

Mitigating microbial contamination risk in food processing



Microbial contamination is an issue in food and beverage processing.

Bacteria, mold, fungi, yeast, and viruses can propagate in the air and on surfaces. Their presence poses sanitation, production, as well as occupational health and safety concerns. Contamination issues challenge productivity, output, and quality control. Even with the best sanitation practices, "hot spots" exist in every industry. Typical sanitation methods need more consistency and efficacy to guarantee that your business is not at risk.

Pyure Dynamic Protection® offers active air purification solutions that can be easily installed and combined with existing sanitation programs, providing significantly cleaner air and surfaces in any size of facility.

Benefits of a Pyure solution :



Cost savings

- Less additional cleaning labor and chemicals
- Reduction in contaminated product



Air & surface hygiene

- Reduced surface bacteria, yeast and fungus
- Improved air quality
- Mitigate staff viral transmission



Operational efficiency

- Less production interruption & downtime
- Improved sustainability and environmental impact



Brand protection

- Risk of recalls and reputational damage
- Supply chain confidence
- Consumer trust



Replicating nature to deliver safe and effective cleaning.

Pyure produces the same natural cleansers present outdoors in the same concentrations — ensuring effective purification of air and cleaning of surfaces in occupied spaces.

What Pyure treats:

Bacteria

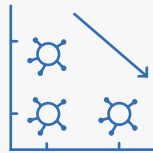
Yeast

Mold

Fungus

Virus

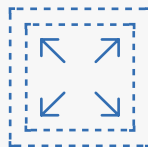
Why Pyure is better:



Provides superior performance in reducing microbial loads in the air and on surfaces.



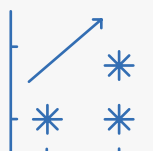
Runs continuously 24/7 while treated spaces are occupied.



Treats any size space with the same efficacy.



Delivered through an existing air handling system or installed as a stand alone solution.



Improves the effectiveness of existing cleaning and sanitation protocols.



Proven to reduce microorganisms in the air and on surfaces.

Reduction in air

PATHOGEN	REDUCTION	TIME
MS2 (simulant of RNA viruses ie. Corona)	99.9%	30 mins
	99.999%	90 mins
Phi-X174 (simulant for DNA viruses ie. Smallpox)	99.9%	30 mins
	99.99%	90 mins
Staphylococcus epidermis (Gram-positive bacterium)	99%	30 mins
	Undetectable	90 mins
Erwinia herbicola (Gram-negative bacterium)	99%	30 mins
	99.99%	120 mins
Aspergillus niger (black mold)	99.9%	30 mins
	Undetectable	90 mins
SARS-CoV-2 (COVID-19 virus)	99%	20 mins
	Undetectable	80 mins

Reduction on surfaces

PATHOGEN	REDUCTION	TIME
Escherichia coli	99.99%	180 mins
Salmonella enterica	99.97%	180 mins
Listeria monocytogenes	98.6%	240 mins
Staphylococcus aureus	99.98%	360 mins
Vancomycin-resistant enterococcus (VRE)	99%	360 mins
Bacillus Subtilis	99.99%	48 hrs
Candida Albicans	99.99%	48 hrs
Aspergillus Niger	99.99%	48 hrs
H1N1 Influenza virus	99.999%	360 mins
Murine norovirus	99.99%	360 mins
SARS-CoV-2 virus	99.999%	120 mins

Case studies — Meat processing plant



Watch this
customer's video
testimonial:

[pyure.com/
meat-plant-video](https://pyure.com/meat-plant-video)

Problem

Periodic testing of various surfaces revealed elevated levels of microorganisms, which meant a potential threat to the spread of foodborne illness. With subsequent increases in the number of recalls, they put in place additional sanitation measures requiring longer and more frequent shutdowns. The addition of third-party sanitation services was costly and provided inconsistent results that left the company with higher cleaning costs and minimal reduction to the problem.

The company was looking for a cost-effective way of reducing microbial levels in air and surfaces to ensure food safety and reduce business risk and shutdown time. It had considered fogging with peracetic acid and treating with chlorine dioxide gas but felt both approaches had significant drawbacks: (i) they could not be deployed in occupied spaces, so they were not 24/7 solutions and required production shutdowns; and (ii) they degraded materials (plastics, rubbers, metal, electronic components) used in the facility.

Pyure impact

A Pyure controlled solution was installed into the ductwork of the air handling system to treat the entire building (265,000 sq ft). Wall mounted units were installed in spaces that did not have ducted air supply. The system provided 24/7 treatment of air and surfaces.

Up to 2-log reduction of microorganisms was detected on various surfaces (swabs and Petri dishes), including inside the ductwork. Employees reported that the facility smelled fresher and that there was a significant reduction in bothersome odors.

