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Cut length accuracy is often affected by factors other than the cutter itself.

At an extrusion line speed of 250 fpm, a one millisecond hesitation of the extrudate upstream of the cutter renders a 50 thousandths of an inch difference between the actual length which passes through the blade intersect point and the product length setpoint. A cutter operating in the flywheel master or timer mode has no way to compensate for this product hesitation since the blade passes through the product at a predetermined interval. A cutter, operating in on-demand/encoder or flywheel follower mode, can compensate for such a hesitation only if it occurs upstream of the feed mechanism. If hesitation occurs between the exit of the feed and blade path, or results from product slippage between the feed belts or pinch wheels, the cutter cannot accurately track the product length which passes before the blade. Therefore, a smooth and consistent introduction of material into the cutting path is important if tight tolerance cut length is to be attained.

Three key areas influence accurate product flow through the cutter, material characteristics, bushing geometry and take-off/puller configuration. Material that is sticker, slightly oval, or has a built in curvature will result in excess friction between the product and the cutter bushings generating hesitation. Very flexible material will not track in a straight line through the feed, and may get hung up at the entrance to the cutter bushing. Cutter bushings in which the bore is too tight, too long, too loose, or misaligned between upstream and downstream will inhibit product flow. Shortcomings of take-offs can cause feed problems. Belts can be too tight, too loose, or misaligned due to improper adjustments. Clamping force can be too light resulting in product slippage between the belts, or too great resulting in product deformation. Water on the product from the cooling bath can also contribute to slippage in the puller belts. Loose gearing in the drive train can cause pulsing or backlash during speed changes or momentary line interruptions, such as when a blade is passing through a rigid product.

Determining which condition is contributing to cut length inaccuracy is not always an easy task. Often, it is a combination of factors each working to create a cumulative error. With demand for tighter cut length tolerances. It is essential that cut length problems are diagnosed with a thorough understanding of the relationship between the extrudate upstream of the cutter blade and the action of the cutter itself.

- Glenn Beasely, Killion Business Group/ Davis-Standard

See also:

- Gage control for tubular film production
- Tubing draw down ratio

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