Food and Beverage

Application Bulletin

# Alcoholic Beverage Producers Make Hand Sanitizer During Pandemic with SUPRAdisc™ AKS Technology

## Overview

Due to the current health issues impacting many across the globe, distilleries, breweries and wineries are turning to hand sanitizer production, supplying local communities and vital services in need.

As of June 2020, the American Craft Spirits Association reports that three-quarters of distillers are either planning to produce or producing hand sanitizer. Sales spiked recently with customers stockpiling sanitization products; however, production demand will endure in the coming months as human behavior is gradually changing to “the new normal”.

Companies are following the Food and Drug Association (FDA) and World Health Organization (WHO) guidelines to make hand sanitizer. These recommendations list specific ingredients such as high-proof alcohol (96% alcohol by volume), distilled water, hydrogen peroxide, moisturizers (glycerine and aloe) and denaturants (denatonium benzoate, sucrose octacetate or tert-butyl/isopropyl alcohol).

Traditionally, ethanol suppliers, distillers, brewers and wineries don’t have experience producing the high-proof alcohol needed for hand sanitizer, so the beverage industry is quickly and collectively sharing knowledge to ensure that production is safe, accurate and effective. However, some of the ethanol utilized for the hand sanitizer application is found to have lingering unpleasant smell to the finished product.

The denaturation process is needed to render a product unfit for human consumption, thus free of high excise taxes. This process occurs at the alcohol or finished sanitizer producer. The added chemicals can also provide unpleasant odors, that consequentially need to be removed to deliver a suitable product for the consumer.

## The Challenge

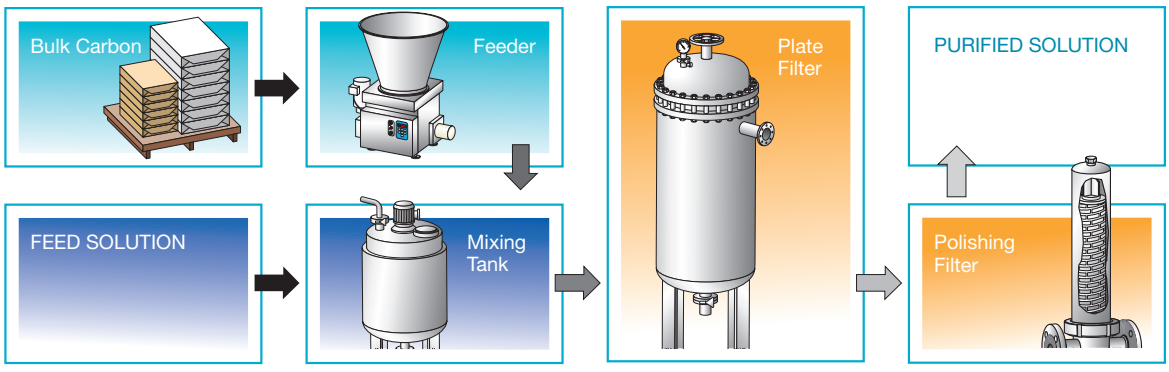
Powdered Activated Carbon (PAC) is the traditional method used in the food and beverage industry for:

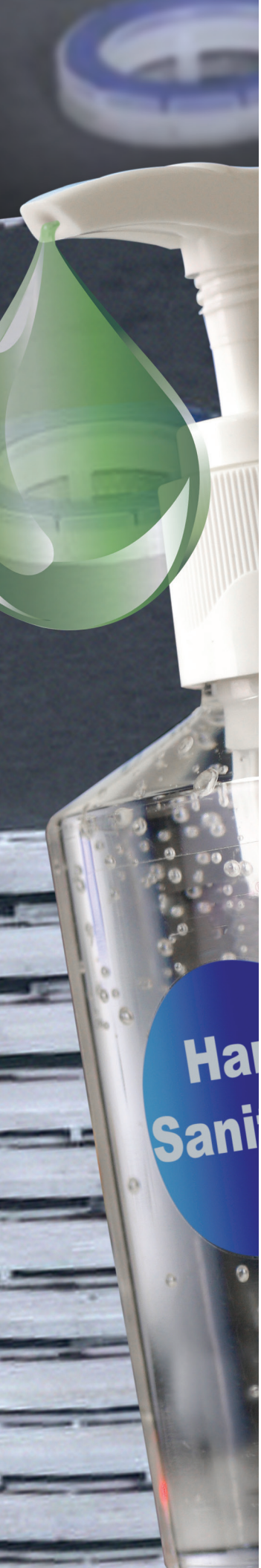
- adsorption applications,
- achieving odor removal
- and decolorization or removal of trace impurities.

