

HPP tolling: a healthy and strategic solution for all kind of products

Food safety is a big headache for a lot of companies around the world because traditional measures that have been introduced to commercialise safer products normally involve large costs and a loss of freshness and other added value properties.

by **Alejandro Blanco**,
Sales Manager, Hiperbaric.
www.hiperbaric.com

HPP technology and tolling are a solution because both provide sustainable and healthier products.

A choice of hundreds of companies worldwide

High-pressure processing (HPP) applies high-isostatic pressure with water at chilled or room temperature (4-25°C/40-75°F) to packaged products in seconds or minutes.

It is an instantaneous and uniform process that does not affect food covalent bonds but modifies the three-dimensional structure of proteins and polysaccharides.

This breaks the micro-organism's membrane, inactivating pathogens, while preserving nutritional and organoleptic properties of the fresh product.

In essence, HPP is synonymous of:

- **Minimally-processed products:** It keeps the original nutritional and organoleptic characteristics.

- **Longer shelf-life:** From a few days up to weeks, or even months, under refrigeration conditions, reducing the use of preservatives such as salt.

- **Guarantee of food safety:** It inactivates spoilage micro-organisms and foodborne pathogens (i.e. listeria, salmonella, vibrio or norovirus).

- **Innovation:** It can be used for product development with novel or unique attributes due to its effect on food constituents.

- **Wide variety of products:** It can be applied in traditional sectors such as juices and beverages,

avocado products (guacamole), meat (sliced deli meats, dry-cured products) or seafood to more trendy categories like ready-to-eat meals, plant-based dips (hummus), baby food or wet pet food.

- **Environmentally friendly technology:**

It uses lower energy than thermal treatments; the pressurisation fluid (water) is recycled and it is a waste-free process.

These are the reasons why hundreds of enterprises around the world have trusted in this technology to revolutionise their process no matter their size, sector or product. Furthermore, restrictions concerning the size and shape of packaging in HPP products are minimal. While it is important to maximise the filling ratio, the basic requirements are the water resistance and flexibility of the packaging, plastic materials being the best option.

How does HPP work?

HPP is a post-packing technology, which means it is the final step in the product processing and only labelling and boxing steps are conducted after HPP.

Packaging must be made of water-resistant materials, as they will be in direct contact with water during the process, and flexible materials to withstand pressure.

As pressure is transmitted instantly and uniformly to every point of the vessel, there is no crushing of the product, however, small deformations can occur which makes flexibility a must.

The packed product needs to be placed inside special carriers – or baskets – and loaded into a special chamber where the product is submitted to pressure.

This vessel is then filled to the top with tap water at ambient pressure and then sealed by heavy steel plugs and wedges.

High-pressure water is then pumped inside the vessel through a special circuit connected to the vessel at one end to a special high-pressure pump at the other.

As more water is pumped inside



HPP toller with a Hiperbaric 525 litre unit.

the vessel over the nominal volume, the pressure is increased until the desired level is reached, normally within the range of 5,000-6,000 bar/ 72,500-87,000 psi.

Then, a reverse count will start to ensure that the product is submitted to the pressure for a time deemed to achieve the desired results in terms of bacterial reduction and shelf-life extension, based on previous laboratory tests.

Once the time expires, the machine will release pressure through a safety valve and proceed to open the vessel, which then moves to the unloading position.

When the new cycle is loaded, the previous one is unloaded and the baskets with the processed goods are ready to be discharged.

The whole cycle is automatic and basket loading and unloading can be automated in the larger Hiperbaric systems.

HPP is also an environmentally-friendly technology as the water from one batch is recycled and reused for the next one.

A healthy and strategic solution

HPP technology has become an essential tool for companies worldwide that have invested in it or have booked a specific tolling service.

A tolling service allows the development and commercialisation

of HPP products to SMEs, entrepreneurs, start-ups, HORECA enterprises and new exporters that cannot or do not want to invest in an HPP unit now.

Thank to these services these companies can enjoy the benefits of technology and tolling.

- **No capital investment:** Instead of investing capital initially, companies can adopt the technology by paying a service fee, usually on a per-pound basis. This allows flexibility for seasonal products, and the introduction of new products and new markets.

- **More competitive retail prices:** Using facilities and processes of a toller, companies can reduce their associated production costs.

- **More economic security in a recently created business:** To reduce capital tie-up offers a lower financial risk.

- **New 'export' alternatives:** Booking HPP tolling services in the destination country limits tax and customs costs, among others.

- **Greater safety in innovation processes:**

The development of products in collaboration with a toller offers the opportunity to modify recipes and probe the consumer with affordable costs, guaranteeing food safety and a higher success rate with the launch of the final product.

Furthermore, HPP tolling customers of Hiperbaric have other interesting advantages:

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- **Hiperbaric Global HPP Network:** As an HPP-toller, you can join the Hiperbaric Global HPP Network. This network grants both tollers and their customers access to Hiperbaric's application team of food scientists, who can assist with food safety assessments and new product development objectives.
- **24/7 support and quick start-up:** Hiperbaric offers an after sales service and support 24 hours a day, seven days a week, helping tollers and their customers run efficiently, without any interruption of operations. Their highly specialised field technicians around the world are devoted to providing reliable support anywhere, anytime.

Advantages of HPP units

Since its inception in 1999, Hiperbaric has designed, developed, produced and marketed its high-pressure processing units internationally.

The company's intensive R&D, combined with an outstanding team of professionals, has promoted it to a leading position (more than 60% market share), with 300 machines installed worldwide.

Thanks to these continuous R&D efforts by Hiperbaric, its HPP units add interesting advantages that

reduce time-outs and speed up processes, making them more reliable:

- **Versatile design:** Intensifiers (high-pressure pumps) can be installed alongside the machine or in a service corridor and also in a platform on top of the vessel. This last design reduces the footprint and facilitates its implementation in a food industrial environment.
- **Wide range of industrial machines:** From 55-525 litres, Hiperbaric's HPP machines meet the requirements of start-ups, small-medium enterprises and large corporations.
- **Labour saving and greater flexibility:** HPP units are integrated with their loading and unloading lines and systems. Hiperbaric provides further turnkey automation solutions adapted to customer needs.



- **After sales service and support worldwide 24/7:**

Highly specialised field technicians, diagnostic services and remote monitoring, after-sales portal. All are customer-oriented to satisfy requirements.

HPP tolling

Aware of the interest that this technology arouses, especially during this challenging time of Covid-19, Hiperbaric recently held a webinar aimed at making HPP tolling known both to companies interested in providing high-pressure processing services, as well as to users who are seeking the opportunity to commercialise a wide variety of HPP products, as a preliminary step to investing in the technology.

We know this technology can be difficult to understand and to answer all technical

questions, Hiperbaric has an excellent engineering and applications team and two pilot plants (Burgos and Miami) where our PhDs do validations and new product developments.

However, a lot of people want to know about the cost of HPP technology and sometimes have doubts about the investment so we approach the HPP technology and tolling service in a free webinar to answer these questions about how HPP acts in their products, what it can provide them and what is the best way to do it.

With a hybrid presentation and round table format, the attendees not only learn about high-pressure processing (benefits for the consumer, equipment, challenges and opportunities, trends) or tolling services (advantages for companies, global HPP tolling network, case studies), but they can also ask their questions live to several HPP tollers from different regions around the world, as well as to Hiperbaric specialists. ■

For those interested in technology and HPP tolling, the recording of the successful Hiperbaric webinar is available via: www.hiperbaric.com