

Industrial Solutions
Process Technologies

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Industrial Solutions

Fresh by
high pressure

Fruits and juices



thyssenkrupp



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High pressure processing (HPP) – Food preservation 2.0

The process - quick, safe and naturally sustainable

Advantages of high-pressure processing (HPP)

The high-pressure processing of fruits and juices denaturises pathogenetic germs and fungi. Nevertheless, that non-thermal process preserves vitamins, flavouring and colour pigments. As food is processed in the final packaging, that process meets maximum hygienic requirements, because a later contamination is excluded. Additives are not used; thus, the product maintains its pure and biological state.

Application areas

A higher water activity is necessary for the HPP process; therefore smoothies, fruit and juices are especially appropriate. As the product is not heated up, taste and appearance remain unaltered. The consumer receives a gently and - most of all - safely and durably made product. New drink variants like DETOX or ANTI-OXIDANTS can be processed gently as well.

Packing materials

The product is compressed by approx. 15 % at a pressure of 6,000 bars; the same also applies to the packing material. Therefore, flexible vacuum or MAP packing materials on the basis of PE, PET or EVON are appropriate for that process. The portion of air within the packing material (upper space) is fully compressed during the processing and has no influence on product or packing material.

Results

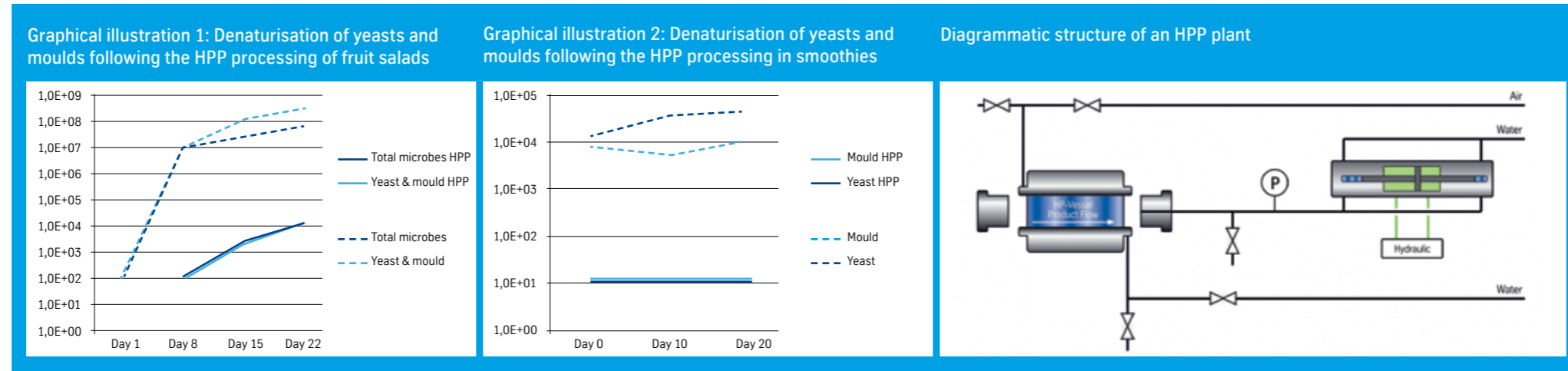
The graphical illustrations 1 and 2 show what the effect of HPP on yeast and moulds is. Compared to an unprocessed sample the number of bacteria is reduced directly by the processing - the product remains stable for 20 days. Compared to that the unprocessed sample is contaminated; after a short time it exceeds the approved benchmarks issued by the German Society for Hygiene and Microbiology.

Already today many processors worldwide apply HPP to gently and safely process their products being worth several billions of Euros.



The process

HPP offers the chance to process products in their final packing material. They are put in a basket for processing - either by a machine or manually. Attention has to be paid that the capacity of the basket is exploited optimally; if required, the packing design has to be adapted to the basket. Baskets are transported automatically into the HP vessel. Following that, it enters the plant and is filled with water to make the remaining air escape. Following that, pressure in the vessel is increased up to 6,000 bars. That value approximately conforms to the weight force exerted by three Jumbo Jets on the surface of a smartphone. After a dwell time of approx. three minutes, which is set product-specifically, the plant relieves the pressure exerted. The water in the vessel is drained and the vessel returns to its initial position. The subsequent cycle may begin.



Necessary supply

The HPP process demands water in potable water quality. That water can be reused after each cycle. Therefore, wastewater or waste products do not occur. The amount of electricity needed varies in dependence on the plant capacity.



Outside left: Fruit salad unprocessed and processed (6,000 bars / 3 min.)

Middle: Pineapple and orange juice before and following the processing

Outside right: Cold pressed fruit juices