



Automated Containment Systems Platform Brochure



Clean air solutions

Protecting your Environment with Next-Generation Technology



Protection. That's our end-goal at Camfil Farr. Our focus is on delivering you the next generation of air filtration technology that safely provides clean air to your employees. With the constant threat of harmful contaminant leakage from secure laboratory settings, Camfil Farr has concentrated on developing clean air solutions that will efficiently and effectively protect outside surroundings and nearby personnel from harmful microorganisms and biocontaminants. Our systems ensure that the highest level of functionality is constantly achieved; because at Camfil Farr, delivering clean air is our top priority.

Experience. Is what Camfil Farr brings to your industry. As a world leader in engineering and manufacturing comprehensive air filtration systems, we have invested our research and development capabilities towards understanding the direct demands of your market. We understand the importance of maintaining lab uptime while conducting filter testing and certification procedures. We understand a leak in the HEPA filter exhaust system may likely result in a reportable event that could either delay or shut down research initiatives altogether.

We understand the difficulties of accommodating for containment system real-estate requirements. At Camfil Farr we understand. And we have the solution.

Results. Are what we deliver. Automated Containment Systems are advanced biocontainment solutions designed to specifically integrate into BSL-3, BSL-3Ag and BSL-4 laboratories. Automated Containment Systems take up to 40% less floor space than conventional filtration systems and are engineered to effectively remove microorganisms from the air. The Automated Containment Systems platform incorporates automated housing and filter integrity certification equipment with industry leading HEPA filtration technology resulting in a system tailored to your application. Our team of researchers and engineers collaborated with industry and government professionals to design an automated certification system, reduced in size, that surpasses top-level laboratory requirements. We asked the right questions, and we developed the all-inclusive system that delivers the answer –

Automated Containment Systems.



Advancing the Industry with Secure Automated Containment Systems

Small and accurate, Automated Containment Systems utilize proprietary scanning technology to ensure precise filter certifications – every time.

The Automated Containment Systems platform includes:

- A non-intrusive automated scanning system that allows for certification tests to be conducted without having to enter the housing and while labs are in operation¹; eliminating downtime and minimizing the risk of exposure for maintenance personnel or contamination of the adjacent spaces. This results in a significantly lower Total Cost of Ownership.
- All the products in this platform use one of the CamControl filter certification systems to operate the automated scanning mechanisms.

The following pages describe the various products within the Automated Containment Systems platform.

¹Optional components required. Refer to our HotLab Testing option.

