ABF 1.2 Aseptic Blow Fill
A new concept in the aseptic filling technology
Aseptic Blow Fill

The growing need from the market for more sustainable and user-friendly packaging solutions for sensitive products is leading all major specialists continually to develop aseptic technologies across their product ranges.

The Aseptic Blow Fill (ABF) is the dry sterilization platform from GEA aimed primarily at food safety security as this is the most stringent requirement in packaging of sensitive products. The ABF is a fully aseptic blowing, filling and capping rotary system that combines an aseptic blow molding module with aseptic filler and aseptic capper modules. The system features a completely dry decontamination technology for preform and cap sterilization; it is cost-effective, energy efficient, environmentally friendly and sustainable.
Aseptic Blow Fill

Preform VHP treatment
The preforms entering the ABF system are at first cleaned of dust and small particles by flushing them with ionized air and then subjecting them to a reheating treatment in the oven to achieve optimized thermal profiling.

The preforms are sterilized just after exiting the oven to minimize energy consumption and the usage of sterilizing agent, while avoiding any damage to internal surfaces of the oven. A Vaporized Hydrogen Peroxide (VHP) treatment on the internal and external surfaces of the preforms is performed using a robust and controlled process without condensation to minimize residue values and achieve 6 Log decontamination performance.

The preform inlet zone and the oven are located outside of the sterile zone.

Airstar aseptic blow molder
After the sterilization process, the preforms enter the sterile zone, where the blowing wheel is enclosed, and are blown with sterile air provided through a filtered circuit that includes a dedicated VHP sterilization system.

The specific and unique design of the aseptic blow molder module features distinctive three-zone separation, locating the electrical components above the sterile zone and any components that require lubrication, below. This ensures a clearly identified sterile zone with minimal surfaces so that the sterile area can be easily cleaned and sterilized before starting a new production cycle. The overpressure isolator system, with filtered air in the sterile zone, continuously preserves sterility and guarantees protection during production.

Mold changeover is performed in a dedicated, controlled area under a laminar airflow generated by an active module. When the mold changeover is completed, only a short sterilization cycle with VHP is required before production can be restarted.

The fresh-blown sterile bottles are handled by the neck from the aseptic blower to the aseptic filling and capping modules without leaving the sterile zone.
Fillstar aseptic filler

When the filling of sensitive beverages demands a high level of hygiene and safety, the ABF filler module eliminates any possible risk to the product, paying special attention to crucial environmental control and achieving the best performance in terms of filling speed, accuracy and flexibility. A full range of sensitive beverages can be filled, from still, clear drinks with or without particles, to carbonated drinks - high or low acid.

When linked to the aseptic blower, the aseptic filler is enclosed in a microbiological isolator with an environment that is sterilized before starting production. Sterility is maintained during production with an overpressure of class 100 sterile air in the working area.

The volumetric electronic magnetic flow meters, fitted on each filling valve, guarantee high filling accuracy and the high performance of the internal cleaning and sterilizing processes. The complete bottle ‘neck handling’ system enables a very quick changeover for any container with the same neck design. The cup insertion and extraction for closed-loop CIP and SIP is a completely automated system that allows the use of steam for the sterilization process, reducing water consumption.

Aseptic capper and cap sterilization system

Similarly to the preform sterilization system, the ABF cap sterilization module is based on the dry sterilizing effect of H2O2 in vapor form at the correct concentration and temperature. The special adopted design, including a rotary caps buffer, ensures that all the cap surfaces are exposed to prevent any shadowed area and achieves over 6 Log decontamination with a gentle treatment avoiding risks of caps deformation.

The cap sterilization module is suitable for treating both sport and flat caps with a quick changeover, without any mechanical intervention and without losing sterility. The ABF solution offers maximum flexibility in treating aluminum foil closures.

The capper module in the ABF system is specifically designed for aseptic applications and completely embedded in the microbiological isolator. GEA provides a patented electrical barrier that allows the effective separation of the sterile zone from mechanical components that require lubrication; a hygienic design with no bellows that’s easy to clean; and the full traceability of the capping process to achieve maximum product safety.
ABF 1.2 distinctive features

The aseptic blowing process
The blowing process of the sterile preforms is performed with sterile air provided through a filtered circuit including a dedicated system that sterilizes the air piping with VHP, from filters to the blow molding station. For this reason GEA developed a specific patented air blowing block that can be sterilized while maintaining reactivity, reliability, ‘reduced pressure drop’ and ‘reduced dead volume’.

Sterile stretching rod [patented]
All the parts that touch the sterilized preform and/or the bottle must be sterile before starting production and therefore it is mandatory to have a sterile stretching rod. The GEA system (patented) allows the stretching rod to be kept inside a sterile housing, sterilized with VHP. The movement is achieved by a magnetic joint between two magnets: an internal magnet connected with the stretching rod inside the housing and an external one connected with a standard moving system by an electrical motor. This also provides the benefit of allowing the automatic disengaging of the magnets if a preform jams during the stretching phase.
ABF 1.2 - The concept

Sterilizing the preform instead of the bottle reduces the quantity of sterilizing agent used as the preform is smaller and has a simpler shape than the bottle itself.

As the preform is made of thicker material it’s possible to increase the temperature of the treatment without risk of shrinkage that would affect the shape of the bottle. This allows the weight of the bottle to be reduced compared with traditional aseptic systems.

ABF 1.2 is an extremely flexible system that can blow and fill up to 48,000 bottles per hour and operate at different levels of decontamination according to specific microbiological protocols. This allows the production of products with different shelf lives – from dairy to aseptic beverages, Extended Shelf Life and other sensitive drinks may be produced on the same system.

ABF 1.2 provides sustainability and space saving. The system uses very little chemical and no water. Energy usage is kept to a minimum by the elimination of air conveyors, sterilization and rinsing carousels. The whole system is more compact than traditional aseptic technology and requires fewer operators.

ABF 1.2 performance
• Available for a wide range of bottle formats, from 0.2 to 2.5 liters
• Production speed up to 48,000 bottles per hour
• Limited downtime for product changeovers to three-hour cleaning and sterilization cycles
• Can fill a full range of sensitive products; still, clear drinks with or without particles; carbonated products; dairy or beverage
• Over 6 Log reduction on both cap and preform decontamination
• Maximum continuous production run of 165 hours

Your benefits
• Reduced chemical and energy consumption for sterilizing processes
• Minimum VHP residuals in the containers
• Full automated sterilization process of the blowing, filling and capping modules, effectively repeatable over time with no operator intervention
• Full aseptic synchronized configuration which guarantees complete control in food safety and integrity for every production batch
• Microbiological validation accordingly to the specific protocols of the major players in the sensitive beverage industry
• FDA proof of concept approved
We live our values.
Excellence • Passion • Integrity • Responsibility • GEA-versity

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