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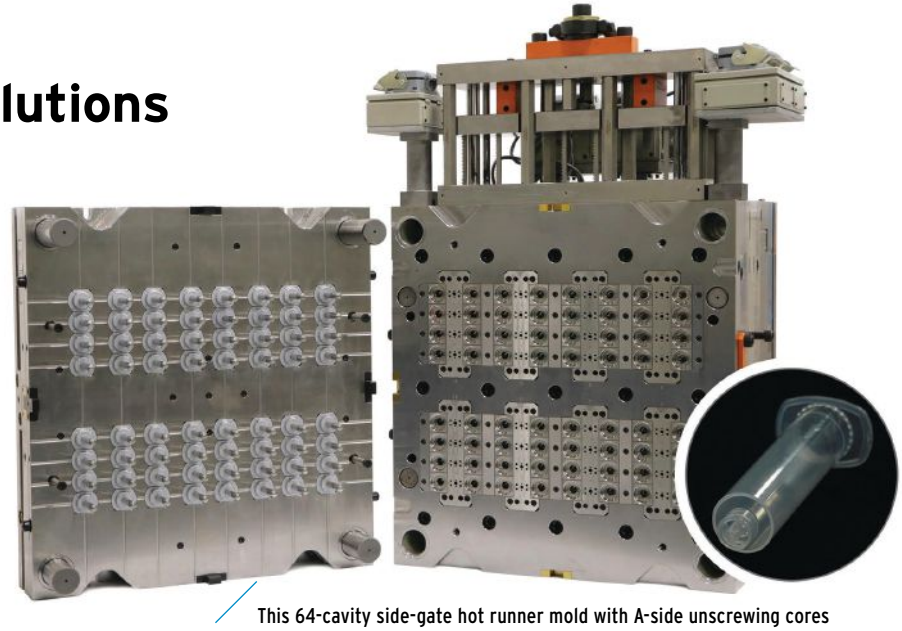
A Conversation With ...

Adler Industrial Solutions

By Christina M. Fuges



This 64-cavity side-gate hot runner mold with A-side unscrewing cores demonstrates Adler's precision manufacturing capabilities. Source (all images): Adler Industrial Solutions

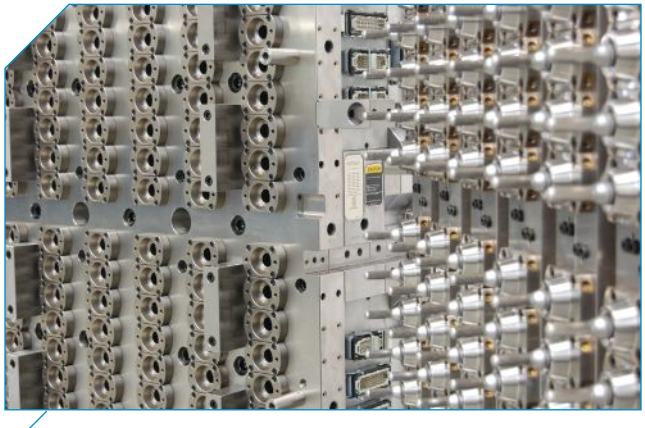
Who is Adler Industrial Solutions?

Joe Karpinski, Tooling Engineer – Lead Estimator, Adler Industrial Solutions (Erie, PA): Adler is a global network of tool and die companies serving manufacturers of all sizes through its family of companies: Rapid Mold Solutions, R&D/Leverage US and R&D/Leverage Europe.

From new product tooling to maintaining existing molds, Adler delivers faster solutions with quicker ROI, competitive landed costs and reliable ongoing service. Our multiple specialized facilities offer product solutions across all mold types. We design and build tooling and full molds for injection, injection stretch blow and injection blow molds.

We source premium materials from reputable U.S., European and Japanese suppliers for both IBM/ISBM and injection tooling, prioritizing quality, timing and price. Our steel comes from suppliers in the U.S., Germany, Japan and Switzerland.

Adler provides comprehensive warranties: one year on all designed and manufactured toolsets, with Class 101 molds covered for 1 million cycles and Class 101+ warranties extended based on maintenance programs. Our on-site support includes technical sales representatives, engineers, toolmakers, project managers and process technicians dispatched based on specific customer needs.



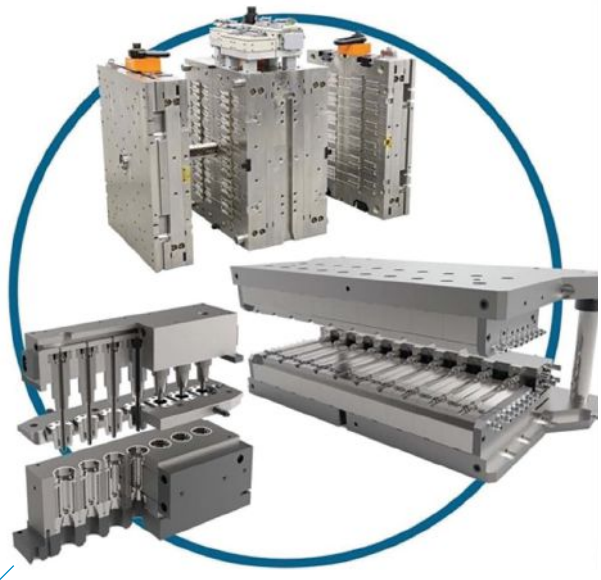
Adler produced this 96-cavity PET preform mold as an example of their high-volume tooling expertise.