The Next Generation in Filtration Technology – CamContain

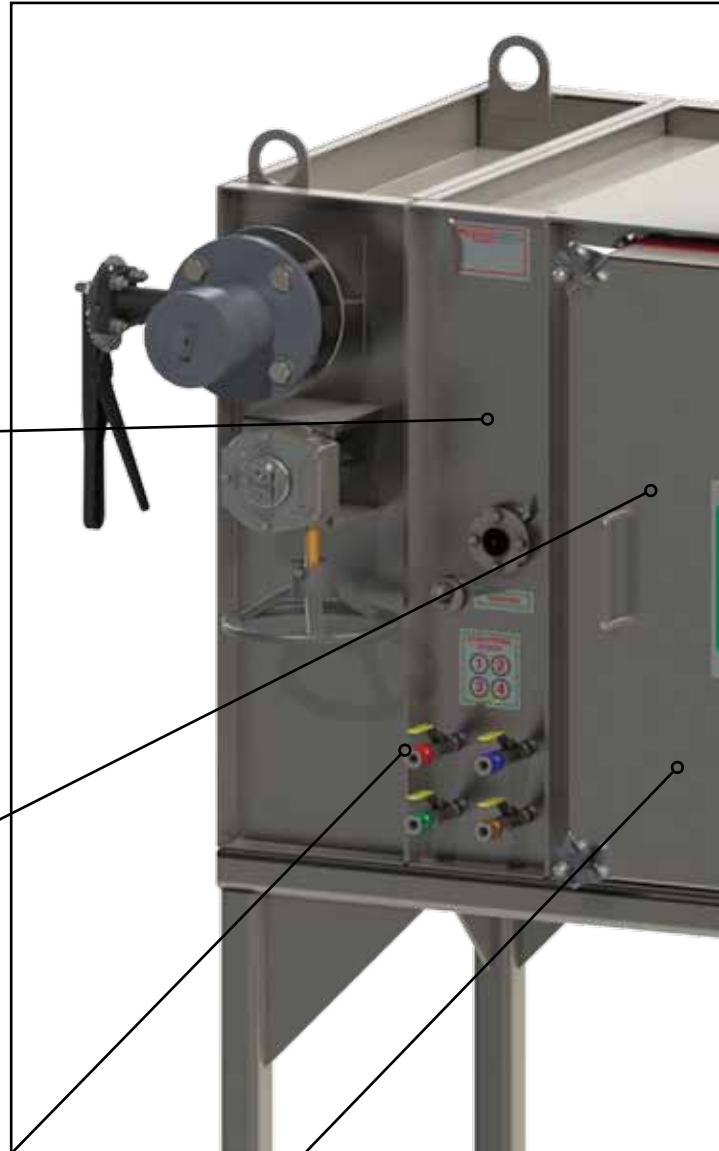
Fully welded, 14 gauge (minimum) stainless steel filter housing. Meets the most stringent global standards for filtration systems. The CamContain containment housing is pressure decay and seal face tested to assure no biocontaminant and microorganism leaks from the housing or around the filter face. The filter housing can also be adapted for multistage HEPA filter configurations.



HEPA filter and auto-scanning system. When performing in-place scan testing of HEPA filters, including the CamContain HEPA filters, the auto-scanning and certification system utilizes advanced probing mechanisms to scan across the full face of the filter and perimeter of the filter-to-housing seal surfaces without entering the housing (not shown, inside door).



Aerosol sample quick disconnects. In order to ensure correct aerosol sample identification, CamContain features color coded and mechanically keyed quick disconnect fittings.



Filtration access doors. Allows access to the containment enclosure and the installed filter elements. The filtration access doors include memory-resistant silicone gaskets that recreate a positive housing-to-ambient seal when properly secured after each filter change. Both bag-in/bag-out and non-bag-in/bag-out options are available.



Changeout Bag Indicator.¹ Provides a visual indication that a change-bag has not been installed in the unit. This reduces the potential for unexpected exposure.



Linear bio-seal isolation dampers. Linear bio-seal dampers have been designed to ensure the long-term integrity of the system. Validated to be bubble-tight after 15,000 cycles, the dampers require 20 foot-pounds (27.1 Newton Meters) of torque to seal. This is a reduction of approximately 70 percent compared to traditional bio-seal dampers, allowing for more economical operators to be used.



Decon Valve Assemblies. Prior to servicing spent filters, CamContain housings are fitted with decontamination valve assemblies designed to effectively recirculate decontamination gasses throughout the CamContain enclosure. Camfil Farr has conducted numerous trials with various decon solutions and can customize your housing to suit your site's decontamination requirements. We have conducted validation studies using three decontamination agents, hydrogen peroxide (2 methods), chlorine dioxide (3 methods), and formaldehyde (standard method).



Small Footprint. The CamContain filter housing is 40 percent smaller than traditional filtration systems, greatly reducing the amount of space required for installation. Fully welded, pressure decay tested construction ensures uniform aerosol distribution across the HEPA filter.

¹ Available as an option.

The Next Generation in Filtration Technology – HotLab Testing



Laboratory continues operation during routine filter certification.

Perform filter testing while your laboratory is still operating.

Camfil Farr is the only manufacturer to offer filter scanning without interrupting normal laboratory operations. No one else can make this claim. In order to do so, our R&D engineers and technicians developed a means to test installed HEPA filters without the need to shut down the affected laboratory and its associated HVAC system. The potential savings to the owner are considerable.