While functional, the use of bulk PAC has significant drawbacks relating to the handling of powder, labor intensity and safety, cleaning of process equipment and long contact time needed for proper adsorption and time (costs) associated with carbon removal from the process.

The installation can provide alcohol exposure to the environment, requiring an appropriate system of ventilation and ATEX certification to minimize the release of volatile organic compounds and prevent explosions.

Figure 1: A typical process involving the addition of bulk activated carbon (cleaning steps not shown)





In the past months, manufacturers have demanded innovative production techniques and modern equipment that

- recognizes reduced labor availability due to new operating environments that adhere to social distancing guidelines,
- require less labor,
- don't have detrimental effects on both occupational hygiene and good manufacturing practice,
- are easy-to-use and maintain,
- have a small footprint,
- provide process flexibility
- and are quick to install and implement.

## The Solution

Pall SUPRAdisc AKS Modules alleviate the PAC drawbacks by incorporating activated carbon within a matrix of cellulosic fibers. This immobilized carbon media is coupled with a downstream protective filter paper to prevent any possible carbon particle shedding downstream of the filter. Additionally, the adsorption efficiency of Seitz® AKS immobilized carbon filter media is more efficient than an equivalent amount of bulk powdered activated carbon (PAC), reducing the overall process time and increasing product yield.

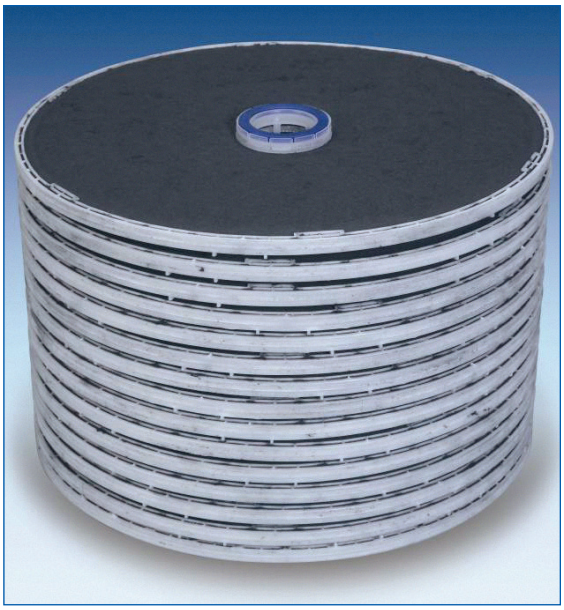


Figure 2: SUPRAdisc AKS Modules

AKS immobilized carbon filter media provides a streamlined process only requiring a single step. The feed stream simply passes through the module once at an appropriate flowrate to achieve the desired adsorption, saving time, resources and expense. It is nearly 100% free of carbon dust, so *both* operators and the workspace are better protected. No additional mixing, filtration or cleaning steps are needed.

At an optimized flowrate, the probability of contact between the impurities and carbon particles is more outstanding in carbon-impregnated sheets, due to the process fluids more efficiently contacting carbon particles immobilized into a sheet matrix.

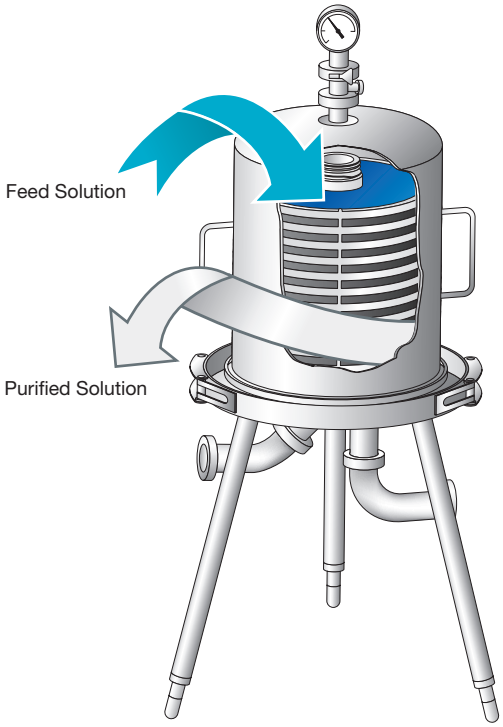



Figure 3: A typical process using a Seitz AKS immobilized activated carbon filter media assembly

The sheet has significant depth (or thickness), due to its construction from a series of layers containing active carbon. The initial layers make the first contact with the fluid, and over time, fluid volume passes, saturating it with impurities. Subsequent layers, however, still have adsorbing sites and the depth of active carbon gives the fluid an optimal flow rate that enables maximum utilization of the carbon.

