



TECHNICAL ARTICLE **STERILE AIR CHECKLIST FOR FERMENTATION PROCESSORS**

Process Filtration



As consumers push for healthy products with clean ingredients, the food and beverage industry has answered with product innovation. A key trend within this innovation movement has been a resurgence of fermentation, especially in the exploding beer and wine categories over the last decade.

Fermentation is a metabolic process in which an organism converts a carbohydrate, such as a starch or a sugar, into an alcohol or an acid. For the food and beverage market, there are three types of fermentation including:

- Lactic acid (yogurt, kimchi)
- Acetic acid (vinegars, kombucha)
- Ethanol (wine, beer)

Large-scale industrial fermentation processes for mass-produced products require strict controls and an advanced filtration system to help plant managers maintain quality control and keep their entire supply chain on track. Below is a helpful checklist:



I. RECIPE COMPLIANCE

Recipes that undergo fermentation use compressed air to introduce oxygen to the yeast cultures. A highly filtered process, producing sterile air free of oil, moisture, and particulate, helps ensure the recipe ingredients and final product meet safety standards.

II. PRODUCT RELIABILITY

The highest quality products are perfected through the processing system. For those that are fermented, the use of advanced filter technology can help create a reliable and consistent product taste, smell, texture, and overall experience for consumers.

III. PRODUCT THROUGHPUT

Once the fermentation process has been established for various products, such as a red wine blend, the next step is to scale the volume and speed of production to meet customer demand. Using a durable filter with a high-quality media will provide necessary airflow, remove moisture, and help sustain longer production run times.

IV. STERILIZATION

Despite thorough cleaning procedures, bacteria may grow on the filter media and reach a downstream product or process. An effective way to protect against this risk is to sterilize production equipment with steam or other caustic chemicals to manage microorganisms.

V. COST OF OWNERSHIP

Over time and hours of use, filters become plugged with contaminate. The media inside undergoes tremendous stress and eventually starts to underperform. Choosing the proper arrangement of sequential series filters will optimize air flow, support long life of the final sterile filter, and lead to significant savings through lowered maintenance costs.



Consider one filter designed for airflow of 1,000 cubic feet per minute (cfm). Every additional pound per square inch (psi) of pressure required to overcome restrictions in that filter adds an estimated \$1,000/year in energy costs.

All of these checklist items are used in food and beverage manufacturing, including beer brewing and winemaking, to help give processors confidence in the quality and consistency of their products. The use of sterile air is necessary at several points during the production cycles. In addition to fermentation, sterile air can pump viscous products through pipes, assist with bagging or packing products, provide a sterile barrier in product storage tanks, and reject sub-standard ingredients from conveyors.

Since 1972, Donaldson has served the food and beverage industry around the world with quality filtration products. Its Lifetec™ line of filtration elements offer strong, long-lasting process protection with high flow rates. Donaldson's proprietary line of filters has helped companies to safely run their fermentation processes to meet food safety and quality requirements, gain efficiencies, and lower production costs.

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