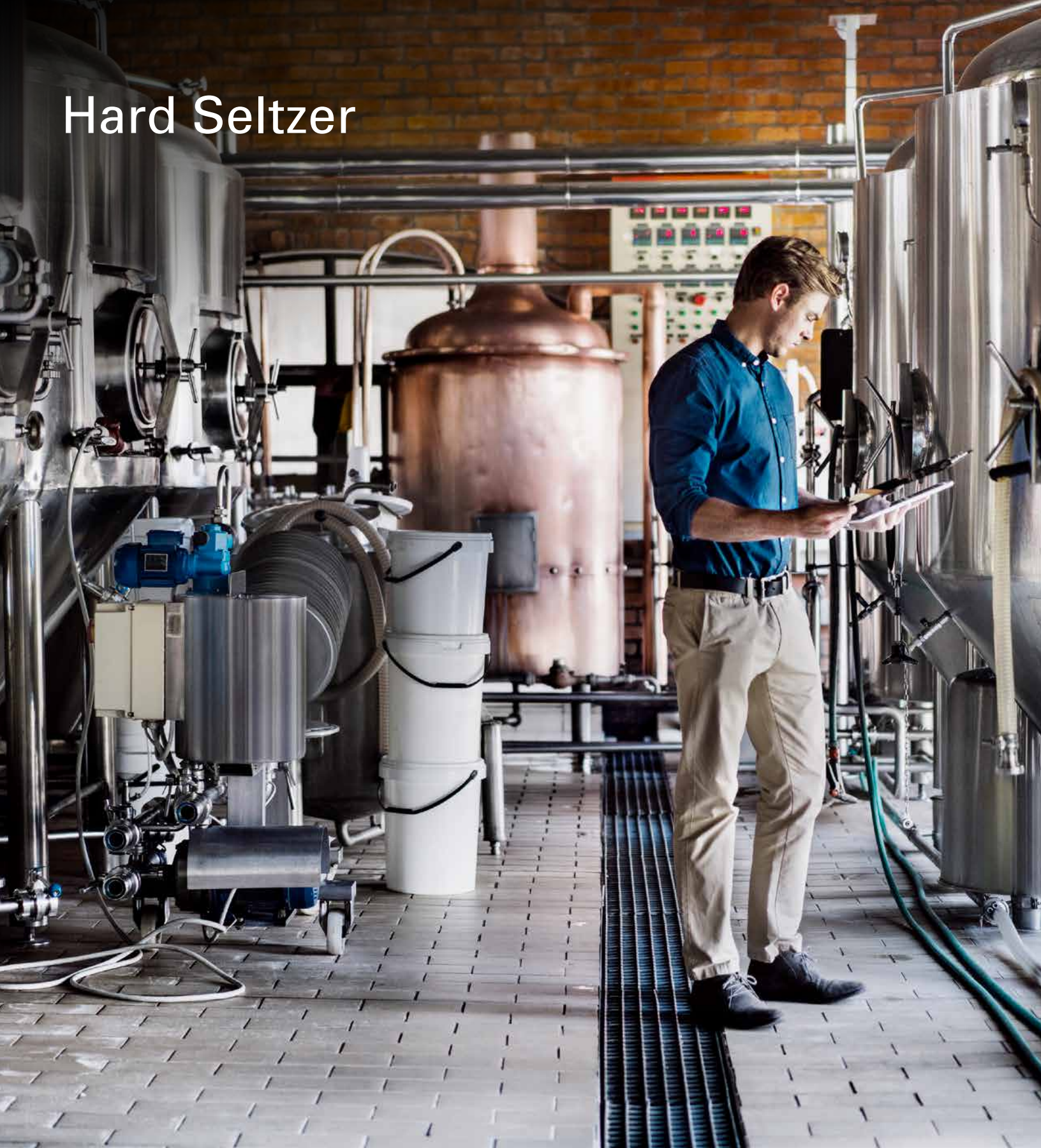


Hard Seltzer



Donaldson®
FILTRATION SOLUTIONS

PROCESS FILTRATION



Six Key Filtration Steps to Produce a Clear, Flavorful Hard Seltzer Product

The hard seltzer market has seen significant growth over the last few years. Spurred by an increase in consumer demand for beverages with fewer calories and varied alcohol content levels, brewers around the globe continue to expand their product offerings to include the popular beverage. Smaller craft and microbreweries are joining the revolution in record numbers as well.

The early days of the pandemic saw retail sales of seltzers skyrocket as dining out plummeted. While sales have slowed at the retail level, the return of restaurant service has provided seltzers with another boost as more bar managers supplement their drink menus with a new consumer favorite.

According to Grand View Research, the global hard seltzer market was valued at \$5.6 billion (USD) in 2020 and is expected to increase at a compound annual growth rate (CAGR) of 31.4% from 2021 to 2028. As industry analysts indicate – the seltzer category is here to stay.



31.4%

The compound annual growth rate of the hard seltzer market from 2021 to 2028. The market value is estimated to reach \$49.4 billion (USD) in 2028.



Expanding into the Hard Seltzer Market

For craft brewers looking to expand their product portfolio, the addition of a hard seltzer line can be a relatively seamless, cost-effective opportunity. Most of the equipment used in the beer brewing process can be utilized to produce seltzer, with only a few minor modifications and additions for the set-up and implementation.

While the base ingredients for seltzer are similar to those used in beer, the addition of natural or artificial flavors after the fermentation process often requires another step to de-color the liquid and reduce any unwanted fermentation-derived byproducts. The final product – a clear, flavorful, carbonated beverage – is achievable with just a few adjustments.

