

# **HPP** *High Pressure Processing*



**Innovation  
Through  
Pressure**



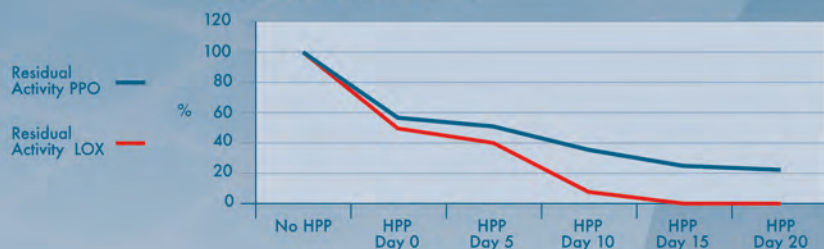
## HIGH VALUE ADDED TECHNOLOGY

**High Pressure Processing (HPP)** is an innovative although industrially mature technology that is consolidating its position as the most natural alternative to the processing of a wide range of food products.

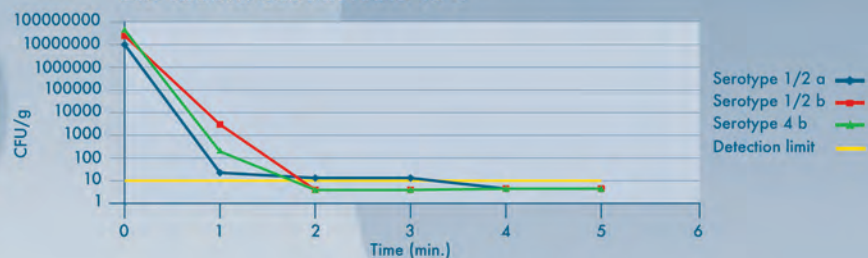
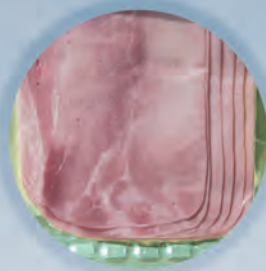
Quite opposite to traditional thermal methods for food hygienisation and preservation, high pressure processing technology respects those original characteristics of the product, guaranteeing the quality and safety and at the same time prolonging its shelf life.

This is a technological solution that is therefore, totally in line with the requirements of a food market that requires natural, fresh, safe and convenient products.

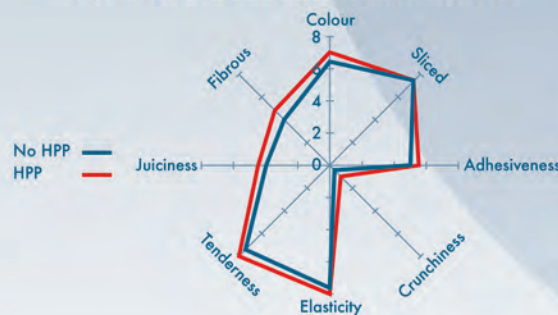
### INACTIVATION OF POLYPHENOLOXIDASE AND LIPOXIGENASE ACTIVITIES IN GUACAMOLE



### REDUCTION OF LISTERIA MONOCYTOGENES IN DRY HAM AT 600 MPA AND +5°C



### SENSORIAL ANALYSIS OF SLICED COOKED HAM PROCESSED AT 500 MPA - 8 MIN. AT +8°C

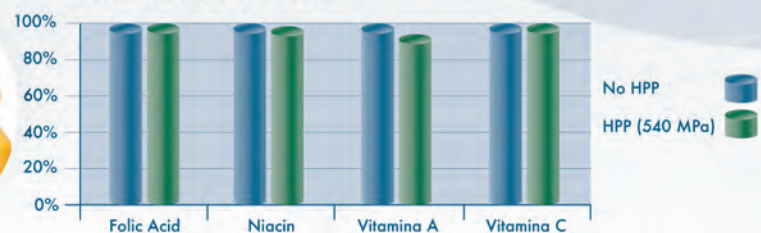


### ADVANTAGES OF HIGH PRESSURE PROCESSING (HPP)

- New product development and differentiation.
- Maintenance of the original quality of food and the original sensorial and nutritional properties.
- Shelf life increase.
- Improvement of food safety, reducing drastically the spoilage and pathogenic flora.
- Allows the reduction or elimination of the use of additives and preservatives.
- Post-packaging Process: eliminates the risk of recontamination.
- Improvement of processes and productive yields.



