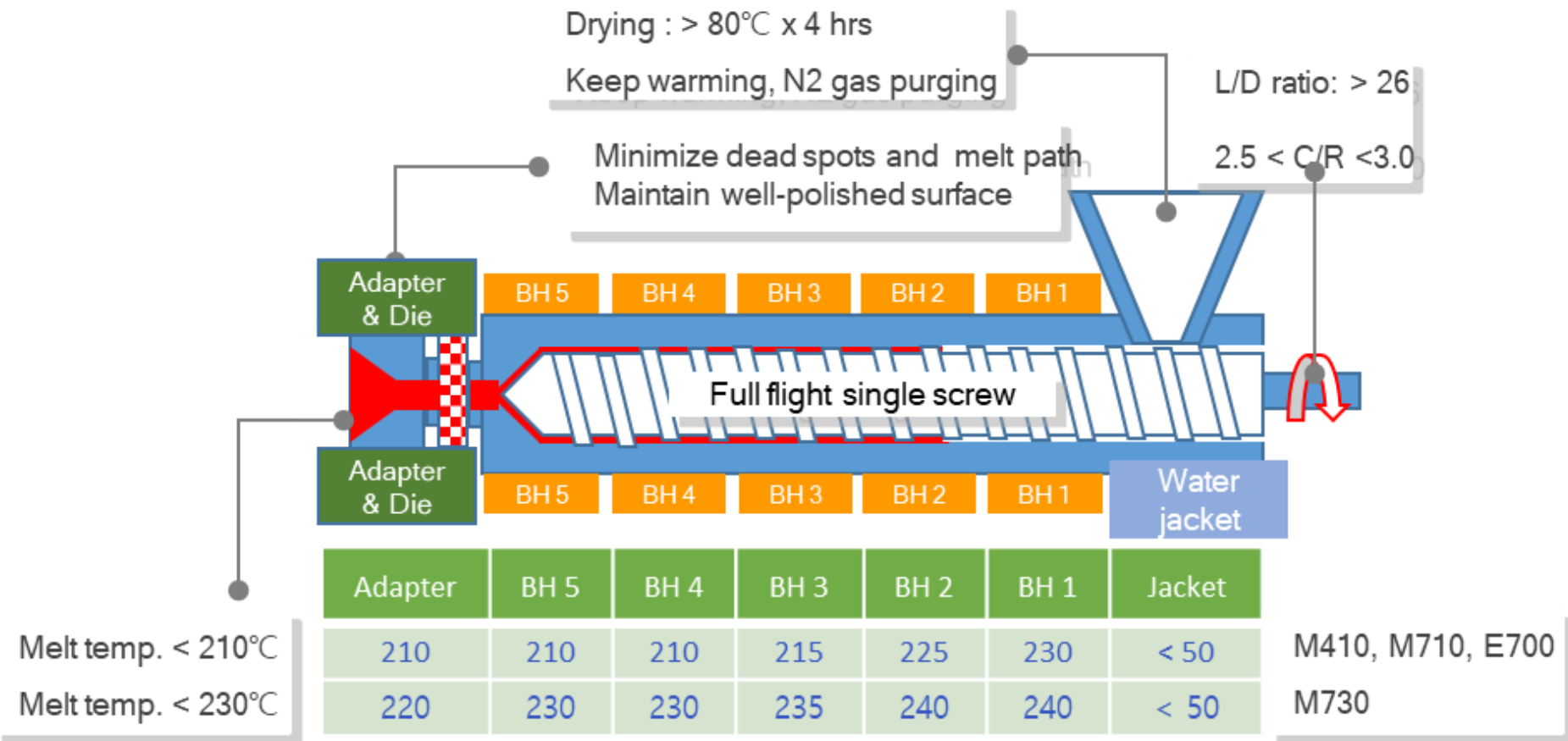


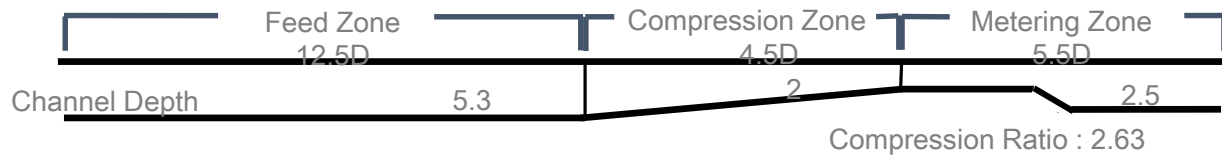
# Extrusion Guide

## Processing conditions for M410, M710, E700, M730



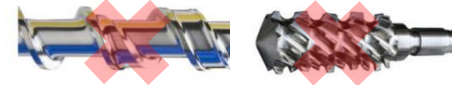
## Screw

Compression	Feeding zone	Compression zone	Metering zone
Ratio 2.63:1	45%	30%	25%, 2-stage



