

WHITE PAPER

IMPROVING FILTRATION IN THE FERMENTATION PROCESS

Optimization strategies
for a competitive industry

Fermentation filtration, a critical element in processing good quality end products.

Fermentation is a key component in producing a very large range of products from vitamins, biofuels, acids, biotech products, enzymes, to beer and dairy. From a simple one-step operation to a complex process that includes other separation technologies, membrane and depth filters play a critical role in assuring contaminant removal.

To stay competitive, it is more important than ever to optimize process efficiencies in order to save production costs and avoid the consequences of downtimes.

This white paper provides information to help educate and inform the reader on best filtration practice methodologies.

Delivering a Quality Product

Filtration is a key component in producing end products from the chemical or food and beverage industries, and delivering quality products. The need for efficient and effective filtration systems has become an essential component to delivering quality product. Depending on the application or the regulating body setting the rules, quality expectations may vary dramatically from one process to another. Filters that remove bacteria, mold, yeast and endotoxins, as well as inorganic matter, add a level of retention and assurance that your fermentation filtration goals are met.

Global Filter provides cartridges, bag filters and vessels for the purification of water when your filtration goal is bio-burden control, sterilizing and/or fine and ultrafine particle removal.

These filters are installed in several locations along your process to eliminate bacteria and remove the contaminants that discolor and change the taste or performances of your final product. From the raw ingredients to the final filling machine, fermentation filtration products treat both liquids and process gases while also protecting tank contents. Controlling the pressure inside tanks through venting ensures safety operation conditions.





Filtration Solutions Have a Direct Impact on the Quality of your Products

Selecting the Best-Suited Media

Several factors must be considered when selecting the best-suited filtration media including the required flow rate, influent quality, and effluent requirements.

One factor to consider is influent quality. There must be adequate coverage of the effective filtration area (EFA), in order to capture the bulk of incoming solids. Depending upon the particulate distribution, and ambient conditions, coverage can be accomplished with a depth or pleated depth filter.

After solid removal, the focus shifts to the capabilities of the remaining components of the system and the desired final product quality. If reverse osmosis, deionization, or carbon system is present, the system must be protected accordingly. This can be accomplished with the use of a high-purity pleated depth product, such as pleated polypropylene or pleated microglass, which optimizes the rating and capacity during this stage.

Additionally, the fermentation ingredients must be purified or filtered with a membrane, to reach the required cleanliness. In general, the final filter will utilize a 0.2 μ m membrane, with or without some form of bacterial retention. Appropriate regulatory agencies or in-house company guidelines will typically provide membrane requirements for your process.

While the general process for producing fermented products is similar from one system to the next, each process is unique and requires specific considerations.

Recognizing Differences in Process & Product

With regard to the multiple variables in fermentation' manufacturing process, the various levels and types of filtration solutions must be considered.

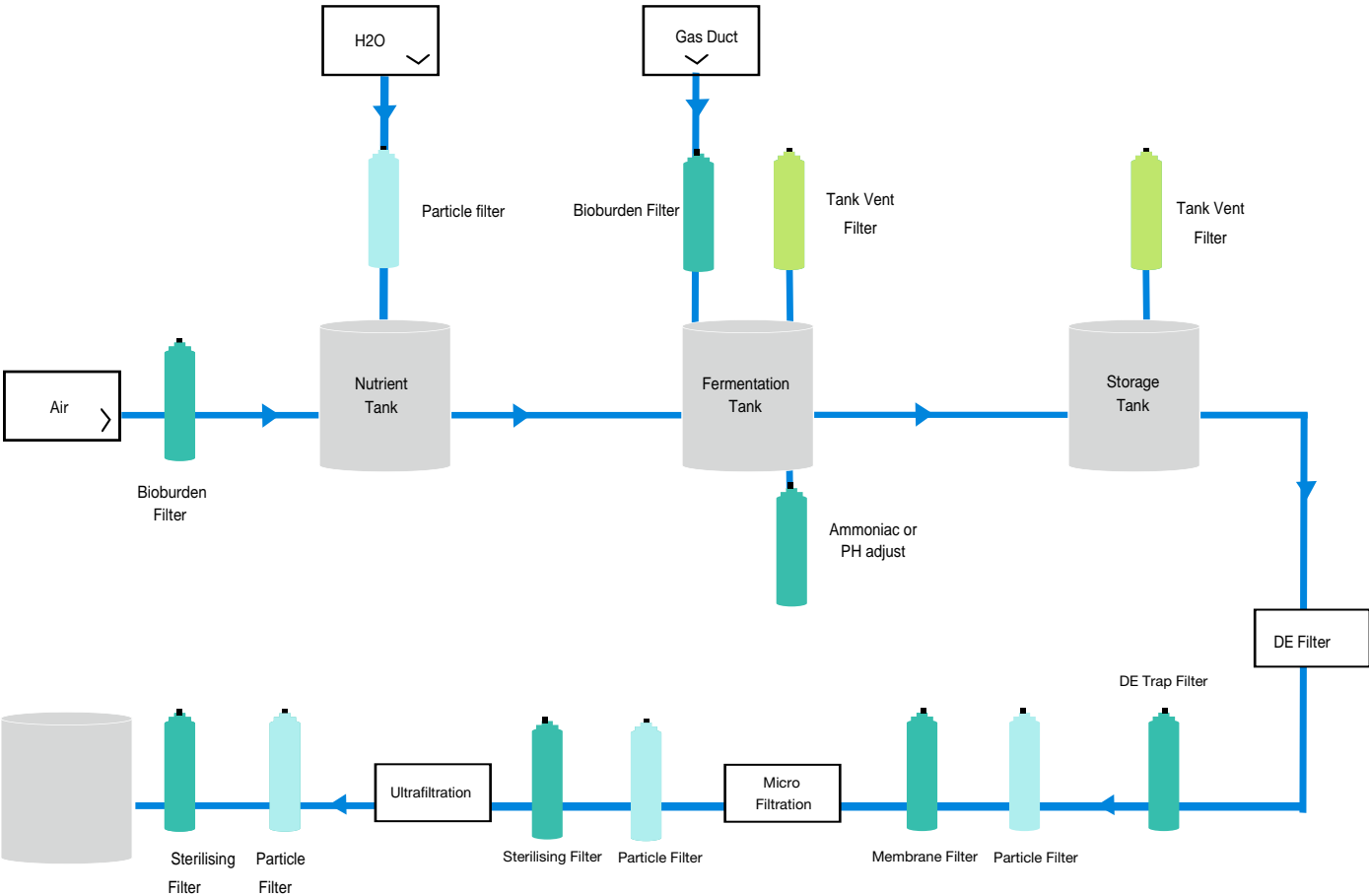
Typical applications for fermentation preparations include:

