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Maximize Profits and Customer Satisfaction by Selecting the Correct Housing: Part II

The following is part two of a two-part article.

Finding the right housing depends a lot on the application in which the housing will be used. Being familiar with your water filtration needs as well as researching the benefits of various types of housing will help you make the right decision.

Whether the application is residential, commercial or industrial; where and how the filter is used plays an important role in the types of cartridges and housings selected to filter the fluid of choice.

Housings for Residential POE and POU Filtration

The two main areas in the home that are filtered are where the water enters the home, or point of entry (POE), and at the point where the water is used, or point of use (POU).

A POE sediment filter should be sufficiently large to provide service for three to four months between cartridge changes. This usually requires a 9- or 20-inch long, 4-inch Outside Diameter (OD) sediment cartridge with the appropriate housing. These large diameter sediment cartridges are commonly installed on new well systems to prevent damage to the plumbing system. If chlorine reduction is required, a 20-inch long 4-inch OD carbon cartridge is the minimum size that should be installed.

POU under-the-counter systems are designed to reduce various contaminants and generally contain one, two or three housings. In many areas of the country where sediment is a problem, POE sediment filters are installed to protect plumbing fixtures downstream. If sediment is an issue in your area and the home's plumbing is not protected by a POE sediment filter, it is advisable to install a prefilter to protect the under-the-counter filter.

There are many housings available that look very similar. It is important that housings installed in residential applications are designed for home use. You can ensure that a housing is safe to use with drinking water and that it has passed minimal structural requirements by selecting housings that are component listed by the National Sanitation Foundation (NSF), which is an independent testing laboratory.

Food Service Applications Require High Capacity Cartridges

Many kitchens in restaurants, school cafeterias, hotels, hospitals and healthcare facilities use filtration systems to remove contaminants from water used for drinking, ice making, food preparation and dishwashing. Because downtime can result in lost sales and profits, water filters used in food service applications generally use larger capacity cartridges and housings that require less frequent change-outs. Many of these systems are designed to last from six to 12 months before the cartridges need to be changed. Clear housings for prefilters or low pressure alarms can be used to notify users when to change filters before the systems plug and shut down.

Water filters installed on cold water lines in food service applications generally use talc-filled polypropylene housings. Water from these housings and cartridge combinations provide water to ice machines, soft drink dispensers, coffee makers and other areas where water is used to make food and beverages. Flow rates for standard OD cartridges range from one to two gallons per minute per housing. Requirements for higher flow rates can be achieved

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by connecting multiple housings in parallel. Larger 4-inch OD cartridges can provide flow rates of five to eight gallons per minute for chlorine reduction. Smaller housings typically are used for individual equipment or polyphosphate feeders for ice machines and coffee makers.

Because of increased operating temperatures of dish washing equipment, hot/high pressure glass filled nylon (up to 160°F) or stainless steel housings (up to 300°F) are used depending on the temperature of the hot water being filtered and supplied to the equipment.

In addition to the food service areas, filter housings often are applied to other parts of the building on individual ice machines and drinking water fountains. Drinking water fountains use either a single 10-inch housing containing a cartridge that improves taste and odor or, where lead contamination is a concern, a cartridge that reduces lead in addition to improving taste and odor.

Laboratories Use a Broad Range of Housings

Most laboratories will use different housings than would be used in other applications. Because labs generally require ultrapure water for testing purposes, they require special housings made of all natural polypropylene. These housings can be specified with either double open end (DOE) cartridges for standard sediment, softening and deionization cartridges or single open end (SOE) with 222 or 226 O-ring seals for absolute micro- or ultrafilters. Laboratories also may require filter housings to filter other fluids in which chemical compatibility issues could become a factor. If chemical compatibility is an issue, each application must be addressed individually. This may result in a broad range of filter housings located in the same area but filtering different fluids. There also may be systems featuring multiple filter housings performing a variety of functions such as sediment, softening and mixed-bed deionization.

Laundries Require Treated Water to Protect Fabrics and Machinery

Water used in commercial washing machines must be free of rust particles to prevent damage claims and to extend the life of the equipment. High levels of chlorine in the water also can cause damage by bleaching expensive clothing, causing it to fade. To keep up with the great demand for water and high flow rates, laundries generally use a large housing or multiple housings. A duplex system may be installed to eliminate the down time associated with shutting off the water for cartridge changes to a single housing. Temperature also may be a concern if hot water is to be filtered. Stainless steel and multiple cartridge stainless steel housings generally are preferred. Smaller laundries can use up to four 20-inch by 4-inch OD cartridges and housings in parallel systems for flow rates up to 80 gallons per minute.

Filter Housings are Used in a Wide Range of Industrial Applications

Industrial filtration applications can range from small batch filtration for paint applications to large duplex systems that continuously produce water to reconstitute juices. There are many applications for standard and large diameter filters and housings such as general sediment filtration of water, oil absorption, chemical filtration and providing chlorine free water for food processing. Gauges that measure pressure, pressure drop and total gallons filtered often are used to indicate and predict when cartridges should be changed. The housing sizes used in industrial applications are likely to vary because of the need for

differing flow rates, the range of contaminants and the varying temperatures of the fluids being filtered. Generally speaking, industrial applications use stainless steel housings, multiple cartridge stainless steel housings, bag vessel assemblies or hot/high pressure housings. These are the applications in which chemical compatibility may be an issue that can limit the choices available.

