

## Rapid freezing of soft products – stabilization with cold opens up new potentials in handling

Food can be soft and unstable, but also hot, moist and breaded, which makes handling a complex matter. Stabilization of the products with cold offers a solution. In order to realize this process step within a production line at high output, a great deal of cooling energy must be introduced into the product within a short time. Air Liquide has developed various freezers and processes suitable for this application.

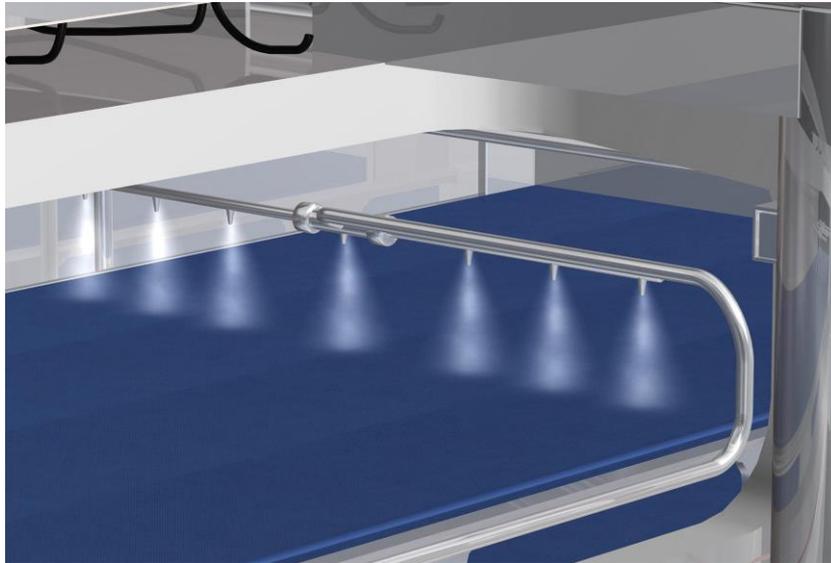


The Cryo Tunnel CFP allows fragile, soft or sticky products to be hardened through contact with liquid nitrogen. (Photo: © Air Liquide)

### Fast cooling of hot products

For many products, heating is required during production. Often, the next process step can only take place once the food has cooled down again. Long cooling times are often associated with considerable losses in quality. Sushi production offers a good example here. After cooking, the rice must be cooled down to the optimum processing temperature. Cooking is usually carried out in a batch process, after which the rice is cooled. This usually means a considerable amount of handling. In addition: Due to the long cooling process, the rice loses consistency and becomes mushy. In the cryogenic freezer, the rice can be cooled from about 90 degrees Celsius to below 20 degrees Celsius inline. The effort is therefore reduced and the rice quality has improved significantly.

Air Liquide has developed the Cryo Tunnel CFP for this application. The system can be used to harden fragile, soft or sticky products by contact with liquid nitrogen. The principle: A plastic band that soaks up liquid nitrogen like a sponge enables flash freezing from below. At the same time, the product surface is hardened with liquid nitrogen via a spray bar.



In the Cryo Tunnel CFP, the special polyester belt is impregnated with liquid nitrogen and the product is also sprayed with liquid nitrogen from above. (Photo: © Air Liquide)

### Packing pre-cooked and marinated minced steaks

Other applications for the CFP Cryo Tunnel are, for example, non-pre-baked pizza crusts, which the freezer stabilizes to such an extent that they can pass through the topping line without damage. In many cases, the freezer is also used upstream of conventional spiral freezers to prevent contamination of the system by marinade or breading and, if necessary, belt marks from the link belt on the underside of the product.

Sometimes it is only when the marinade hardens on the product surface that a robot with a vacuum gripper can be used to automate the process step - for example, when minced steaks are to be packaged, as was the case at one of Air Liquide's customers. The manufacturer's products are not frozen food, but rather minced steaks, which are distributed refrigerated.

The company had previously packed the steaks manually, because the warm and sticky surface did not allow automatic gripping of the products. It was also not possible to prevent the packaging machine from becoming soiled by dripping marinade. With the CFP Cryo Tunnel, the complete surface is hardened and the minced steak can be packed automatically. This more than doubled the line output while reducing the line staff.



Air Liquide has developed the ZIP Roll for cooling or freezing loose rolling products. (Photo: © Air Liquide)

### Automatic packing with multihead scale

Loose rolling products can also be packed automatically with a multihead scale - provided the products do not have a sticky surface. Here Air Liquide has special freezers like the ZIP Roll in its program.

The system is designed for cooling or freezing loose rolling products and can also be integrated into existing production lines due to its small size. Therefore, by hardening the product surface with cold, the range of applications of multihead scales can be significantly extended. The concept has already proven successful with chicken fillet strips, sliced sausage, tuna and mozzarella balls.

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