

Freezing steak, poultry and pizza Air Liquide offers efficient cryogenic processes

Digitization, Industry 4.0, E-Commerce – the food industry is in a constant state of flux and is continuously required to keep up with the current trends and demands of the food sector. In particular the meat industry is faced with strict regulations – products must have a long shelf life, conservation agents must be free from chemicals, and transport must comply with the quality standards. Foods must be accessible to consumers quickly and in a healthy, uncomplicated manner. The gas producer Air Liquide offers various cryogenic solutions, with the aid of which foods can be efficiently processed, frozen and chilled.

The advantages of cryogenic applications

The term “cryogenic” describes extremely low-temperature materials, processes and properties. The special feature of cryogenic applications and uses lies in the very low temperature, which enables freezing and chilling to be carried out quickly, flexibly and efficiently. The icy cold gas brings about very fast chilling of the foods, which in turn means distinctly fewer ice crystals than are caused by conventional freezing. As a result the cell walls of the products to be processed are harmed less and the products are in a better quality condition. The Air Liquide installations and the gas provided comply with the highest hygiene and safety standards. The quality of sensitive foods especially is retained by this process.

Crust Flow PTM – a challenge and the matching application

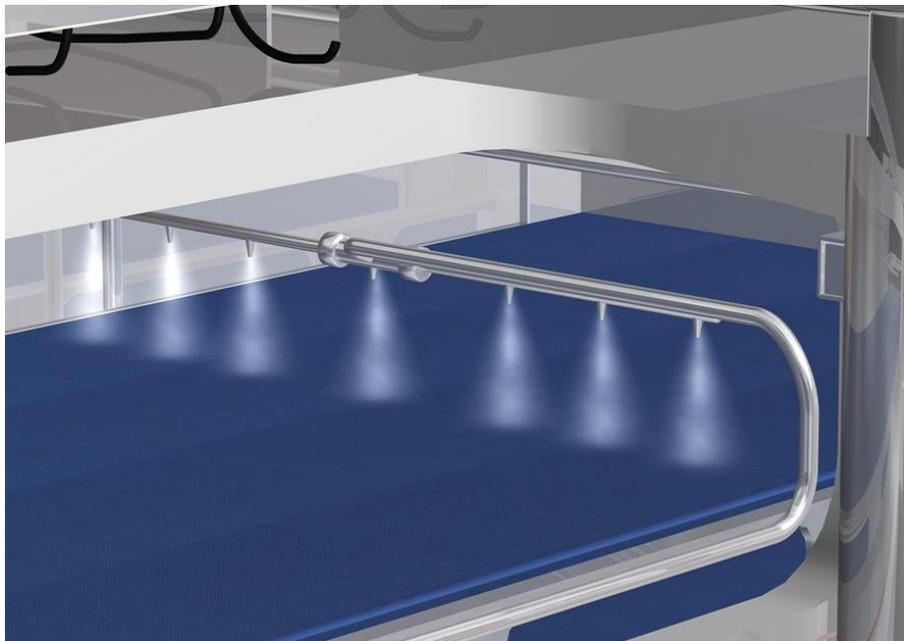
The patented Crust Flow PTM from Air Liquide is an example of a unique cryogenic application. This all-rounder is able to stabilize or lightly freeze the surfaces of for instance marinated steaks, poultry products, ice candies or pizza in a very short space of time. With this system the products are also packaged automatically, without any further step being necessary.



Crust Flow front view

The challenge to be mastered in developing the Crust Flow PTM consisted in freezing or stabilizing both fragile and pasty as well as air-permeable foods unharmed. A further difficulty lay in the often limited space conditions in the customers' production lines. The necessary thermal energy had to be withdrawn from the product along a short stretch of the production line without this having any negative effect on the product properties.

The Crust Flow PTM works with liquid nitrogen as cooling agent. The injection system is adapted individually to the product size and properties. The freezer can be operated optionally with an immersion bath, a wetted plastic tape, or with top spray and ventilation. Product contact with the liquid nitrogen enables fast thermal transfer in a very small space. The Air Liquide chiller/freezer stands out through its efficiency and safety as well as ease of operation, uncomplicated maintenance and minimal investment and installation costs.



Nozzles in the Crust Flow

ALIGAL – The range for cryogenic applications

The Air Liquide ALIGAL gases have been specially developed for use in the food and beverage industry. They satisfy the requirements of food legislation in accordance with HACCP and allow complete traceability. The ALIGAL product family is designed for use as a protective atmosphere, cooling agent for freezing and chilling, and as an ingredient in the beverage industry. The liquefied gases are subject to permanent analytics so that the quality and safety can be guaranteed at all times. The special ALIGAL cylinder can also be seen under this aspect. Its special coloring distinguishes it from the general range of technical cylinders. The application equipment is operated with two different gases - nitrogen (ALIGAL 1) or carbon dioxide (ALIGAL 2).

Individual turnkey solutions

A particularly fascinating aspect for the food industry is the offer of advisory services, which should definitely be used prior to integrating a cryogenic solution into an existing production line. The experts from Air Liquide analyze the production facility, product properties and production volume and create an individual system. In this way each customer receives an individual turnkey freezing and chilling solution. The service is supported by digital tools which collect data and regulate processes. The customers can access these data via a Cloud. The topic of security is an important aspect of installation. The experts from Air Liquide supply the flanking security facilities for each cryogenic solution, as well as monitoring of the ambient air quality.

Further information and contact

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