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Feedscrew and barrel wear inevitably leads to lower output and lost revenue. To avoid production deficiencies, it's a good idea to replace worn components before declining outputs are noticeable. The ROI for a replacement screw and barrel can typically be recouped over a very short period of time. New screw designs can not only bring your production levels to previous levels before wear has set in, but can bring increased output beyond the previous levels.

There are three main types of wear to consider: Adhesive, Abrasive and Corrosive.

Causes of Adhesive Wear (metal-to-metal contact)

- Straightness of barrel and screw
- Alignment of drive, barrel, feed section, and feedscrew
- Screw design
- Uniformity of barrel heating
- Combination of screw surface and barrel liner
- Improper barrel support
- Unsupported dies at the end of the barrel
- Excessive head pressure

Causes of Abrasive Wear

- Processing polymers containing fillers such as calcium carbonate, mica, barium sulfate or glass fibers
- Processing blends containing masterbatches of titanium dioxide or other inorganic hard particles

Causes of Corrosive Wear (material attacking surface metals)

- Processing polymers such as PVC and flouropolymers that create aggressive degradation by-products during start-up, shutdown and normal processing
- Processing corrosive additives such as flame retardant masterbatch

Although wear is inevitable, there are six ways to extend the life of your barrel and feedscrew and get the most for your investment.

1. Check compatibility between the screw and barrel material of construction to avoid adhesive wear problems.

2. Select barrels and screw material of construction to guard against abrasion and corrosion. Various hard facing flight treatments extend the life of screws for abrasive materials.

3. Ensure that correct processing conditions are used.

4. Regularly check screw and barrel alignment.

5. Properly support heavy dies and other auxiliary equipment.

6. Use optimal screw designs for your process.

Typically, when wear occurs, processors increase rpm to maintain the desired output requirements. Although this may seem like a quick fix, this method increases hourly power/utility costs and only works until the increase in rpm's influences melt temperature. At this point, product quality usually suffers and scrap is generated. If you opt to replace the barrel and/or feedscrew, not only can you resume normal production levels, but also the return on

investment can be significant.

For example, consider a minimal increase in productivity due to the replacement of the screw due to wear. Let us assume that you are currently achieving 275 pounds per hour throughput and that a new screw will put you back to a rate of 300 pounds per hour, or a 9 percent improvement. If your end product sells in the marketplace for approximately $1.10 per pound, you have the potential to earn $40,000 in added profit during the course of a year assuming an incremental 30 percent margin rate on the increased production (25 lbs/hr extra throughput x 5,000 hrs/year total production x $1.10/lb sales value of product x 30 percent margin rate). With the cost of a typical mixing screw under $7,000, this yields an approximate two-month payback.

– Paul Banks Davis-Standard, LLC Extrusion Systems

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