

Robust Sterile Gas Filtration for Packaging Cannabis Oil Products

Overview

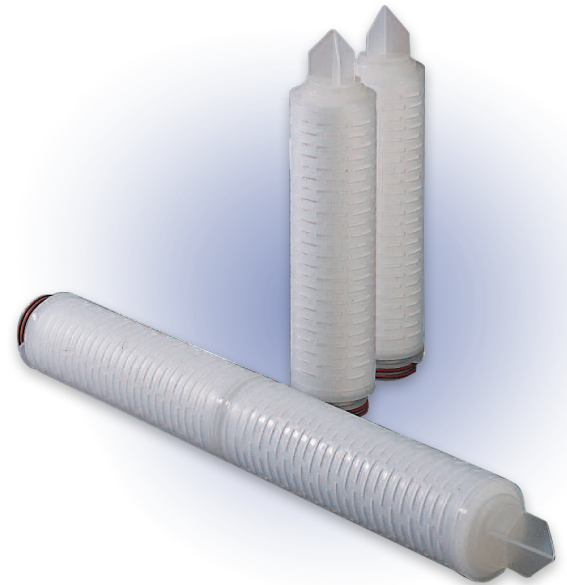
Cannabis derived oils can be final products or an ingredient across a range of consumer-facing industry segments including pharmaceutical, food & beverage and cosmetics. Today the global cannabis oil market is one of the food industry's fastest growing ingredients markets heavily driven by consumer trends in Canada and the United States. Experts predict the market for cannabis oils to grow at a rate of 31.90% from 2020 to 2027 with the combined market value reaching \$45 billion by 2024.¹

Across food and beverage markets, companies prioritize the quality of finished products for end-consumers and their company's brand protection. Manufacturers developing products containing cannabis derived oils face regulatory pressure to uphold good manufacturing practices. This has led to companies seeking entire downstream processing solutions to ensure safe-for-consumption products and economically viable product yields.

In order to achieve both, companies must prevent microbial contamination during processing and packaging. Contamination from unprotected gas exposure or uncontrolled packaging sanitization can lead to complete product loss of packaged goods. Contamination control of all fluids and airborne contaminants makes the difference.

The Challenge

The typical aseptic production environment for cannabis derived oils requires protection of the sterile product from beginning to the end. Thus, protecting the product from a wide range of bacterial contamination is an essential part in the final processing and packaging steps so no impurities are introduced. Like other heat labile botanical extracts and ingredients common in biopharmaceuticals, heat treatment isn't ideal for cannabis derived oil manufacturers for food & beverage applications given its fragile properties. Therefore, using filtration is their last line of defense. Compressed inert gas, such as nitrogen, is used in a variety of situations to remove airborne contaminants including oil vapors, dust, smoke, and microbes like fungi and bacteria.



Emflon® PFRW filter cartridge



Various air filtration technologies are available depending on regulatory requirements and company guidelines. Compressed gas filtration should meet these expectations. Depending on company specifications, there may be a need for repeated *in situ* steam sterilization of the processing equipment including the filters. In this case, it is advantageous to understand the mechanical robustness, filter performance claims, and life expectancy of filters to select a cost-effective filtration solution.

The Solution

Pall Corporation offers capabilities in sterile air filtration for packaging cannabis derived oil products with its Emflon® filter cartridges. They have been proven cost-effective in numerous installations around the globe due to their reliability and efficiency.

For gas applications, the dual layers of the hydrophobic polytetrafluoroethylene (PTFE) membrane in the Emflon PFRW cartridge provides the sterilizing grade filtration characterized by extremely high titer reductions for microorganisms required to prevent contamination risk. Although designed for gaseous fluids, these filters are also validated under liquid bacterial challenge test to safeguard against water droplet or vapor contamination in worst case scenarios.

Cost per sterilization cycle is directly influenced by robust multi-cycle steaming performance. Multi-cycle steaming tests are a routine part of sterilizing grade gas filter validation. Emflon PFRW filters are validated for 165 1-hour steaming cycles at 140 °C (284 °F) in the forward direction. Such performance claims are the outcome of rigorous testing on multiple production filters, involving various test parameters designed to prove the mechanical resistance of the filters.²

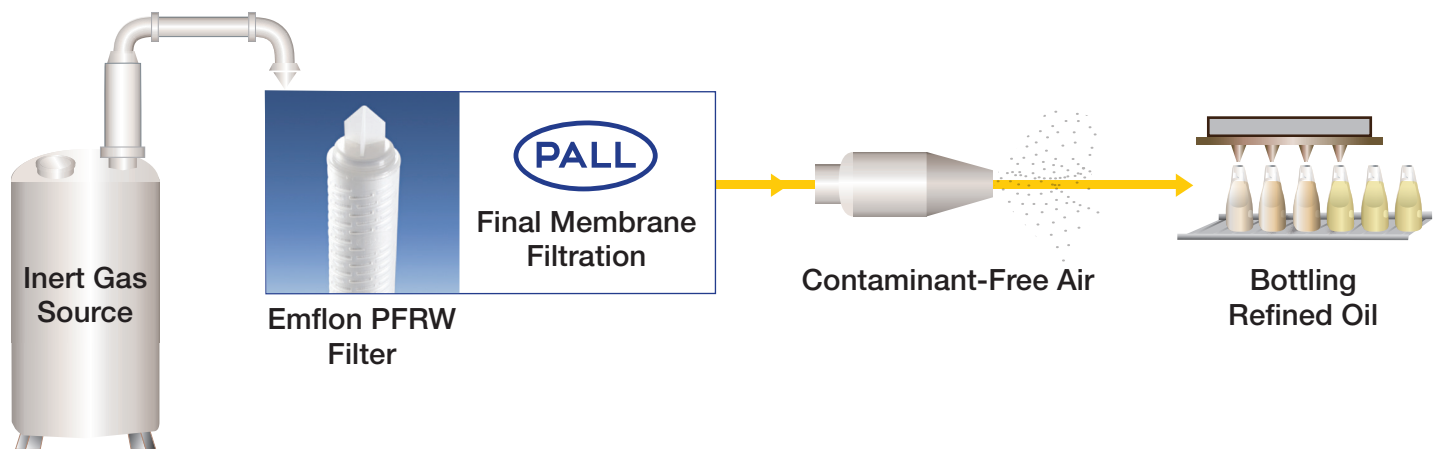


Figure 1: Schematic of typical process flow diagram for compressed gas

The Benefits

The combination of exceptional product features translate into cost-saving benefits for the customer at a critical control point in their process. These include:

- Minimized risk of post-process contamination and reliable product and equipment protection utilizing sterilizing grade gas membrane filters, resulting in improved final packaging yield
- Lowered cost of ownership because of long service life of Emflon PFRW filters due to its robustness during multi-cycle steaming
- Monitoring capabilities of integrity-testable membrane filters for continued performance

References

¹ www.globenewswire.com/news-release/2020/04/20/2018808/0/en/CBD-Oil-Market-Size-2020-Industry-Share-Growth-Trends-Revenue-Analysis-Top-Leaders-Dr-Hemp-Me-Green-Roads-Royal-CBD-CBD-Oil-Europe-King-CBD-Says-DBMR-Analyst.html

² Please request Emflon PFRW Technical Performance Document.

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About Pall

Pall Corporation provides critical filtration, separation and purification solutions to meet the demanding needs of a broad spectrum of life sciences and industrial customers around the globe.

Across 80 locations and 10,000 people worldwide, we are unified by a singular drive: to solve our customers' biggest fluid management challenges. And in doing so advance health, safety and environmentally responsible technologies.



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