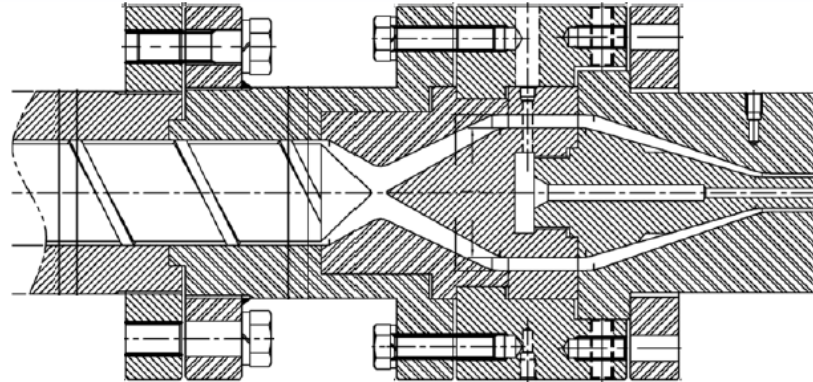
- Length-to-diameter(L/D) Ratio:  $>26$
- Compression Ratio(C/R):  $2.5 < C/R < 3.0$
- Screw Diameter:  $>50\text{mm}\Phi$
- Flight Pitch: 1D (Helix Angle  $17.66^\circ$ )
- Flight Width: 0.1D
- Channel Depth in Feed Section:  $0.15\sim 0.20D$

Barrier transition or Mixing section that can cause deposition is **not recommendable**



**Figure** A typical screw for polyketone extrusion

## Tube & Pipe Die



*Figure 2. A typical die for polyketone extrusion*

- The die should be designed such that the melt has a gradual increase in linear velocity, ensuring a self-cleaning action.
- The area between screw tip and torpedo bottom should be streamlined, thus avoiding low shear rate areas and consequent build-up of stagnant material.
- Basket-type die head is not recommendable. It can cause deposits.

## Processing

Process		Recommended condition
Pellet Drying	Method	Dry clean air drying, or vacuum drying
	Temperature	70°C(160°F) and below for dry air drying
	Time	Minimum: 4 hours, maximum: 8 hours
	Conveying	Reduce the contact with ambient air and keep warming
Nitrogen Purging		Recommended at the feed section to reduce the thermal oxidation reaction during extrusion.
Start-Up	Initial Heating	Two steps of heating is recommended. Set the temperature to 150°C in order to avoid the oxidation and degradation of any residue inside the extruder. Move to the 2nd step heating to an initial temperature program before 1 or 2 hours of running the machine. Start the extruder operation using LDPE with a MFR of 2-5. When the extrudate gets clean and stable, drain out LDPE from a hopper and directly pour Poketone pellets into hopper. Recommend to keep the screw rotation over 30 rpm to avoid a feed bridging problem. When the extrusion gets stable, check the melt temperature(M710: 210°C) and try to lower it step by step as much as possible

## Processing

Process		Recommended condition
Purge	Case	<p>When the following phenomena occur, the purging operation is recommended.</p> <ul style="list-style-type: none"> <li>▷ Cross-linked gels and black specks are rapidly increased</li> <li>▷ The color of the products is getting yellowish</li> <li>▷ The extrudate is rapidly decreasing due to bad feed of the pellets</li> <li>▷ The melt pressure or the screw torque is abnormally increasing</li> </ul>
Purge	Procedure	<p>First of all, follow the standard purge procedure you have. And then refer to the following;</p> <ol style="list-style-type: none"> <li>1. Drain or pour the polyketone pellets out and put LDPE with MFR of 2~5 into the hopper or the feed throat</li> <li>2. Keep the same temperature profile.</li> <li>3. Continue purging with LDPE until polyketone is completely flushed out.</li> <li>4. When most of defects disappear in the LDPE melt, directly change over polyketone pellets over LDPE pellet in the feed throat or in the bottom of hopper.</li> </ol>
Shut-down	Procedure	<p>First of all, follow the standard shut-down procedure you have. And then refer to the following;</p> <ol style="list-style-type: none"> <li>1. Drain or pour the polyketone pellets out and put LDPE with MFR of 0.5~1 into the hopper or the feed throat</li> <li>2. Keep the same temperature profile.</li> <li>3. Continue purging with LDPE until polyketone is completely flushed out.</li> <li>4. When most defects disappear in the LDPE melt, the operation of extruder should be stopped when the extruder is filled with LDPE.</li> </ol>