Packaging Industry

ePLAN® fluid

KOSME GmbH

Fluid engineering in PET bottle production

PET dominates beverage market

Since their introduction in the 1970s, PET bottles have captured about half the market for non-alcoholic soft drinks and are gaining share in the milk and milk products, fruit juice, beer and wine categories because of their lighter weight compared to glass. The gross weight of one-and-a-half liters of a liquid in a PET bottle is almost the same as that of one liter glass, a convenience to consumers and money-saver for distributors.

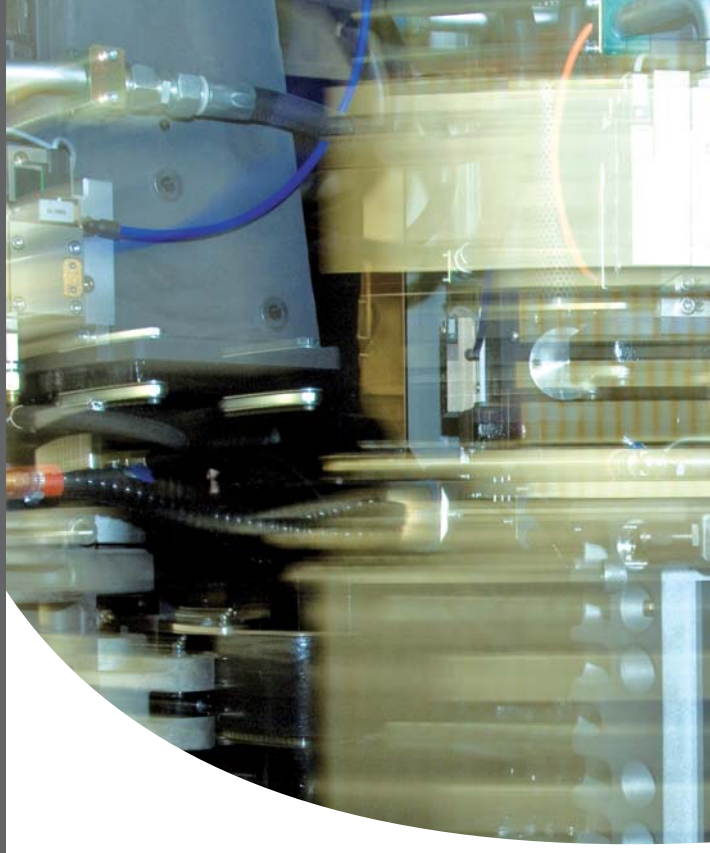
PET bottles are manufactured by heating preforms under controlled conditions, stretching them with a core rod to length and finally blowing them into a negative form using compressed air.

"PET bottles are a part of daily life most people take for granted. One of PET's advantages is the ease with which the thin-walled beverage containers can be formed in just about any size or shape. Austrian manufacturer KOSME makes some of the most advanced stretch-blow molding systems in the world, like the new KSB 6R. In a three-second cycle, bottles are blown under high pressure in negative forms to create a distinctive, often proprietary shape. The electrical and pneumatic engineering for KOSME molders are performed on the EPLAN Platform, including EPLAN Fluid which has helped shorten the final design phase from weeks to mere days."

ePLAN your engineering

FRIEDHELM LOH GROUP

EPLAN speeds machine design process



"The new flagship molder KSB 6R can turn out up to 10,800 1.5-liter bottles per hour. The rotational machine developed together with KOSME's parent company, KRONES, was designed for reliability and ease of operation, with low energy consumption and the flexibility to handle preforms for bottles from 0.1 to 3.0 liters with neck ring sizes ranging up to 43 mm."