The consistency and effectiveness of in-house sanitation efforts vastly were improved, resulting in consistently low levels of microorganisms detected, even in hot spots.

Customer benefits

The addition of the Pyure solution allowed the company to stop using supplemental, third-party sanitation services and decrease the amount of time and labor dedicated to the cleaning process.

No recalls were experienced after implementation, and fewer are anticipated due to the lowered levels of microorganisms — saving direct and reputational costs.

Ten yearly production days were added by eliminating unscheduled sanitation shutdowns from elevated microbial counts and lower frequency cleaning of air ducts.

The payback was estimated to be less than 12 months, based solely on cost reductions and increased production time, without factoring in the value and benefits of reduced business and reputational risk.



Case studies — Beverage processing plant

Problem

The company produced canned and bottled beverages in a high-speed line rated for thousands of units per minute. During the filling process, there was spillage on the line. Given the nature of the beverage and the ambient plant conditions (high temperature and humidity), the spillage led to rapid microbial growth on the filling lines.

The microbial growth necessitated/required the filling lines to be shut down every few days for an 8-hour sanitation shift to remove the biofilm buildup and sanitize the equipment. The cost of an 8-hour shutdown was estimated to be over \$75,000 in contribution margin.

Pyure impact

A Pyure controlled solution was installed on the shop floor near the filling lines, with its own blowers to direct the flow of natural cleaning agents over the line.

With the Pyure solution running, the company saw a reduction of over 90% in the biofilm buildup and the levels of microorganisms detected on the filling lines. The company subsequently reduced the quantity of harsh chemicals used, which reduced VOC levels within the plant.

The downtime required to clean the canning line decreased from 8 to 4 hours, while the frequency of line shutdowns was reduced from every 4 days to every 6 days.

Customer benefits

Adding the Pyure solution allowed the company to increase the 'uptime' of the canning and bottling lines while decreasing the costs associated with the chemicals used in its cleaning activities.

Reduced volatile organic compounds (VOCs) and microbial loads improved the occupational health and safety of employees working in the facility.

The reduction of harsh cleansing chemicals has extended the life of the filling line equipment.

Based on the contribution margin generated from increased uptime and cost savings associated with less intensive sanitation activities, the ROI was estimated at three months.



Case studies

Watch this customer's video testimonial:

pyure.com/odor-elimination-video

Dairy farm

 **MILTRIM FARMS, INC.**

Problem

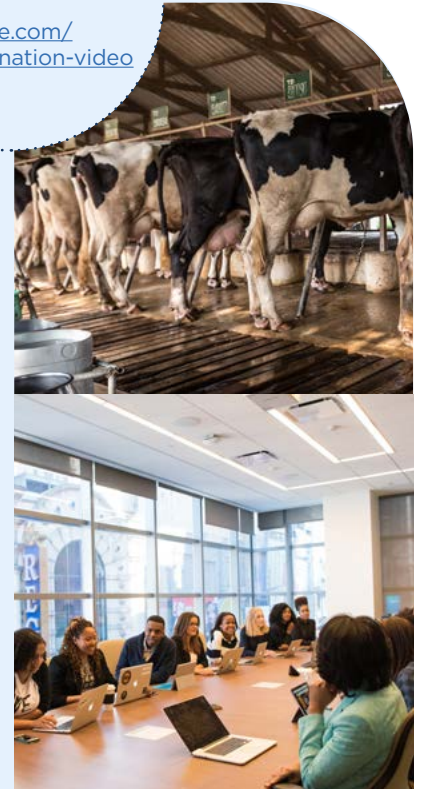
A large dairy farm with state-of-the-art equipment had a conference center adjacent to the production facility. The center had a reception area, kitchen, bar, restrooms, and business offices with 16 foot ceilings. Though the conference center had its own air handling system, it was plagued with a persistent, pungent manure smell.

Pyure impact

Pyure induct devices were installed in the air handling unit to treat the entire center. Following the installation, the manure smell disappeared. While the smell outside was strong, the conference center had a fresh and odor-free smell, resulting in high guest satisfaction.

Customer benefit

The customer could use the center more extensively and rent it out for events. Visitors commented on the absence of odors, contributing to a more positive guest experience.



Indoor farming

TRICHOME

Problem

An indoor farming operation was experiencing fungal contamination. The high humidity, temperature, and nutrient-rich environment used in hydroponic crops were believed to be the cause. The contamination was proving to be a vector for other forms of contamination and required extensive additional sanitation practices.

Pyure impact

A Pyure controlled solution was installed into the air handling system's ductwork to treat the growing rooms and other areas of the facility. Pyure treatment significantly reduced the quantity of fungus found on plant surfaces, in the media and on the roots, such that the fungus was barely visible.