What does this mean to the laboratory owner?

It means that their lab does not need to shut down just to re-certify its HEPA filtration system. It means that during preventative maintenance filter scanning, the lab and its associated ducting system does not require decontamination. In many cases, this system can pay for itself during the first recertification cycle.

What does this mean to the lab designer?

HotLab Testing changes the way lab planners program their space. Experiments do not need to be stopped to

re-certify filter elements and the laboratory does not need to stop generating money just to test its filters. Programming lab space with HotLab Testing in mind gives the designer more flexibility and allows them to offer real value to their client.



Your Laboratory may be unavailable up to 7 days without the HotLab Testing Option.

How did we do it? We have developed a clean-in-place system module for the CamControl system that decontaminates all the parts of the certification system exposed to air sampled from the housing prior to disconnection of the CamControl system. This safety system prevents cross contamination between other tested filters and housings. It also prevents potential contamination of the lab or the space near the filter housing.

The Next Generation in Filtration Technology – CamVent



For additional information on the CamVent, please see Camfil Farr product sheet 3426-1009.

Compact and accurate, CamVent utilizes innovative scanning technology to ensure precise filter certifications – every time.

The Camfil Farr CamVent is a slim and compact HEPA filter system that is ideal for filtering plumbing vent stacks or as a HEPA filtered tank displacement device. It is well suited as a secondary HEPA filter system for biosafety cabinets. It may be used as a transfer HEPA filtering system to balance system pressure pulses between two biosafety zones.

The Camfil Farr CamVent...

- Replaces larger containment systems in plumbing vents that were once large and cumbersome.
- Provides HEPA level filtration for toxic displaced air from storage tanks that collect liquid wastes from various process points.
- May be applied as a transfer system. Transfer systems minimize pressure pulses that are caused when someone enters a room. Because these rooms are tightly constructed, opening a door may

cause the room pressure relationships of the adjacent spaces to fluctuate. Providing pressure relief minimizes these variable conditions.

- Can be used as a HEPA system for biosafety cabinets in certain applications.
- May include an optional hygienic bag-in/bag-out kit providing an additional measure of security to protect service personnel from handling potentially contaminated filters.
- Allows automated scanning of filters with the non-intrusive CamControl system. By adding an optional blower pack and the CamControl scanning package, non-intrusive scanning of the HEPA filter is possible for in-situ certification. The entire surface of the filter and the media to frame connections are scanned for leaks. The filter may be certified in-situ per IEST-RP-CC-007. The assembly also allows the use of Camfil Farr's optional CamControl family of filter certification systems.

The Next Generation in Filtration Certification Technology – CamContain Ceil

Ceiling Mounted Roomside Exhaust Containment Module With Auto-Scan Testing Capability

The Camfil Farr CamContain Ceil can be used in pharmaceutical, biotech, Biosafety Level (BSL) Labs and medical facilities for critical exhaust applications where interstitial and external space is limited and containment of contaminants is critical.

The standard 24" by 54" size accommodates installation in a hard ceiling or can be adapted for installation in a ceiling grid system. It provides an ideal design solution for retrofit or upgrade of existing spaces to meet more stringent BSL design requirements. The compact design provides BSL capability for applications where standard high level containment systems may not be practical because of space limitations.

The CamContain Ceil XS filter and assembly may be certified with Camfil Farr's non-intrusive Cam-

Control automated scanning system or Motion Control Lite. The portable certification equipment certifies filter performance, filter seal integrity, leak detection, average efficiency, and pressure decay testing. Test data is recorded, documented and transferred to a secure database if the CamControl System is used.

In applications which do not require in-situ filter scanning, the CamContain Ceil XO model provides a zero bypass ceiling-mounted roomside exhaust system designed for on-site overall efficiency testing.

