Cleaning, Short and Long-term Storage of 3M™ High Flow Series Filters in Food and Beverage Applications

Introduction

3M™ High Flow series filters can be used in a wide variety of Food & Beverage applications to help control particulate, haze and larger microorganisms. In many applications, the service life is not exhausted at the end of a filtration run, and the end user may wish to store the filter for use at a later date. The purpose of this technical brief is to provide the end user with guidelines on potential short-term and long-term storage solutions, as well as guidance on cleaning filters with a dilute solution of NaOH. Since it is not possible to provide a single storage method that would be suitable for the very wide variety of Food & Beverage applications, it is strongly recommended that the end user evaluates the solution and method for compatibility with their system before use.

Cleaning with Dilute Caustic Solutions

The most preferred method of intermittent cleaning of filters in Food & Beverage application is a 15-minute rinse in the forward direction with warm (55°C) filtered water to drain. However, in some circumstances, particularly when there is a high load of organic matter on the filter, the use of a dilute caustic solution rinse (<2% NaOH) may be preferred. Ensure that any water used for cleaning has been filtered to the same degree or lower as the filter being cleaned.

Procedure

After a filtration cycle is complete, flush the filter in the filter housing with filtered water to drain for 5 minutes.

- Drain the filter housing of any water.
- With the filter still in the filter housing, slowly pump a dilute (<2%) solution of filtered NaOH into the housing, making sure that the vent valve is cracked slightly open to allow air to escape.
- Once the solution emerges from the vent valve, stop the pump and close the vent valve, leaving the solution in the filter housing.
- Leave the filter in the housing soaking for 15 minutes, or longer if deemed necessary.
- Drain the dilute caustic solution from the filter housing
- Flush the filter and filter housing for 15 min with water filtered at the same or lower filtration flowrate to remove any residual NaOH solution.

Short-Term Storage (1-2 days)

- At the end of the filtration cycle, warm water regenerate the filter if desired.
- Hot water sanitize the system. This is typically accomplished by flushing the system with 80 °C filtered water for a minimum of 30 minutes. Ensure that the entire system is at temperature by measuring the temperature at the farthest point from the hot water inlet. Also be sure to crack open all valves, including bleed and vent valves, to ensure that the hot water reaches all points of the system.
- Once the housing has been at temperature for 30 minutes or more, discontinue flow and close the inlet and outlet housing valves (including the vent valve). The housing, now filled with hot water, can typically be stored for 1 to 2 days.
- When the filter is required for use, re-sanitize the filter and housing again with hot, filtered water.
- Note: The duration of storage using this method is dependent on the level of bioburden in the fluid being filtered. We recommend evaluating the need for further water sanitization in periods shorter than 24 hours in fluids with higher bioburden.

Long-Term Storage (greater than 2 days)

- At the end of the filtration cycle, perform a 15-minute rinse in the forward direction with warm (55°C) filtered water, drain the water.
- Hot water sanitize the system. This is typically accomplished by flushing the system with 80 °C filtered water for a minimum of 30 minutes. Ensure that the entire system is at temperature by measuring the temperature at the farthest point from the hot water inlet. Also be sure to crack open all valves, including bleed and vent valves, to ensure that the hot water reaches all points of the system.
- Drain the filter housing, allow it to cool.

End-users can consider three methods of long-term storage

Sodium Metabisulfite Solution (common for wineries only)

- Prepare a solution of sodium metabisulfite (commercially available from most wine supply companies) to a concentration of 500 – 1000 ppm. Acidify with citric acid to a pH of 3.
- Remove the filter from the housing
- Remove the O-ring from the filter cartridge and store separately
- Ensure the vessel for the filter storage is compatible with sodium metabisulfite
- Place the filter cartridges in a container with the sodium metabisulfite solution and seal.
- Periodically (once per week) monitor and maintain the solution concentration.
- This solution can also be used when the filter cartridges are still contained in the filter housing, although extended exposure of housings surfaces to the sodium sulfite solution may results in damage of the internal housing finish.

Food Grade Acid Based Sanitizers (PAA or Peracetic acid)

- Drain the filter housing of any fluid. Do not proceed to the chemical sanitation step until the filter housing has cooled to ambient temperature.
- Slowly fill the filter housing with the food grade acid-based sanitizer solution at a maximum concentration of 1.0% v/v. Follow all safety precautions provided by the sanitizer supplier.
- Once the filter housing is filled with the sanitizer, close all housing valves.
- After storage, and before use, drain the sanitizing solution from the filter housing. Follow all safety precautions and disposal recommendations provided by the sanitizer supplier.
- To remove any residual sanitizing solution in the filter media, flush the filter in the forward direction for 15 minutes with filtered, ambient temperature water.

