Since the beginning of this year, in the Phoenix plant in Kleve, the most modern European production location of the Unilever Group, a new PET bottle filling and sealing machine has been installed, equipped with a whole array of performance-enhancing technical features. It is used for the aseptic filling of the Rama Cremefine range suitable for cooking, whipping and refining. The modern processing methods allow to guarantee a minimum shelf life of the products of up to 26 weeks.

Overall view of the 5200-8/8 FF plastic bottle filling and sealing machine designed for Unilever in the Ahaus plant shortly before shipping (photo: Kimberly Wittlieb)

Bernd Neumann, Leverkusen, Germany

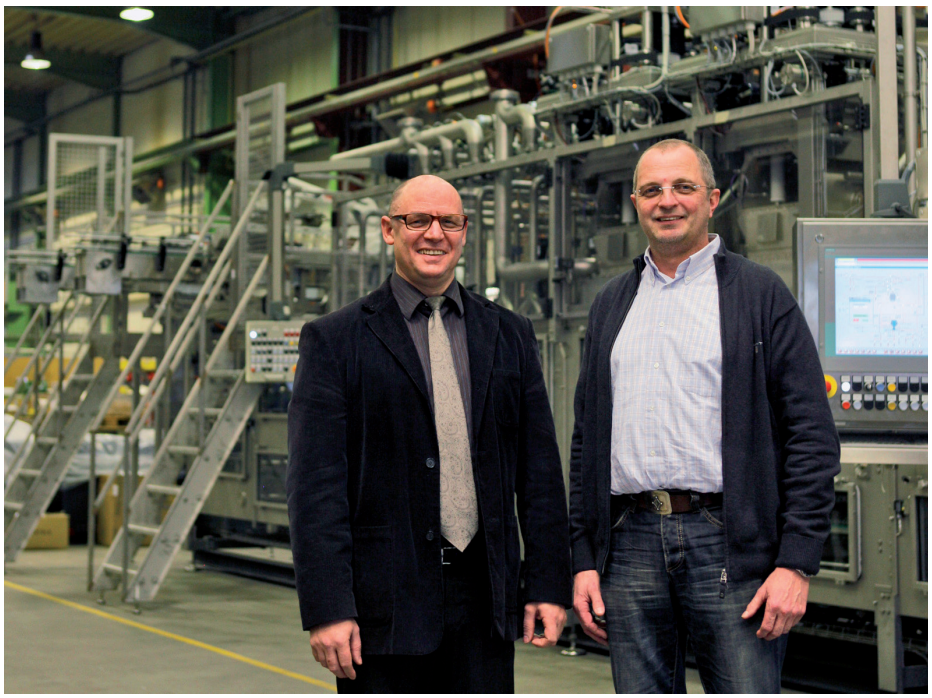
High flexibility thanks to robots and special cell boards

The machine, which bears the model designation FF 5200-8/8, was supplied by the former Finnah Packtec GmbH, trading under the name of H+E Packtec GmbH since 1st February 2012. The company, headquartered in Ahaus and well-reputed for many years as a specialist in aseptic bottle and cup filling and sealing machines as well as from, fill and seal machines, was the general contractor responsible for the implementation of the entire contract, from the positioning of the bottles to their discharge for collection. This was done in close coordination with the technical project management of Unilever throughout the implementation phase.

Here for the first time robotics were used. Further design subtleties of the line designed as double-lane linear filler include special cell boards, various closing systems and the chain drive working with two synchronized servo motors.

All in all, four robots by ABB are in use. Two of these aggregates insert, in an alternating cycle, the bottles into the transport cell boards, after the very lightweight containers, coming from a

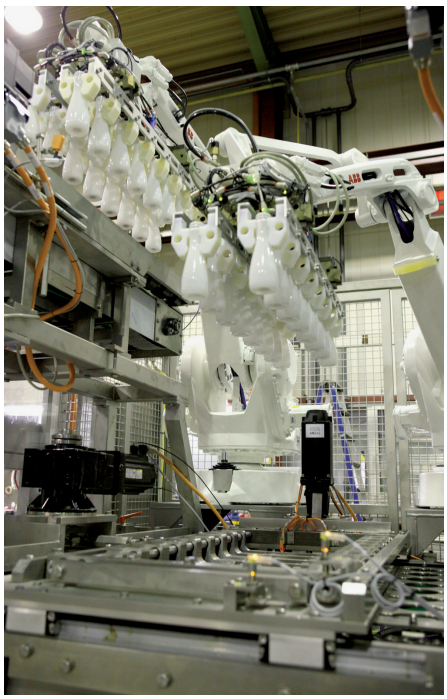
Reiner Hergarten (left), new CEO of H+E Packtec GmbH since the beginning of this year, and Heinz Brüning, the H+E Packtec project manager responsible for the Unilever machine (photo: Kimberly Wittlieb)



