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Management

The art of fine-tuning a micromolding business

On Oct. 14, 2001, Stamm AG began making molds and molding parts in a new building amidst the fields and vineyards of Hallau, Switzerland. IMM visted to find out a few of the company's secrets to micromolding success.

We knew something was different without entering the building. Where solid walls exist in almost any other molding plant, Stamm has mostly windows. From outside you can see directly into the moldmaking and molding areas, and even the offices.

Other than letting in light, General Manager Andreas Stamm says the windows serve two significant purposes. They allow employees to enjoy the scenic surroundings from almost anywhere in the factory. Equally important, they make the company open from the outside in, especially for customers. As for the secrets, Stamm is not at all concerned. He says the real secrets are unseen.



IDEAS, ACTION, PEAK PERFORMANCE

Stamm's strategy is to foster a constant stream of ideas and provide the resources to make them real. Action, not philosophy, is the key here. "The more I say," explains Stamm, "the less important it is."

The concentration on micromolding came after what Stamm describes as "two years of looking around" inside the business. He is referring to his first two years in the company started by

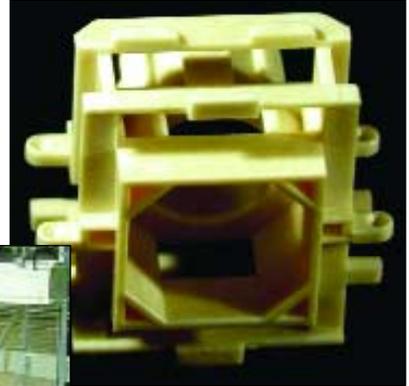
his father, which followed a 20-year career as a classical pianist. Talk about a career change!

Stamm AG began making molds more than 50 years ago and soon expanded to molding. For most of its life, the company was what Andreas Stamm describes as the typical small Swiss molder. The company made a variety of products for a variety of markets. For whatever reason, much of that work tended to be small parts with very tight tolerances. The Swiss are commonly associated with watchmakers, who by nature like working with small, precise instruments. Stamm says there is a lot of truth in that reputation.

Looking at the business a few years ago, Andreas Stamm saw

This Demag-Hekuma production cell runs a 32-cavity mold on 6-second cycles, replacing a 16-cavity mold with a 16-second cycle. Yield is segregated by cavity using 32 tubes for precise QA and mold control. The trays can be accessed and changed while the system is in production.

The holes that you see in this lens holder for an optical disk recorder have an ID of .13 mm and have to allow smooth pass-through of a copper wire as thin as a human hair.



The yellow color on the specially chosen flooring material helps brighten the manufacturing hall. It is virtually the same color as the rapeseed plants that grow in the adjacent fields. The large windows visually integrate the inside of the facility and the outside when the plants are in bloom.

several factors converging: demand for micromolding was growing; parts were getting smaller; and the precision level was escalating.

Stamm AG already had a moldmaking shop with the skills, equipment, experience, and, most of all, the desire to do micro work. Now, it thrives on it. Employees like to say their challenge starts where others give up. Core pulls with .3-mm diameters that are only 3 mm long are normal here. Powerful microscopes are standard tool-making equipment and .1-mm cutting tools are commonly used on the high-speed machining centers.

The same mentality applies to molding. The company's largest part currently is a foot pedal for a Bernina sewing machine, but the vast majority of the parts are extremely small. The 25 molding machines range from 25 to 200 tons, and there is room for more. Most, including all the newer ones, are from Demag Ergotech.

Stamm says Demag's specially modified control software and its Mikro hardware adapter with





This partial view of the moldmaking area, which is at one end of the building, does not show the room available for growth, but it does show how open the operation is to the outside through the large windows.

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sheet music and imagining the sounds to looking at a part drawing and imagining the mold and the processing system. He says the thrill of making an idea real is as motivating for molding specialists as it is for musicians.

Such vision and engineering are now being applied to the management of Stamm's growth. Before the new facility, the company reached a point where it had to either physically expand or decline to bid on certain jobs.

Stamm saw this as an opportunity to build a facility that would "encompass our ideas as well as all our assets." Thus was born the new wide-open plant. The idea of small isolated departments could never work for a company that believes the uncensored exchange of information among everyone is critical to success. On the contrary, the open space, light, and bright colors make this an exciting workplace.

The new plant is 2800 sq m (30,128 sq ft) and now houses 40 employees. Ten are in moldmaking, 24 in molding, three in quality control, and four in the back office—including Andreas Stamm. The company processes 400 tons of materials per year and is poised for more growth. Stamm's convinced that the key is to play to the company's strength: help OEMs understand the potential of micromolding. He's a strong proponent of bringing customers to the plant so they can see for themselves what Stamm has to offer. If the weather is good, they can do that from outside the building.—
Robert Neilley



Contact information

Stamm AG
Hallau, Switzerland
Andreas Stamm
+41 (52) 687-0067
www.stamm.ch
a.stamm@stamm.ch

a 14-mm-diameter screw together support the precise injection and closing times demanded by super-small parts. The machines fill multicavity molds using uniform injection speed—as opposed to ramping—which makes process control much easier. Platen parallelism is particularly important with the multicavity molds, says Stamm, and these machines are very stiff and accurate.

