ABF - The concept

Shifting the process instead of the bottle reduces the quantity of sterilizing agent used as the preform is smaller and has a more simple shape than the bottle itself.

In the process, a mold of thicker material than the bottle itself is possible to increase the temperature of the treatment without risk of damage that would affect the shape of the bottle. This allows the weight of the bottle to be reduced compared to traditional aseptic systems. ABF provides flexibility, sustainability and space saving.

ABF is an extremely flexible system that can blow and fill up to 48,000 bottles per hour and operate at different levels of decontamination appropriate for each product. This allows products with different shelf-life—low-acid aseptic beverages, high-acid aseptic beverages, water—to be produced on the same system. ABF can be used for ambient or cold-filling operations. The system saves on chemicals and waste treatment costs by eliminating air conveying, sterilization and rinsing carousels, water UHT sterilization. The whole system is more compact than traditional technology and requires fewer operators.

ABF uses Fillstar’s volumetric electronic fill (FX/CX) fitted with magnetic flow meters: an industry standard for filling sensitive beverages. The bottles are neck handled throughout filling and capping. The Fillstar can fill any beverage including products with pulps, fibers or fruit pieces.

ABF 4C is the Ultra Clean version of the Blow-Fill machine. A customized sanitization of the preforms together with a specific caps treatment, ensures that the ABF 4C is able to satisfy any clean production need (i.e.: Extended Shelf Life products, Customized bars, ...).
Aseptic Blow Fill

ABF - Airstar technical aspects

**ABF - Aseptic Blow Filling** is a complete new concept for aseptic filling. It is the world’s first rotary aseptic blow moulding machine with an integrated aseptic blow nozzle. The principle is to sterilize the preforms with Vaporized Hydrogen Peroxide (VHP) at the exit of the oven. After that the preforms, with sterile air in a sterile environment and maintain this environment through the filling and capping process. Achieving this minimizes the use of chemicals required for bottle rinsing, moulds and other non-cleanable components and all components that require lubrication are located outside the sterile zone. Electrical components are located above the sterile zone. Mechanical components are located outside the sterile zone which is maintained continuously in sterile air, sterilized by HEPA filters. This ensures the sterility of the modules and the modulating exhausters control the flow of sterile air; this requires both the use of microfilters for the sterilization of the air and the sterilization of the piping with VHP.

**Airstar** is the first truly aseptic blow moulding machine with an integrated aseptic blow nozzle. The principle is to sterilize the preforms with VHP at the exit of the oven; then blow the preforms ‘upside down’. This inversion is performed immediately after the pitch wheel where they are sterilized by VHP treatment. The sterilizing nozzle, with the ‘upside down’ position of the preform, delivers a strong dedusting combined with the sterilization process. A preliminary dedusting phase is performed just before the inlet of the blower to remove any gross particles inside the preforms.

**Aesteas**, the world’s first rotary aseptic blow moulder, was designed by GEA Procomac from a clean sheet, using the know-how, GEA Procomac’s broad experience in designing aseptic lines, its broad experience and all its know-how. Aesteas has gained through many years of designing aseptic lines, to meet the most stringent aseptic requirements.

**Preform VHP treatment**

The preform VHP treatment sterilizes the internal and external surfaces of the preforms with Hydrogen peroxide vapor phase at controlled temperature and concentration. This is forwarded by a magnetic joint between two magnets: an internal one connected with the stretching and inside the Sterile Zone and an external one connected with a sterilizing cycle (SOP) with VHP. The movement is performed by a synchronous movement of the magnets if jamming of the preform occurs during the stretching phase. The magnetic joint is the link between the stretching and inside the Sterile Zone separator from the outside (dirty) environment.

**The blowing process**

The blowing process of the sterile preforms is performed with sterile air, thus requires both the use of microfilters for the sterilization of the air and the sterilization of the piping with VHP. For this reason GEA Procomac developed a specific air blowing block that can be sterilized by VHP at the same time. The blower is separated from the sterile zone by a compensation chamber.

**Aseptic Blow Moulding (ABM)**

**ABF - Airstar aseptic blow moulder**

**ABF - Aseptic Blow Filling (ABF)** is a complete new concept for aseptic filling. It is the world’s first rotary aseptic blow moulding machine with an integrated aseptic blow nozzle and an integrated aseptic blow nozzle. The principle is to sterilize the preforms with Vaporized Hydrogen Peroxide (VHP) at the exit of the oven. After that the preforms, with sterile air in a sterile environment and maintain this environment through the filling and capping process. Achieving this minimizes the use of chemicals required for bottle rinsing, moulds and other non-cleanable components and all components that require lubrication are located outside the sterile zone. Electrical components are located above the sterile zone. Mechanical components are located outside the sterile zone which is maintained continuously in sterile air, sterilized by HEPA filters. This ensures the sterility of the modules and the modulating exhausters control the flow of sterile air; this requires both the use of microfilters for the sterilization of the air and the sterilization of the piping with VHP. The movement is performed by a magnetic joint between two magnets: an internal one connected with the stretching and inside the Sterile Zone separator from the outside (dirty) environment.

**Designed by competence**

**Aesteas**, the world’s first rotary aseptic blow moulder, was designed by GEA Procomac from a clean sheet, using the know-how, GEA Procomac’s broad experience in designing aseptic lines, to meet the most stringent aseptic requirements.

A key design decision was to blow the preforms ‘upside down’, enabling all non-sterile components to be located outside the sterile zone. This inversion is performed immediately after the pitch wheel where they are sterilized by VHP treatment. The sterilizing nozzle, with the ‘upside down’ position of the preform, delivers a strong dedusting combined with the sterilization process.

A preliminary dedusting phase is performed just before the inlet of the blower to remove any gross particles inside the preforms.

**Change-over**

Change-over of the moulds is performed in a specific isolated area under laminar air flow generated by a sterile module with HEPA filters. A sterile assembly system allows the operator to change moulds easily. After the changeover it is performed a rapid cycle of sterilization with VHP before aseptic production is initiated.

**Sterile stretching rod**

All parts that touch the preform and/or the bottle have to be sterile before starting production and therefore to be sterile before starting every production phase. The internal surfaces of the blower have to be sterile before starting production. The sterile stretching rod, after being turned into the upright position, is restarted. The sterile topside, allowing being turned into the upright position, is restarted. The sterile topside, allowing being turned into the upright position, is restarted.

**Sterile process continuity**

Aseptic Blow Filling (ABF) is a complete new concept for aseptic filling. It is the world’s first rotary aseptic blow moulding machine with an integrated aseptic blow nozzle and an integrated aseptic blow nozzle. The principle is to sterilize the preforms with Vaporized Hydrogen Peroxide (VHP) at the exit of the oven. After that the preforms, with sterile air in a sterile environment and maintain this environment through the filling and capping process. Achieving this minimizes the use of chemicals required for bottle rinsing, moulds and other non-cleanable components and all components that require lubrication are located outside the sterile zone. Electrical components are located above the sterile zone. Mechanical components are located outside the sterile zone which is maintained continuously in sterile air, sterilized by HEPA filters. This ensures the sterility of the modules and the modulating exhausters control the flow of sterile air; this requires both the use of microfilters for the sterilization of the air and the sterilization of the piping with VHP.

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