

▶ BY GREGORY FARNUM

CAPITALIZING ON OPPORTUNITIES



Forward-looking moldmaking shops are taking on tool repair as one way to survive the onslaught of foreign competition.

PM Mold

The fact that China is now an export powerhouse is no secret—particularly to America’s tool and die industry, which, as the 21st century dawned, was coming off its most prosperous period in decades. Between 1992 and 2000, the Department of Commerce reports, the U.S. tool, die and mold sector racked up an 85.5 percent growth rate in shipments, with employment rising by 16 percent.

That has all changed. The recession coupled with the growth of foreign competition has put approximately 30

percent of U.S. toolmaking companies out of business, according to the Commerce Department.

Had enough bad news? The U.S. moldmaking sector certainly has. That’s why many of the survivors in this sector have adopted some strikingly new approaches. A prime example is the prominence of mold repair and alteration. In the 1990s, the repair and alteration of molds was largely something that small shops—those that couldn’t get the big contracts—specialized in. Today, it’s an aggressively

courted revenue stream.

“Repair and alteration amount to about 70 percent of our business now,” said Larry Koning, president of LS Mold Inc., Holland, Mich., a 26-man shop that also builds new dies and molds ranging from very small ones up to those weighing 1,500 tons. “Since 2000, we have made a shift toward that type of work in response to the downturn in manufacturing and the pressure from low-priced Chinese tools.”

This sort of shift isn’t limited to companies within driving distance of

Detroit. "Right now, repair and alterations in my shop are probably about 85 percent of the work," said Lonnie Aldrich, owner of Ran-Bro Tool Co., a North Plains, Ore., shop that boasts an ability to produce, alter or repair precision components or molds ranging from an ounce up to 18,000 lbs. "A lot of the molds made in [Asia] will need some rework," he remarked.

It's the larger molds, though, that have been particularly lucrative for Ran-Bro. Because so many of the shops that could compete with Ran-Bro on molds of 6,000 lbs. or larger went out of business, it is getting a lot of work.

"I'm getting the work for molds that weigh up to 30,000 lbs. that were all built in [Asia] or Italy," Aldrich said. "Companies bought them over there because of the cost savings. But, because they were made of inferior materials or were inferior in design, or through the natural change of parts, they needed modification. I have to keep them running, maintain them, alter them, keep them going."

Kent Hanson, president of H.S. Die & Engineering Inc., a large, multifacility tooling firm headquartered in Grand Rapids, Mich., concurred with the notion that large molds from Asia present an opportunity for U.S. moldmakers. "Most non-European moldmakers still can't effectively handle the large tooling programs or molds that run in molding

presses over 750 tons," he said.

Do users of reworked molds risk paying a hidden cost in terms of lowered quality? Aldrich voiced the consensus when he said: "I don't believe there are any quality issues between a mold that's been altered or repaired and a new mold. If you have a tool that has made half a million parts, it's going to have a little bit of wear and some flash areas, but all of that can be sharpened and trued back up. The texture may be washed out a little bit, but you can go in and change areas to make them match and blend. Even parts of the mold that have been worn down significantly can be built back up. Any mold can be repaired or altered. I would always look at that alternative before I replaced one."

The Skill Factor

Most agreed that tapping into mold repair and alteration does not require specialized equipment. But, they added that a large helping of good old-fashioned know-how is needed.

"All of the same cutting tools are used, as are all of the same milling machines and EDMs and everything else you use for building the new molds," said Aldrich. "But there are some differences. You have to be a little more creative to figure out ways of repairing a broken tool. A lot of times, imported molds aren't built to our standards, but when the tool breaks and comes apart,



Hommer Tool

A machinist in Hommer Tool's mold shop works on repairing a mold component.

you have to be able to fix it. You have to have a lot more experience than you do when building new tools."

Peter Manship, president of Mold Craft Inc., Willernie, Minn., a 35-man firm that designs and builds multicavity molds for precision plastic parts in addition to repairing molds, said his shop uses the same equipment to repair molds as well. Manship, who is also president of the American Mold Builders Association, said, "Once a tool is built, correction takes a lot of skill."