The filling and sealing machine allows to handle various neck diameters and bottle shapes (photo: Kimberly Wittlieb)

bottle positioner with air rinser and distribution station, have been fed in on two dual-lane vacuum belts. This upstream configuration comes from the Italian company Lanfranchi.
The cell boards are designed by H+E Packtec so that they can accommodate two different neck diameters.
In the Unilever system, these are 28 and 38 mm. The robotic gripper systems are accordingly programmable and can be adapted virtually "at the push of a button" to the two bottle sizes and neck diameters.

In an alternating cycle, two robot arms place the bottles into the transport cell boards (photo: Kimberly Wittlieb)

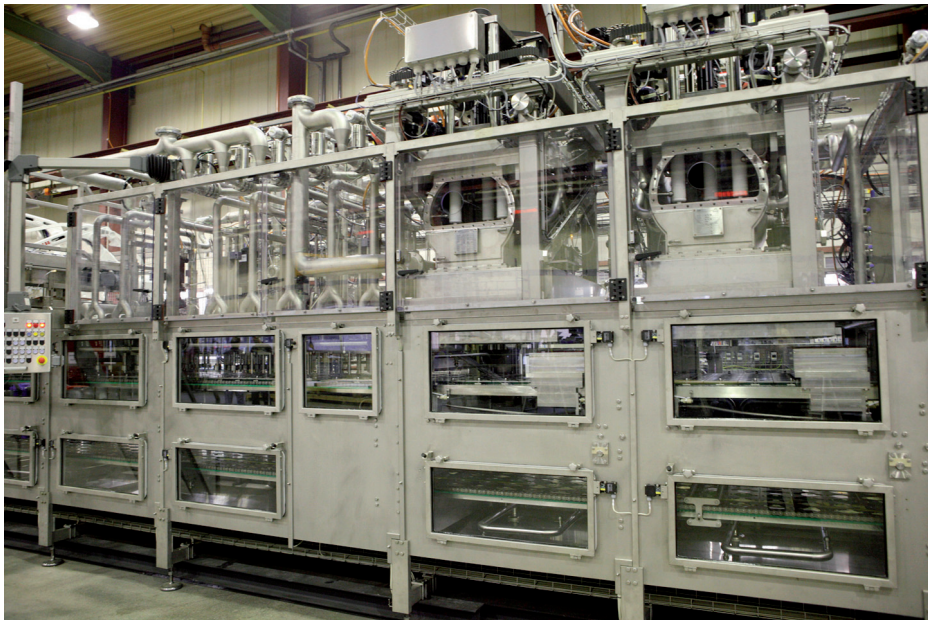


Patented sterilization concept

The core of the line is formed by the bottle sterilization zone and the filling section equipped with two dosing systems. Here the likewise patented aseptic design of H+E Packtec that uses H_2O_2 atomized in a hot air stream plays a crucial role. Compared to conventionally used peracetic acid, this hydrogen peroxide aerosol is not only more cost-effective but also more environment-friendly.
The plastic bottles are sterilized in a module with a length of 1.25 m, in which the hot air mixture is introduced without contact through a piping system in a diving motion into the containers. The holistic aseptic system ensures complete sterility of the entire in-line processing path. This is why the dosing systems and the sealing and capping station are likewise located in the closed tunnel pressurized with the positive sterile air stream.

Wide application range

With the two serially arranged dosing systems, the FF 5200-8/8 is suitable for filling quantities from 100 ml to 1,000 ml, where in a first dosing cycle 500 ml are filled and in a second cycle up to 1,000 ml are replenished. As the model number of the two-lane system suggests, the



The bottle sterilization section (left) is followed by a pair of dosing systems (photo: Kimberly Wittlieb)

line is designed for 2 × 8, i. e. 16 bottles per cycle. Depending on the filling volume, an output of 15 to 36 cycles per minute or 14,400 to 34,560 bottles per hour is achieved.

