

Pulsed UV light against germs

Clean packaging for dairy products



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Hygiene is important in all areas of life. This is particular true for food industry and dairy products such as those used in yoghurt filling, as they are very susceptible to contamination by microorganisms and fungal spores. These can come from various sources, for example from the packaging materials used. Therefore, disinfecting the yoghurt pots and sealing films before filling and sealing is a crucial step in a safe production process. Pulsed UV light is a practical, environmentally friendly solution for this. It deactivates a wide range of microorganisms and spores quickly and without leaving any residue. The systems can also be easily integrated into the production

integrate systems.

Traditionally, yogurt manufacturers rely on chemical cleaning to disinfect the packaging, usually with hydrogen peroxide, which has proven to be very effective in practice.

but also accepts disadvantages.

XENON Pulsed Light works with short, yet very high-energy UV light pulses that kill virtually all known pathogens and also destroy the repair mechanisms of their DNA.

(Source: AI-generated, 2024 by Microsoft Copilot)

The use of chemicals always means a certain environmental impact, waste can never be completely avoided. The use of steam can also damage heat-sensitive packaging materials, so it has disadvantages. Alternatives that offer a better ecological balance are therefore sensible for both the plant manufacturers and the manufacturers of dairy products in order to remain competitive in the future.

Clean up to disinfection level Log 6

A well-known alternative to disinfection with chemicals is irradiation with UV light. The effectiveness of disinfection measures with UV radiation depends on the dose: the irradiation intensity must be high enough and the irradiation time long enough to be able to kill microorganisms and viruses to the desired extent.

Continuous UV light irradiation attacks the DNA, but often does not overcome its repair mechanisms, so that after packaging the number of germs increases again and the shelf life of the dairy products can be reduced. Pulsed xenon light from the Polytec range

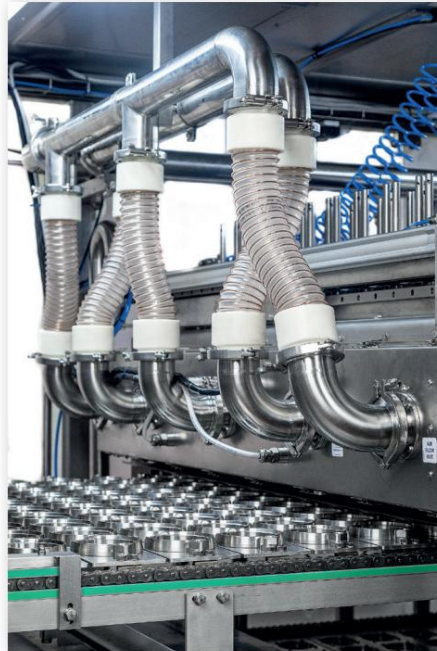


Fig. 3: Ten yoghurt cups are disinfected simultaneously in 0.5 to 1 s (here without cups).

therefore uses a different approach (Figure 1). It works with short, but very energetic UV light pulses, which are practically

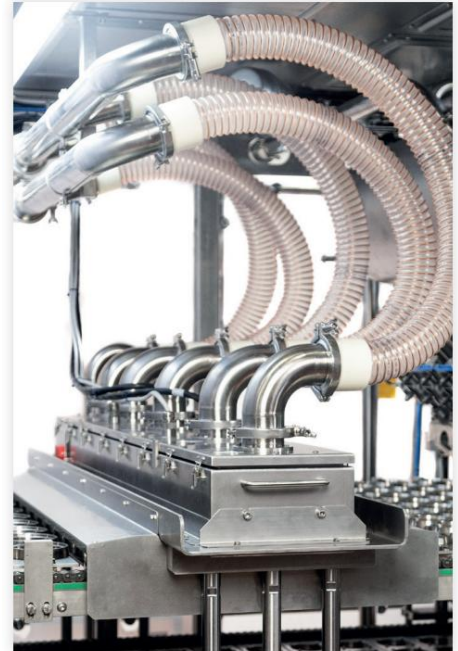


Fig. 4: Another UV lamp disinfected the sealing film for the cup lids.

kill all known pathogens and thereby destroy the DNA repair mechanisms of the microorganisms.

In addition to damaging the DNA, the water inside the cell evaporates and the cell walls break open. The process is FDA-

and can meet hygiene requirements up to Log 6 and more depending on the application. This means that up to 99.9999 percent of harmful bacteria, fungi or viruses are killed, which corresponds to the disinfection requirements in an operating room.

And because pulsed light produces little or no heat, it can be used on a wide variety of materials, including heat-sensitive plastics.

These properties make systems that work with pulsed light ideal for disinfecting yogurt cups before filling. They work with high productivity.

They offer high production speed and can be easily integrated into a filling machine, a conveyor system or elsewhere in the manufacturing process. For different application conditions, different UV lamps and housings can be combined to form systems whose UV light output is then perfectly suited to the respective application.

In principle, any food container with a sufficiently wide opening can be disinfected, including bottles and cans. The food-safe, washable

durable lamp housings are made of Stainless steel and meet IP67 and NEMA 4X standards. The lamp unit can be easily screwed onto existing conveyor systems and can be positioned so that it does not affect the movement of the packaging on the belt.

