



Technical Brief

Suggested Cleaning/Regeneration Method for Porous Metal Filters - Graver TPM

Scope

Filter cartridges eventually will become blinded by the contaminating particles that are removed from the fluid stream. When properly sized for the application, metal filters can be regenerated to perform at up to 95% of their clean, differential pressure. By following prescribed cleaning methods, it is possible to extend the maximum life of the filters. Water used in these procedures should be filtered to the same micron rating as the final filter used in the process train to avoid recontaminating the filters. Please be sure to wear the appropriate protective clothing, gloves and a face shield when handling chemicals. Consult the Material Safety Data Sheets.

Types of Contaminants

In order to effectively clean porous metal elements, it is important to identify the types of contaminants that are plugging the filter. By knowing this information, it is possible to determine the most effective cleaning methods. In some instances, it will not be possible to clean the elements and it will be necessary to utilize a commercial cleaning company.

Inorganics: These are considered non-carbon containing contaminants such as metals, salts, oxides and hydroxides.

Organic: Typically petroleum based compounds such as oil, grease, wax, gums, tars and polymers.

Biological: Protein based contamination such as bacterial, algae and food or plant material.

Since the contaminants can occur in combination, it may be necessary to utilize more than one cleaning method or cleaning agent.

Cleaning Methods

Backwash

This is the simplest cleaning method and should be used routinely to maintain the filter's condition. In this process, liquid or gas (blowback) is utilized in the reverse direction to remove contaminants from the surface of the filter. Pulsing the liquid in the reverse direction, versus just reverse flow, may provide a more effective result. Be certain to avoid exceeding the recommended reverse pressure rating. Typically, a reverse flow (pulse) at 1.5 to 2 times the typical forward flow or pressure drop is all that is required.

Soak or Circulation

These methods require the introduction of a detergent, acid or caustic as the cleaning agent in either a static or circulation mode. If circulating the cleaning solution, the flow should again be in the reverse direction at 1.5 to 2 times the flow rate/pressure of the forward direction.

Procedure - All filter housings in a process train must be correctly piped so that they can be isolated, from each other. By installing a valve and tee connection on both the inlet and outlet of the housing, the cleansing chemicals can be brought into and removed from each housing, to drain, without flowing into the previous or next filter housing. The tee and valves should be the same pipe size as the process piping or a size large enough to accommodate a flow rate 1.5 to 2 times that of the process or filtration flow rate. Each filter housing should contain an inlet and outlet valve and pressure gauges upstream and down-stream of the housing. The gauges should be liquid filled and have a face diameter of at least 2.5 inches. The pressure range should be such that each graduation can be easily read and differentiated from the other gauge reading. Accuracy is important.

For the cleaning agent, dilute acid such as nitric or phosphoric up to 10%, caustics such as sodium hydroxide up to 15% or commercial detergents such as Alconox or Tergezime can be utilized. Compatibility should always be verified with the metal as well as the housings if done in a circulation mode. A series of cleaning agents may be required due to the presence of multiple types of contaminants. The effectiveness of the cleaning agent can be improved by increasing the temperature of the solution to 80°C. If doing a static soak, a 4 – 6 hour time period is appropriate.

Once complete, rinse with filtered ambient water for 10 – 30 minutes, in the **reverse direction**, at a flow rate 1.5 times that of the initial flow rate used on the product filtration. Repeat the cleaning process if necessary if the cartridges do not recover to within 10% of the original ΔP .

Furnace

Due to the thermal tolerance of porous metal elements, it is possible to burn or volatilize the organic or biological contaminants. Temperatures up to 850°F are possible. Since some contaminants may leave ash, additional cleaning methods may need to be employed after the furnace.

Developing a cleaning method requires a trial and error approach due to the varying nature of potential contaminants. If those doing the cleaning lack the experience or facilities to conduct the cleaning, it is recommended that the elements be sent to a commercial cleaning company such as:

Carolina Filters, Inc*

109 East Newberry Avenue
Sumter, SC, 29150
803-773-6842

Southern Metal Processing*

130 Allred Lane
Oxford, AL 36203
256-831-8130

** Commercial cleaning companies provided for informational purposes only. Graver does not endorse or warranty the work performed by these independent companies.*

For further information, contact Graver Technologies at 800-510-0932 or www.gravertech.com or your local Graver Technologies representative.