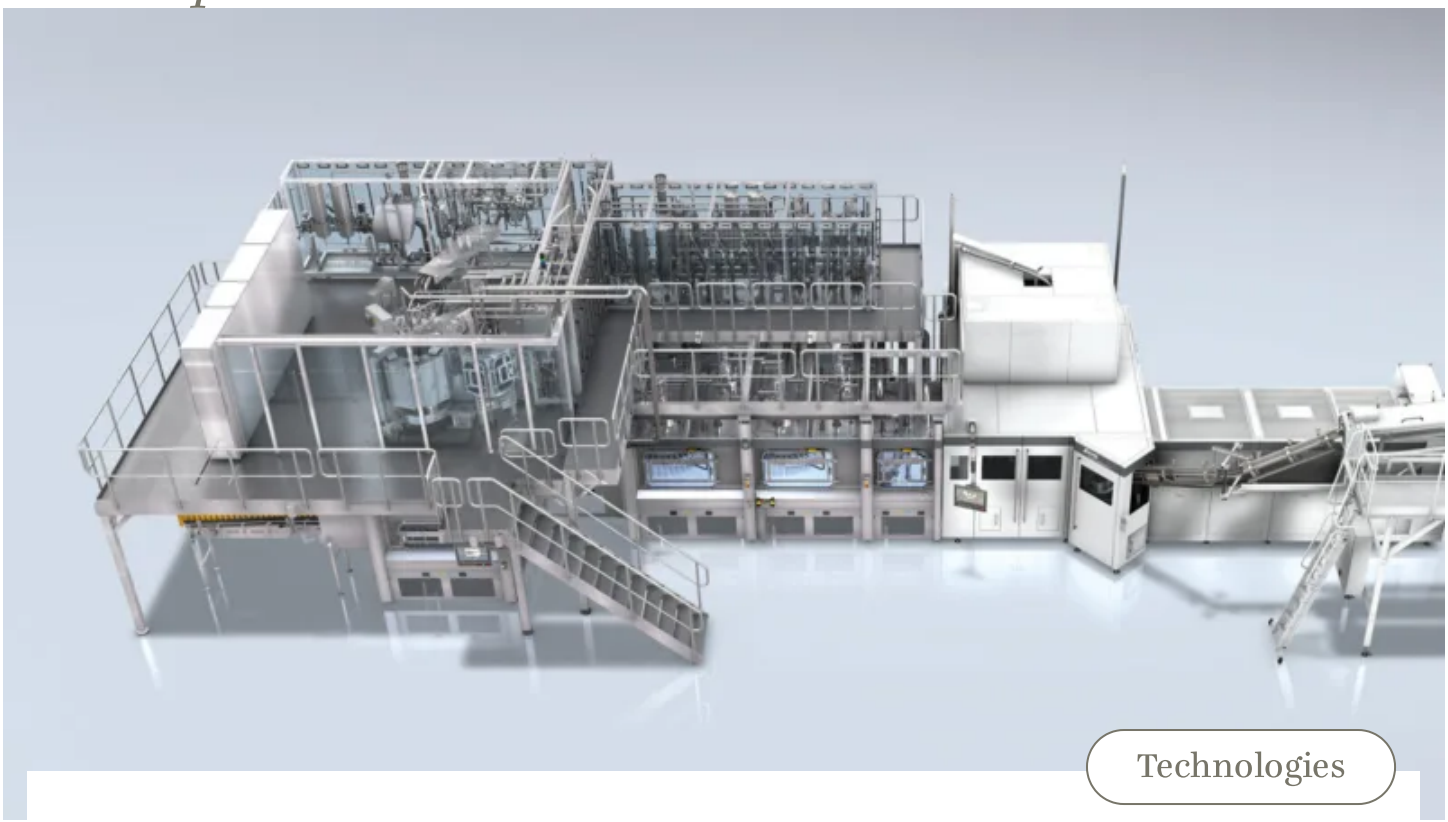

Technologies

INNOPET BLOFILL ACF-R

High capacity, greater safety

6/12/2024 , 6 min.

With its new aseptic block for bottle sterilization KHS is setting standards in safety and hygiene. Beverage bottlers don’t have to compromise on performance here, however: thanks to its rotary filler, the block can produce triple the output of the linear filler.

NON-RETURNABLE PET RETURNABLE PET

PHOTOGRAPHY / ILLUSTRATION

Frank Reinhold, Christian Sperling

COVER PHOTO

The InnoPET BloFill ACF-R has a stretch blow molder, sterilization module, filler carousel and capper installed at ground level. The process technology and valve manifold are arranged above these up on a platform.

Where maximum safety is of prime concern when filling sensitive beverages into PET bottles, KHS' linear aseptic fillers have long proved themselves on the market. It's thus only logical, then, that the Dortmund systems provider is now proud to also present a rotary aseptic filler for higher capacities whose hygienic properties are setting new standards. Here, the machine and systems manufacturer is consciously focusing on bottle sterilization that – unlike preform sterilization – can also be combined with the KHS FreshSafe PET coating system that provides additional product protection for sensitive beverages. In this procedure all potential germs are removed from the containers directly prior to filling. This gives bottlers more flexibility and greater availability during format changeovers than with preform sterilization, where changing the stretch blow molds disturbs the sterile state of the block. Bottle sterilization also allows lightweight containers to be gently handled with ease.

