



thyssenkrupp

Insights\_Uhde



## High pressure for freshness

Leipzig. In the schoolyard everyone's getting excited about the end of term. Lina (11) takes a sip of delicious orange juice from her drinking bottle. One more double period, then six weeks of lie-ins, lazy days and freedom!

Kiel. As Sebastian (22) carefully cuts open the packet, a spicy aroma hits his senses. His granny has sent him another of her famous care packages from the Black Forest. And of course it wouldn't be complete without the smoked ham.

Düsseldorf. Frieda (34) diverts her calls to her assistant and dis-appears into the kitchenette. A few minutes later she's sitting on the law firm's rooftop terrace enjoying a freshly prepared avocado sandwich.

To ensure Lina's juice stays fresh, Sebastian's ham is as deliciously aromatic when he opens it as when his granny sent it, and the avocado on Frieda's sandwich looks and tastes appetizing and fresh, the ingredients have to be carefully preserved. With High Pressure Processing technology ([HPP](#)) from thyssenkrupp Industrial Solutions, the shelf life of food products can be significantly extended – without heat treatment and without chemical additives.

Food products such as milk are normally preserved by pasteurization. In this process food is heated for a few seconds or minutes to temperatures of 60 to 100 degrees Celsius to eliminate harmful bacteria and fungi and extend shelf life. However, momentary heating has the disadvantage that it can cause a loss of aroma and natural food pigments. The appearance and flavor of the food suffer, and vitamins can also be destroyed. Other methods of preservation involve heating food to even higher temperatures above 100 degrees Celsius. Or preservatives are used to extend shelf life but these can compromise the flavor of the food and destroy valuable nutrients.

[High Pressure Processing from thyssenkrupp Industrial Solutions](#) functions without heat and without additives. This special treatment significantly extends the shelf life of food products – with no loss of nutrients or aromas. The key to the process is a pressure chamber, into which pre-packaged food is placed, whether dairy products, meat, fish, vegetables, fruit or juices. The chamber is then filled with water and high-pressure treatment can begin: For just a few minutes the pressure in the chamber is increased to around 6,000 bar. Thanks to the water the pressure is applied evenly through to the core of the food. While the cell membranes of bacteria and pathogenic germs are destroyed, the food's covalent bonds remain unaffected. This preserves aromas and vitamins and inhibits decay. For example, if we cut open an avocado and don't eat it straight away, we notice very quickly that the green flesh turns brown and the flavor changes. With HighPressureProcessing, that's no longer a problem. The high pressure inactivates the enzyme polyphenol oxidase. It's this enzyme that makes avocados turn brown. HPP-treated avocados never lose their verdant color and stay fresh up to eight times longer.

### **No heat, no additives**

With fish and meat products, it's particularly important to observe the use-by date. The consumption of rotten meat can be seriously harmful to health. Large quantities of foods contaminated with salmonella and listeria are recalled every year. A major advantage of thyssenkrupp Industrial Solutions' HPP technology is that food is processed in its final packaging. The harmful pathogens are denatured completely without contact, which prevents contamination.

The high pressure of 6,000 bar presents special challenges for the food packaging. It's roughly equivalent to the weight of three jumbo jets acting on an area the size of a smartphone. Food and packaging are compressed by around 15 percent. PET and PE packaging is therefore particularly suitable for this process. A further advantage of the HPP process from thyssenkrupp Industrial Solutions

is the avoidance of undesirable by-products. No chemicals are used and no effluent is produced. The drinking water used in the pressure chamber can be recirculated – so the process is good for food products and good for the environment.



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**The bottom line:** Lina's fruit juice, Sebastian's ham and Frieda's avocado sandwich... their fresh aroma, healthy nutrients and delicious flavor are what we love about these food products. The expertise of engineers from thyssenkrupp Industrial Solutions ensures that our favorite food and beverages stay fresh and natural as long as possible – while providing maximum protection for our food and our environment.

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