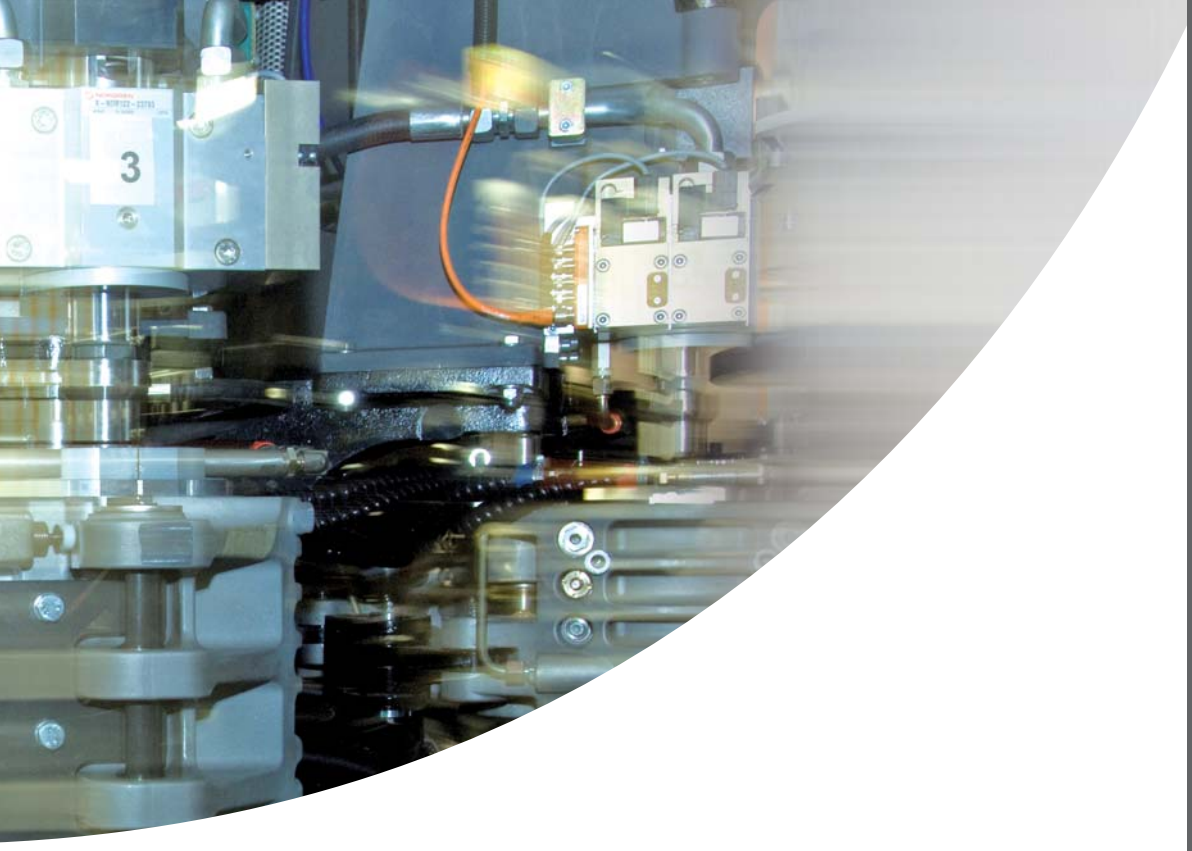
These steps are carried out fully at great speed and efficiency in machines manufactured by KOSME GmbH in Sollenau, including the company's molder, the KSB 6R.

Machine delivers speed and highly precise results

With the KSB 6R, preforms are sorted automatically and conveyed suspended to the machine. A conveyor transports them at precisely spaced intervals and constant speed through the multi-stage heating process before they are inserted by a gripper into blow forms arranged like a horizontal revolver drum. After the blank is stretched to the right length, the bottle is blown into the form by up to 40 bars of air pressure. It takes three seconds to produce a finished bottle and the machine tolerates no irregularities. Synchronicity is established through a positive connection of all the mechanical parts driven by a central frequency inverter-controlled motor.

While the directly geared linear transportation through the machine is relatively simple mechanically, the control system of the pneumatic cylinders and the air supply for the blowing process is quite sophisticated. Forms are located on a rotating retainer with six cavities. The bottles are blown into the forms in a multiple-stage process at differing pressures. The required compressed air is retrieved from the main air blast and re-used, and an optional recycling system can reduce the required amount of air even further. The forms are kept at a constant temperature, using an integrated liquid cooling system.

The pneumatic part of the KOSME machine as well as the fluid circuits were designed by Andreas Gamp, a veteran of 10 years with the company and part of the design team for the past six. He and three colleagues do the electrical engineering on the EPLAN Platform, and for the past three-and-a-half years, he's also been using EPLAN Fluid (previously fluidPLAN) for the fluid power design.



PROJECT turnaround times minimized

"We were one of the first users of this software in Austria," says Andreas Gamp. Considering the extensive pneumatic design involved – more than 50 meters of compressed-air lines alone are installed in a KSB 6R – one could say Gamp is a power user of EPLAN Fluid.

Cuts design time from weeks to days

"EPLAN Fluid makes it very easy to establish a project-specific database and to generate the corresponding bill of materials automatically," says Gamp. "It is also very simple to structure the diagrams so every installer can easily keep track. The possibility with EPLAN Fluid to display the respective partial bill of materials next to the functional schematic on the same sheet, as well as integrating photos to illustrate the respective mounting position are also major advantages."

EPLAN supports the KOSME designers by also helping track component usage and expenses. The company is looking forward to a further increase in productivity and convenience by migrating to the latest version of EPLAN Fluid. "With its modular structure, this product provides core functions that are required in electrical CAE as well as in fluid or instrumentation and control engineering," says Andreas Gamp adding: "The additional improvements that could be achieved in our workflow will help KOSME extend its current excellent market position even further."

> "The biggest benefit is the way EPLAN speeds up project turnaround time. After dimensioning has been completed, realization of the intended design as a complete set of schematics with all its derivations takes just a few days," says Andreas Gamp. "Before we began using EPLAN Fluid, a project of this kind would have taken a few weeks."

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"It's a more efficient way to perform all the pneumatic design required for a system that boasts more than 50 meters of compressed air lines."

Making machines that make better PET bottles faster

SUMMARY

KOSME GmbH is a leader in making the simple PET bottle that people take for granted an even more cost-effective solution for beverage bottlers. The company's state-of-the-art bottle-making system, the KSB 6R, is as sophisticated as the end product is simple. KOSME makes good use of EPLAN Fluid's advanced design capabilities to accelerate complex design projects and create diagrams that make it easier for installers to keep track of what's required.

Find out more about KOSME on www.kosme-austria.com

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Published in 2008

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