

M.R. Mold & Engineering

Case Study

For Open Mind Technologies/hyperMILL CAM Software

M.R. Mold takes silicone mold manufacturing to the next level with *HyperMILL*™

Rick Finnie founded M.R. Mold in 1985 to build molds and tools for silicone and plastic part manufacturers. And, in the early 2000's as the manufacturing sector began leaving the country Rick was forced to find a way to evolve and remain competitive in this rapidly changing environment. Then, at a trade show, a presenter told him that to survive, manufacturing companies like his needed to find their niche and really focus on it.

Working with silicone is inherently more difficult than working with plastics because you have to get it right the first time. If you're not happy with a plastic part you can melt it down and reuse the material, but once silicone cures you just don't have this option. Silicone parts begin as a thermoset liquid that flows through a cold runner system to maintain its low viscosity and high flow rate on its way to the cavities where heat is applied to cure and solidify it. And, because of this, silicone temperatures and pressures must be very precisely maintained to allow the material to flow freely to the mold and then expand at a controlled rate as it is heated and cures.

Another big consideration is that silicone 'flashes' very easily which results in excess material being attached to the finished part.

Rick reexamined the silicone mold portion of the business and realized that they had already overcome these technical process challenges. They had created proprietary and unique cold runner systems, had overcome the flashing problem by holding extremely tight tolerances, and were proficiently producing silicone molds. They just weren't doing a good enough job of marketing their unique silicone expertise. Also, when he looked at the competitive landscape he saw that although there were thousands of mold makers in the world, the majority of them were focused on building molds for plastic injection molding, whereas there were, and still are, less than a dozen or so serious competitors with silicone mold expertise worldwide.

Eureka, it's silicone!

Rick Finnie had found his company's niche and took the bull by the horns by aggressively marketing their silicone expertise while developing new tools and unique cold running systems to support silicone mold manufacturing. They also opened a 4,000 square foot technology center and stocked it with company-owned plastic and silicone injection molding machines to allow them to conduct mold trials, do first article inspections and perform mold qualification testing before delivering the molds to their customers.

Finding the perfect mill and new CAM software to drive it

M.R. Mold had been producing their molds using a time consuming combination of EDM and 3-axis machining and Rick realized that if they wanted to cut time and increase efficiencies they needed to invest in a 5-axis machining center.

Last summer Rick was introduced first hand to Yasda brand milling machines while at the AmeriMold Expo with a friend and fellow manufacturing plant owner.

"I knew of the Yasda brand." Rick said, "I knew it was well spoken of, that it was popular, and that they were extremely accurate.

"My friend, who owned a Yasda mill, explained that he had nine other mills, that their brand names are very popular, and that they are all very well respected. But, he told me that the Yasda was far superior."

Rick and M.R. Molds' management did their due diligence, bit the bullet, and purchased a Yasda YBM Vi40 5-axis machining center and began looking for CAM software that was up to the task of controlling this high-end, high speed 5-axis super mill.

'Like putting unleaded fuel in a dragster.'

"When we purchased the mill, Jeff, the Yasda rep, recommended that we reconsider the programming software we were using. We were using a very popular brand, had been for years, and all of our guys were trained on it. But, Jeff basically told me that *'using that software on this new Yasda machine would be like putting unleaded fuel in a dragster.'*

"He recommended 3 or 4 different CAM programs and we started our investigation by getting quotes and learning about their capabilities. We finally narrowed it down to two software packages and I did a little additional research by visiting and exploring their websites. The OPEN MIND *hyperMILL*™ website was very impressive. One of the real selling points for me was looking at their testimonials and list of customers and realizing that *hyperMILL is the software that manufactures use.* We chose *hyperMILL* because we felt it was the best out there to make this high-end 5-axis machine do what we wanted it to do. We needed it to hold extremely tight tolerances and deliver parts with superior surface finishes and with the Yasda mill if I want to take off one-tenth (0.0001 inch), I can remove one-tenth and that's exactly the type of accuracy I need."

Another concern, especially when moving to new software, is the learning curve, and Rick said that "Nobody here had ever operated a 5-axis machine before, and suddenly we were faced with a machine with a rotating table that not only rotates but tilts side to side while the entire axis moves simultaneously.

"And, on top of that, the programmers had to take a crash course on *hyperMILL* while learning how to operate the Yasda 5-axis mill because we had just received a purchase order for a very complex part that required both."

To help meet the deadline Nhut Nguyen, M.R. Mold's lead programmer, received five days of onsite *hyperMILL* training.

Nhut said, "The trainer came to our company, sat down with us and was totally focused on the needs of our company. He customized *hyperMILL* to fit our needs, and that's pretty unique."

Nhut added that, "*hyperMILL* customer support is top notch and when I email questions I get answers back within 10 to 20 minutes. I really appreciate this!

After the training Nhut programmed and machined the company's first 5-axis Yasda/*hyperMILL* job and completed it well ahead of schedule.