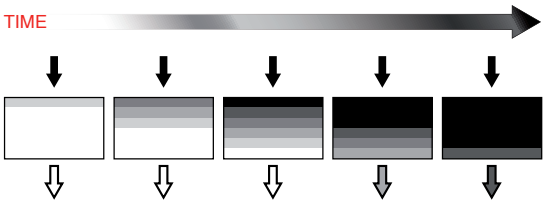
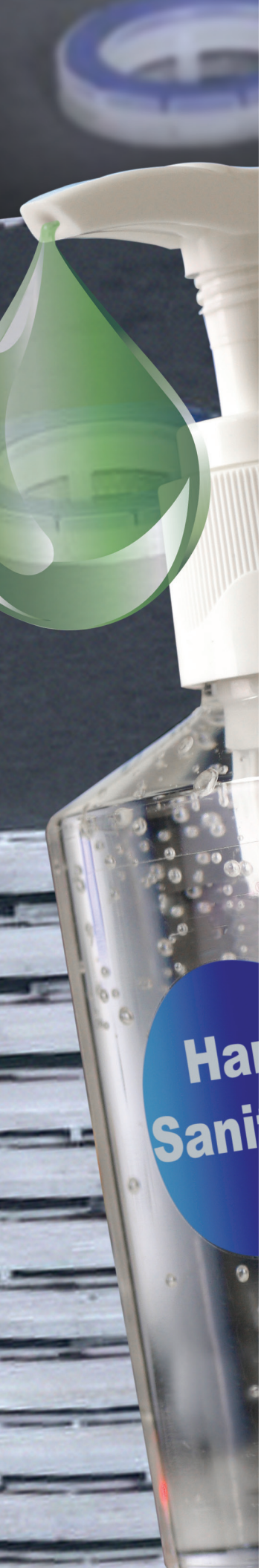
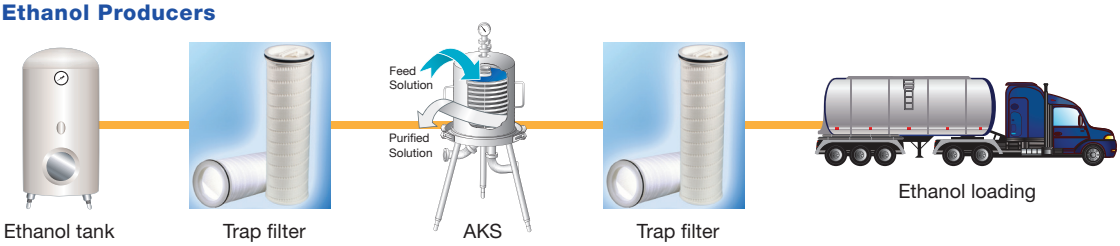



Figure 4: Adsorption behavior within a single carbon sheet with time

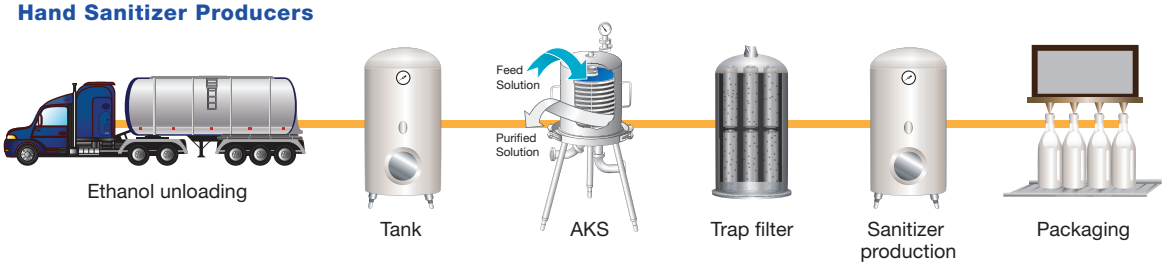
The two typical SUPRAdisc AKS applications on sanitizer production can be seen in the flowcharts below.



## Ethanol Producers




## Hand Sanitizer Producers




Particle filtration must occur upstream of carbon-impregnated filter sheets to maximize the required adsorption of impurities.

The high packing density and modular design of the SUPRAdisc allows for extremely high surface area in a compact footprint. Up to six modules can be stacked together in a single SUPRAdisc WSFZ housing. Customers can operate with WSFZ housings and SUPRAdisc AKS modules or with Seitz AKS flat sheets if an existing filter press installation exists. WSFZ housings can be installed in parallel to meet required production flowrates.

