

Bosch Packaging Technology Sets the Trend for Safer Baby Food With Aseptic Packaging Technology

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Continuous enhancements in safety and sterilization are essential to baby food manufactures and processors. Brand trust by consumers is essential in this sector of the food industry. Bosch Packaging Technology, the worldwide leader in food, confectionery, and aseptic packaging machinery has recently launched new equipment for this sector that is truly next generation in terms of safety and security. The Servac-TFA 4830 is a sophisticated mid-to high-capacity aseptic thermoform/fill & seal machine that replaces traditional glass jars with safe and convenient plastic cups. This newly redesigned machine provides processors of baby and particulate food higher levels of safety and product sterility over traditional glass jars. The Servac-TFA 4830 machine also provides a streamlined production process that consumes less energy and is more cost effective.

Thermoformed Cups = Safety

The Servac-TFA 4830's hygienic design guaranties exceptional production and product security. This method of aseptic filling and packaging allows processing of pre-sterilized food in a gentle and energy saving way that keeps vitamins and sensitive nutritional components of the packaged food intact. The normal retort method used to kill spores and microorganisms in the baby food is now eliminated from the process. The Bosch system utilizes atomized H₂O₂ to sterilize the packaging material and replaces the steam-only sterilization process. Catalytic converters are used in the machine's exhaust to neutralize the vapors emitted from the process.

The machine also incorporates an efficient gas flushing systems for the head space of the cups. This system uses filtered nitrogen gas and provides low values (only 2%) of oxygen in the cup head space, while increasing product protection.

Professor Bernd Wilke, PhD (University of Hohenheim, Food Technology Department) confirms that the peroxide remainders in the filled product stay well below the rigorous values allowed by the American Food and Drug Administration (FDA), and in fact are virtually non-existent. According to the authority, the new method has a GRAS status (Generally Recognized as Safe), meaning it is completely benign to the consumer.

The thermoformed cups are made out of a flat roll stock material called base web and are far more cost-effective than the traditional glass jars used until now. The integration of an EVOH-layer barrier inside the base web also protects the sensitive product in the cup, allowing longer room temperature storage periods. The barrier protects against oxidation and an additional PE-layer protects against moisture loss. Sophisticated multilayer lid webs provide additional coverage against any mechanical damage.

This hygienic level of the packaging machine makes it possible to extend the pre-sterilized product's shelf life for periods of six to twelve months at ambient temperatures. The French manufacturer Bledina/Danone has already achieved this level of shelf-life for its popular baby meals.

Ease of Use and Flexibility

Servac-TFA 4830 machines are equipped with a state-of-the-art drive and control system thus easing operation and set up of the machines. Operation is performed via a built-in touch-screen operator panel with graphic display and codes buttons. The comprehensive graphic display system with password-protected menus allows fully automatic adjustments of the set-up and operational parameters.

All machine workstations are servo-driven, which provides not only the efficiency of mechanical movements, but also allows quick and precise changes of the drive characteristic. A new product with a new viscosity value may require a different value of the web advance acceleration or deceleration, while a new type of plastic web may need a different value of the pre-plug speed. The servo drive technology makes those changes easy. This flexibility allows the new Servac-TFA 4830 to easily be adapted to a wide spectrum of product variations while at the same time maintaining superior cup quality.

The filling operation is achieved with only a small number of parts in the sterile zone – a refinement that improves hygiene and reduces machine size as well as helps to speed up size changeovers. It uses Bosch's established piston pump technology, which can handle liquids or viscous products.

The integrated notch-cutting die cut station can be simply adjusted via an operation panel to allow a change between groups of 2, 4 or 6 cups, depending on production requirements. With the breaking lines between the cups already notched, the consumer can easily separate the cups.

In the case of a machine malfunction, a corresponding message appears as a text line on the operation screen. The machine controls also include computerized administration and message storage.

This thermoforming line operates at speeds of up to 24 cups per stroke. With an output of 43,000 cups an hour, the Servac TFA 4830 can handle a wide range of sizes, producing individual and multi-packs. The line operates efficiently in a multi shift mode, with the daily production output reaching around 100 tons per day.

This user-friendly equipment is characterized by unique product security, a high degree of size flexibility and maximized cup stability, even with extremely thin films. The modular structure of the open and all-round accessible construction ensures flexibility and accessibility.

The Piston Filler

The full metal piston filler integrated into the TFA machine, maintains highly precise filling of viscous products, which may also include small particulates. In cases of baby food and ready meals, the filled product may include solid particulates with a spherical diameter of up to 25 mm. The volumetric Bosch filling units are famous for their precise filling capacities. At low viscosity, (products like pudding) the fill precision remains at ± 1 g for a 4 x 125 ml package.

Even with high viscosity, (mixtures of baby food that may include particulates) the weight deviations do not exceed the value of ± 2 g per cup. Specific product weight fluctuations can be easily balanced within the menu control by adjusting the filler servo drive. The accurate filling system provides further cost reductions by keeping package overfill within an acceptable range.

The full metal filler design, typical for all Bosch aseptic machines, maintains a high hygienic level and excellent CIP process results since it does not include any elastomeric gaskets or seals. Rubber, silicone or similar elastomeric materials increase the risk of contamination by allowing microorganisms to survive the machine sterilization process.

The full metal piston filling system requires very little maintenance since it does not utilize membranes and tubes that require time-consuming checks and replacement. Each fill piston is connected to one fill nozzle. The metal pistons slide within their bodies without gaskets because of the precise fit between them which prevents any leakage from occurring. The separate filler servo drives allow a precise adjustment of the fill volume without stopping the machine.

Improved Reliability Through Process Engineering

The lid web transportation system has been developed to maintain reliable continuous lid web advance within the sterilization section. In the new design of the SERVAC TFA 4830, the lid web roll is placed at floor level, where it can be easily replaced by the operator. The aseptic module, which provides the necessary sterile media for the machine, is placed at a lower level within the machine frame, reducing the space requirements of the whole line and keeping the length of the tubes and connections as short as possible.

Computer-aided cup-forming technology is designed to handle a wide range of cup materials and allow complex cup shapes to be manufactured with a high degree of cup stability. Even with an extremely thin wall width, it represents considerable material cost savings and retains cup quality.

As an additional option, the SERVAC TFA 4830 can be equipped to utilize Polypropylene webs (PP). Products filled into PP cups can be heated by the consumer using a microwave oven.

All machine process parameters are validatable and repeatable. Bosch Packaging Technology offers assistance to manufacturers looking not only for perfect technology, but also comprehensive knowledge of microbiology processes and aseptic validation.