

Explained below are a few examples of how many of today's common production lines can benefit from using filtration.

STEAM

The heat energy contained in steam is also a catalyst for the formation of rust, scale and corrosion. It can also accelerate degradation of many plastics and elastomers. Although steam is nearly sterile because of its high temperatures, there remains a need for filtration to remove inert and particulate matter. Donaldson steam filters will protect critical applications.

- **Sterilizing Steam** – Filtered steam can be used to sterilize the sterile air filter and other plant equipment.
- **Cooking or Culinary Steam** – Culinary grade steam is essential to maintain integrity of a product and associated equipment. Steam can be used for cooking or direct injected into a product. Filtration saves money because:
 1. Filtered steam is a quality assurance measure that protects against product recalls.
 2. Filtered steam protects against unexpected downtime imposed by safety inspectors, regulators, or audits.
- **Heating steam** – Steam can be used indirectly for heat transfer. The efficiency of heat exchangers or heat transfer equipment and the speed in which they operate is dependent on the condition of the steam. Most metals are very good heat conductors, but when they become coated with scale or debris, the exchange efficiency will drop drastically. Filtration saves money because:
 1. Increased heat transfer efficiency speeds production rate.
 2. Less frequent servicing/replacement of exchangers.
 3. Less energy required during production.



PROCESS & STERILE AIR

The combination of heat, moisture and oil in dark compressed air pipes is the ideal environment for microbial growth. Certain applications need a bacterial retentive filter in addition to the compressed air requirements.

- **Tank Ventilation or Blanketing** – When product is moved into or out of a storage vessel, an equivalent exchange of air volume must replace the product. Filtration saves money because there is less wasted product caused by microorganism contamination.
- **Packaging Air** – Compressed air that comes in direct contact with the product or product contact surfaces need to be sterile. PET bottle blowing and aseptic packaging conditions require sterile air.
- **Drying Air** – Compressed air for drying process pipes after CIP. The CIP/sterilization cycles are done to purge the system of product and microorganisms. Drying the system with air that is not sterile will leave a critical process susceptible to contamination from the very start of production. Many bottling and canning procedures use sterile air to dry containers after cleaning and before filling.
- **Aeration** – Air that is directly injected, entrained, or sparged, such as in an ice cream freezer or beer wort aeration.
- **Pigging** – Pigging is a process that helps recover product that would otherwise be wasted and ensures lines are clean when changing products being manufactured.



COMPRESSED AIR

Compressed air is unique in that depending on the application, the concern is usually with one of three types of contaminants: particles, liquids, and gasses. Compression of air/gas will increase the concentration of all contaminants, making filtration even more important.

- **Machine Tool Air** – Machine tools require air that is free of dirt and water. Dirt causes wear of precision components that will decrease the tools operational efficiency. Water has poor lubrication properties and will wash away protective oils causing metal-to-metal contact. Filtration saves money because:
 1. Less frequent tool replacement
 2. Lower energy costs by maintaining high mechanical efficiency.
- **Instrumentation & Control Air** – Signal air used for actuators, solenoids, regulators, and flow controls needs to be free of oil, water, and dirt. Instruments are typically controlling a large and valuable product batch; any error or malfunction could be disastrous. Filtration saves money because:
 1. Less frequent servicing and calibration of the instrumentation.
 2. Prolonged instrumentation life.
 3. Protection from occurrence of critical faults that cause catastrophic events.
- **Spraying Air** – Spray finishes like polyurethane, lacquer, enamel, and powder coats are very sensitive to air quality. Moisture and oils will affect the adhesion of most finishes, and dirt will show through to ruin an otherwise perfect job. Filtration saves money because:
 1. Less re-work due to unacceptable quality, less material waste.
 2. Prolonging spray gun life by protecting needle/seat from wear.
- **Laser Cutting Machines** – The laser needs to be surrounded by dry, filtered air as it passes through internal mirrors and optics to ensure clean reliable cuts. Lasers will ionize vapors in the compressed air and cause them to plate out on mirrors and lenses reducing the efficiency and eventually leading to replacement. Filtration saves money because:
 1. Less scrap caused by unacceptable cut quality.
 2. Lower and less frequent laser servicing costs, reduced downtime.



LIQUID

Liquids may become very dirty in a short time because unlike air, the relatively high viscosity of liquids will make a liquid hold onto particles without falling out of suspension. Donaldson's extensive liquid product line contains dozens of media grades and housings that will fit your needs.

- **Process Water** – Process water can indirectly come in contact with the final product, such as water used for rinsing bottles or rinsing after chemical disinfectants.
- **Ingredient Water** – Ingredient water comes in direct contact with the final product, such as water that becomes part of the final product. This water can be filtered down to sterile grade using Donaldson PES membrane elements.
- **CIP Solutions** – Clean in Place (CIP) solutions can be monitored for pH, filtered, and re-used in many applications rather than treating and sending the water to drain.
- **Final Product** – Filtration of final products (e.g., beer, wine, olive oil or bottled water) or aqueous solutions can be done using Donaldson's liquid filtration.



Important Notice

Many factors beyond the control of Donaldson can affect the use and performance of Donaldson products in a particular application, including the conditions under which the product is used. Since these factors are uniquely within the user's knowledge and control, it is essential the user evaluate the products to determine whether the product is fit for the particular purpose and suitable for the user's application. All products, product specifications, availability and data are subject to change without notice, and may vary by region or country.



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