CRITICAL PROCESS FILTRATION, INC.

Choosing the Right Filters for Wine Clarification

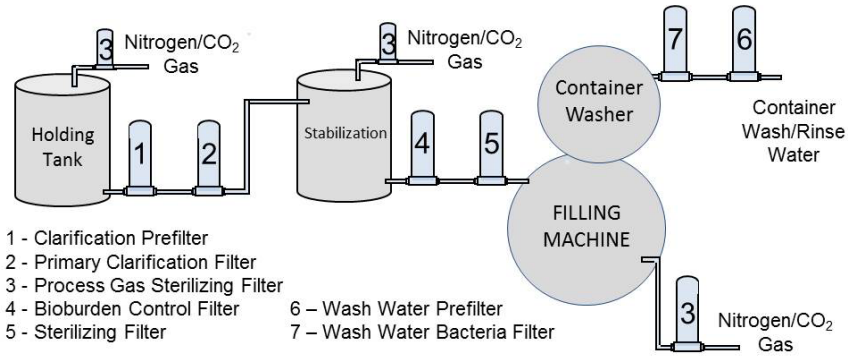
After aging and before bottling, wine goes through a series of processes for clarification and stabilization. The first of those processes is the removal of sediment and other suspended particles. Taking out unwanted particles and larger organisms reduces the amount of material that could create off flavors and aromas. The figure below shows the filtration steps before bottling. The housings marked 1 and 2 are those performing this critical process.

Clarification is more than just reducing haze or making the wine visually clear. The particles removed range from small diatomaceous earth particles that may leak from the initial filtration after aging, to yeast and other microorganisms that might adversely affect wine flavor and character.

The 2-stage filtration process shown in Figure 1 is designed to be efficient and allow the most throughput. The first filter (housing 1) may have a depth media filter with a pore size rating of 3 or 5 microns. This filter will capture larger particles and sediment. It will also protect the second depth filter, which may have a pore size rating of 1 micron, from becoming overloaded with particles and prematurely clogging. The combination allows more wine to be processed and can reduce overall clarification filter costs.

Some winemakers may choose to use only 1 filter, depending on the level of particle and organism content at this stage of the process. Critical Process Filtration will work with winemakers to determine if a single stage or multi-stage system will produce the best results in the most cost-effective way.

Figure 1 - Filters in Wine Packaging



Choosing Filters for Clarification

Depth filters are made with media that is melt-blown or spun-bonded into continuous polymer fibers that are formed into either a thick tube or a flat sheet. The most common materials for depth media are polypropylene and fiberglass.

Standard depth filters are made by forming the fibers into tubes with thick walls using the melt-blown process. These types of filters capture particles through the depth of the media. Examples of standard depth filters are shown in Figure 2. The clarification prefilter (housing 1 in Figure 1) is likely to hold a standard depth filter. Polypropylene is the most common material for standard depth filters, though other materials are sometimes used for specialty applications.

Melt-blown media is more efficient than other types of depth filters, like yarn-wound filters. As the name suggests, yarn-wound filters are made by winding yarn around a core. The yarn can shift and create channels for liquid to flow through without being filtered. Melt-blown filters are continuously bonded fibers in self-supporting tubes that do not require a core. They are generally more efficient and easier to dispose of once used.

Figure 2 – Critical Process Filtration standard depth filters

Application Summary

Figure 3 shows filters made using flat sheet media of polypropylene or fiberglass fibers. The flat sheet media is pleated to create more surface area. With the increased surface area, the filters are capable of capturing and holding a larger quantity of particles. The Primary Clarification Filter (housing 2 in Figure 1) is often a pleated depth media filter, though it could also be a standard depth filter, depending on the nature of the particles being removed.

Choosing Filter Pore Sizes

The size and number of particles in the wine determines what filter pore sizes to use and how many filters will be needed. The first stage of clarification could be designed to remove a large number of particles with sizes over 5 microns. This is often the particle size found in sediment that has settled from the wine. Though individual particles smaller than about 20 microns are not visible to most people, when they either agglomerate or settle to the bottom of a container they become visible. Using a 5 or 10 micron rated filter as the Clarification Prefilter will remove most of these particles in the first clarification stage.

The Primary Clarification Filter can serve as a second particle filter or be chosen as the first filter to remove microorganisms and begin the biological stabilization process. If the winemaker chooses to use this filter only to remove particles and reduce haze, then a 3 or 5 micron pore size rating is sufficient. If the Primary Clarification Filter should also begin the biological stabilization of the wine, then a 1 micron or 2 micron rated filter will remove yeasts and some bacteria that may have entered the process.

Figure 3 – Critical Process Filtration's pleated depth filters are available in a wide variety of configurations to fit existing housings

Filter Options

Filters are chosen considering the particle sizes targeted for removal and the quantity of particles. Also, filters must be capable of functioning after whatever disinfection or sterilization process will be used.

Critical Process Filtration has several filter options, as shown in the table below. These filters are available as cartridge filters and disposable capsule filters as well is in flat disc form for laboratory scale testing.

Contact Critical Process Filtration for help determining the best filter options for you.

Filter Options for Wine Clarification

Process Area	Filter Application	Filtration Function	Critical Process Media*
Clarification	Sediment & Particle Reduction	Protect downstream processes and filters from fouling by large particles	MB, NS, PD, GD

*Media Codes
GD = Pleated Fiberglass Depth Media
MB = Melt Blown Polypropylene Depth Media
NS = Nano-Spun Polypropylene Depth Media
PD = Pleated Polypropylene Depth Media

Visit our website or contact us for more information and to access data sheets on all of our products.

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