

EXACT[®] Plastomers

PROCESSING GUIDELINES IN PROFILE EXTRUSION APPLICATIONS

EQUIPMENT

EXACT[®] Plastomers are linear polyolefins and can be extruded on machines used to process LLDPE and conventional LDPE. Like LLDPE, they will require higher torque than LDPE of the same MI. General purpose (LDPE) screws with a compression ratio in the range of 2:1 to 3:1 can be used. As with LLDPE, higher productivity with better temperature control and more uniform temperature distribution can be obtained when using the more specialized screws, such as barrier screws. These polymers are not moisture sensitive and do not require corrosion resistant screws, barrels or dies.

TEMPERATURE SETTINGS

Since EXACT Plastomers are lower melting than LLDPE, a rear zone temperature similar to that used with conventional LDPE should be used to prevent melting in the feed zone of the machine. In fact, EXACT Plastomers with densities of 0.885 and less, which have melting points of 160°F (70°C) or lower, have been run successfully with a neutral rear zone. A forward ramp temperature profile starting from about 280°F to 300°F (140°C to 150°C) in the rear zone to about 400°F to 450°F (200°C to 230°C) in the front zone will usually work. Higher temperatures can be used if needed to reduce viscosity, but melt temperatures in excess of 525°F (275°C) are not recommended. Transfer lines and dies should be set at about the measured melt temperature or as much as 20°F (10°C) lower. Hopper throat cooling is recommended and may be required to maintain temperature control in the rear zone of the extruder.

DRAWDOWN

As with other narrow molecular weight polymers, EXACT Plastomers draw down very well, and have a low melt strength. The high drawdown capability can facilitate the production of very thin walls. The downstream sizing and handling equipment should be designed to work with the low melt strength and softness of the polymer.

MELT FRACTURE

Like other narrow molecular weight polymers, EXACT Plastomers are subject to melt fracture when high extrusion speeds (high shear rates) are used. This melt fracture is a surface phenomenon caused by high shear stress and resultant slipstick flow on the die walls, leading to a rougher surface.

As with LLDPE, surface melt fracture can be overcome by using a processing aid, available as masterbatches from some suppliers. These are typically effective at concentrations of 500 to 750 ppm during extended runs; higher concentrations are frequently used at start-up to precoat the die with the processing aid.

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