How does Adler manage cross-functional and international collaboration to ensure seamless project execution?

Andy Hanson, Project Processing Engineer, Adler (Kansas City, MO): Fortunately, as our network of facilities grows, so does our overall pool of talent within the company. Over the years, Adler management has made it a priority for employees from all facilities to get to know one another well, making it easy for them to reach out to and learn from each other's experiences. When a project is awarded to one facility, that facility communicates with others to draw on their previous experiences. Lessons learned from previous projects are applied to the current one. This allows for rapid knowledge growth across all facilities. With strong, experienced project engineers at each facility, communication is clear, documented and acted upon in a timely manner. When awarding a project to Adler, companies get the capabilities of all Adler facilities.

Having a precision mold building facility in the UK makes working with customers in Europe much easier. We recently sent a mold package from the U.S. to Europe. After several months of running the mold, our customer found minor issues with the supplied hot runner system. The issues warranted additional machining on the mold to accommodate minor changes to the hot runner. Rather than shipping the mold across the Atlantic, the machining was completed at our UK facility, saving our customer time and money.

In addition to shared knowledge and global convenience, the growing network of Adler facilities adds horsepower. Quite



Adler designs, engineers and manufactures three main tool types: injection, injection stretch blow and injection blow molds and tooling.

simply, we can take on very large projects. Currently, we are working on a 14-mold package that would have been very difficult for one Adler facility to complete on time. Due to the large pool of talent and consistency across facilities, we can distribute the package across multiple facilities to meet the timeline while maintaining the quality and attention to detail our customers require.

Karpinski: Adler leverages its global network to solve problems, provide solutions and most importantly, provide a "one stop shop" environment for our customers. Our multidisciplinary teams can manage both large and small projects, leveraging our global network.

Adler executed a multi-mold package for a customer that with our global network. The task was to build nine molds and deliver them within the same timeline. How was that accomplished? It was accomplished by a consistent and clear line of communication. Sound simple? Yes, Adler has built a team that supports the Adler mission, which is to be the best at what we do. Adler has the benefit of multiple resources, experience and knowledge to strive for one goal.

How have mold design and simulation tools transformed the way Adler designs and validates molds, and what benefits have customers experienced as a result?

Karpinski: The tools and software we use to evaluate and analyze a customer's product are the foundation of our "cradle to grave" customer support. This includes MPI for mold design and simulation, as well as finite element analysis (FEA) and computational fluid dynamics (CFD). Our transparency and

Adler's Product Solutions Lab in Erie, PA, provides comprehensive molding services from development through production.

The team uses ultra-precision wire EDM technology for advanced machining applications.

communication directly correlate to the mold flow and simulation techniques we used to validate the mold's construction.

Hanson: Computer-aided engineering is integrated into the mold design process at Adler. Our engineers have very strong mechanical engineering backgrounds, allowing them to understand when CAE applies to their design. Evaluations using FEA structural analysis help engineers verify the predicted strength and longevity of specific areas of the molds. Mold filling simulation software enables mold designers to optimize gate locations, wall thicknesses, overall part geometry, steel selection and cooling line effectiveness. Using CAE, we identify potential problems and optimize the design before the mold is built. Mold design changes are much cheaper, quicker and easier to perform before the mold is built.

With that said, the results of CAE are only as good as the engineers who run the software and evaluate the results. Our engineers have the expertise to combine theoretical CAE predictions with the practical realities of mold design and molding.

Our customers appreciate our ability to design molds for even the most challenging products. We are often awarded the "tough molds" for this very reason.

How do Adler's in-house Product Solutions Labs (PSLs) for ISBM, IBM and custom injection molds add value for customers, particularly in validating molds before they ship?

Hanson: Adler's PSL labs provide full-service capabilities for mold qualification. This begins with our experienced process and quality engineers, who are well-versed in processing and measuring a wide array of products, including challenging resins and intricate parts that are difficult to measure. The PSL labs are well-equipped with the latest precision measurement equipment, including CMMs, vision systems, physical testing equipment (such as Instron, pressure and volume gauges), numerous precision hand gauges and an in-house CT scanner. All measurement equipment is held to a strict calibration schedule, ensuring accuracy.

With these capabilities, we can perform nearly all levels of customer qualification, from form, fit and function to installation qualification, operational qualification and performance qualification with customer-owned equipment (machines and automation) installed in the PSL lab.

