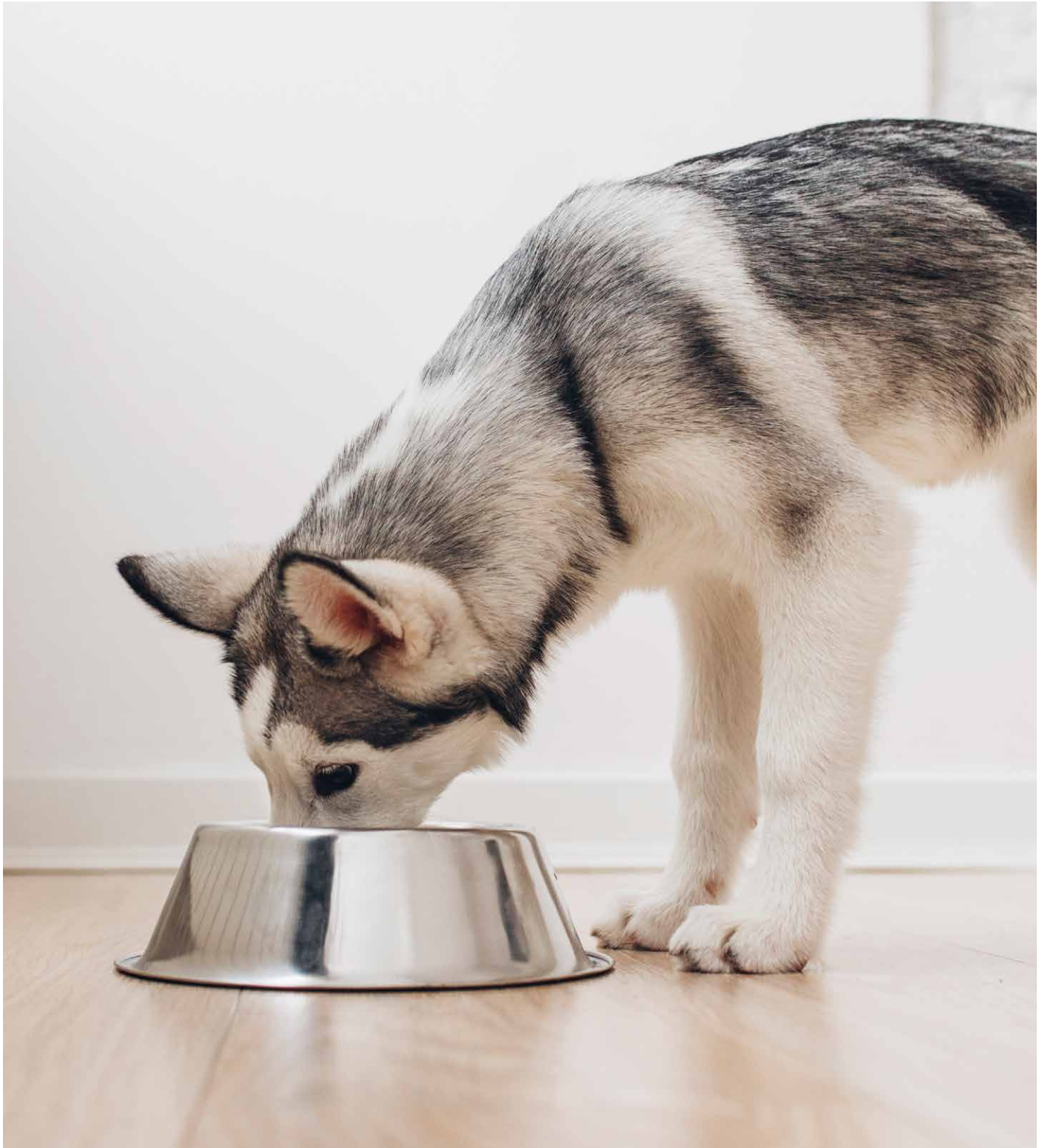




The Premiumization of Pet Food Requires New Manufacturing Best Practices

Process filtration helps pet food processors stay competitive



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Not so long ago, “humanizing” pet food offerings by making them more appealing to pet owners was a point of differentiation. Now, premium and “natural” pet foods are no longer niche — they are increasingly preferred by consumers, leading many pet food manufacturers to transition to more holistic recipes to optimize margins and even avoid losing market share. Manufacturing processes that help maintain product shelf life and, ultimately, quality, are coming into focus in the drive to remain competitive.

