Aseptic milk packaging: new trends

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France has been a pioneer in the field of aseptic milk bottle filling in Europe. The French may even be the world’s greatest plastic bottled UHT milk consumers! Serac’s objective in this field is to meet the manufacturers’ constantly evolving demand and to adapt its range of aseptic machines in order to address new trends.

Milk shelf life in France is traditionally high, in response to the retailers’ requirements and the inconsistent quality of the collected milk, which forced manufacturers to use extensive heat treatment. The quality has improved significantly for a number of years. Now 95% of milk in France is UHT. Yet there is a variety of milk processing methods throughout Europe.

Belgium, Spain and Portugal follow the same pattern as France. By contrast, Northern Europe favors pasteurized milk. As for Germany and Italy, they offer both fresh milk and UHT milk. The European drinking milk market is therefore not homogeneous.

Bottled UHT milk has just started to develop in Russia, where the first aseptic line has just been set up.

The main advantage of milk aseptic filling is that it can be used to extend the milk shelf life with a lesser deterioration of organoleptic properties of the product compared with sterilized milk for example.

The reason is that milk, which is highly nutritious, is one of the most sensitive products from a microbiologic and organoleptic point of view.

Complex decontamination solutions

Today, as far as Serac’s aseptic lines are concerned, there are several solutions to decontaminate plastic bottles for UHT milk. First of all, an aseptic blowing machine can be used to produce a sterile co-extruded and blow-molded HDPE bottle that consists either of six layers (light and oxygen barrier) or three layers (light barrier only). No chemical treatment is thus required inside the bottle.

The bottle is then trimmed just before being filled in a sterile atmosphere.

Second, for open-neck bottles, including PET bottles, “wet processing” with a peracetic-acid based liquid solution (PAA) or “dry processing” with a hydrogen peroxide-based gas solution (H2O2) can be used.

Unlike PAA processing, H2O2 processing has the advantage of not requiring sterile water rinsing after processing. It therefore reduces overall water consumption.

Innovating to add value

Although milk remains a staple product, its manufacturing requires complex processing: UHT sterilization of milk, aseptic filling, barrier materials, and therefore a high production cost.

In order to attract new market players, technical innovation is therefore important. As a pioneer in the design of aseptic filling machines, Serac is continually investing in R&D in this field. One of the major fields of research in packaging decontamination is the electron beam or “E-Beam”.

With this process, it is possible to avoid using chemical products. Nowadays, there is growing interest in «chemical-free» processes. E-beam is therefore one of tomorrow’s solutions.

Towards smaller and more flexible machines

Demand is also evolving in terms of machines. High output volumes enable the large dairy companies to write off their production units.
Newcomers on the other hand look for smaller machines with slower outputs, especially on the new markets. They also tend to favor bottles versus cartons because they stand out on the retailer shelf.

**Greater flexibility is another emerging trend**

In order to make investments profitable, food manufacturers also wish to fill different products on the same line, such as fruit juices (products with acid pH) or fermented milk (non-sterile chilled products). We are therefore starting to have requests for flexible multi-product lines in order to produce extended shelf life and cold chain products on a same line. Flexibility in packaging materials is also required, with lines that can fill both polyethylene and PET bottles.

Lastly flexibility is required in terms of packaging sizes, with lines filling both quarter of a liter and one liter containers. We have therefore developed neck transfer systems which are used to rapidly change the format without requiring machine sterilization.

To sum it all up, production lines must be more flexible in terms of products, materials and formats, while retaining their primary objectives: product sterility and integrity, as well as performance of the filling line.

*Column written further to Roland Nicolas’ interview*