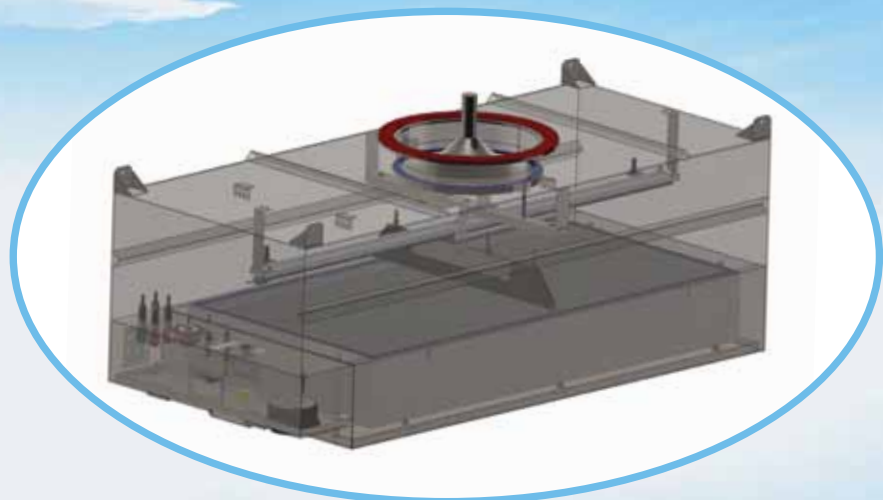
The Camfil Farr CamContain Ceil series modules:

- Provide higher airflow capacity per module than industry alternatives, reducing the number of units (resulting in lower initial cost), maintenance and energy expenditures. The number of air changes within the containment envelope may be increased as a result.
- Are extremely versatile, allowing

for varying height conditions above the finished ceiling. The finish trim allows for dimensional elevation adjustment from 2 to 14 inches below the ceiling surface.

- Are pressure decay tested at the factory to ensure product integrity.
- Reduce operation and maintenance costs. This includes decontamination, damper adjustment, filter testing, and prefilter/HEPA filter service or replacement.
- Allow complete isolation and limited volume control through the use of a linear bubble-tight gel seal isolation damper.
- Accept HEPA and ULPA filters from 99.99% at 0.3 micron to 99.9995 efficiency at MPPS.
- May include an optional hygienic bag-in/bag-out kit providing an additional measure of security to protect service personnel from handling potentially contaminated filters.
- Includes a differential pressure gauge for visual indication of filter pressure drop.

For additional information on the CamContain Ceil, please see Camfil Farr product sheet 3425-0909.



The Next Generation in Filtration Technology - CamControl



Pictured above: Motion Control Lite

For additional information on the CamControl, please see Camfil Farr product sheet 3427-0909.

Automated Non-Intrusive Filter Certification Solutions

The Automated Containment Systems product platform features non-intrusive scanning technology.

This feature is important to the building owner and their safety personnel as non-intrusive scanning virtually eliminates the risk of operator exposure.

The CamControl automates the process of scanning.

Innovative in design and configurable to meet your specific requirements, the CamControl systems increases the quality and accuracy of recertification procedures by reducing exposure to test personnel and adjacent environments, while increasing the speed of in-situ tests.

Reduced risk. Immediate results.

That's what CamControl delivers to your filtration system. The automated operation of CamControl eliminates the need to remove an access door and manually scan a filter.

Inadvertent filter damage is eliminated. User access to the filter module is prevented which can result in damage to the filter media, such as a puncture. Filter damage and risk is reduced since the technician is not required to work through a thick plastic scanning bag.

Testing labor is reduced. Manual scanning may require two test technicians where automated scanning only requires a single technician.

Data is safely and quickly received and results are recorded instantly, allowing for immediate adjustments or repairs to occur.

Depending upon the site's requirements, there are several versions of CamControl to choose.

Best. CamControl.

The Camfil Farr CamControl system allows nonintrusive testing of HEPA and ULPA filters without compromising the containment housing pressure boundary.

The CamControl system is designed to work with the Automated Containment Systems product platform (i.e. CamContain containment housings, Ceil-series, and CamVent). The CamControl automates a scanning probe, installed in an Automated Containment System, and moves at a computer-controlled speed eliminating the possibility of errors associated with manual scanning.

