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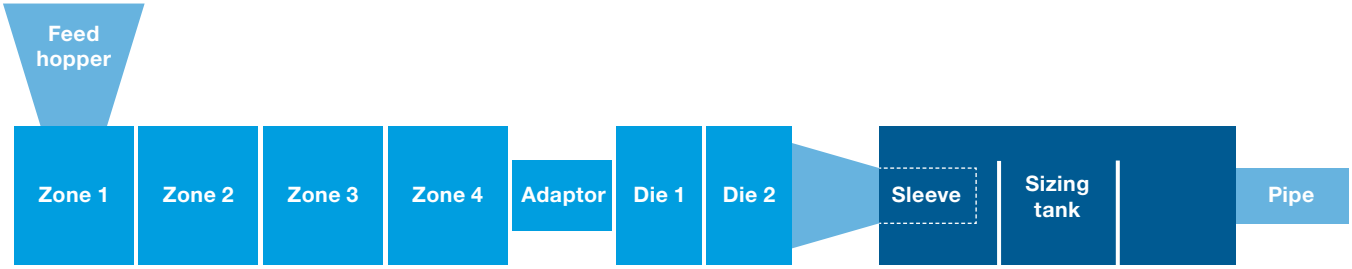
Ryton® PPS XE Pipe Extrusion

Listed below are general processing recommendations for extruding pipe from Ryton® PPS XE Series alloys.

Pipe extrusion line schematic



Extruder set-up

- 24:1 to 28:1 L/D
- General Purpose screw with 2.5:1 to 3:1 Compression ratio. Mixing head optional.
- 20/80/20 Screenpack
- Heated die clamp

Pipe die

- Low volume, high compression die head suitable for low melt viscosity materials
- Die bushing ID should be 1.3 to 1.7 times the pipe diameter
- Die annulus 1.6 to 2.0 times the desired pipe wall thickness

Sizing

- Aluminum sleeve designed for low vacuum sizing (1.5 mm diameter holes, not slotted)
- Sleeve diameter for 1 % to 2 % shrinkage
- Multiple sectioned tank with short vacuum section.

Material drying

- Dry at 80 °C to 85 °C (175 °F to 185 °F) for 4 to 6 hours prior to processing
- Hopper driers and/or desiccant driers are suggested with –40 °C (–40 °F) Dew Point recommended.

Temperature profile for 3:1 screw

Extruder Zone 1	288 °C (550 °F)
Extruder Zone 2	300 °C (570 °F)
Extruder Zone 3	300 °C (570 °F)
Extruder Zone 4	300 °C (570 °F)
Adaptor	300 °C (570 °F)
Die 1	293 °C (560 °F)
Die 2	293 °C (560 °F)

Processing Considerations

Ryton® PPS XE Series alloys process better at higher extruder rates where the shear from the screw does more of the melting rather than the heaters. Extruders should be sized to run above 50 % capacity for the process to generate sufficient shear heating while minimizing residence time. Bubbles, smoke or gels are indications of the material being too hot for too long in the extruder. Temperatures may be adjusted as appropriate, but dies should not be set below 288 °C (550 °F). Cold dies and/or breaker plates will result in the material crystallizing during processing and over-pressurizing the line. If melt temperatures need to be lowered, it is preferred to adjust the extruder profile rather than lowering die temperatures. Sustained melt temperatures above 315 °C (600 °F) for prolonged time periods can lead to thermal degradation of the compound on the screenpack and result in unacceptably high extruder pressures.

Purging Procedure

Equipment used for processing Ryton® PPS XE Series alloys is best purged at processing temperatures using a fractional melt flow HDPE (Marlex® HHM 50100). After purging with HDPE, run the extruder dry, and with the extruder and die still at temperature, break down the die and clean hot. The screw should be pulled and cleaned hot, and the barrel should be cleaned hot as well.

Off-gas products produced during processing can be irritants to the mucous membranes, therefore adequate ventilation is recommended.

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