That skill takes various forms, such as welding expertise. "To build up a broken parting line or repair one worn by an abrasive plastic normally requires a fine weld," said Manship. "Done correctly, this will make an older tool like new."

Welding expertise has meant money in the bank for Dave Drawert, president of Tooling Molds West Inc., Tempe, Ariz., a 20-man shop that repairs molds and builds custom automation devices along with dies, jigs and fixtures. "We have a welder who can put a bead on a razor and dot the head of a pin with a bead—with no sinks or voids."

It's a great draw for attracting mold repair, he said, but it doesn't stop there. "We've also gotten good at hiding the weld by texturing it with an EDM process we've developed using an electrode that we can hold in our hand. We've spent a lot of time calculating the power settings and the gap we need because once you start EDMing, you risk burning areas you don't want to burn."

A keen eye for design doesn't hurt either. As part of his "top 10" list for refurbishing an injection mold (see sidebar), H.S. Die's Hanson looks for design features that can have a negative impact

What's in a number? 8.27

That number links LS Mold Inc. to a young female worker at the Japanese-owned Uniden cell phone plant in Shenzhen, China. 8.27 is the exchange rate between the U.S. dollar and the Chinese yuan—one dollar buys 8.27 yuan. While the value of the euro, the pound and the yen has been growing dramatically relative to the U.S. dollar, the dollar-yuan exchange rate has remained exactly the same for years.

That's because unlike the currencies of other economically powerful nations, whose values fluctuate according to market conditions, the value of the yuan is fixed by the Chinese government. It pegs it to the value of the dollar. Thus, if the dollar gains in value, it buys 8.27 yuan; if it loses value, as it has been doing for some time, it buys ... you guessed it, 8.27 yuan.

So while goods from other major U.S. trading partners steadily grow more expensive, prices for products from China remain low—artificially low say most experts, perhaps by as much as 40 percent. The fixed exchange rate is the centerpiece of China's export drive, which also involves keeping wages at rock bottom—employees at the Uniden plant in Shenzhen work mandatory 11 hour days for a monthly salary of 484 yuan. Do the math.

—G. Farnum

on a mold's performance, such as a lack of cooling near the part surface, in which case machining new water lines into the mold may be the answer.

Hanson added that sometimes the problem with a foreign-made mold is not that it doesn't comply with the original design, but that it does.

"We have found that, in many cases, offshore tool shops will build a mold to produce the part as initially designed, even if [doing so] creates a bad tooling condition with thin steel, poor cooling areas or vertical shut-off conditions. Typically, U.S. shops will warn customers about such conditions and work together with the part designers to come up with a viable solution for everyone,

offering a longer tool life, better cycle times and less maintenance cost."

Attitude Adjustment

Skill isn't enough, according to Tooling Mold West's Drawert. It also takes attitude—an entrepreneurial spirit. "You have to be prepared to take anything in the way of jobs," he said. "At our firm, we're opportunists. We'll build anything for a buck. You can't stay elitist and just build new molds. That kind of thinking has to go away or you'll die. Today, it's all about service."

J.R. Hommer, vice president of Hommer Tool & Manufacturing Inc., Arlington Heights, Ill., subsumes this attitude under the heading of being

The following companies contributed to this report:

American Mold Builders Association
(630) 980-7667
www.amba.org

Hommer Tool & Manufacturing Inc.
(847) 394-3355
www.hommer.com

H.S. Die & Engineering Inc.
(616) 453-5451
www.hsdie.com

LS Mold Inc.
(616) 392-5926
www.lsmold.com

Mold Craft Inc.
(651) 426-3216
www.mold-craft.com

Ran-Bro Tool Co.
(503) 647-7448
www.ran-bro.com

Tooling Molds West Inc.
(480) 921-9939
www.tmwinc.net

Hanson's top 10

Kent Hanson, president of H.S. Die & Engineering Inc., drawing on his many years in the moldmaking business—both on the shop floor and in the front office—has come up with a "top 10" list for mold refurbishment.

"The following steps represent a major refurbishment that will increase tooling life and also reduce the cost of manufacturing and secondary operations in the molding facilities," he said.