Consisting of three modules, CamControl Valve module, Motion module and Control module, the assembly is easily moved from system to system via a simple dolly cart.

The integral computer system automates all of the operations required to complete a downstream scan of the filter element. This computer evaluates the data received from the scanning probe and reports to the user where leaks are located.

Monitor outputs include aerosol concentration confirmation, penetration results, pressure decay testing and global efficiency testing. The data is permanently archived to the internal tamperproof database, where reports may be generated through a portable format document (PDF). The database and report system are compliant with the requirements of 21 CFR Part 11.

Individual housing data is also logged so the CamControl can be used to evaluate and archive data of any containment level system across different facilities.

The CamControl will save countless hours versus manual intrusive system-disrupting certifications.

Better. Motion Control.

An entry step to the fully-equipped CamControl system is the stand-alone Motion Control module. Unlike the Motion Control Lite module described below, this module fully integrates with the CamControl system.

The technician can certify the HEPA filter in-situ with their own photometer

and aerosol generation equipment. The Motion Control does not directly contact any internal filter housing parts but externally connects to the internal sensors and drive mechanism.

Motion Control module allows the owner to make a modest initial investment towards acquiring the CamControl system.

Good. Motion Control Lite.

The Camfil Farr Motion Control Lite is a scanning mechanism drive control device that facilitates non-intrusive filter certification. Human errors associated with manual scanning are eliminated, and test results are more accurate when compared to other testing methods.

The technician can certify the HEPA filter in-situ with their own photometer and aerosol generation equipment. Motion Control Lite provides the technician with information that identifies the location of leaks and allows the technician to produce a subsequent report based on the testing data. This gives the user complete control of the scanning mechanism, setting the required scanning speed or step rate, and scanning the entire surface of the filter.

The Motion Control Lite does not directly contact any internal filter housing parts but externally connects to the internal sensors and drive mechanism. Motion Control Lite includes three integral safety devices to protect the scanning mechanism from damage. It is also equipped with quick connect fittings to adapt the user-supplied photometer or particle counter to the scan probe ports.

	Motion Control Lite	Motion Control Module	Cam-Control System
Automated Containment Systems Equipment			
CamContain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CamVent	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Ceil X (ceiling-mounted HEPA filter housing)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Ceil WM (wall-mounted HEPA filter housing)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Scannable HEPA Filters			
Camfil Farr Absolute XS HEPA Filter (1000 cfm at 1" ΔP)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Camfil Farr Absolute XH HEPA Filter (1500 cfm at 1" ΔP)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Camfil Farr Filtra2000 (Gel) HEPA Filter (2150 cfm at 1" ΔP)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Camfil Farr Filtra2000 (Gasket) HEPA Filter (2400 cfm at 1" ΔP)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Camfil Farr Megalam CeilX	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Camfil Farr cylindrical Absolute HEPA filter	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Challenge aerosol device requirements			
Requires owner-furnished photometer or particle counter	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Requires owner-furnished challenge aerosol generator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Particle counter included			<input checked="" type="checkbox"/>
Challenge aerosol generator included			<input checked="" type="checkbox"/>
Features			
Accurate filter leak locating	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Repeatability of results	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Non-intrusive filter scanning	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Eliminates potential of filter damage	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Upgradable to CamControl system		<input checked="" type="checkbox"/>	
Global efficiency testing			<input checked="" type="checkbox"/>
Pressure decay testing			<input checked="" type="checkbox"/>
Data logging			<input checked="" type="checkbox"/>
Test report generator			<input checked="" type="checkbox"/>
Test report time stamp			<input checked="" type="checkbox"/>
Test report electronically signed			<input checked="" type="checkbox"/>
21 CFR, Part 11 ready			<input checked="" type="checkbox"/>
HotLab Test Option ready			<input checked="" type="checkbox"/>

For additional information on the Motion Control Lite, please see Camfil Farr product sheet 3427L-0909.