Following the Lead of Human-Food Processors

Whether it’s a dry, wet, fresh, frozen, or dehydrated product, processors encounter different challenges to maintaining product shelf life and quality. Of utmost importance are:

- Minimizing microbial growth
- Minimizing contamination
- Controlling pH levels

But many of the additives traditionally used to address these challenges are now perceived as harmful and must be removed or replaced in response to consumer demand. To compensate for these changes, adopting best practices found in the human food processing industry can help maintain product freshness and quality, with fewer traditional additives.

In fact, many large pet food processors are already going beyond compliance with Food and Drug Administration (FDA) regulations that currently govern pet food processing. Companies are paying attention to voluntary standards developed for human-grade food processing. Following guidelines such as Safe Quality Foods (SQF), Canada Gap, and British Retail Consortium (BRC), can help pet food processors minimize contamination, and differentiate their pet food from competitive products.

A key part of meeting these standards is filtering the air, steam, and liquids used in food processing. While filtration cannot completely remove all possible contamination from the surrounding environment, it can be just as important as sourcing high-quality ingredients to help manage contaminants before they move downstream into food or onto food-contact surfaces.

GMPs include Filtration in Three Critical Areas

As most pet food manufacturers know, any processing utilities that come into direct contact with a product must be examined as part of an HACCP (Hazard Analysis Critical Control Point) program that ensures product safety. These utilities include steam, ingredients, and processing water as well as compressed air and gases. Filtration of these processing utilities is a proven measure in helping reduce contamination, including aseptic processes, to meet Good Manufacturing Practice (GMP) goals and comply with food safety, quality, and legal requirements.

Specifically, filtration is important at three critical control points:

- 1. Points of origin:** Where your facility brings in or generates air, steam, or liquid, such as your utility or bulk storage room;
- 2. Food contact points:** Farther downstream, wherever the air, steam, or liquid touches food or food-contact surfaces; and

3. Final opportunity points: “Last chance” locations to catch impurities that could irreversibly damage your product if they survive into packaging.

Redundancy in filtration is important to help reduce the possible risk of different types of contamination at different points of the process. In addition, this “step-down” or staged method of filtration is cost-effective since pre-filters on points of origin remove larger contaminants that would otherwise cause wear on more costly point-of-use filters downstream.

Best Practices for Filtering Water, Steam, and Compressed Air

1. Filter water up to ingredient water.

Ingredient water is typically sourced from a municipal water supply. Water filtration usually begins here, upstream, with the retention of suspended solids such as sediments and particulates. It is needed at the start of the process to help protect downstream treatment steps.

Later in the process, ingredient water comes in direct contact with, and may become part of, the final product. Ingredient water can be filtered to meet product and process demands, including nominal to absolute rated liquid filter medias.

Water in contact with product, post pasteurization, should be filtered to remove any potential harmful bacteria before packaging.

For more tips on water filtration, download our [“Water Filtration Applications for Food & Beverage”](#) guide.



LifeTec™ P-GSL N filter element

2. Support shelf life and product consistency with properly filtered culinary-grade steam.

While the high temperatures of steam used to sterilize product contact surfaces will help reduce bacterial growth, other kinds of contamination can occur. Particles, rust, and scale can be present in system equipment, and these can pose an even greater risk when steam is recirculated.

Filtration is essential on steam lines, and the choice of filtration methods is critical, especially in high-pressure, high-temperature applications.

