

Filter Options for Soft Drink Production



Filters are used to protect soft drink processes and product quality. They prevent possible contaminants from entering the production system with ingredients. They also remove bacteria and other organisms that might enter the system from a variety of sources, even the environment.

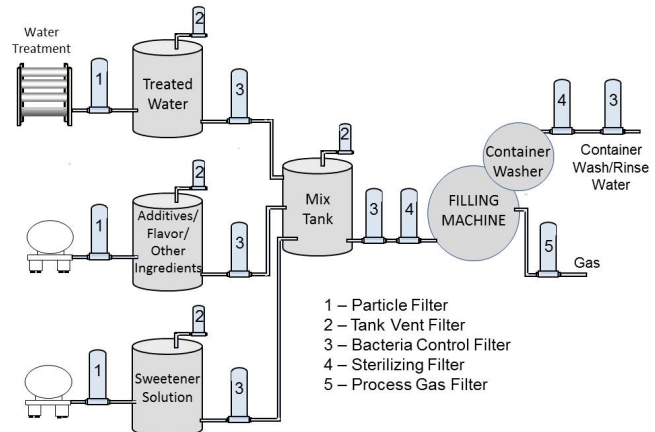
Ingredients entering any process can carry both inorganic particles and microorganisms that can harm production processes and/or product quality. Cartridge filters are a cost effective method of controlling these contaminants as they enter a facility or process, assuring that the ingredients are pure and the end product is safe and flavorful.

Bacteria, yeasts, molds and other organisms can be found everywhere. They can find their way into the process through raw materials, sweeteners, the facility environment, even on packaging materials. Cleaning and operating procedures might reduce the number of organisms, but no cleaning method can prevent environmental organisms from re-entering the equipment as soon as the cleaning process is completed.

Low pH drinks with high carbonation levels will kill most bacteria that get into the final package or at least inhibit their growth. Soft drinks that are not carbonated and have less acidic pH levels, such as sports drinks or flavored waters, lack protection against spoilage organisms. Therefore, barriers such as filters should be installed to remove bacteria and other organisms.



Figure 1 - Filtration in Soft Drink Production



Particle Removal and Prefiltration

Unwanted particles can be almost any size. Larger particles, those larger than 1 to 5 microns, are easily removed using depth filtration.

Depth media in cartridge filters is found in two forms. The standard depth filter is a self-supporting tube made using a polymer, most often polypropylene. Standard depth filters will capture a range of particle sizes through the thickness of the media. The other form of depth filter is pleated flat sheet media, most often made with polypropylene or fiberglass. Polypropylene is the most widely used material for water and water-based fluids. Pleated media filters have the advantage of a large surface area that can hold a higher quantity of particles on their surface than the standard depth filters.

Bacteria Reduction/Removal

The most critical filters in Figure 1 are those used for bacteria control for both product and container cleaning water (housings marked 3 and 4). Those filters remove microorganisms discussed above, with the first filter removing most of the bacteria and the second the remaining organisms. The most commonly used filters are membrane-based. The first filter may have a pore size of 0.45 or 0.65 microns to protect the final filter with its 0.22 micron pores. Using the 0.22 micron filters will assure capture of all bacteria, but there is a risk that some flavor or color elements may be captured by the smaller pores. For that reason, some operators use 0.45 micron membranes, which will remove many of the microorganisms found in soft drink environments. It is important to know what organisms are present and their size before choosing a final filter pore size.

Process Gas Filtration

Process gas filters (housing marked 5) are also critical to the quality of the final product. These keep particles and bacteria that may be carried by process gas from being injected into the product during filling. Holding and stabilization tanks may also use a process gas blanket to prevent oxygen from contacting the product. If process gas is not used for tanks, filters prevent particles and bacteria from the plant environment from contaminating the product during storage. Almost all process gas filters and tank vent filters are hydrophobic membrane with 0.22 micron pore size ratings.

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Process Area†	Filter Application	Filtration Function	Grade*	Media**
Particle Removal and Prefiltration	Sediment/Particle Removal	Protect downstream processes and filters from fouling by large particles	G	MB, NS, PD or GD
			F	PD or GD
	Prefiltration	Remove smaller particles and some larger organisms like yeasts and molds	G	MB or NS
			F	PD or GD
Final Filtration and Filling/Packaging	Bacteria Reduction	Remove most bacteria, yeasts and molds	F	CWPS, PS or PVWL
	Bacteria Removal	Remove all bacteria, yeasts and molds	F	PS
Product Storage and Filling/Packaging	Tank Vent and Process Gas Filtration	Prevent particles or bacteria from the environment from entering storage tanks and remove contaminants from process gases like CO ₂	G, F	PVWB or TM

†Note: See the Selection Guide "Filter Options for Process Water Treatment" for applications in process water and ingredient water treatment systems.