### EFFECTS OF HIGH PRESSURE PROCESSING ON VITAMINS IN FRESH ORANGE JUICE





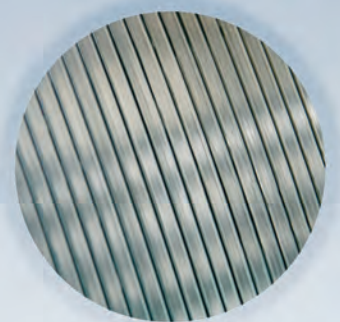
## NC HYPERBARIC'S SOLUTION

World-wide reference provider of High Pressure Processing technology

All NC Hyperbaric equipment is conceived, designed and manufactured for its use in the food industry. The Wave range includes suitable equipment, for both small productions (market tests, pilot plants, niche markets...) and the highest volume production environments. Furthermore, NC Hyperbaric equipment guarantees the necessary versatility to process a great variety of products.

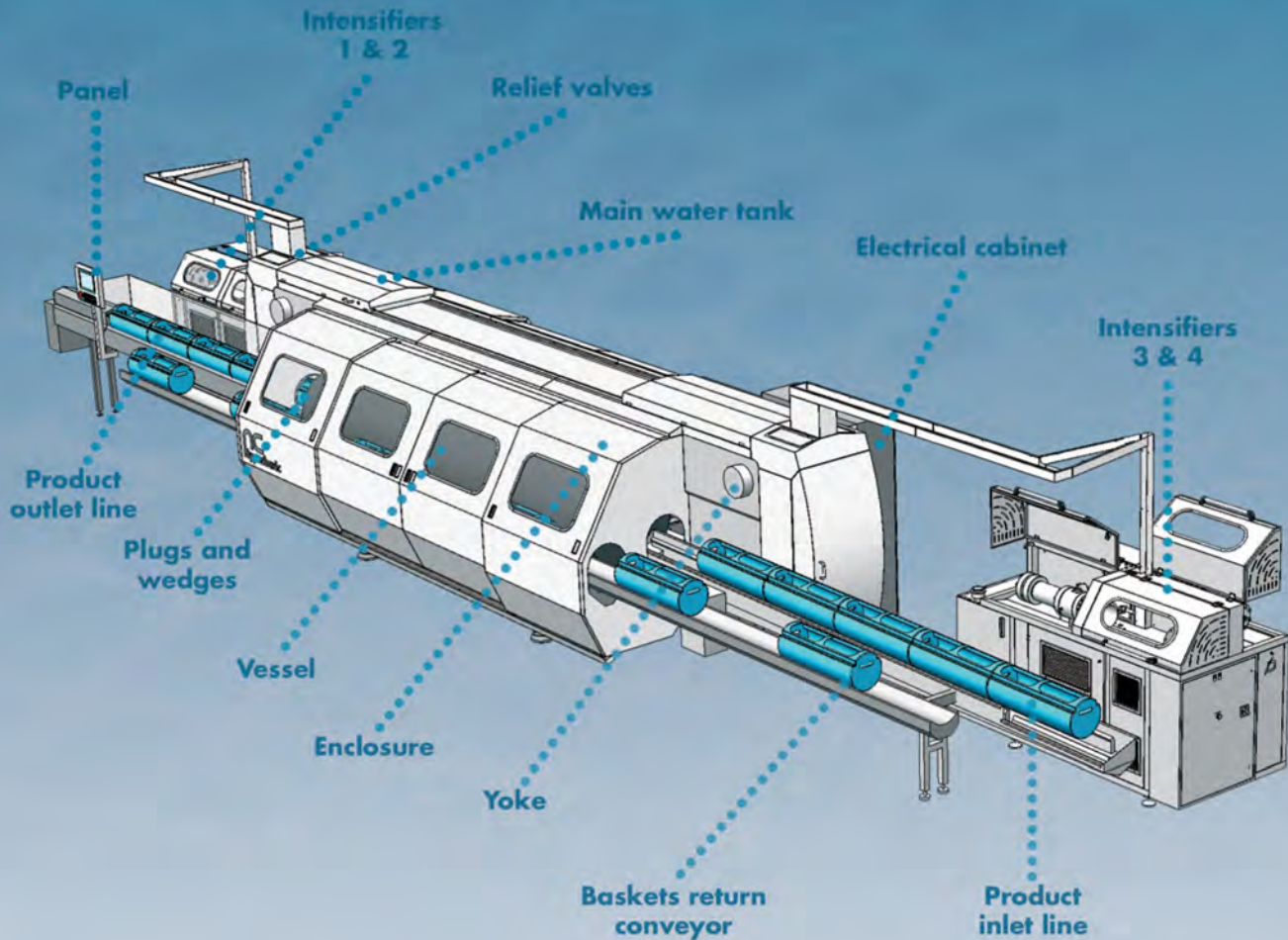
The industrial applications of this technology require huge working pressures (between 300 MPa and 600 MPa or 3,000 bar and 6,000 bar or 43,000 psi and 87,000 psi) so another key parameter in the design of the Wave range is its reliability. The "multilayer" technology of the chamber or processing vessel along with the "leak before burst" design guarantees the safety of operation.