The traditional filtration media for steam has long been sintered carbon, an option in use since the 1950s. Carbon can be suitable in temperatures up to 260° C / 500° F and pressures to 27.5 bar / 400 pounds per square inch gauge (psig).

However, with a sandpaper-like texture, some granulated carbon tubes can shed carbon particles during use. By contrast, high-grade stainless steel tolerates high pressure and is rated for use up to 371° C / 700° F. Stainless steel filters can also be ultrasonically cleaned up to six times before replacement.

In pet food processing, where steam is injected into product or used to clean and sterilize food processing equipment, it is best practice to use culinary-grade steam. The premier standards organization for food processing, 3-A, defines culinary-grade as steam filtered to remove 95% of particulates two microns and larger. In fact, Donaldson LifeTec™ P-GSL N filters are 99.9% efficient in that range, exceeding 3-A requirements.

The standard also requires stainless steel filtration, because the media is non-fiber releasing and is fabricated without binders, adhesives, additives, or surface-acting agents that can leach into the process. Typically, two sets of steam filters are recommended on a culinary-grade steam line: Pre-filtration to remove particulates 25 microns or larger, followed by the 2-micron point-of-use filters.

If your steam system has a regulatory challenge, it pays to consider stainless steel steam filters. They are durable,



standards-compliant, can be regenerated several times, and thereby support energy savings. While carbon tube filters have a lower initial cost, the return on investment for stainless steel LifeTec P-GSL N filters can be significant.

3. Remove impurities from compressed air used to dry equipment after wash downs to reduce risk of contamination and comply with best practices.

Filters on a compressed air line help remove potential contaminants, including particles or lubricants shed by the compressor, and condensation that occurs as the air cools. Because moisture allows bacteria to breed, keeping air clean and dry is crucial.

You can learn where to install compressed air filters in your process by consulting ISO 8573-1, the international standard for clean, dry air. Once you've determined the proper locations and micron sizes for the filters you require, there are other things to know before making your filter purchases. When purchasing filters, make sure the manufacturer you choose observes all industry standards that are important to your process and that their testing is sufficient for your needs.

Here are some tips to help you select an appropriate filter:

Look for Meaningful Micron Ratings

Unless you're well-versed in filtration, some filter labels can be challenging to understand. For example, there are elements on the market that claim to capture 99.999% of particles at 0.01 micron.

While those claims may sound impressive, it's not the physical size of the pathogen that poses the risk. It's the presence of the pathogen itself. Most organisms of concern — primarily pathogens — are larger than 0.2 microns. Filter media that has been third-party validated at 0.2 microns will help provide suitable filtration for contact with food product.

