

Plastics News

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Bekum, Fidelity team upon blow mold technology

Bekum America Corp. and Fidelity Tool & Mold Ltd. are touting a new blow mold technology that they say can double the production capacity of shuttle blow molding machines.

Developed by Fidelity Tool & Mold of Batavia, Ill., the patented multi-parting-line technology mold is effectively a stack mold system for a blow molding machine that Fidelity claims will allow molders to turn out more than 100,000 bottles a day from a 16-ton double-clamp blow molding unit.

Fidelity has granted Bekum an exclusive three-year original equipment manufacturer license, which allows the blow molding machine maker to integrate MPL into turnkey container manufacturing systems. Bekum exhibited the MPL technology on a full production system at NPE2009, held June 22-26 in Chicago.

The novelty of the Fidelity solution is that unlike injection stack mold designs, the center lines of each cavity row remain static during the mold opening cycle. The firms claim that it's a remarkably simple solution to a problem that has challenged blow molding machine designers for many years: how to increase output without adding to the size of the machine or extending the mold-open portion of the cycle.

In the Fidelity design, the mold is constructed as four independent mold blocks. Alternate mold blocks are connected by tie bars and driven by the machine clamp, creating two independent parting lines that remain on the same center lines as the clamp opens and closes.

In-flight brainstorm

Fidelity founder and owner Jim Vassar said the idea for the mold design was hatched during a return flight from visiting a customer.

"We were called in to see if we had any new technology or ideas to increase productivity," Vassar said. "The customer wanted to run bottles faster, but unfortunately at that particular time, we did not have a good answer.

"On the flight back from that meeting, I came up with this idea and spent the duration of that flight — about three hours — sketching and working out the different ways it could be done."

First, Fidelity established that it could fit the required tooling hardware between the platens of a blow molding machine. The next step was to source an extrusion head unit. "Without a head there was no way I could build the mold," Vassar said.

He contacted W. Muller USA Inc. of Agawam, Mass., which confirmed it could build the required double-row head. Vassar then approached Bekum America about the project.

"Over 10 years, starting at the K'98 show, Bekum has shown tandem blow [molding], which is top and bottom blowing, and neck-to-neck blowing at NPE 2006," said Steven London, Bekum's chief operating officer and executive vice president.

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"All of these technologies worked quite well in lost-dome applications, but what we saw with the MPL system was the best system for a calibrated-neck finish. The calibrated neck was one of Bekum's original patents, and it is the biggest advantage of the MPL system."

London said Bekum is well-aware that the new technology has the potential to reduce machine sales, but at the same time it will let the company move up further into wheel-type blow molding markets.

"This falls exactly in line with what we have been trying to do [in machine technology]. It will make us truly competitive against the wheel machines in output and floor space," London said.

The project partners moved ahead with a trial mold. "We developed a beta test to see if the mold would function correctly," Vassar said. "We set it up in a lab machine under production conditions and it worked flawlessly the first time.

"Very rarely do you even put in a conventional system and have to do nothing to it. We were very presently surprised."

They decided to go ahead with a full production system, which was tested last month and exhibited at Bekum's booth at NPE. Designed around a 15-ounce shampoo bottle from Alberto Culver USA, the two 4+4 cavity MPL molds were installed in a 15.7-ton BM406D double-clamp continuous extrusion blow molding machine. A video showed the system running on the same production cycle time as the single-parting-line tooling but producing double the output — up to 5,000 bottles per hour.

Vassar said that one MPL mold is a little more expensive than two standard molds, largely because of some additional hydraulic components. While the system can be run on a smaller blow molding machine, it is still necessary to size the machine's cooling and plasticizing capacities to the enhanced output rate.

London estimated that an MPL production system would cost about 1.6 times that of a standard machine of the same clamping size; for two single-parting-line mold sets, the investment would be twice as much.

Plan moves forward

London talked about the three-year OEM license agreement that Bekum has with Fidelity at NPE.

"Everything will come through us and we will take responsibility," London said. "As the customers come to us with container needs and with outputs that are suitable for MPL, there will be cost advantages of looking at an MPL system."

Fidelity will take on retrofit projects itself, and Vassar plans to license other mold makers.

"It would be difficult for a company our size to take on a project of this size without upsetting our business, so I am looking for investors," he said. "My goal is not to impede the ability of this technology to move forward."