Application example: Linear cup filling system

The Greek machine manufacturer Alfa Machine, for example, has installed such pulsed xenon systems from Polytec in its fill-seal machines for dairy products (Fig. 2). One for disinfecting the cups and one for disinfecting the sealing film. The linear cup filling system has a production capacity of 15,000 to 18,000 cups per hour, depending on the viscosity of the respective product. It is suitable for all liquid to viscous food products such as yoghurt, milk creams, desserts, ready meals, butter or spread cheese. The pulsed UV technology offers high peak energy for efficient decontamination of containers, chers and their lids up to Log 4, which means that up to 99.99 percent of the existing microorganisms are reliably killed.

For disinfection, each cup is irradiated with UV pulses. The lamp is positioned above the conveyor belt so that 10 cups are treated at the same time (Fig.

3). This takes no longer than 0.5 to 1 s and the disinfection can easily keep pace with the high production speed.

The sealing film for the lid is also freed of microbiological contamination in the same way and at high speed. For this purpose, the second UV lamp is integrated into the system after the film feed (Fig.

4). The lamps work very efficiently with a high level of effectiveness, so the process requires less energy than conventional disinfection solutions.

The cooling of the lamps ensures that the dairy products do not heat and the sealed, washable lamp housing made of stainless steel can be easily cleaned with a steam jet if necessary. In addition, the disinfection system is user-friendly, easy to operate and thus reduces the complexity of the operating processes. Disposing of waste saves the handling of chemicals and chemical residues are also no longer an issue.

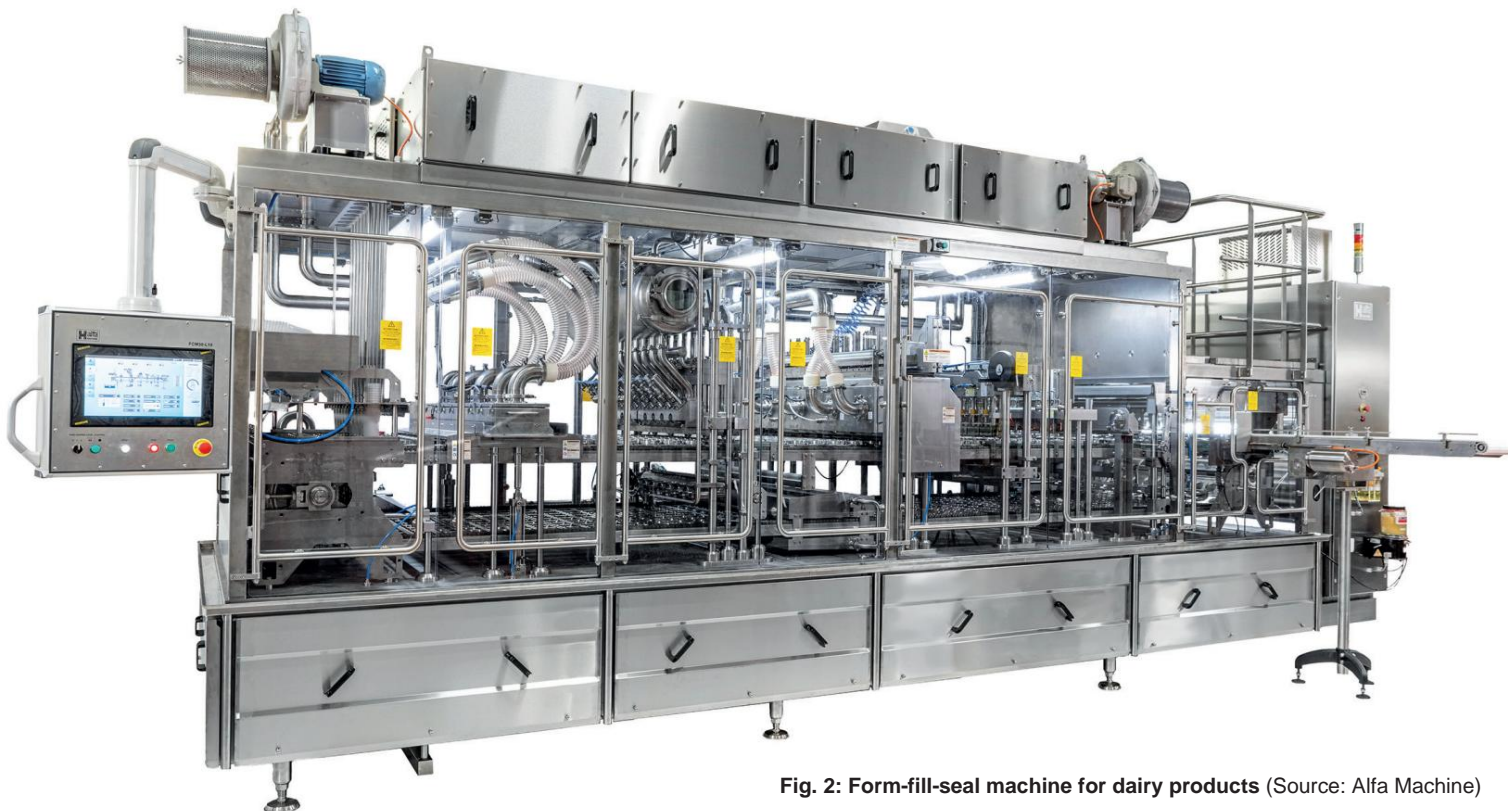


Fig. 2: Form-fill-seal machine for dairy products (Source: Alfa Machine)