

# **EASTAR™ PETG**

copolyester 6763

## **Do's and don'ts for extruding film**

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### Drying

#### Do

- Dry Eastar™ PETG copolyester 6763 at least four hours at 65°C (150°F) using a desiccant-type dryer. Insufficient drying will cause excessive molecular weight loss during extrusion, with resultant decrease in physical properties.
- Use a dryer that will deliver air having a dew point temperature of –30° to –40°C (–20° to –40°F).
- Use a handheld dew point indicator to routinely monitor actual dew point.
- Use a dryer that will deliver air at a velocity of 0.06 m<sup>3</sup>/min per kg/h (1 cfm per lb/h) of pellets being processed.
- Maintain drying equipment properly. It is critical to check regeneration temperatures, supply temperatures, filters, and airflow.

#### Don't

- Exceed a drying temperature of 65°C (150°F) because softening and caking of the pellets will occur in the drying hopper.
- Use a nondesiccant-type dryer such as the heater-only type or the refrigerant-coil type.
- Use dryers with insufficient airflow.

### Equipment

#### Do

- Use extruders having L/D ratios of at least 24:1. Outputs expected are generally in the range of 2.4 to 4.3 kg/h per kW (4 to 7 lb/h per horsepower).
- Use a low-compression, barrier-type screw. PVC-, polyolefin-, or styrene-type screws have been used with Eastar™ PETG copolyester 6763 with some degree of success. For best results, the screw should be designed specifically for PETG 6763.
- Use internal screw cooling in the first four feed flights of the screw to facilitate feeding and prevent bridging, but end cooling before Zone 1 on the extruder.
- Use a 24-80-100-80-24-mesh screen pack. The screen pack configuration/mesh may need to be adjusted, depending on the amount and quality of regrind.
- Use a coat hanger, flexible-lip film die with a 25-mm (1-in.) land and 0.75- to 1-mm (30- to 40-mil) lip opening. All flow surfaces should be hard chrome-plated and highly polished.
- Use standard 3-roll sheet-casting stacks (305-mm [12-in.] minimum roll diameter) for producing nip-polished or "kiss-polished" film. Film can also be produced by straight casting onto a chill roll without nipping; however, nip-polishing yields higher quality film.
- Use air pins to minimize neck-in and prevent edge-weave when producing cast film by the conventional chill-roll process (not required when nip-polishing).
- Use sharp, rigidly mounted razor blades for trimming film edges.
- Use a winder having good tensioning control and a proximity lay-on roll.

## Don't

- Use short-barreled (L/D or 20:1 or less) or underpowered extruders.
- Use high-compression or long-transition screws since excessive power requirements and overheating may result.
- Use a restrictor-bar die for film extrusion.

## Extrusion procedures

### Do

- Start with a completely clean hopper, extruder, and die before processing Eastar™ PETG copolyester 6763.
- Extrude at the minimum melt temperature that can be used to produce acceptable film. For film, temperatures in the range of 246° to 274°C (475° to 525°F) are typical. Excessive melt temperature may cause degradation and loss of properties.
- Clean extremities of die lips thoroughly and apply silicone spray release agent to these areas before starting the extrusion line. Otherwise, the polymer may stick to the die lips, causing drag or flow lines in the film.
- Use a prethreaded leader of film in the takeoff unit to facilitate an easy, rapid, and clean start-up.
- Use a chill-roll temperature just below the temperature at which sticking begins to occur. This temperature will be dependent on the surface and size of the chill rolls, extruder output, and film thickness. This will minimize chill-roll plate-out and provide good film flatness.

- Use an antiblock agent where a winding aid is needed. (Consult an Eastman representative for additive recommendation.) For blister packaging end uses where denesting of blisters is involved, a silicone coating can be used alone or in conjunction with the antiblock agent. For applications where a silicone coating cannot be used and improvement in denesting is required, use a higher loading of antiblock additive.
- Use proper procedure for extruder shutdown by stopping the drive motor, cutting off all heaters, and sealing the die orifice with a drool pan to prevent oxidation.

### Don't

- Extrude Eastar™ PETG copolyester 6763 at melt temperatures exceeding 274°C (525°F).
- Allow the extruder to sit idle for long periods at operating temperatures.
- Use low casting-roll temperatures. These cause excessive chill-roll plate-out and interfere with film flatness.

The information contained in this publication is intended as general guidance for a typical manufacturing operation. Users must determine for themselves whether this information is appropriate and adequate for their specific operation.

For more information, contact Eastman at the address shown on the back cover of this publication.

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