Regardless of the validation requirements, our goal is to exercise the mold with a wide enough window to ensure the

mold is ready to enter our customer's facility. Once it arrives, the final qualification can be completed in a timely manner. Our goal is not to get the mold approved and out of our facility. Our goal is to get the mold approved and ready for final qualification at our customer's facility.

Karpinski: Adler promotes automation, optimization and technical documentation for all customers. How is that done? We invest in quality inspection equipment and software, highly accurate machines and robotics and a document management system that allows for the sharing of information. All customers are provided with technical reports from QA to Engineering, and ultimately, traceability of all components constructed for every project.

How do you ensure sustainability and cost-effectiveness in your moldmaking processes?

Karpinski: Adler ensures sustainability and cost-effectiveness by innovation, automation and energy efficiency. Lights-out manufacturing has been a buzzword and approach that many custom mold builders strive for, but Adler has made it a part of their organizational culture. Every project undergoes an evaluation process by production and management to ensure that the quoted work is implemented from project inception to completion.

Adler does not follow the mentality of "that is how we have always done it", rather, we look outside the norm to achieve the highest level of efficiency and the highest level of quality. Once again, that starts with all the upfront efforts that Adler dedicates to all projects. Adler is continually investigating and researching more effective ways to reduce operating costs, enhance machine efficiency and streamline processes to foster sustainability for the organization's future.

Those initiatives can be in the form of high efficiency lighting throughout the production facility, the types of coolant and chemical used in the machines on the production facility, implementing a scrap re-claim program or a highly efficient chiller system for the PSL Lab.

Hanson: Adler is continually seeking cost-effective ways to enhance its manufacturing capabilities. A very strong push for lights-out manufacturing has led to the purchase and implementation of many high-end pieces of equipment. This includes precision machinery, measuring equipment and automation. In addition to the equipment, Adler realizes that equipment means very little without capable employees to implement its use. With that said, Alder employs a wide range of employees. We have 40-year experts in the field combined with a younger generation eager to learn from the experience of others. This creates a pool of new employees while maintaining the high standards of work expected from seasoned industry veterans, providing a long-term plan for success.

Our customers use our experience and capabilities to evaluate their molded products before the mold build process begins. Often, this leads to small product design changes that improve cycle time (less energy used per part) and lighten the molded product. Small improvements on large volume products can have significant cost and eco-friendly advantages.

The QA Inspection Lab at Adler's Erie facility features state-of-the-art equipment, including the Zeiss Contura and Metrotom 800.

Share a specific project where the Adler team solved a complex challenge for a customer and how your expertise made a difference.

Karpinski: We were recently approached by a customer who had a complex mold manufactured by another company. The job was to evaluate, mold, recommend solutions and get the mold to produce acceptable for market testing. The timeline was extremely aggressive due to time-to-market deadlines. We committed to meet or exceed the goal.

We received the mold along with some sample parts, which were not acceptable for testing. The parts had excessive flash

Adler operates blow molding R&D and Product Solutions Labs in both the UK and USA to support customer development needs.

and deformation due to improper ejection. The hand-load insert was not seating correctly and the pressures used to mold the part exceeded recommended limits for mold longevity. The customer did not provide 3D models or prints, but our inspection and scanning equipment enabled us to reverse-engineer the problem components.

We were able to quickly identify the mechanical issues in the mold and presented cost-effective solutions. Once the solutions were presented to the customer, we acted immediately. The engineering and manufacturing departments collaborated to provide information on the production floor, ensuring the mold was in proper working condition. The in-house molding team was prepared to receive the mold and set up the sampling process to reduce the timeline.

This was a prime example of "thinking out of the box" and clear communication to solve a problem. There were no magic wands waved during this process, but we were able to showcase our expertise in quality, engineering and manufacturing. The result was that we produced acceptable parts for the customer, exceeded the estimated timeline, and kept the budgeted costs to a minimum for the customer. The same customer is now collaborating with us to develop a production-level mold. This was a "win-win" for Adler and the customer.

Hanson: When building class 101+ molds, precision is not a bonus; it is a requirement. Complex molds with multiple movements using polymers that flash at ~0.0006" require machining processes capable of holding extremely tight tolerances. It is often assumed that with a polymer that flashes at ~0.0006", holding steel tolerances at or below 0.0005" will produce flash-free parts. This is an accurate statement if the stack-up of tolerances is ignored.

However, when the mold stacks comprise multiple moving components, the stack-up of tolerances quickly adds up. The ±0.0005" machining allowance quickly translates into gaps of 0.001" -0.002", resulting in flash. Due to tolerance stack-ups, our designers often use tolerances as low as ±0.0001". It is one thing to put tight tolerances on a print. It is another thing to actually hold those tolerances.

We achieve this precision by hiring and training the right people and by purchasing the best equipment possible to both machine and measure the steel accurately for verification. Not only do we hold the tolerances, but we also record and provide the steel data to the customer at the end of the project as proof of that performance. Having actual steel dimensions not only satisfies FDA requirements, but it also helps the end user maintain and troubleshoot the mold over its lifetime. MMT