*Grade Codes

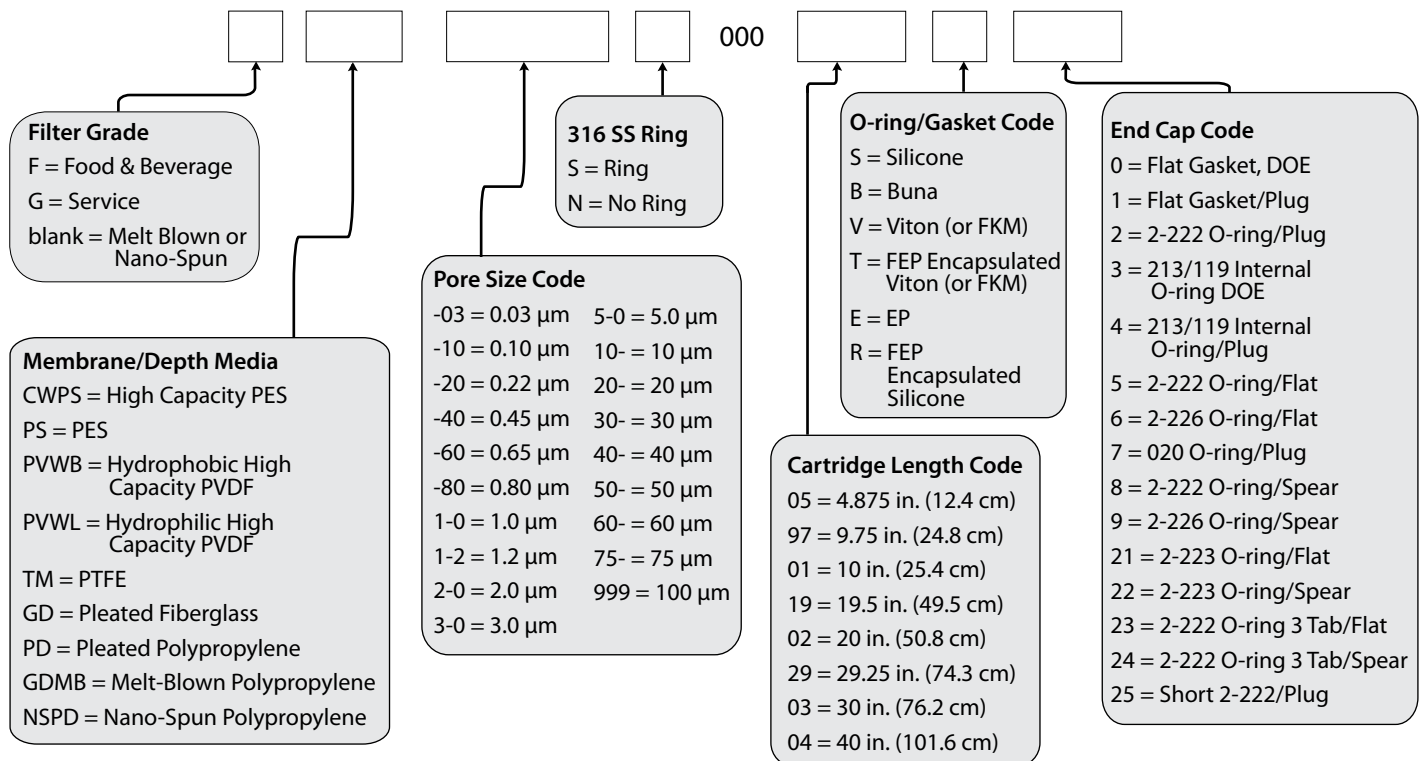
F = Food & Beverage grade G = General Service Grade

**Media Codes

MB = Melt Blown Polypropylene Depth Media NS = Nano-Spun Polypropylene Depth Media PD = Pleated Polypropylene Depth Media
 GD = Pleated Fiberglass Depth Media CWPS = High Capacity PES Membrane PS = Polyethersulfone Membrane
 PVWL = High Capacity Hydrophilic PVDF Membrane PVWB = High Capacity Hydrophobic PVDF Membrane TM = PTFE Membrane

Contact [Critical Process Filtration](#) for help determining the best filter options for you.

Cartridge order numbers have several variables from grade to media and pore size to end cap type. For example, Food & Beverage Grade, Polyethersulfone Membrane, 0.22 Micron Rating, with SS Support Ring, 20" Length, Silicone O-Rings, 2-226 O-Ring/Spear End Cap Configuration = FPS-20S00002S9.



Visit our [website](#) or [contact us](#) for more application information and to access data sheets on all of our products.



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