Customer benefit

The customer found that there was a small increase in yield, improvement in the overall quality of the crop, and much lower microbial levels at the end of the growing process. This, in turn, allowed the customer to reduce the intensity and duration of its sanitation activities between growth cycles, leading to substantial cost savings. The reduction in fungus levels lowered the risk of another contaminant being introduced into the facility and causing a catastrophic loss of production.

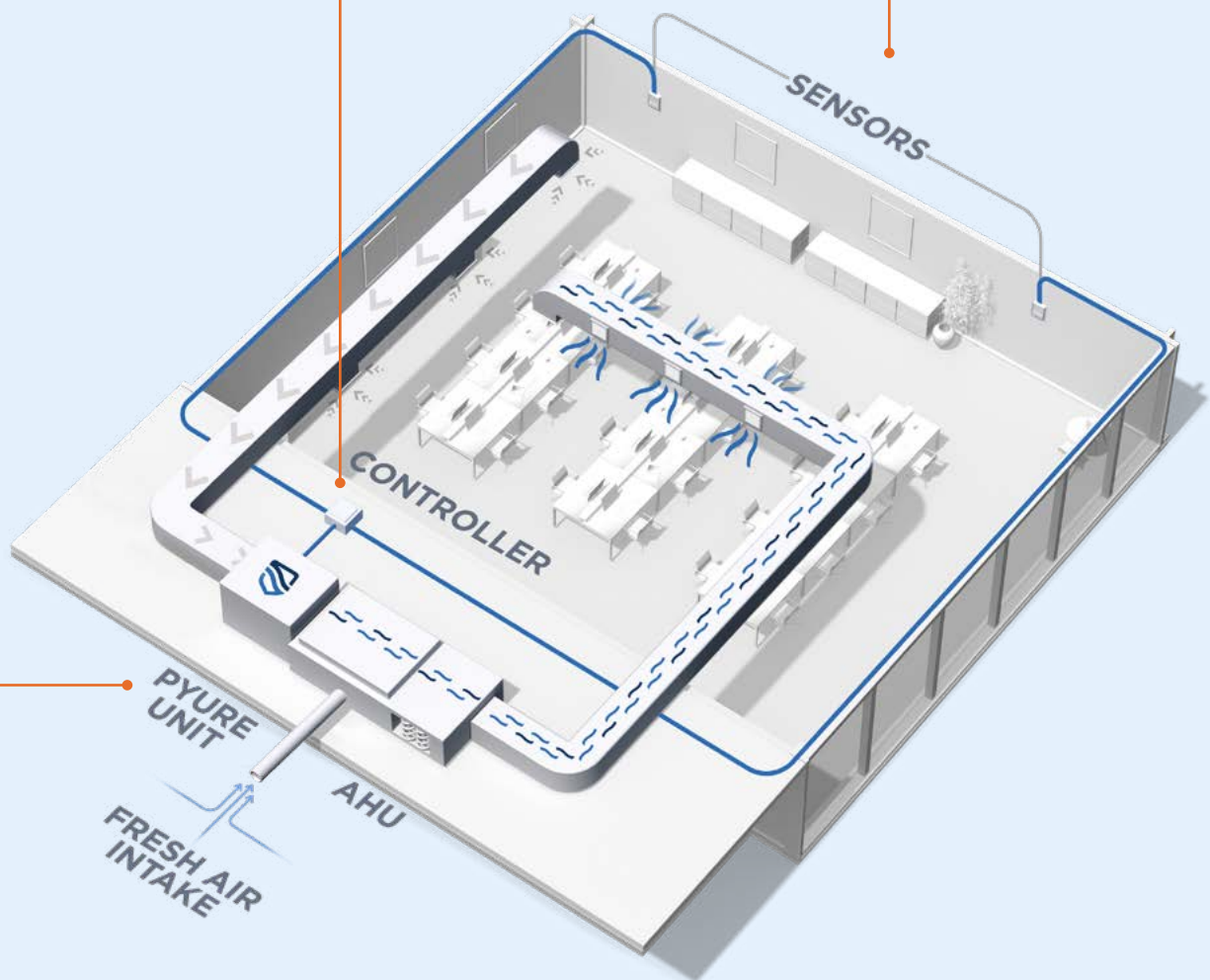


Optimized air quality.

Our completely scalable and sensor driven systems offer customizable controls and helpful data analysis to measure and optimize performance. The Pyure system continuously adjusts as the demand for purification changes over time, ensuring optimal safety, performance, and energy efficiency.

Controller responds to sensor readings and modulates the Pyure device to treat the real-time air quality.

Sensors provide real-time reading to controller.