He added that mold users should remember that a good preventative maintenance program can more than double the life of any mold. Though these recommendations deal specifically with worn molds, they also serve as a general guide to troubleshooting new molds.

1. Prior to starting any work, run sample parts to review them for flash or areas where the part may stick and need additional polishing. Review every function of the components and actions during the molding cycle, including the ejection of parts, electrical and hydraulic components, hot manifold and cooling systems.
2. Make sure all safety systems, guards and limit switches are in proper working order to protect plant personnel from injuries and the mold from damage.
3. Master the cover parting line by flat stoning and deburr the cavity. Years of operation can cause irregularities in the parting line and burrs in the cavity.
4. Completely disassemble the mold to review all fit and function of 2-D and 3-D components and actions and all systems. It is not uncommon for the initial part design to require changes in order to create long-lasting tooling.
5. Replace, rebuild or repair components and actions and refit all of them back into the mold. Then check timing and function.
6. Drill every water/coolant line to ensure maximum thermal transfer of cooling lines and the fastest cycles possible. Add water/coolant lines as needed to maximize cooling if the current system is inefficient.
7. Review gating to see if some form of automatic part degating can be added to reduce secondary operations.
8. Completely reassemble the mold, making sure all moving components and actions function correctly, and address any benching or polishing issues.
9. Spot the entire mold, weld as needed to repair any flashing and, once completed, bench all welded areas and open up all vents.
10. Cycle the mold to review all of the corrections that were made and all of the functions of the mold, then make further adjustments as needed.

—G. Farnum

"mold smart," which, for Hommer, has entailed a substantial investment in automation, as well as the implementation of industrywide best practices. Among those practices is a systematic approach to customer communication, which includes a weekly update report that tells the customer the status of his job, and direct communication between the customer and shop floor.

"Those who are updating their business practices are succeeding," he said. "Those who simply had a good cash position 3 years ago are going under."

Working smarter ... better service ... shorter lead times—in many cases, these are nearly synonymous. Ran-Bro's Aldrich recalled conversations he had a few years ago with the president of one of America's largest consumer electronics companies.

"He would tell me that buying [molds] from [Asia] and doing the repair and rework once they got here was costing the company a little more money, but that they were getting done on average 6 weeks earlier. So, time-to-

market was more important to him than the initial quality of the tool. At the time, things were so busy we were having lead times out here [on the West Coast] of 6 to 8 months. The guys [at the electronics company] got tired of feeling that their work wasn't important to us so they went to [Asia]. We drove them over there. Now we have to get our attitudes changed so we can bring them back."

Making Friends

LS Mold's Koning noted that one way to help decrease lead times is through cooperation among companies, something that was relatively rare in the tool, mold and die industry before the onslaught of foreign competition.

"We are a member of the Great Lakes Tool & Die Coalition," he noted. "We work with groups of shops so that we are no longer working in isolation. For

example, we just landed a major new project, but we are very busy. So, I may contract out the surfacing that's required to another shop we work with, because maybe they have some open time on their CNC machines and I don't."

Koning added that because of the level of cooperation that was forged during the tough times, LS Mold can now quote jobs it couldn't previously. "For instance, I do injection molds but now can quote on jobs that have a stamping component as part of them. Today's level of cooperation among shops within our collaborative allows that to happen."

This collaborative impulse isn't limited to the Great Lakes region. "The AMBA encourages cooperation among its members," said Clare Goldsberry, spokesperson for the organization. "We have a consortium of AMBA members in southeastern Michigan who collaborate with each other, but we're also see-

ing this sort of cooperation in other parts of the country as well. It makes sense, because they can leverage each other's strengths."

She added that the industry will continue to see more repair work in the future, not only because of inferior foreign-made molds but because OEMs are opting to use molds for longer periods of time now. They often choose to repair or alter existing molds rather than build new ones.

Goldsberry does, however, foresee some of the moldmaking work that has been lost to foreign competitors returning to the U.S. "It's a small world until you have to start molding parts," she said. "Then, it's a long way to China."△

About the Author

Gregory Farnum is a Detroit-based journalist specializing in industrial and scientific issues.