Alcohol Solutions (typically 50% v/v of neutral grain spirits)

- Drain the filter housing of any fluid. Do not proceed to the next step until the filter housing has cooled to ambient temperature.
- Slowly fill the filter housing with the alcohol. Follow all safety precautions provided by the supplier.
- Once the filter housing is filled with the alcohol, close all housing valves.
- After storage, and before use, drain the alcohol solution from the filter housing. Follow all safety precautions and disposal recommendations provided by the alcohol supplier.
- To remove any residual solution in the filter media, flush the filter in the forward direction for 15 minutes with filtered, ambient temperature water.

Returning the Filter to Service

- When filters are required for use, remove them from the storage solution, fit them with o-rings, and install them in the filter housing.
- Flush the filters with clean, filtered water to remove any residual storage solution.
- Hot water sanitize the filter.

Additional technical service can be provided by your local authorized 3M Distributor or 3M.

SAFETY INFORMATION

Please read and follow all instructions and safety information contained in these instructions prior to the use of this product. It is expected that all users be fully trained in the safe operation of this product. Retain these instructions for future reference.

Intended Use and Product Selection:

The 3M™ High Flow Series Filters are intended for use in standard industrial filtration applications of aqueous fluids in accordance with the applicable product instructions and specifications.

3M™ High Flow Series Filters products are also intended for use with non-aqueous fluids where materials of construction are compatible. Certain limited 3M™ High Flow Series Filters products are also intended for use in Food and Beverage (F&B) applications. Refer to the specific 3M™ High Flow Series Filters product's data sheet to determine whether it includes a F&B designation and can be used for such applications.

Since there are many factors that can affect a product's use, the customer and user remains responsible for determining whether the 3M product is suitable and appropriate for the user's specific application, including user conducting an appropriate risk assessment and evaluating the 3M product in user's application.

Restrictions on Use:

3M advises against the use of these 3M products in any application other than the stated intended use(s), since other applications have not been evaluated by 3M and may result in an unsafe or unintended condition. Do not use in a medical device, drug, or cosmetic application or in applications involving life-sustaining medical applications or prolonged contact with internal bodily fluids or tissues. If you are considering using this 3M product for a restricted use, you must first contact 3M with information about your proposed application to request prior written authorization for supply for such use.

Explanation of Signal Word Consequences	
WARNING:	Indicates a hazardous situation which, if not avoided, could result in serious injury or death.
CAUTION:	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury and/or property damage.
NOTICE:	Indicates a situation which, if not avoided, could result in property damage.

Explanation of Safety and Related Symbols	
 or 	Attention: Read Accompanying Documentation

⚠ WARNING

To reduce the risks associated with fire and explosion:

- Removal of packaging used with this filter may produce static electrical charges or sparks, risking combustion of flammable or explosive materials, liquids, or gases; Only open packaging in an area free of flammable and explosive materials.
- Always use appropriate personal protective equipment (PPE) when installing, operating, or changing the product as per your standard Operating Procedure.
- Do not modify the cartridge or its components.
- Do not use a cartridge that has been damaged.
- If appropriate, flush cartridge prior to relief of system pressure.
- Depressurize and drain the system prior to installation and removal.

⚠ CAUTION

To reduce the risks associated with hot surfaces due to hot process fluids:

- Use caution when removing cartridges or bags from housings.
- Use this product only in applications where the fluid is chemically compatible with the materials of construction of the 3M filter cartridge.

To reduce the risks associated with lifting and handling:

- Always consider the weight of the cartridges or bags, especially in the wetted state and use appropriately rated lifting equipment for lifting or moving heavy cartridges or bags.

NOTICE

To reduce the risks associated with damage to cartridge or property damage due to product loss:

- Read and follow Use Instructions before installation.
- Do not exceed maximum differential pressure or temperature limits.
- Do not expose the cartridge to back pressure.
- Ensure gaskets or o-rings are in place, as applicable, prior to installation.
- Care must be taken not to drop, hit or impact the cartridge or bag to minimize the possibility of product damage.
- Cartridges or bags should be stored in the original package. Recommended storage conditions are dry and where the average temperature is between 5 °C and 40 °C

To reduce the risk associated with environmental contamination:

- Dispose of used cartridge in accordance with federal, state, and local laws and regulations.
- Handle, Store, Use and Dispose of cleaning and storage chemicals in accordance with federal, state, and local laws and regulations.

Technical Information
The technical information, guidance, and other statements contained in this document or otherwise provided by 3M are based upon records, tests, or experience that 3M believes to be reliable, but the accuracy, completeness, and representative nature of such information is not guaranteed. Such information is intended for people with knowledge and technical skills sufficient to assess and apply their own informed judgment to the information. No license under any 3M or third party intellectual property rights is granted or implied with this information.
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