

## TOOLING

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## Scoring with Roehr's coring

A number of toolmakers have found that collapsible core and expandable cavity systems make traditional unscrewing systems look like minor leaguers. —**Carl Kirkland**

On an increasingly competitive playing field, moldmakers pitching collapsible core technologies to their customers found it to be a winning closer. It eliminates secondary operations and complex coring approaches, while providing dramatic reductions in cycle time, resulting in new jobs that your competitors with that “we’ve-always-done-it-this-way” mindset swing at and miss.

A couple of years ago, Progressive Components of Wauconda, IL acquired the assets of Roehr Tool Corp. (Hudson, MA), a pioneering developer of collapsible core technologies (see [www.immnet.com/articles/2006/August/2931](http://www.immnet.com/articles/2006/August/2931) for an initial report). Sources at Progressive have shared with IMM a few success stories of moldmakers who’ve pitched their C-Core collapsible core technologies to customers and have come up winners against competitors pitching rack-and-pinion systems. We’d like to share them with you.

Just in case you’re unfamiliar with them, collapsible cores are used to help run parts with internal threads or undercuts. Rather than mechanically unscrewing such parts, or stripping them, collapsible cores shrink out of the way during ejection.

The exterior of the collapsible core is attached to the ejector plate, while its tapered inner core is attached to the back



Collapsible cores have helped molders mold in undercut features that once were machined. They reportedly can reduce cycle times by more than 30% and have helped toolmakers significantly reduce lead times.



ble cores, like Harrington Mold (Ontario, CA).

### Automation alternative

It’s had a number of successes providing several two- and four-cavity collapsible core molds running electrical connectors in high-temperature, glass-filled engineering materials, like Ultem, both for military and civilian markets, according to Charles Nelson, Harrington’s tooling engineer.

of the mold. So, when the mold opens, the threaded outer core collapses as the ejector plate moves forward. Cycle times fall, while cost savings rise, according to Progressive customers—especially customers experienced with using collapsi-

ble cores, like Harrington Mold (Ontario, CA).



### C-Core coaching

According to those in the know, C-Core rookies can’t just mount the mound and pitch shutouts with collapsible core technology. It’s not your basic plug-and-play type of technology for rookies, says Jim Cullison, Roehr Tool’s director of engineering.

“There’s some initial hand-holding involved when a shop is building its first collapsible core mold. We’ll get involved in an initial application review of a part design, and then a review of the mold design. After a shop has built one or two molds utilizing this technology and it’s well within their comfort zone, though, there’s little or no need for such support.”

In addition to personal assistance, Roehr Tool also offers application support through comprehensive documentation that provides mold base machining dimensions and assembly recommendations. Also, when bringing the engineering teams at the technology’s distributors, Progressive Components and D-M-E Co. (Madison Heights, MI), moldmakers reportedly can offer customers proven, cost-effective options with confidence.

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“One of our customers was molding threads and undercuts using rack-and-gear systems, but there were problems, and the undercuts had to be machined into the parts in a separate operation. By converting over to the collapsible cores, we eliminated all the mechanical unwinding mechanisms and were able to mold many of the undercut features that had previously been machined. It eliminated a lot of the problems and the costly secondary operations as well. We’ve built several more molds for them since then using this same approach.”

Another project involved building molds for manufacturing threaded PP and PVC pipe fitting connectors for a customer that manufactures pools and spas. Nelson says the customer brought in poorly designed two- and four-cavity tools requiring manually loaded inserts.

“They were doing the unscrewing by hand, on the bench, which added a ton of labor expense to the cost of the parts,” says Nelson. Luckily, this customer had some prior experience with collapsible cores, and was open to Harrington’s recommendations. The toolmaker wound up providing its customer with new, eight-cavity C-Core molds.

“Use of the collapsible cores eliminated their labor and part costs,” Nelson says, “and of course, they’ve never gone back.”

“We’re always excited to use this approach,” says Ray Harrington, Harrington Mold’s president. “We’ve turned customers on to the technology, and even converted many of their tools to use it.”

### Faster fabrication

In addition to the parts manufacturing cost savings that collapsible cores provide to their customers, Progressive sources say other moldmakers use the technology to cash in on savings in mold manufacturing time.

