CASE STUDY

Company:

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Products:

Tunnel Ovens
Chamber Ovens
Laboratory Ovens
Solid State Technology
Generators
Magnetrons

Applications for:

Wood Industry
Food Industry
Ceramic Industry
Chemical Industry
Plastic Industry
Microwave Plasma
.... and many more

Benefits:

Consulting and Support
Research and Development
Practical Process Design
Simulations with CST Studio
Service worldwide

In the ready-meals sector, frozen products dominated the range for a long time. But with the changing demands of customers, a lot has changed on the market. Today, consumers of convenience products are more interested in sophisticated quality. The younger generation is more informed about ingredients and has a different attitude towards healthy products than a few years ago. The demand for better ingredients and nutrition-conscious concepts is constantly increasing. The demand for organic, vegetarian or vegan products is becoming more and more important. However, there is one crucial catch. Production and filling can be highly automated and continuous up to a certain point.

Challenge

When it comes to the final stage of quality assurance, things get complicated. The necessary pasteurization process is carried out in a conservative method in a water bath, which kills off the harmful germs in the food. However, this process has the disadvantage that it is time-consuming and therefore expensive and important nutrients are lost.
For the pasteurization of ready-meal trays up to now with the more energy-efficient irradiation with microwaves, the perforation of the film and the use of a non-return valve were essential to prevent the trays from bursting due to the overpressure. However, this also creates the risk that new germs from the ambient air are drawn into the product again during cooling and the resulting vacuum. In addition, grease residues are formed around the hole, which makes subsequent process-safe sealing of the film impossible.

Solution

The innovative and groundbreaking COSTPANO® process from Fricke and Mallah Microwave Technology GmbH from Peine / Germany reinvents the heat treatment of food with microwaves. The basic idea is that the protective film should remain closed so that the nutrients in the dish and the harmful germs are kept out. The worldwide patented COSTPANO® process eliminates the excess pressure in the tray and makes both the hole and the valve in the sealing film superfluous. In addition, COSTPANO® creates very homogeneous temperature fields in the trays with a time-linear increase, which enables energy-saving, gentle and aromatic cooking.

Benefits

With this heating method, the overpressure in the meal trays is physically avoided, which eliminates the danger of explosions and deformation of the meal bottoms. A hole or valve in the sealing film is no longer necessary. The steam can no longer escape through the sealed film, which results in considerable energy savings, prevents the formation of odors and preserves the flavors of the food. As the steam does not escape within the continuous flow systems, no condensation and contamination occur there.

The process has been certified by an internationally recognized research institute in the field of food technology.

Moreover, COSTPANO® is the only system suitable for pasteurizing new sustainable types of packaging made of cardboard or organic material, as the control of the heating power is so intelligent that the more delicate materials are not damaged.

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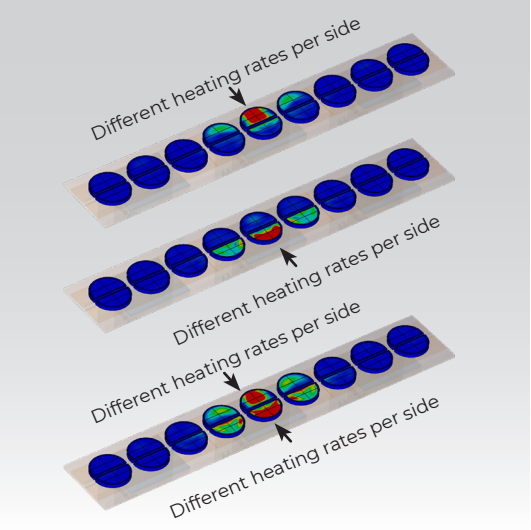
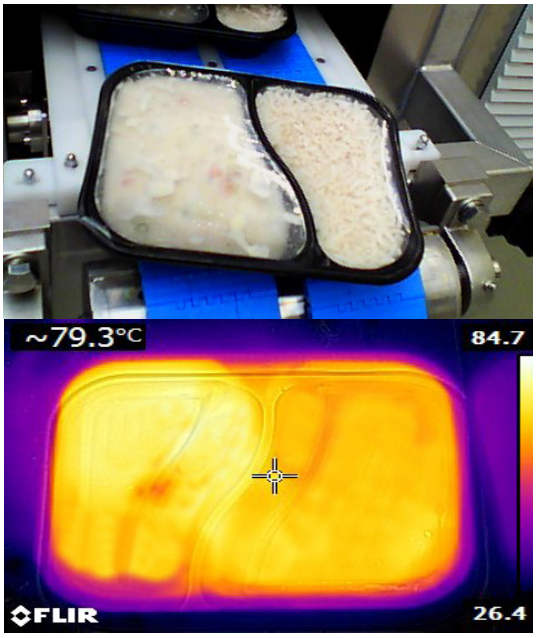


2D - Selectivity: Generators can be used selective

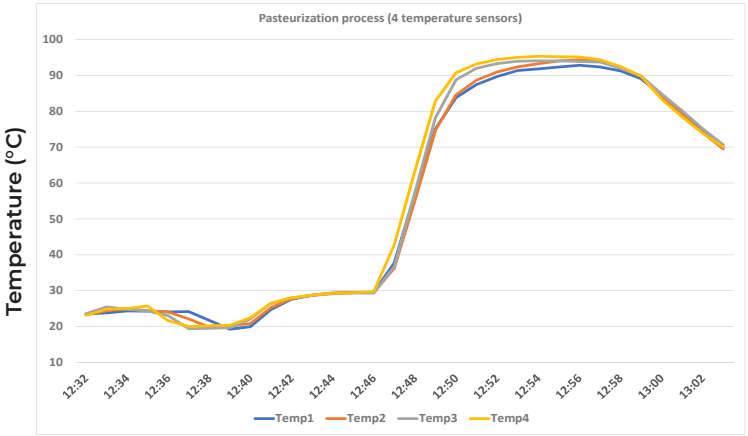
Result of power loss per object (in one tray) during one complete run through – during its way through the oven and end result after passing – very homogeneous result. In this model, 2-cavity trays were heated with different heating rates per side. Enabling the equalizing and holding of the work-temperature for the required heating process (pasteurisation).

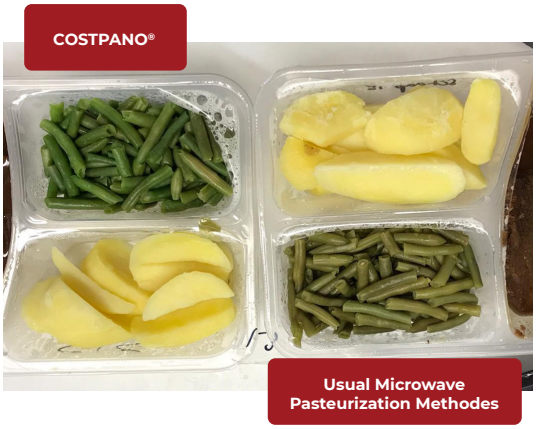
These in-depth simulations were used to design the standard **COSTPANO®** microwave tunnels.



Temperature time dependency for 2 chamber trays

Very homogeneous temperature profile of both tray chambers. In contrast, the free microwave irradiation of food generally has a chaotic temperature-time course with high temperature rates and many non-linearities.





Gentle treatment of food

The COSTPANO process pasteurizes the food particularly gently. This results in no loss of flavor and preserves the visual characteristics of the food.

The food retains its fresh color even after pasteurization and tastes like freshly cooked.