

REDUCED VOLUME SCREWS EXPANDED ARTICLE

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When you are forced to use a large press to mold a small shot size, for example, running a 10 oz. shot on a 50 oz. press, you have the potential for material degradation due to the long residence time. The risk varies, of course, with the specifics of the job and type of plastic. Process control may also be an issue. The usual solution to this small-shot problem is to downsize, or retrofit the machine with a smaller bore barrel, mating screw, tip assembly, end cap and drive adapter. Thus, a one of a kind injection unit is created. This type of modification increases injection pressure, which must also be dealt with. Unless the screw and barrel are shortened the length to diameter ratio will be increased. As a result, this solution is very expensive and time consuming to install when compared to Concor's procedure.

"A much simpler, and less expensive way to shorten residence time is with a volume reduction screw," says Randy Conner, President of Concor Tool and Machine, Inc., in Hayward, WI, a firm specializing in molding machine screws, barrels and components. To cut residence time, Concor makes a new screw with less plasticating area. They do this by making the screw flights wider, thereby reducing throughput. Since the reduced volume screw has the same overall dimensions as the original, it can be used without any other component changes. Conner says he has reduced the volume by as much as 60% on screws for many types of thermoplastics. Cost is a small percentage over that of a standard screw. He emphasizes that the modified screw will have the compression ratio and other geometry recommended for processing the material. Of the volume reduction screws the company has made since 1989, according to

Conner, all of them have performed well and provided the most cost-effective solution to volume reduction requirements. Molders are usually agreeable to try the reduction design, because as Conner points out, the screw can easily be re-cut and converted to the standard general-purpose design. Normally these types of screws are manufactured out of tool steel, so a re-cut screw will not need re-plating or re-nitriding. In extreme cases, Concor has incorporated the volume reduction concept into a downsize situation with excellent results.

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