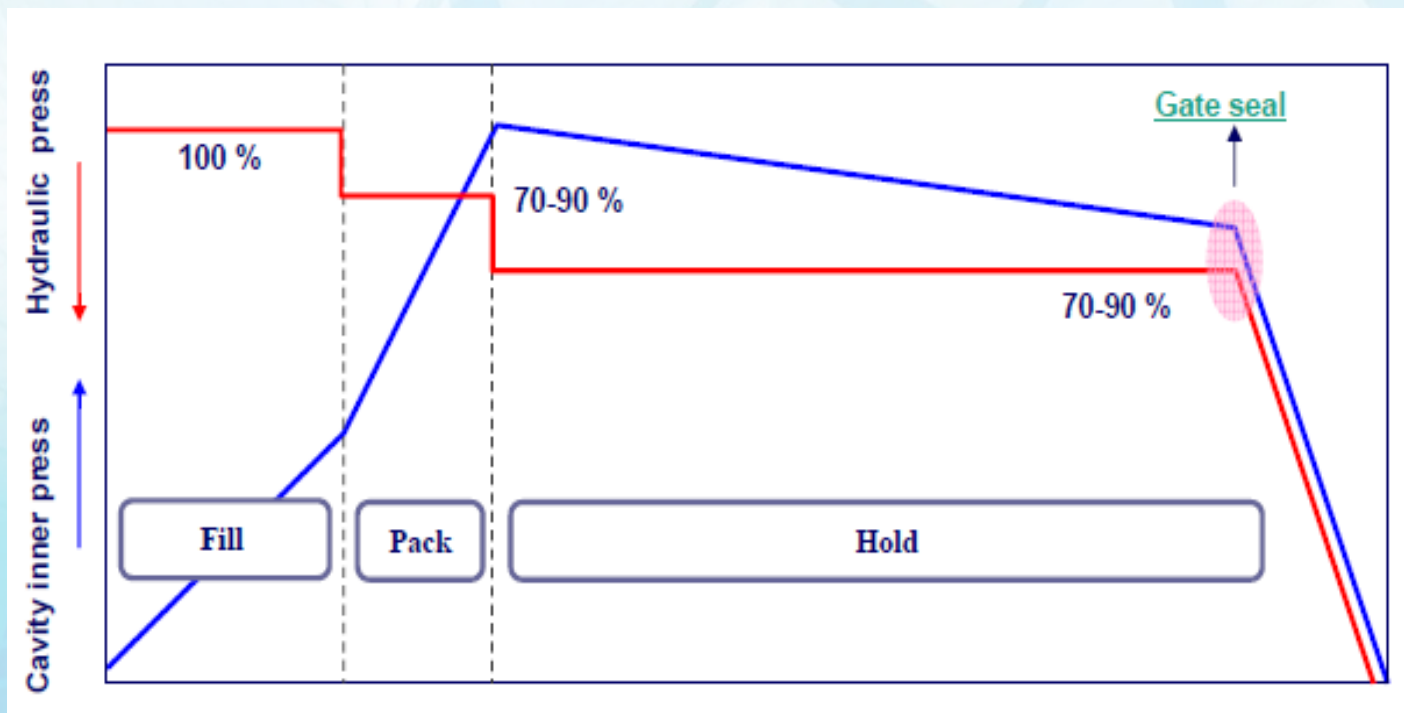


Process setting - Hold Pressure Time

- Hold pressure plays a key role to optimize parts not only in dimensional but also in mechanical properties. In hold stage (hold/pack), remaining melt for about 1~ 5% of cavity is forced to pack to compensate for volumetric shrinkage during cooling.
- Hold pressure time estimation: $6 \sim 8 \text{ sec} * \text{wall thickness} \geq \text{Gate seal time}$
- HPT (Hold pressure time) is determined by practical gate seal time.

Process setting - Pressure set up

- Injection pressure : 50 ~ 120 MPa (7 ~ 17 kpsi)
- Pack & Hold pressure : 60 ~ 90 % of injection pressure
- Switch point from IP to HP : 95 % to 98 % filling of cavity



Drying & Material replacement

Pre-drying condition

- **KEPITAL does not need to pre-dry prior to molding unless bag or boxes are left open for a certain period. However, pre-dry is recommended in high moisture environment e.g. raining season.**
- **Natural products : 80 ~100 °C (175 ~ 210 °F), 1~2 hrs**
- **Colored products : 100 ~110 °C (210 ~ 230 °F), 1~2 hrs**

Material replacement & Work interruption

- **It is recommended that barrel should be cleaned up with PE, PP or PS before and after running of KEPITAL.**
- **In case of work interruption for 15 ~ 30 minutes, purge out KEPITAL inside cylinder with recommended purging materials, and maintain the temperature of barrel at 150 °C (300 °F, below melting temperature of POM copolymer)**
- **Do not leave POM material in cylinder for prolonged time at over its melting temperature, especially be careful over 15 min above 210°C (410 F).**

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