

INNOKETONE® PK Pre-Drying

Method: Clean air drying or vacuum drying;
Temperature: 70°C (160°F) to 80°C (175°F) ;
Time: Minimum 4 hours – Maximum 16 hours;
Handling: Minimize exposure to humid environments; maintain consistent heating during transfer.

Hopper setup

Temperature: ≤70°C (160°F) with maintained heating
Feeding: Feeders perform flood feeding or starvation feeding;
Feed inlet: Maintain water circulation cooling (below 50°C);

Preparation
in the early
stages

Extruder

Screw Design: A conventional single-screw extruder (full-flight screw) is recommended. Since INNOKETONE® PK are shear-sensitive, minimizing shear forces inside the extruder yields higher-quality polymer melt.

- **Compression Ratio (C/R):** $2.5 < C/R < 3.0$;
- **Pitch:** 1D (helix angle 17.66°);
- **Flight Width:** 0.1D;
- **Feed Zone Depth:** 0.15–0.20D

Screw Configuration

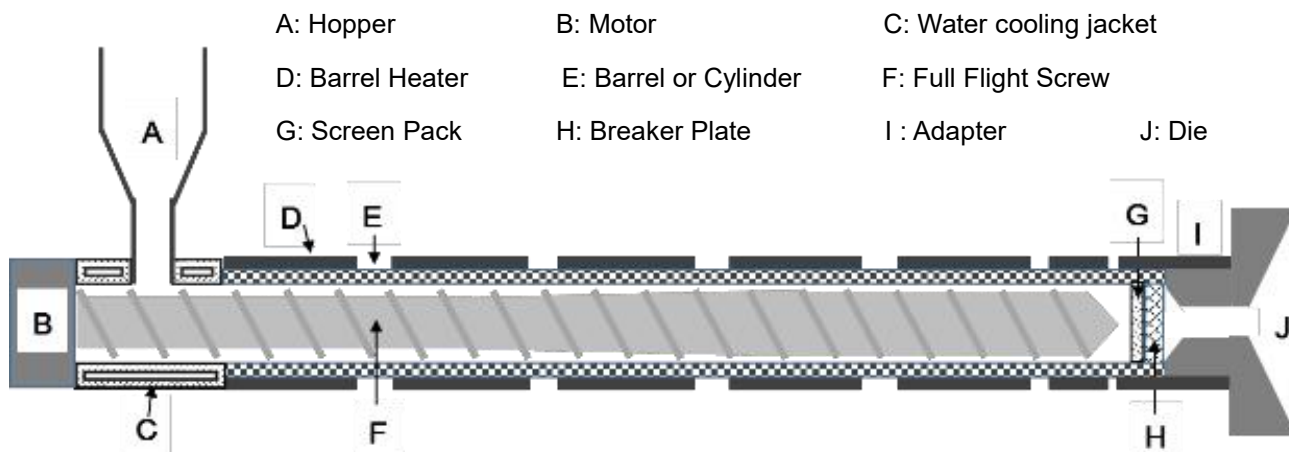
It is recommended to **increase** the lengths of the **feed zone** and **compression zone** compared to conventional designs, as INNOKETONE® PK has lower thermal conductivity than polyolefin polymers. This extended feed and compression zone length ensures more uniform melting.

The standard configuration for a single screw is as follows:

Item	L/D	Feed	Compression	Metering
Pipe	>26	45%	30%	25%
Film	32	>10D	>11D	<11D
	28	>8D	>10D	<10D
	26	>8D	>9D	<9D



- ① **Grooved Feed Section:** Generally not recommended.
- ② **Mixing Elements:** Generally not recommended. If installed, inspect for material residue after testing.
- ③ **Screw Cooling:** (Optional) To prevent feed bridging, cooling with a 4D screw depth is typically recommended.
- ④ **Barrel Heaters:** 4 to 6 barrel heaters with cooling jackets.



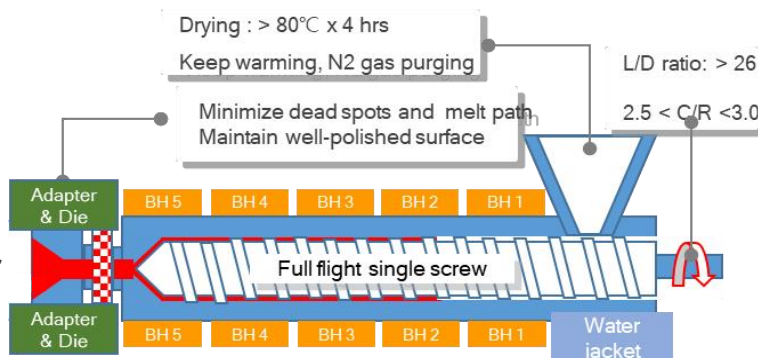
Temperature Curve:

(1) Mainly Reverse Temperature Curve

Feature: Higher temperature at feed zone, lower temperature at die head

(2) Secondly Hump-shaped Temperature Curve

Feature: Highest temperature at middle zone, lower temperatures at feed zone and die head



Star

Initiate secondary heating by setting the temperature to 150°C to prevent oxidation and degradation of residual material inside the extruder. 1–2 hours before operation, switch to secondary heating and set the initial temperature profile.

Use PP (for pipes) or LDPE (for films) with a Melt Flow Rate (MFR) of 2–5 for startup.

- **For Pipe Extrusion:** After PP yields clean and stable extrudate → Empty the hopper of PP → Purge with PETG until clean extrudate is achieved → Load PK resin into the hopper.
- **For Film Extrusion:** After LDPE yields clean and stable extrudate → Empty the hopper of LDPE → Empty the hopper of LDPE.

Recommended screw speed should be maintained above 30 rpm to prevent feed bridging issues.

Once the extrusion process stabilizes, check the melt temperature and attempt to gradually reduce it as much as possible.

Barrel Cleaning

➤ **Case:** Cleaning is recommended when the following phenomena occur.

◆ Products exhibit **yellow** discoloration

◆ Rapid increase in cross-linked gels or black specks

◆ Sudden output reduction due to poor pellet feeding

◆ Abnormal rise in melt pressure or screw torque

➤ **Operation steps:**

First, follow the existing standard cleaning procedure. Then refer to the following:

Empty or pour out INNOKETONE® PK pellets → Add PP (for pipes) or LDPE M710F grade pellets (for films) with MFR less than 0.5 into the hopper or feed port → Maintain the same temperature profile.

- Continue cleaning with LDPE until all INNOKETONE® PK polymer is completely flushed out.
- For **pipe extrusion**: When most defects disappear in the PP melt, directly replace PP pellets with PETG at the feed port or hopper bottom.
- For **film extrusion**: When most defects disappear in the LDPE melt, directly replace with INNOKETONE® PK pellets.