Take Glen Cassetta, for instance. He’s the GM at CDM Tool & Mfg. Co. (Hartford, WI). Not long ago, it had a job to build a single-cavity mold for a glass-filled nylon clutch cover used for off-road recreational vehicles.

**Expandable cavity tooling allows for use of smaller molds and molding machines. Other reported benefits are less work, less complexity, and lower costs.**



“There were special details involved with this project, because it wasn’t a thread you could unthread, but rather an

undercut groove, round and less than 2 inches in diameter,” Cassetta explains. “So from the beginning, our only consideration was using collapsible cores. If we had to build a retracting mechanism, it would have taken us considerable

## A balk

**In 1999, Carlson Tool & Mfg. Corp.** (Cedarburg, WI) built a two-cavity mold with C-Core tooling for manufacturing a glass-filled nylon plumbing component. Five years later, its customer wanted a four-cavity mold to run the part, but it didn’t want to have anything to do with collapsible cores.

“The customer thought they were a pain—they thought C-Cores were too complicated and that the delivery time was kind of long, so they considered using a rack-and-pinion system,” says Carlson’s Mike Miller, design engineer. “But the number of threads required would have taken a rack that was way too long for the customer’s molding machine. We had already used the C-Cores on other projects since building that first one for for them, so we were more familiar with them.”

After reviewing all the possible options with its customer, C-Core technology was the winning choice. One good reason why is because the first C-Core mold Carlson built for it five years ago was still running, and running well.

## No contest

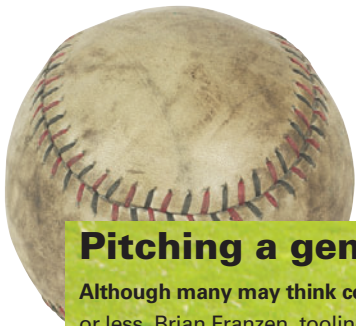
**One moldmaker that’s sold on the benefits** of both C-Cores and expandable cavities is A.J. Tool Co. Inc. (Hubertus, WI). Just listen to what Dan Ebert, A.J. Tool’s general manager, has to say.

“We have used both C-Cores and expandable cavities and we love this pre-engineered, prefabricated product. It’s quick and easy to use. You buy it, you modify it slightly, and you’re on your way.”

He says many molders prefer to subcontract out their round work when jobbing out an unscrewing tool, but “your lead times depend on the turning house’s turnaround time, so, choosing C-Cores helps decrease lead times.”

Ebert says other key reasons for using collapsible core technology are that “collapsible cores don’t care how many threads you have in a part and they’re faster and less expensive than unscrewing mechanisms on molds with one or two cavities.”

And, he adds that unlike rack-and-pinion systems, C-Cores are unaffected by thermal expansions issues. “When we’ve tried spinning parts that are 4-5 inches in diameter, we’ve experienced difficulty controlling thermal expansion and providing enough clearance for the unscrewing detail without having it also produce flash. With a C-Core we don’t have to worry about flash.”



## Pitching a gem

Although many may think collapsible cores are suited only to molds with four cavities or less, Brian Franzen, tooling supervisor at contract manufacturer PolyTech Molding Inc. (Prairie Grove, AR), says it built an eight-cavity C-Core-equipped mold that's run well over a half-million parts since the first of the year at its molding facility about 45 minutes away in Rogers, AR. The part is a glass-filled nylon WX 1.5 nut with about a 2.5-inch diameter.

"Our customer was working with a troublesome tool built offshore and asked us to build a second tool. They asked me what I thought and I said we'd probably be looking at a rack-and-gear. He suggested we use C-Cores, though, and I said I'd give Roehr Tool a call and see what they thought," Franzen says. "My main concern was that there wouldn't be enough collapse on the cores, because the cores have to be able to pull away from the thread, and there's a set limit before the threads can be stripped off—these are buttressed threads and quite deep.

"We ordered the C-Cores finish-machined. Like all molds, there usually are a few things to tweak, but Roehr had done a fine job. They were ready to go. This wasn't the

first mold we've built using C-Cores . . . it had been a while, but we're really pleased.