The equipment of NC Hyperbaric is easily integrated in the industrial food chain. Installation does not require civil works and in addition, multiple units can share the units that generate pressure.



# Natural Safety

## BASIC COMPONENTS OF THE NC HYPERBARIC EQUIPMENT



## ADVANTAGES OF NC HYPERBARIC TECHNOLOGY

- The horizontal design simplifies installation and maximizes the traceability of the product.
- Optimal, easy integration in the production line.  
Total automation of the process.
- High reliability and safety of use and operation.
  - Special design for the food industry.
- Broad range of volumes and capacities.
- Clean and environmentally friendly.

NC  
Hyperbaric

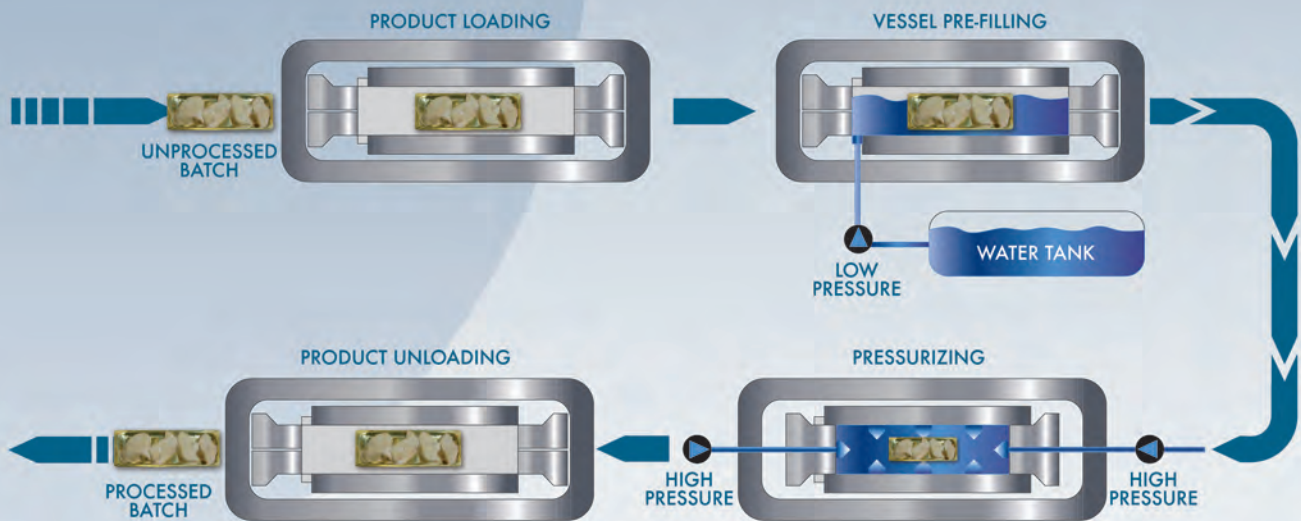
# HPP High Pressure Processing

## WHAT IS HIGH PRESSURE PROCESSING?

**High Pressure Processing (HPP)** consists in submitting food products during some minutes to high levels of hydrostatic pressure (isostatic pressure transmitted by water). The pressurization of foods at cold or room temperature inactivates the vegetative micro-organisms (bacteria, virus, yeasts, moulds), both pathogenic and spoilage, present in food products.

High pressure acts mainly modifying the cellular membrane of the micro-organisms and also inactivating certain vital enzymes. The totally uniform distribution of the pressure makes possible a homogenous treatment of the whole product, regardless its shape and size. The result is the desired level of hygienisation, without deteriorating the organoleptic quality.

The range of food products suitable for **High Pressure Processing** is very wide: in general, any product containing a good percentage of water can be satisfactorily processed by **HPP**, including a great variety of meat products, fish and seafood, dairy, juices, and most of fruit and vegetable-based products as well.



**Diagram of Operation of a HPP Unit**

The product to be processed is placed in an appropriate container considering the size of the vessel or processing chamber. An automatic loading system gets the containers inside the vessel. Then the vessel is moved horizontally until placed inside the yoke – the structure that supports all the equipment-. In such