Chemical plant applications present a host of challenges. The primary concern is the chemical compatibility between the fluid being filtered and the cartridges, housings and other components.

Waste Oil Adsorption

Oil absorption is a growing market. A standard polypropylene 20-inch by 4-inch OD cartridge and housing with an oil adsorption cartridge can be used to filter the final wastewater from gas and oil facilities, bilge water from leisure or commercial shipping, surface runoff (truck stops and airports), auto service stations, machine shops, industrial processes, factory and repair shops, and car and truck washes. Prefiltration will extend the life of the cartridge(s) as will reducing the flow rate to the lowest possible level.

Pressure Drops Across the Housing and Cartridge

Pressure drop in POU applications are not as critical as those in POE or main line applications. POU pressure drops of 20 to 30 psi at one to two gallons per minute are common in under sink water filter systems with Granular Activated Carbon (GAC) cartridges. Since the treated water flows through a separate tap, this pressure drop is not a problem. POE applications on the other hand may require only one to two psi differentials when the cartridges are new and the flow and water pressure are not restricted downstream. This may require the use of larger-than-expected housings or multiple housings in parallel to maintain the required pressure throughout the service life of the cartridges as contaminants accumulate within the cartridge. Some industrial as well as food service equipment applications require minimum pressures to operate properly. Cartridge and housing pressure drop flow tables from the manufacturer should be consulted to determine the clean pressure drops that you can expect.

Inlet and Outlet Connections

Typically the inlet and outlet of the housing matches the pipe size of the location in which it is installed. However, in well water applications where lower water pressures are typical, housings with larger inlet and outlet openings should be installed to minimize additional pressure drops. Housings and cartridges of 10- or 20-inch lengths and 4-inch OD often are used in well water applications. Multiple housings also can be installed depending on the water contaminants being filtered.

How to Ensure Cartridges and Housings Meet Performance Expectations

In recent years many low-cost cartridges and housings have been introduced by small start-up operations and overseas suppliers. While these housings may be indistinguishable in appearance and specifications from the quality products of reputable manufacturers, they may be priced much lower. When you encounter disparities in pricing, it could be an indication that value-added features or differences in quality are behind them. Because these may be important to you or your customer, it is advisable to make a more thorough comparison of the products and factor the results into your purchase decision.

Independent certification of the manufacturer's claims is one of the most important value-added features. Having an independent third party use scientific testing to verify the manufacturer's claims may provide some peace of mind in your ever increasing litigious business environment. Housings may be tested and certified through NSF. Make sure that components you use have received an NSF Standard 42 component listing—the minimum listing required for drinking water applications. This certifies that the materials will not leach harmful contaminants into the water and that the housing passes the minimum structural requirements of 100,000 cycles of 0 to 150 psi and minimum burst of 500 psi or four times recommended operating pressure.

While the importance of NSF certification cannot be overstated, you should remember that tests are conducted on very few samples. To be confident that the product you buy off the shelf performs to the levels of those tested, purchase your housing from a company that is ISO9000 rated. This rating certifies that the manufacturer has met

strict quality criteria for standards in the manufacturing and design process.

It also is important that the cartridges and housing you use are made from the same manufacturer. While cartridges and housings may look alike, there are important differences. Each manufacturer designs its cartridges to fit the exact dimensions of its housings. Mixing cartridges and housings can lead to a bypass of the cartridges' seals resulting in poor performance, which could be a liability burden if health claims are made. This is the reason that NSF tests cartridges and housings together and discourages the use of cartridges built by one manufacturer in the housings built by another.

Features that Make Housings Easy to Install and Use

Many features are now available that make housings easier for you to install and your customers to use. Integral brackets are molded into the cap of the housing, which means you save the time spent installing add-on metal brackets. Built-in brackets are more rigid than the metal brackets, and because they're made from the same material as the rest of the housing, they resist rust and are as chemically compatible to fluids as the rest of the housing.

You also can buy housings with features that make it easy for your customer to know when to change cartridges. Clear housings have been used for several decades so that customers can see when the cartridge is dirty and needs to be changed. One of the drawbacks of clear housings is they can create an environment that supports the growth of algae when the housing is exposed to sunlight, especially when located outside in warm climates.

An alternative to clear housings is using gauges that indicate when cartridges should be changed. You can choose between several different types of gauges. A standard pressure gauge measures the pressure on one side of the housing. By using two of these simple pressure gauges, one on each side of the housing, the differential pressure easily can be calculated by subtracting the outlet pressure from the inlet pressure. Any easier way to determine the differential pressure is to use a differential pressure gauge, which takes the math out of determining when to change the cartridge. One example of an easy-to-read gauge is a color change differential pressure gauge. Either a green or a red color is shown to indicate when the filter needs to be changed. Another type of differential pressure gauge uses a needle that points to one of several colors from green to yellow to red to indicate the condition of the cartridge. A filter change is indicated when the needle is in the red area of the gauge.

Manufacturers Are Good Sources of Application Information

Manufacturers of quality products maintain technical support departments of highly trained specialists to assist customers in selecting and installing their products. If you have any questions about the proper application of a cartridge and housing combination, do not hesitate to call the manufacturer of the products you purchase to get their recommendations. It could save you time, money and an unhappy customer. WQP

For more information on this subject, write in 1013 on the reader service card.

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