Experience HEPA filtration at its best with Camfil Farr. For optimal performance with the Automated Containment Systems product platform, we have engineered world-class auto-scan testable HEPA filters designed to get the best performance.



CamContain. Our Filtra2000 HEPA filter offers the highest flow filter element than can be scanned in-situ. The Filtra2000 operates up to 2,400 cfm (4,075 m³/h) at 1.0" w.g. (250 Pa) for a gasket seal filter. The gel seal version operates at 2,150 cfm (3,650 m³/h) at 1.0" w.g. (250 Pa). Each Filtra2000 is individually factory-tested according to the IEST Recommended Practice for the applicable filter type and labeled with the test performance data. This filter possesses the energy-saving features required to apply for LEED® credits per the United States Green Building Council requirements. For additional information on the Filtra2000, please see Camfil Farr product sheet 1823-0606.



CamContain. The Absolute XH is an excellent alternative for full size auto-scannable HEPA filter elements. The XH operates up to 2,000 cfm (3,400 m³/h) at 1.35" w.g. (335 Pa) The high-capacity Absolute filters are manufactured from the highest quality components, under demanding quality control conditions, and are certified to ensure performance in the most critical of applications. The XH is available in efficiencies from 99.99% to 99.9995% at MPPS. The XH is your choice for HEPA level air filtration in applications where ultraclean air, increased airflow capacity and energy-savings are critical. For additional information on the Absolute XH, please see Camfil Farr product sheet 1801-0606.



CamVent. Camfil Farr Absolute Filters provide the highest level of protection for processes and personnel. Incorporating a silicone U-gasket seal filter for CamVent applications, each Absolute filter includes Micro glass fiber media with an efficiency of 99.99% at MPPS. The media is pleated using Camfil Farr's Controlled Media Spacing™ (CMS) technology. CMS™ ensures optimized filter element depth and pleat spacing, resulting in minimized configuration losses and low resistance to airflow. Thermoplastic separators to ensure uniform pleat spacing and formation of a rigid self-supported media pack. Media-to-media contact, and associated fiber break-off, is eliminated. This Absolute filter model has an encasing frame of heavy-duty, 304 stainless steel. For additional information on the CamVent Absolute filter, please see Camfil Farr sales drawing 500969.



CamContain CeilX. Camfil Farr Megalam™ Panel Filters provide fine airborne particulate control to meet the requirements of today's high technology laboratories. With configuration and performance flexibility, the Megalam Panel will provide the highest level of protection for product processes and personnel. Each Camfil Farr Megalam Panel Filter is available in micro glass fiber media with 99.99% to 99.9995 efficiency at MPPS. The media is pleated using Camfil Farr's Controlled Media Spacing™ technology. Continuous glass filament separators to ensure uniform pleat spacing and form a rigid self supported media pack. Media-to-media contact, and associated fiber break-off, is eliminated. It includes a heavy-duty, lightweight anodized aluminum frame for high-strength and ease of installation. For additional information on the Megalam, please see Camfil Farr product sales drawing 503395.

The Automated Containment Products featuring the CamContain systems successfully integrate research, technology, experience and leadership into a complete automated filtration solution that exceeds all industry regulations. Many of the innovative features are covered by numerous domestic and foreign patents. A partial listing of US patents follows: 6,770,108, 7,186,286, 7,210,363, 7,220,291, 7,334,490, 7,552,621, 7,739,926, 7,758,664, 7,993,437.

CAMFIL FARR is the world's largest and leading manufacturer of filters and clean air solutions

There is a good chance that, at this very moment, you are breathing clean air that has passed through a filter manufactured by us. Our products can be found everywhere from offices to clean rooms for sensitive electronics production, mines, factories, hospitals and nuclear power stations. Camfil Farr is a global company with 29 subsidiaries, 23 production plants and an extensive network of agents in Europe, North America and Asia.

www.camfilfarr.com

For further information please contact your nearest Camfil Farr office.