

PNR Italia atomizers reduce the consumption of sanitizing liquid by 17%

A manufacturer of machinery for aseptic filling of food containers optimizes the caps disinfection process



SCENARIO FOR THE SECTOR





Aseptic filling of packaging in the food industry

Increasingly, food and beverage producers in the food industry (UHT milk, fruit juices, fruit purees, fruit, and tomato concentrates or purees, cubes, tomato pulp and tropical fruit, soups, and low acid products) choose **cold sterilization** to avoid the use of refrigeration and preservatives and not to compromise the quality of the product with excessive heat.

In food processing plants, the **filling of packages in completely aseptic conditions is one of the most critical aspects**. At that stage, it is necessary to ensure the complete aseptic sealing of the plant, on the contrary it would not be possible to grant guarantees on the actual preservation of the product.

The packaging of food products in aseptic bags at room temperature involves using special machinery that combines multiple elements in a single integrated production line. This integrated approach ensures microbiological safety throughout the process, from initial treatment to sealing.

The aseptic filling phases of food packaging at room temperature are:

-  **1 | HEAT TREATMENT:** pasteurization or sterilization of the food to be packaged;
-  **2 | COOLING:** it may be necessary to cool the product after pasteurization or sterilization and before packaging it;
-  **3 | PACKAGING STERILIZATION:** before being filled with the food product, the packaging is thermally or chemically sterilized;
-  **4 | ASEPTIC FILLING AND SEALING:** the aseptic packages are first filled and then closed with caps and nozzles in an aseptic chamber saturated with disinfectant solution.

17% Percentage of saved sanitizing liquid

INDUSTRY
Food



APPLICATION OF PNR ITALIA PRODUCTS
Sanitisation of sterile food bag caps



PROBLEM
Optimizing the consumption of disinfectant liquid ensuring the same sanitization level



PNR ITALIA SOLUTION
Atomizers set



THE PROBLEM OF OUR CLIENT

The customer who contacted PNR Italia is a manufacturer of industrial processing of food machinery.

The need was to design a **sanitization system for 200lt aseptic food bags caps**. Sanitation takes place in a 380mm wide circular chamber in an aseptic filling machine.

PNR Italia had to **identify the type of atomizers that could blow the sanitizing solution in optimized time and quantity inside the chamber**.

The cap is made of plastic, and the entire filling operation is carried out at room temperature. During the sanitization in the chamber, it is possible to reach 90 °C, and it is performed through hydrogen peroxide at 33% -35% blown by three atomizers inside a small sterilization chamber at 8ml per second.

The operation of welding the nozzle and closing the cap takes place inside the chamber and lasts 2 seconds.

The whole process begins when large drums containing empty 200lt food bags are placed on a rolling conveyor and pallet rotating wheel that takes them under the machinery to fill and close them. The cap and the nozzle are welded to the bag in a sterilization chamber. Once closed, the drum is ready for transport.



ASEPTIC FILLER
PLANT DIAGRAM

PNR ITALIA SOLUTION

After some laboratory tests, the PNR Italia technical office suggested using **three MXL 2330 air assisted atomizers**.

During the laboratory tests it was found that for the type of chamber geometry and for the length of the ducts it is necessary to keep the atomizers open at least 1 second to reach evenly the cap surface.

ADVANTAGES FOR OUR CLIENT

Under the highlighted conditions, 6.63ml of sanitizing liquid was consumed, with a **reduction of 17% compared to the system previously used**.

FOCUS ON THE PRODUCT

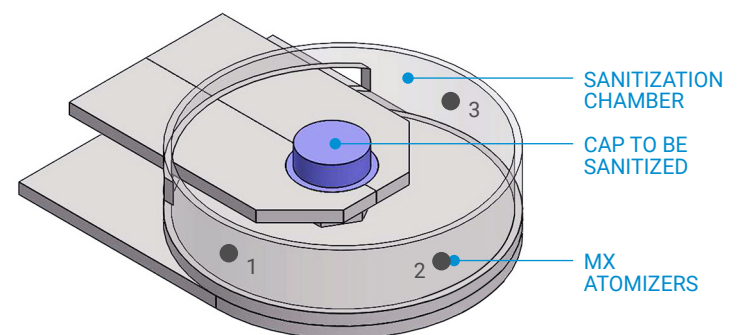


MX bodies contain an air actuated cylinder which controls the spray operation by means of a needle, opening or closing the water inlet in the liquid nozzle.

PERFORMANCES

MXL 2330

@PW= 1 BAR	UNIT OF MEASURE	THEORETICAL VALUE
ATOMIZER FLOW RATE	ML/S	2,21
SYSTEM FLOW RATE	2,21X3= 6,63 LPM @ 1BAR	



CHAMBER FOR CLOSING AND SANITIZING CAPS
ISOMETRIC VIEW

PNR ITALIA

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