Process Filtration's Role

Filtration plays an integral role throughout the entire process of producing and packaging hard seltzer. From the base water mixture to purification for food and beverage product packaging applications, Donaldson has been a valued filtration supplier to the brewing industry for nearly four decades. Donaldson's advanced micro-filtration solutions can be customized to fit the largest million-barrel producer's operation or modified to fit the small, independent brewer down the street.



Proof of Concept

In an effort to engineer an effective, multi-step hard seltzer filtration solution, Donaldson partnered with a craft brewer in the Boston area to refine their approach and process steps. Through a consultative engagement, Donaldson optimized the brewer's existing beer clarification technology to pilot a small-scale seltzer production.

Donaldson's filter set-ups for multiple components helped fill in some of the gaps at the brewer's facility. The pilot program was a success and allowed the brewer to scale to full-size production without changing the quality of the end product.

Additionally, Donaldson has been conducting a trial program with a large hard seltzer leader to identify missing links and potential areas for improvement in their approach to filtration. Together, the two companies have monitored and made improvements to the filtration process that Donaldson is now taking to the wider craft brewery market.

Filtration Flow Chart

Below are six hard seltzer process filtration steps – indicated in blue – that Donaldson can help brewers with today:

1 Water Filtration: Sugar and Water Mixture

Water filtration occurs before it is mixed with sugars. Removing suspended solids prior to other water purification technologies, such as reverse osmosis, will optimize water treatment technologies and help set the stage for the entire batch.

For the water filtration step, Donaldson offers a broad range of high-quality housings and filter elements. Donaldson's premium LifeTec™ filter elements are high-performing and efficient. Their innovative design and structure help maximize the filtration process while maintaining the integrity of the product being processed.

2 Yeast and Nutrients

3 Sterile Gas Filtration: Fermentation

Sterile gas filtration is necessary to start fermentation and prevent competing microorganisms from growing in the tank. Donaldson's **LifeTec P-SRF V sterile filter** elements use compressed air and technical gas to create a barrier and reduce unwanted microbes from entering the fermenter.



4 Primary Filtration: Yeast Removal

Once fermentation is complete, it's time to remove the yeast-based byproducts from the base of the seltzer mixture before flavoring can be added. If neutralization is needed, carbon filtration can help reduce the flavor of the seltzer base prior to dilution and flavoring. For seltzers that are pre-sweetened with fermentable sugars, pasteurization or the addition of stabilizers are required for product stability.

As with earlier steps, Donaldson offers a solution to remove leftover yeast flocculates from the primary filtration round. Donaldson's L-BH single- or multi-bag liquid housings fitted with **L-BE filter bag** elements are engineered to remove large solids from fermentation tanks. They provide maximum durability and reliability for pre, coarse, and bulk liquid filtration.



5 Strong Base 7.8 ABV, Dilution Filtered Water

6 Secondary Filtration: Including Activated Carbon Media to Reduce Fermentation Derived Flavors

7 Trap Filtration

Carbon adsorption is necessary for producing a neutral-tasting seltzer base. When loose granulated carbon is activated for this step, a trap filter is mandatory to guard against any carbon granules that may migrate downstream.

If you are using a diatomaceous earth (DE) filter, a trap filter is typically needed to remove particles released during the bulk filtration step. This prepares the seltzer for the final clarification and stabilization steps before packaging occurs.

Donaldson trap filters aid in product quality, allowing the seltzer to maintain its unique flavor characteristics without allowing any migrating filter aids to enter the product. In either application, Donaldson's **LifeTec PP100 N 5 micron** element, along with its sanitary **PF-EG filter housing**, are a good combination for this step.



**8 Primary Filtration:
Cross-Flow
or Lenticular**

**10 Beverage Contact
Package Stability**

**9 Flavor and
Carbonization
(CO₂ Gas Filtration)**

**11 Beverage
Contact
Packaging**

If a craft brewer needs assistance with pasteurization, Donaldson can provide an alternative to heat treatment that makes a hard seltzer product stable.

Using Donaldson's **LifeTec PES-BN filter** element for final filtration helps stabilize the seltzer and reduces the chance of spoilage while improving the clarity level that consumers expect from the popular beverage.



It is standard practice to clean the inside of food and beverage product packaging, including cans before they are filled with a finished seltzer product. Below are a few ways this practice takes place:

Compressed Dry Air (CDA)

The most frequently used process for cleaning the inside of empty food containers or cans, often called "can ionization," is with compressed air. Donaldson offers a complete compressed air solution, that at a dew point of -40 degrees, creates dry, filtered air. Commonly referred to as a "dry wash." This can be scaled to meet a craft brewer's production goals.

Sterile Water

If a craft brewer prefers a "wet wash" for product packaging, they use heated, filtered water. Donaldson's **LifeTec filtration solutions** are tailor-made for the hard seltzer process. Their durable design maintains consistent porosity and impurity retention throughout their service life without shedding or losing contaminants.

Sterile Gas (CO₂)

Another approach to the carbonation of hard seltzer and nitrogen blanketing of beverage product packaging is the use of sterile gas. Donaldson's **PE-G gas filtration solution** is a great option for this approach.



Innovating to Support Hard Seltzer Filtration

Through product development and customer trial programs, Donaldson is serving the growing craft brewing and hard seltzer industries. Donaldson's proven process filtration products offer craft brewers affordable and efficient avenues for expanding their product portfolios and discovering new revenue streams in a refreshing and burgeoning category.

To learn more, visit donaldsonprocessfilters.com

Important Notice

Many factors beyond the control of Donaldson can affect the use and performance of Donaldson products in a particular application, including the conditions under which the product is used. Since these factors are uniquely within the user's knowledge and control, it is essential the user evaluate the products to determine whether the product is fit for the particular purpose and suitable for the user's application. All products, specifications, availability and data are subject to change without notice, and may vary by region or country.



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