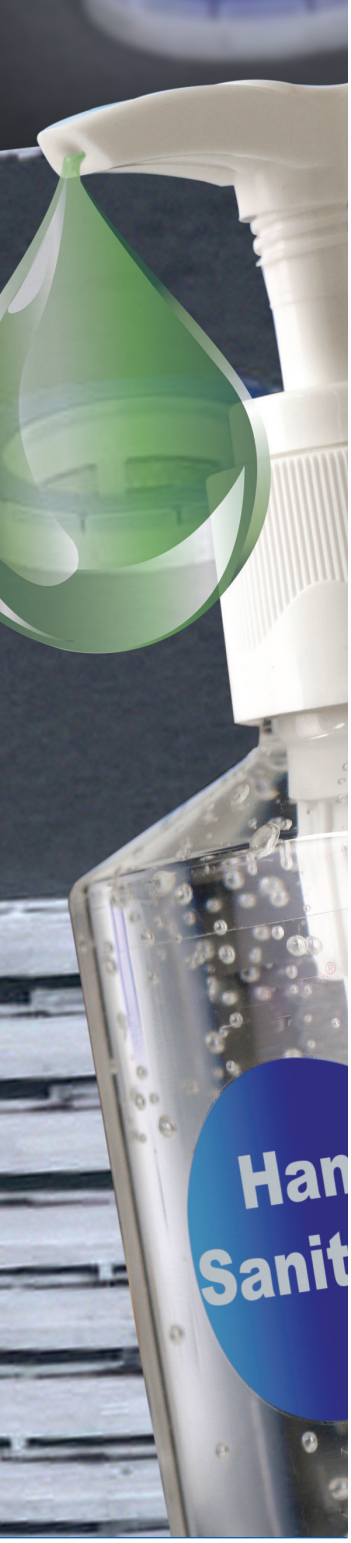
With minimal components and replacement parts, the WSFZ housing set up carries a significantly lower initial investment cost, quick installation and shorter lead time when compared to the PAC bed. The housing installation can also provide extra floor space for future production expansion.

Another advantage of the WSFZ housings is that they are not limited to AKS filter modules usage and can be repurposed for other filtration needs such as polishing, turbidity reduction or chill-filtration in spirits and other standard production processes.

## The Benefits

With SUPRAdisc AKS modules, beverage companies can achieve cost-effective and quality-enhanced filtration for hand sanitizer off-odor removal. When using these modules, customers gain the following benefits:

| Features | Benefits |
|---|---|
| Carbon-impregnated media with a homogeneous and consistent matrix | • Free of carbon dust<br>• Simplified handling and cleaning<br>• Increased process security due to the enclosed design |
| High packing density and adsorption efficiency as compared to PAC | • Reduction of overall process time<br>• Shorter change-out times<br>• Increased product yield<br>• Good permeability with excellent filtrate quality |
| General-duty media targeted to food and beverage industry needs | • High economic efficiency due to a long service life<br>• Minimal spare parts and maintenance<br>• High system availability for quick implementation<br>• Available to a wide variety of production demands,meaning you can leverage the modules in a variety of process lines |




## About Pall Corporation

Pall Corporation works to protect what matters everyday by providing filtration, separation, and purification solutions to businesses across the globe. Pall serves the food and beverage industries with advanced membrane filtration technology and systems, enabling companies to produce shelf-stable, consumer-safe products at the lowest operating cost.

There are only a few companies in the world that can effectively do what we do, and none of them match our combination of product breadth and performance across traditional filters and system solutions with our depth of application knowledge.

To learn more about Pall Food & Beverage visit www.pall.com/foodandbev.

## Sources

www.forbes.com/sites/abigailabesamis/2020/03/25/american-craft-distilleries-are-making-hand-sanitizer-to-help-fight-the-spread-of-coronavirus/#3239627b2942

www.entrepreneur.com/article/348127

www.businessinsider.com/distillery-making-hand-sanitizer-coronavirus-2020-4?r=US&IR=T

www.thedailybeast.com/american-distillers-are-making-top-shelf-hand-sanitizer

news.cornell.edu/stories/2020/04/cornell-aids-distillers-making-hand-sanitizer

www.fda.gov/regulatory-information/search-fda-guidance-documents/policy-temporary-compounding-certain-alcohol-based-hand-sanitizer-products-during-public-health

www.fda.gov/news-events/press-announcements/coronavirus-covid-19-update-fda-provides-guidance-production-alcohol-based-hand-sanitizer-help-boost

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