New filler design

The new rotary Innofill PET ACF-R filler has been combined with the energy-efficient InnoPET Blomax Series V stretch blow molder. The resulting InnoPET BloFill ACF-R aseptic block currently has a capacity of up to 36,000 1.0-liter bottles per hour as opposed to the linear fillers that work at a maximum rate of 14,000 bottles an hour. In the future the block will even be available with an output of up to 48,000 500-milliliter bottles every sixty minutes. In addition, the new plant engineering achieves a sterility of log 6 inside the bottles – which is equivalent to a reduction in germs of 99.9999%.

During development special attention was paid to the aseptic filler that was completely redesigned. One key feature was to limit the structure to a maximum of four smaller stars for the supply of hydrogen peroxide (H_2O_2) and activation and drying with sterile air. The stars are used in place of the previous large carousel. The benefits of this simplified technology are lower consumption figures and lower costs for installation and maintenance thanks to the machinery's modular design and smaller footprint. "The sterile zone must be completely

encapsulated and kept separate from the bottling shop," says Manfred Härtel, filling product manager for KHS. "Large carousels need a liquid lock to separate them from the ambient air. This isn't necessary on our version with the small stars, making the machine very much easier to configure and operate."

↑
One highlight of the new rotary block is its automatic format changeovers, rendering manual operator intervention superfluous and thus retaining the filler's internal sterility.

Learn more on khs.com about our new, particularly powerful Innofill PET ACF-R aseptic block.

READ MORE

High standard of hygiene

The InnoPET BloFill ACF-R is spread out over two levels: at ground level are the stretch blow molder, sterilization module, filler carousel and two-way servocapper. The process technology with the service module, H_2O_2 preparation, sterile compressed air production, cap sterilization unit and valve manifold are up on the platform.

The outsides and insides of the PET bottles are sterilized before they reach the filler's aseptic zone where the sensitive products are filled into the containers and then sealed on the servocapper. In the hygiene area a measurable positive pressure is formed using sterile air generated by the block itself. This produces a flow of sterile air both in the direction of the bottle sterilization unit and through the capper to the bottle discharge via an airlock. The containers then undergo quality control (leak and fill level inspection) before traveling on to the dry section of the line.

A large number of fixed nozzles prevents spray shadows from being formed during sterilization of the bottle exterior. When the bottles enter the interior sterilization unit, the neck area is also individually sterilized. "What's special about our sterilizer is that we've done away with the otherwise standard stars between the various processing stars," Härtel explains. "So that this works, the sterilizer has been constructed so that no intermediate stars are needed and the main stars can directly interact with one another. To avoid collisions, we've also fitted the lances for interior sterilization with guide control." These have movable arms that insert the spray lances into and retract them from the PET bottles. "All told, these new features make for a small aseptic zone and a high standard of hygiene. Together with the reduced number of stars and drives, this considerably reduces the machine's overall footprint. Another quality hallmark of our bottle sterilization system is that after 24 hours less than 0.5 ppm of H_2O_2 residue remains in the bottles," he states happily.

Clean machine

Liquid barriers in the filler carousel safeguard the closed hygiene zone from the outside environment. Here, liquid H_2O_2 in a concentration of around 30% is used, as is water to prevent the hydrogen peroxide outgassing into the atmosphere and thus protecting health and safety. Rinsing sleeves and CIP caps are also no longer required, as the entire aseptic zone is sanitized with caustic and/or acid identical to that used in interior and exterior cleaning. The latter is used to remove mineral residue

that could cause critical deposits to build up which in turn would impact the machine's sterility. The adapted process significantly reduces the CIP time. To minimize consumption, the CIP media are collected, fed back into the system and reconcentrated prior to the next CIP cleaning cycle.

Thanks to its flexibility, the modular aseptic filler is suitable for use with various KHS PET filling systems that have also been modified. These vary their speed according to the respective filling phase and determine the fill level using flow metering. The current standard comprises valves with a free-flow system for the still beverages normally filled on aseptic equipment. Alternatively, systems can be used that are able to process fibers and pulp. In the future, the machinery is also to be capable of the sterile filling of carbonated products such as fruit juice spritzers.

> "All told, these new features make for a small aseptic zone and thus a high standard of hygiene."

Manfred Härtel
Filling product manager for KHS

Numerous highlights

Like the filler carousel, the capper that also works in an aseptic environment has a double gas lock to ensure optimum encapsulation. The caps stacked in rows are transported to the compact aseptic zone for sterilization. They are subsequently sterilized inside and out from all sides with vaporized H_2O_2 on a kind of revolver system and activated and dried. They are then passed down to the capper below in a closed infeed.

Härtel considers a further highlight of the new rotary block to be its automatic format changeovers which, provided the bottle neck remains the same, renders manual operator intervention superfluous, thus retaining the internal sterility. This saves the filler module having to run through a full cleaning and sterilization cycle. At a press of a button on the HMI, within the space of just three minutes various servomotors adjust cams in the filler infeed and discharge, the bottle base guide in the capper and the railings, for instance. Expansion joints and steam barriers are used to maintain sterility. If the bottle neck diameter needs to be changed, this can be done manually as an option.

“With our new aseptic system we combine maximum safety with high outputs,” Härtel concludes, pleased that when it comes to sterile filling, KHS is once again able to demonstrate its great expertise in filling technology.

Any further questions?

Manfred Härtel

KHS GmbH, Bad Kreuznach, Germany
+49 671 852 2644
manfred.haertel@khs.com