"The main benefit was space savings. We actually have a four-cavity mold running the same part. It's about seven years old, it's built with a hydraulic system, and it's a problem child. Cycle time for the new C-Core mold is 48 seconds. The C-Cores are beautiful. And even without any grease, the mold is running just great."



time. Instead, we used an off-the-shelf product that, with some minor adjustments, fit the project perfectly and saved us considerable time. That mold is about a year old now, and still is perfectly producing parts cycle after cycle."

Speaking of time savings, Progressive sources say their C-Cores also save cycle times. They say that a conventional rack-and-pinion system wastes up to a third of the cycle unscrewing the cores. Do the math—C-Cores can produce more than 30% more parts per hour.

OK, but what if you're going to quote a build for a tool running parts with undercut details, like threads, dimples, and protrusions? No worries. Expandable cavity systems are available to save the game.

### Space-saving simplicity

Expandable cavity systems reportedly eliminate the need for side-action mechanisms and the resulting extensive machining of components and mold bases required. And, in addition to re-

ducing a mold's complexities, they also reduce the size of the mold and the size of the press to run it in. Just ask CDM's Cassetta.

CDM has expertise in building expandable cavity and C-Core tooling. It has built systems for a customer that had to mold HDPE male threads for fuel containers used by major manufacturers of outdoor power and agricultural equipment run in four-cavity family molds.

Cassetta says the major factors influencing CDM's decision to use expandable cavities were the space available for such tooling and its simplicity.

"It fit the package better," he says. "It involved less work, was less costly, less complicated, and it didn't require more room than we had to work with. With another type of unscrewing system, we would have had to expand the mold considerably larger, causing our customer to buy a new, larger molding machine.

"There is also a bit of a cycle time savings, because expandable cavities open as soon as the mold opens. You don't have to wait for it to unwind and rewind the core. As soon as the mold opens, the core starts expanding, so as fast as the mold opens and closes, the thread clears. There's definitely a cycle time advantage in this case." ■

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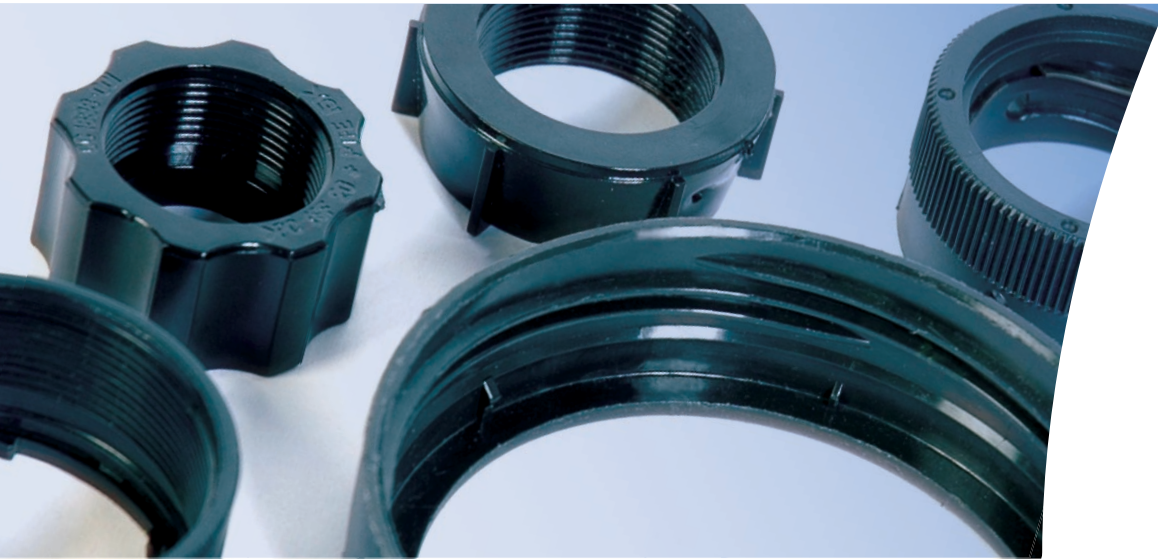


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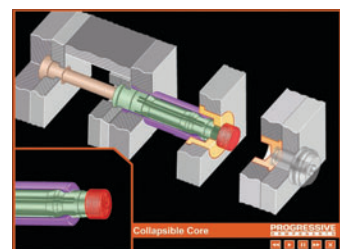
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