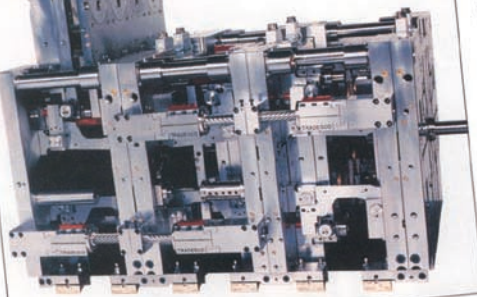


StackTeck in The Press

tooling

LEAN TOOLING SOLUTIONS FOUND IN STACK MOLDS

Figure 1. A 3x8 three-level QPC stack mold can be converted to a four-level.



The concept of lean manufacturing is generally reserved for the molding process, but Tradesco Mold Ltd. is working to extend these concepts of waste reduction to the tool. "Increased flexibility in production, reduced product costs, lower inventories, improved quality, and shorter delivery times give molders huge advantages over their competition, creating a partnership between the molder and his customer," says Vince Travaglini, vp of engineering for Tradesco (Rexdale, ON). And when the concepts of lean manufacturing are applied to high-cavitation, multilevel quick product change (QPC) molds, Travaglini believes molders will see such benefits.

Although stack molds are nothing new to the molding industry, recent advances like two-, three-, and four-level stack molds allow molders to double, triple, or quadruple output by taking advantage of force cancellation. Cycle times are increased by only fractions of a second to account for the in-

creased opening strokes required for the added levels, explains Travaglini.

The recent introduction of the three-level mold (Figure 1), for example, fits shut height and part volume requirements that fall between that of the two- and four-level stack molds. This allows both shallow- and deep-draw parts, such as thin-wall containers, to be molded in a more efficient tool.

LEAN ADVANTAGES

By combining the capabilities of stack molds with QPC molders can quickly change over core and cavity module sets without changing over the entire mold, explains Travaglini. All water, air, and hot runner electrical connections stay in place because the frame is left in the molding press (see Figure 2). This reduces mold changeover time from one shift for a conventional two-level stack mold to as little as 45 minutes for a QPC design.

Lean manufacturing also requires processes to be flexible to accommodate mold changeovers. QPC allows molders to run various products of both high and low volumes in efficient, high-cavitation, multilevel stack mold frames, and respond quickly to changes in customer demand (see Table 1, p. 70).

Another advantage of QPC, notes Travaglini, is reduced waste through minimized inventories. "In large batch molding operations, molders are often required to warehouse large volumes of parts until they are required for shipping," he says. "With QPC, molders can produce only what is required by their customers. It lends itself to the concept of pull scheduling in which the next downstream process or end customer pulls parts from the molder only as they are required."

To make molding processes even leaner, QPC can be complemented with in-mold labeling technology, allowing molders to deal with smaller batch processing more efficiently, explains Travaglini.

QPC IN ACTION

The primary benefit of Tradesco's QPC is reduced mold change time, says Brad Crosby, president and owner of Airlite Plastics Co. (Omaha, NE). Airlite runs stack molds almost exclusively in its proprietary molding operations, which specialize in the production of containers and lids.

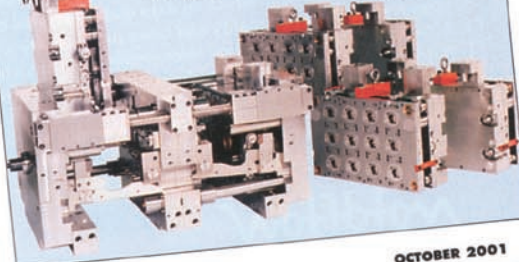
"Back in the days of single face molds, mold changes weren't too hard to do, but it took awhile," Crosby explains. "When two-level stack molds came along in the '80s, the time it took to change a mold got longer, sometimes 6 to 8 hours. Then came three- and four-level stack molds, which have so many connections for water, air, and electricity that frequently a mold change rolled over to the next day before things were running well."

"With QPC, it's simplified, so we have no problems doing it right the first time, and time to change over to a different product is reduced by about 75 percent," he adds.

Quicker changeovers mean more up time, and in the lean manufacturing

continued on p. 70

Figure 2. Shown here is a 2x12 QPC system. The frame stays in the press, allowing the water, air, and hot runner electric connections to remain in place while the core and cavity modules are changed to support a new product run.



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model that means Airlite runs lower inventory levels. It also means less time for startup, enabling Airlite to reduce scrap and get into production faster.

Crosby notes that stack molds are expensive to purchase up front. However, using the QPC system reduces Airlite's costs to add new products to its line. "This is especially good if those products aren't going to be running a high percentage of the time," Crosby says. "A new product might run 10 percent of the time the first year. But you don't have to buy a new mold frame, and the frame translates to almost half the price of the mold. So, startup costs for getting into QPC are higher, but in the long run we save on the cost of adding new products."

To take full advantage of these multicavity, multilevel QPC stack molds, Travaglini says standardiza-

Not having to buy a new mold frame SAVES ALMOST HALF the cost of a new mold.

tion is required from the molder and the moldmaker. "In order to produce value in the eyes of the customer, the moldmaker must work with the molder to define long-term tooling strategies to fully capitalize on lean molding techniques," explains Travaglini. "Mold suppliers must get involved in the molder's process or value chain to understand what product families can or will be molded in the future. In doing so, standard machine sizes, mold sizes, mold cavitation, and part pitches can be easily created." —Clare Goldsberry

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