HOW SMALL IS MICRO?

Several definitions exist that describe what constitutes "micro" in a molded part. Since precision is the watchword in this its chosen field, Stamm has a precise, three-part definition of what constitutes a micro part: A micro part weighs less than .1g, has a part geometry of less than .2 mm, and requires precision tolerances of less than .01 mm.

The definition is not cast in stone (or tool steel). Andreas Stamm says there is one main reason why projections for micro-molding growth made five years ago have not been met: OEMs and product designers needed time to learn what is possible. They are catching up. Companies are now asking about parts with .02-mm wall sections, which Stamm says are beyond today's technology. The good news is that they have that awareness and the technology is growing.

Stamm AG serves the electronics, communications, medical, and small industrial technology markets. Just a few years ago, 45 percent of turnover was from one customer. The customer base now numbers around 40. The largest six are spread over several markets. The medi-

This four-cavity mold will replace a two-cavity tool used to mold a telecom connector, visible just below the blue pen used to show the scale.



cal segment is the most active. Many of Stamm's products, both individual parts and subassemblies, are destined for medical equipment such as tips for catheters, a dosing assembly of an intravenous feeding system, or a device for widening and unclogging arteries during cardiac surgery. Assembly has become a large component of the business and continues to grow.

PUSHING THE TECHNOLOGY LIMITS FOR PRODUCTIVITY

The core of Stamm's business is toolmaking: designing and building small but extremely complex molds. One of its greatest strengths is building multicavity tools for products other moldmakers might think are impossible in even a single-impresion tool. Complementing that skill is Stamm's expertise with a variety of high-performance materials like PPS, LCP, PAEK, PES, and others. Production is about 70 percent domestic; the rest is sent to Germany, France, England, and the U.S.

More than four years ago, Stamm was contacted by Gillette, which was seeking a supplier for the ink feeding tube for gel-ink ball pens. Weighing less than .003g, the part had near-zero tolerances. Production technology for this product started with a one-cavity mold. Cavitation has since been in-

creased several times.

Most recently, a 32-cavity hot runner mold was developed to run in a special production cell consisting of a 25-ton Demag Ergotech press with Mikro adaptation and a custom automation system supplied by Hekuma. The part's tip is too delicate to be touched in any way during extraction, a problem resolved with the automation. We saw the 32-cavity mold running at cycles of less than 6 seconds, which is a huge improvement on the 16-second cycles of the previous 16-cavity mold. Production is about 60 million parts/year.

Automation is integral to this operation, and it is on the rise. Another Demag Ergotech-based production cell is equipped with a Reis six-axis industrial robot. Several of the products being made are possible only by combining moldmaking and processing skills in a production cell with specially designed automation systems.

ORCHESTRATING GROWTH

Andreas Stamm is applying a lot of what he learned as a classical musician to managing the business. He compares looking at

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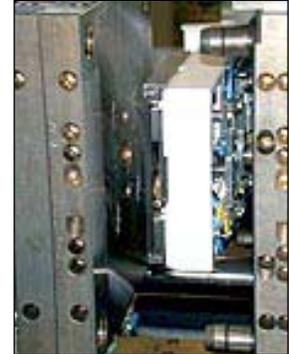
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The moldmaking part of Stamm's building has room for expansion, and like everything but the warehouse, a great view of the surrounding farms and vineyards. The wire and sink erosion machines and HSMC are out of this frame on the left.



The Hekuma handling system for Stamm's tiny ballpoint pen nozzles sorts the parts by cavity. The tubes below the receiving plate carry the parts by vacuum pressure to individual containers that can be checked while the system is running.



The Hekuma takeout robot's arm design allows for the nozzle tip being too fragile to touch in any way as it exits the mold.



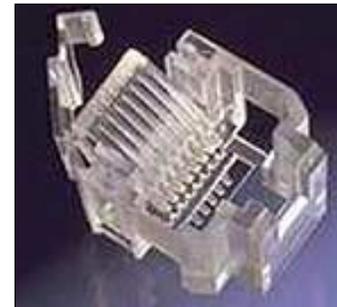
Stamm AG see robots as necessary for micro-part quality maintenance. With this Reis six-axis system, it has combined pick and place with assembly and sorting functions for a complex part with inserts.



Encapsulation molding, as in the case of this medical nozzle, is another Stamm specialty.



Stamm's new purpose-built factory is designed to be open. It is filled with light and the operation and equipment are clearly visible from the outside.



The complexity of the micro parts made by Stamm AG is only hinted at in this telephone plug connector.