position, the ends of the vessel (plugs) are closed and it is filled with water at low pressure. Once it is completely filled, the plugs are totally closed and from this moment on the high pressure intensifiers start working, pumping more water inside the chamber until the desired pressure is reached (up to 600 MPa / 87,000 psi). Such pressure is maintained during the time set (between several seconds and 5 min), pressure is discharged in 2 or 3 seconds, plugs are open and the vessel moves again to the loading/unloading position where, at once, the processed batch is pushed onto the unloading line while the next batch is automatically loaded, ready to be processed in a new cycle.

[www.nchyperbaric.com](http://www.nchyperbaric.com)



### WHO WE ARE?

**NC Hyperbaric** was founded in Burgos (Spain) in 1999, being heir to a 50 year old tradition of manufacturing precision industrial machinery (spin-off of the Nicolas Correa Group). From its very beginning it has been engaged in the design, technological development, production and commercialisation of high pressure processing equipment for food industry.

Since 2004, **NC Hyperbaric** is the world leading manufacturer of industrial high pressure processing equipment, with operative machinery installed in Europe, America, Asia and Oceania for the processing of meat products, fish and seafood, dairy, vegetable products and ready to eat meals.

**NC Hyperbaric** is a high tech company, engaged in a continuous R&D effort in order to propose the most advanced technological solutions.

The company is proud to have clients from the world largest food industrial groups as well as some medium and small innovative enterprises.

The mission of **NC Hyperbaric** is to reliably satisfy the needs of the customers for the production of healthy, innovative foods processed by high pressure, fostering the development of the human team.

**N.C. Hyperbaric, S.A.**  
C/ Condado de Treviño, 53  
Polígono de Villalonquéjar - 09001 BURGOS • SPAIN  
Phone: +34 947 473 874 • Fax: +34 947 298 111  
[info@nchyperbaric.es](mailto:info@nchyperbaric.es) • [www.nchyperbaric.com](http://www.nchyperbaric.com)

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