CONCOR Tool and Machine

QUALITY FEED SCREWS AND BARRELS

The more you know, the better we look.

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How do you monitor screw and barrel wear? How often do you do it, and does it catch problems before they become major?

I have spent countless hours over the past 30-plus years answering these questions. They are paramount to our industry. If all of us had a better understanding of the answers, our cost-per-part ratio could drop considerably.

First, we should monitor screw and barrel wear by watching recovery time, shot consistency, part quality, barrel temp. setpoints, and screw drive torque requirements, to name a few. All of these an more are indications of something less than desirable going on with our equipment.

Second, we should be monitoring screw and barrel wear constantly. By observing all of the above, when a processing problem comes to our attention, we can address it. If we can do a screw pull, there is so much to learn by measuring the screw flight diameter and barrel ID. When we measure the screw flight diameter, we need to pay special attention to where along the flighted length we see the most wear. This will give us important information we can use to dial in the temperature profiles, screw design, or screw material we have been using.

The same goes with measuring the barrel ID. Where do we see the most wear? Is it toward the rear of the barrel, or near the discharge end? We would like to see the barrel ID wear evenly throughout its length. If this isn't the case, and it usually isn't, we can take a close look at the temperature profiles we have been running, screw profile, or maybe the barrel lining material.

Thirdly, if we can monitor the screw and barrel wear, we will eliminate most, if not all, the problems before they become major. If we can log the data we gain from a screw and barrel inspection, we will soon be able to see how much time it takes to wear the screw and barrel before it adversely affects our processing. We should know in advance when we will need to refit the machine.

Randy Connor, president
Concor Tool & Machine Inc.

We pull the screw and check visually and dimensionally at lease once a year for benign resins and every six monthes for abrasive and/or corrosive resins. Barrels are checked at this time, as is clearance between barrel an screw. Barrel ID and screw OD are logged so as to determine where wear is occurring.

When clearance exceeds tolerance, replacement is in order. Small, medium and large units have increasing tolerances for clearance; the manufacturer can help. Generally, small units have a tolerance of .015 inch, medium .017 inch, and so on. *- Brent*

I have initiated a simple test that allows me to measure average wear in a screw and barrel while the machine is running. It allows me to accurately estimate output for a given rpm, wear between barrel and screw, and maximum output the machine can plasticate.

I have used this method to schedule downtime for screw and barrel replacement and to diagnose problems such as heaters out of calibration or obstructions in the screw. Plasticating limits can be taken from this test to place the molds in the best possible presses. The data I collect include cycle time, total shot weight, screw run time, screw rpm, maximum rpm, rated output at maximum rpm, and screw and barrel wear after removal.

Backpressure and heats are considered after the calculations are done and before replacing components.

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From Injection Molding - July 2006