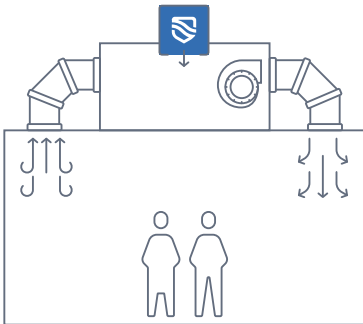
Pyure unit works with single or multiple air handling systems.

Hassle free installation and upkeep.

Pyure solutions can be installed with or without an air handling system.

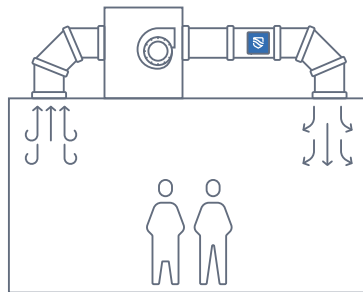
Centralized air handling

- Large rooftop units
- Large indoor units



Decentralized air handling

- Smaller units inserted in ducts throughout the building
- Wall mounted units where there is no ductwork



No or limited air handling

- Large stand alone units with blowers
- Portable, stand alone units
- Wall mounted units



Pyure makes maintenance easier.

Little impact on existing handling system

- Minimal increase in airflow resistance
- Virtually no extra wear and tear
- Marginal impact on energy consumption

Low frequency maintenance and a system that helps clean

- Annual replacement of UV optics and sensors
- Periodic cleaning of filters (frequency depends on the dust and oil concentrations in the air)
- Reduces the frequency and intensity of duct decontamination

Controlled solutions.

Designed to treat even the largest of spaces, our controlled solutions work with new and existing air-handling systems. Sensor-driven with customized controls that respond to real-time data.



Pyure IDI™ Purifier Series

A versatile solution that fits into the ductwork of any air handling system. Connect with more IDI units to increase the treatment area.

TYPE: Indoor, inline with HVAC

NOMINAL TREATMENT AREA: 3,000* sq ft



Pyure MVP16™ Purifier

Integrates into a new or existing air-handling system where space is limited and provides more cleansing power than induct systems.

TYPE: Indoor, inline with HVAC

NOMINAL TREATMENT AREA: up to 85,000* sq ft

BLOWER: optional



Pyure MVP24™ Purifier

A heavy-duty unit built with a reinforced shell suitable for outdoor applications.

TYPE: Rooftop, inline with HVAC

NOMINAL TREATMENT AREA: up to 200,000* sq ft

BLOWER: optional



Pyure MVP48™ Purifier

Our most powerful system, the MVP48™ purifier is ideal for the largest installations.

TYPE: Indoor, inline with HVAC

NOMINAL TREATMENT AREA: up to 450,000* sq ft

BLOWER: optional



Insight Edge™ Controllers

Controllers modulate purifiers based on feedback from the sensor system, creating an efficient method of treating pollutants in the space.



Sensor system

Air sensors placed throughout the environment send readings to the sensor system which provides constant real-time feedback to the control system.

Non-controlled solutions.

The simplest to install, our non-controlled products can be added to air ducts, wall mounted or plugged into a standard outlet. Switch them on for instant air purification and surface cleaning in small to medium size environments.



Pyure Mini® Purifier

The Mini series is designed to fit in with its small proportions, modern design and low noise levels. This makes it ideal for cleaning and deodorizing air in offices, waiting rooms or any other small commercial space.

TREATMENT AREA: up to 500* sq ft



Pyure IDU™ Purifier

The IDU purifier is a duct mounted purifier that is easy to install and requires only an electrical connection for operation.

NOMINAL TREATMENT AREA:
2,000* sq ft (model dependant)



Odorox® HRC06™ Air Purifier

The HRC06 purifier is wall mounted and can modulate its output to purify and deodorize commercial and industrial applications.

TREATMENT AREA: up to 6,600* sq ft



Odorox® Slimline™ Purifier Family

Rugged purifiers with a durable exterior beneficial for public spaces and commercial or industrial installations that require a portable unit.

TREATMENT AREA:
up to 900 - 1,500* sq ft



Odorox® Boss™ Purifier

Designed for tough environments, the Boss purifier is suited to applications like remediation following fire or water damage. It's also ideal for areas with frequent movement and contact.

TREATMENT AREA: up to 2,500* sq ft



Odorox® Boss XL3™ Purifier

By adding an external fan to provide greater air movement, the Boss XL3 purifier is ideal for spaces that have been affected by smoke, flooding, wastewater, and other air pollutants.

TREATMENT AREA: up to 3,250* sq ft

Let's discuss a solution tailored to your needs or plan a trial.

At Pyure, we're dedicated to finding the right solution for solving your challenges and delivering the outcomes you need.

Get in touch to find out more about how we can help.

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Who we work with:



pyure.com | [@pyureco](https://twitter.com/pyureco)

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