Fermentation

- Liquid Filtration
- Sterilizing Grade Filtration
- Gas / Vent Filtration



Optimizing the Fermentation Process



Liquid Particle Filters

Particulate Removal Filter
PP Series, FG Series, HFPP Series

Meltblown Particulate Removal Filter
GWTB Series Polypropylen Meltblown cartridges

Pleated Depth Particulate Removal Filter
GHLS Series

For the H2O inlet, this filtration step will help remove particulates from process water and ensure water quality as an ingredient. The goal of the particulate filtration step from the pre and post filtration to micro and ultrafiltration is to remove coarse particulates from the finished product. Installed downstream of the DE filter, the particulate filter will remove potential DE fines from the final product. This will ensure high quality of the process and minimized sediment as well as poor quality perception of the final product.

Sterilizing/ Bio Burden Grade Filter

0.1µm and 0.2µm Sterilizing Grade Filters
PPES Series Pharmaceutical Grade PES Membrane
AFS Sanitary Vessel

Bio Burden / Endotoxin removal Grade Liquid Filter
BRPES Series
BRHNY+ Series

PTFE hydrophobic membrane
GGPTFE, BRPTFE, PPTFE Series

Reduces and removes virtually microorganisms and contaminants down to 0.2 micron as final filtration to high purity applications and as further polishing in downstream ultra high purity water systems. This will protect the tanks and their contents from contamination. Our sterilizing grade cartridges are pharmaceutical validated according to HIMA rules.

Tank Vent Filters

Tank Sterilizing / Bio Burden Grade Vent Filter
PPTFE Series Pharmaceutical Grade PTFE Membrane
BRPTFE Series Hydrophobic Polysulfone Membrane
PSH Series
GFTVE Tank Vent Vessel

Storage and fill tank vent filtration allows for bacteria and particulate-free air to pass during filling and evacuation, protecting the storage tank and its contents from contamination. This filter is typically rated at 0.2 micron and is hydrophobic and bacterial retentive, which prevents moisture airborne contaminants from entering the tank. Our BRPTFE-Series can be used if full sterilizing grade is not required, however it has a LRV bio reduction value.

Global Filter Tailors Filtration Solutions To Fit Your Needs.

SEPARATE YOURSELF FROM YOUR COMPETITION

Global Filter's industry-leading products allow various fine chemicals - and food & beverage applications. Our high-purity pleated depth and membrane filter cartridges lead the industry in quality, performance, and cost-effectiveness. Our customers receive hands-on support in several specialized areas including unparalleled customer service, technically trained staff, efficient customization of products, and stocking agreements. Our products are manufactured in Europe.



Quality Products

Constant Quality
50 Years of Experience in the
Fine Chemical Industry
Product manufactured in our plants
ISO 9001 Quality System Management
CE 1935 / 2004 , FDA, GMP



Reliability

Reduce Costly Downtime
Robust Construction
Cost-Effective
Agile Organisation
Filtration Total Cost Ownership
Management



Fast Delivery

On-Hand Inventory
Minimal Lead Times
Easy Access to Products
3 Manufacturing Plants Worldwide

FILTER VESSELS





Filtration Elements by Removal Capability

Meltblown Products (>5.0 micron filtration)

- Water Grade Polypropylene Meltblown Cartridge
– GWTB

Pleated Depth Products (0.2-5.0 micron filtration)

- Pleated Microglass Filter Cartridge
– FG
- Pleated Polypropylene Filter Cartridge
– PP

Pleated Membrane Products (< 0.2 micron filtration)

- Bio-Burden Reduction Grade Polyethersulfone
– BRPES
- Pharmaceutical Grade PTFE
– PPTFE
- Hydrophobic Polysulfone Membrane
– PSH
- Hydrophobic PTFE Membrane
– GGPTFE , BRPTFE, PPTFE
- Bio Reduction Grade Nylon 6.6
– BRHNY+



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