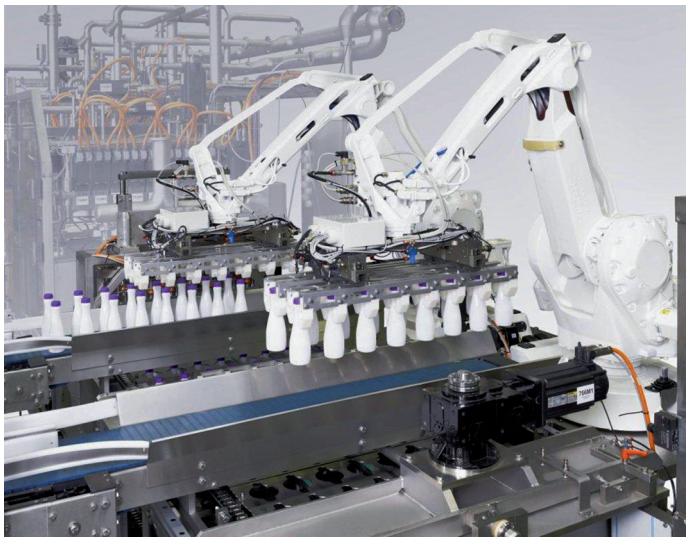
There are several options for the sealing of the containers. From a cap sorter by CSI Closure Systems, both bounce caps and screw caps are fed into the in-line sterilization, so that subsequently capping with one of these variants – optionally with an additional sealing blank – is possible. Afterwards, the bottles are labelled using two parallel inkjet printers.

The bottles are then removed alternatingly by two further robots, which pass the finished products to discharge conveyors. This conveyor system for customer-side final packaging including interface handling and automation comes from Paxona AG.

High requirements met

Frank Jansen, technical project director of the Phoenix plant, has managed the implementation from initial idea to final acceptance and explains the decision criteria for investment. "We need highly flexible filling in order to be able to respond quickly to the needs of the market. In the past we were not able to make big changes to bottle shape, size and neck diameter or closure since we were not able to fill such bottles using conventional systems.

Together with H+E Packtec we developed a concept that makes it possible to process two neck diameters, to fill bottles from 100 to 1,000 ml and to close both PET and HDPE bottles either with a seal and/or screw cap or only with a bounce cap. Especially the robotics system used for the first time is at its most impressive in this system configuration. Thanks to this versatility, we will use the machine not only for the current product but plan to use it in the future to bottle other products as well."



Product discharge is also handled by two robots (photo: H+E Packtec)

The FF 5200-8/8 aseptic bottle filling and sealing machine, designed for a maximum throughput of 36,000 bottles per hour, is generally suitable for a wide variety of applications in the food and beverage industry, not only in connection with dairy products, but also e. g. for fruit juice manufacturers. It can process not only PET but also PE and HDPE bottles of various shapes. Here the neck diameter may be from 20 to 45 mm and the bottle diameter up to 80 mm. With regard to height, containers up to 300 mm are manageable.

As an in-line system, the line is essentially an interesting alternative to rotary table machines, since the machine can also be used for small batches without long downtimes for cleaning and sterilization. Before a product switch, only cleaning of the dosing systems is necessary. With regard to spatial requirements, an in-line system offers definite advantages. Last but not least, the two synchronized servo motors installed both at the beginning and at the end of the chain belt ensure very smooth actuation. Thus they provide quieter transport of the bottles and precise positioning of the containers within the entire production process.

Special cell boards allow to handle two different neck diameters (photo: Kimberly Wittlieb)

The company headquartered in the west of Münsterland and trading, since 1st February of the present year, under the name of H+E Packtec GmbH, formerly known as Finnah Packtec GmbH, is affiliated to the process specialist headquartered in Bonndorf in the Black Forest and likewise renamed from Finnah Protec GmbH to H+E Protec GmbH. Both companies will be present at this year's Anuga FoodTec at the joint booth of the parent company SH+E Group in hall 7.1, booth B 38. ❑