"We've only been using *hyperMILL* and the Yasda machine for about 6-months, Rick said, "and the guys have developed a high level of confidence in programming and operating the machine."

Time saving efficiency - 6 days the old way versus 1 day now

"We just finished machining a very nice mold for a massage ball that has a whole series of spikes covering 360 degrees.

"If we had to build that mold a year ago with our older technology we would have had no choice but to make a whole series of electrodes - some electrodes machined from a standing position and some electrodes machined from a side position - and then go on the EDM machine and vector-in each of those electrodes.

"I estimate that it would have taken us two days to manufacture the electrodes plus another two days of EDM time on each half of that mold, and our guys machined the entire mold in just one day, not six! They had one half machined in the morning and the other half that afternoon, and it was done! So, that machine and the *hyperMILL* software are already paying for themselves.

"We were very pleased with the *hyperMILL* training we received. We have two seats of *hyperMILL*, and have two programmers' who are trained on it, and we hope to get more programmers trained on it moving forward.

"The people at OPEN MIND have been very helpful and are wonderful to work with. I really don't have any issues. I understand that we still have more things to learn about *hyperMILL*'s additional capabilities and we're looking forward to becoming increasingly proficient in the software while increasing our efficiencies. I definitely feel that we made the right choice. "



Rick Finnie, Founder and CEO
M.R. Mold & Engineering

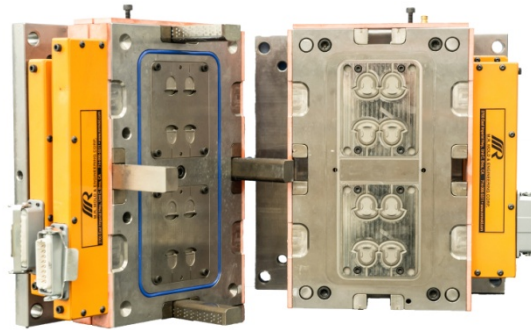


M.R. Mold has dramatically improved their throughput and profitability with the speed and accuracy of their new Yasda YBM Vi40 5-axis mill, controlled by Open Mind *hyperMILL* software.



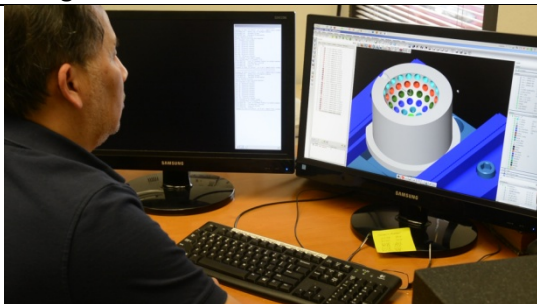
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Complex molds for silicone parts like these require high tolerances to eliminate flashing and a built-in cold runner system for accurate curing.

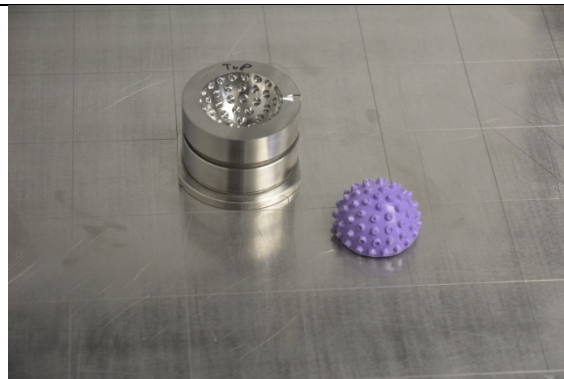


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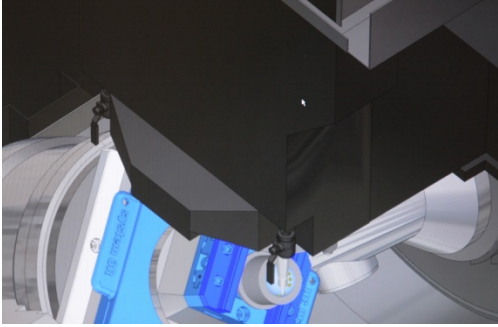
M.R. Mold specializes in unique molds like this with built-in cold runner systems.



Nhut Nguyen, M.R. Mold's lead programmer designed and programmed this challenging mold for a silicone massage ball for 5-axis machining on their Yasda mill after completing five days of intensive on-site *hyperMILL* training.



One half of the mold and finished silicone massage ball designed and programmed using *hyperMILL* and produced in record time. Before moving up to 5-axis machining both halves of a mold like this would have taken six days of machining and EDM time. Now, with the help of *hyperMILL* it was completed in less than one.



hyperMILL simulation shows the machine as well as the part being milled providing worry free collision avoidance.



The M.R. Mold Technology Center is stocked with the latest plastic and silicone injection mold equipment to insure the integrity of their molds and to manufacture samples of finished product for their customer's inspection.