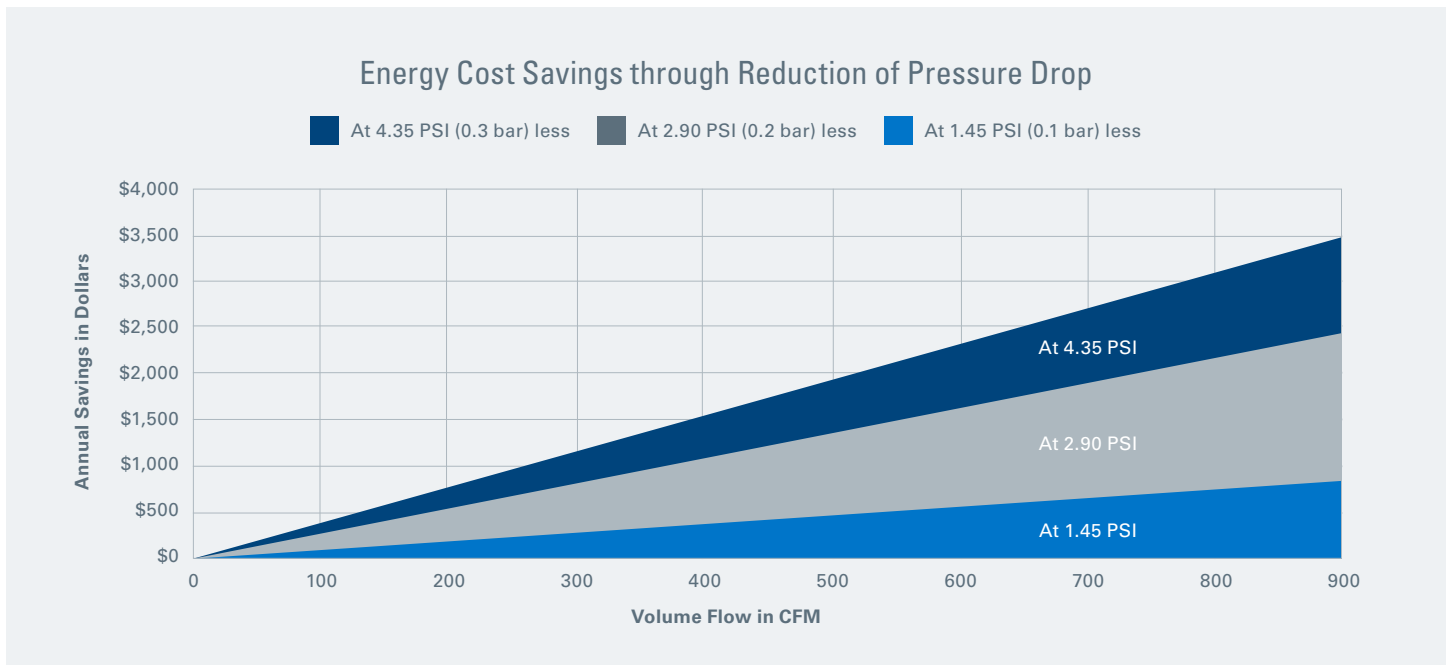
Donaldson LifeTec P-GSL N filters are 99.9% efficient in the removal of particulates two microns and larger, exceeding 3-A requirements.

When selecting a series of compressed air filters, it is important to qualify if the compressed air will be product-contacting or not. Filter performance that is traceable to ISO 12500 standards for particle and oil aerosol removal will help maintain your site’s best practices. That performance should also provide the needed prefiltration prior to the point-of-use (sterile) filter which will help filter product-spoiling microorganisms.

Insist on Filters Tested in Wet Conditions

The compressed air filter you select should continue to work after it collects oils and condensation from the airstream. As moist air passes through the filter, liquid surface tension can build up and restrict airflow — much like breathing through a drinking straw during exercise. The more restrictive the filter, the more work (and energy) is required to move the air.

Restriction is measured in “differential pressure” or dP. When you’re comparing filters, look for one that’s tested for dP in a wet operating condition and specified by ISO standards. Some manufacturers only test their filters dry, which fails to account for the liquid surface tension issue. A higher performing filter will have a lower wet pressure drop, and you’ll be able to find this information on the filter’s technical data sheet.



A higher-quality filter provides better airflow, which can reduce total cost of ownership.



Consider Oleophobic and Hydrophobic Media

Because airflow is so important, aim for high-quality media inside the filter. The best materials are depth-loading and moisture-resistant, meaning they can draw liquid from the air stream and quickly drain it away. Donaldson's LifeTec series of compressed air filters are constructed with oleophobic and hydrophobic medias that shed oil and water, respectively, and help maintain a drier state. Their borosilicate media is free of binding resins (glues) that are common in traditional filters and can tend to block airflow.

Higher-quality filter media can support to a lower total cost of ownership. Consider just one filter designed for airflow of 1,000 cubic feet per minute (approximately 28,300 liters per minute). Every additional pound per square inch (psi) of pressure required to overcome restrictions in that filter adds an estimated \$1,000/year in energy costs. Over a typical filter life of 10 years, a higher-quality media in that one filter location alone could save the business \$10,000.

For a compressed air filtration system that works economically and effectively, consider the LifeTec P-SRF line of sterile air filters. Their advanced technology helps you manage operating costs while supporting the quality of air used in product processing and packaging.

To learn more, visit donaldson.com/process



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