THE WORLD LEADER IN CLEAN AIR SOLUTIONS

Healthcare Clean Air Solutions

PARTICULATE AND GASEOUS FILTRATION

AAF® INTERNATIONAL

BETTER AIR IS OUR BUSINESS®

Total Clean Air Solutions for Healthcare Facilities

Around the globe, AAF® and AmericanAirFilter® brand filters are providing clean air solutions for healthcare facilities in areas such as patient rooms, medical procedure areas, operating rooms, dentist offices, research centers, morgues, and cafeterias. From inexpensive disposable panel filters to high efficiency, extended surface filters and chemical gas-phase filtration, we market the widest range of air filtration products available.

Strategic Approach to Air Filtration Solutions for Healthcare

Healthcare facilities pose a unique design challenge for heating, ventilation, and air-conditioning (HVAC) system engineers. These systems provide a broad range of ventilation requirements and protection from airborne hazard. From operating rooms and laboratories to waiting areas and patient rooms — the risks and appropriate safety measures vary from space to space.

Our experts provide total filtration solutions to respond to every area in your healthcare facility – protecting patients, workers, and visitors is what we do.

The Importance of Air Filtration

Clean air is vital in hospital and healthcare facility operations to protect patients, staff, and visitors from airborne diseases and infections, as well as providing a comfortable, healthy, and odor free environment. These facilities face unique challenges in controlling airborne pollutants and gaseous contaminants.

Healthcare facilities pay particular care to Indoor Air Quality (IAQ) concerns because patients may have suppressed immune systems, making them more susceptible to adverse health effects. Healthcare workers, who spend many hours a day in facilities with potentially poor IAQ, are frequently at greater risk of exposure to infectious agents. Gaseous contaminants originate from a wide variety of sources, such as vehicle emissions, cleaning compounds, disinfectants, medical laboratories, office equipment, and waste removal areas. Best practice solutions address each of the various types of odors and gases.

AAF International provides custom air filtration products and solutions to meet the most demanding airflow and efficiency requirements for controlling temperature, humidity, and air purification in any type of healthcare setting. AAF products are designed with energy efficiency in mind. Offering you the highest efficiency products with the lowest energy requirements, AAF has the filtration solution to improve IAQ and reduce operating costs.

Filter Efficiencies for Healthcare Central Ventilation and Air Conditioning Systems

Published by the American Institute of Architects, Academy of Architecture for Health, and Assistance from the U.S. Department of Health and Human Services.

Area Designation	Minimum No. of Filter Beds	Minimum Filter Efficiency	
		Filter Bed No. 1 MERV	Filter Bed No. 2 MERV
General Hospitals			
All areas for inpatient care, treatment, and diagnosis, and those areas providing direct service or clean supplies such as sterile and clean processing, etc.	2	8	14
Protective environment room	2	8	HEPA
Laboratories	1	13	–
Administrative, bulk storage, soiled holding areas, food preparation areas, and laundries	1	8	–
Recirculation of air within individual isolation rooms	1	HEPA	–
Psychiatric Hospitals			
All areas for inpatient care, treatment, and diagnosis, and those areas providing direct services	2	8	14
Administrative, bulk storage, soiled holdings, laundries, food preparation areas	1	8	–
Nursing Care Facilities			
All areas for resident care, treatment, and/or diagnosis, and those areas providing direct service or clean supplies	2	7	13
Administrative, bulk storage, soiled holding, laundries, food preparation areas	1	7	–
Outpatient Facilities			
All areas for inpatient care, treatment, and diagnosis, and those areas providing direct service or clean supplies such as sterile and clean processing, etc.	2	8	14
Laboratories	1	13	–
Administrative, bulk storage, soiled holding areas, food preparation areas, and laundries	1	8	–

Notes

1) Additional roughing or prefilters should be considered to reduce maintenance required for filters with efficiency higher than MERV 12.
2) MERV based on ANSI/ASHRAE Standard 52.2.
3) Non-central AHU Systems shall be equipped with permanent (cleanable) replaceable with a minimum MERV 3.
4) Filter Bed Location. Where two beds are required, Filter Bed No. 1 shall be upstream of A/C components. Filter Bed No. 2 shall be located downstream of any fans or blowers (Blow-through System).
5) Humidification equipment shall be located 15′ minimum upstream of Filter Bed No. 2.
6) Filter housing blank-off panels shall be permanently attached to frame constructed of rigid materials, and have sealing surfaces equal to or greater than filter efficiency installed in frame.
7) Filter measuring devices shall be installed across each filter bed having a required efficiency of MERV 12 or more, including hoods requiring HEPA filters.

AAF Solutions for Healthcare Facilities

"HVAC Systems may contribute far more both to transmission of disease and, potentially, to reduction of transmission risk."

– Airborne Infectious Disease,
ASHRAE Position document June, 2009

Hospital Laboratories

Chemical safety and cross contamination control are vital to testing and research laboratories in any hospital. The success of some lab processes, such as in-vitro fertilization, are dependent on air purity.

Critical Procedure Areas

Faced with an influx of potentially contagious patients and their families, it is imperative to reduce and remove airborne contaminants generated inside and outside the doors of the emergency room.

Reduce indoor airborne contaminants from undiagnosed patients and protect staff and visitors in waiting areas.

Outside emissions from vehicles in and around emergency areas and ambulance bays can be harmful, odorous, and irritating. Comprehensive filtration systems, including AAF particulate and gas-phase solutions, are required to ensure a safe, effective emergency procedure area.

Equipment Areas

Healthcare equipment and instrumentation are major investments that should be protected and AAF can help. Areas and items of concern may be the HVAC units, control rooms and electronic instrumentation, diagnostic equipment, X-ray machines, and office equipment. Select from AAF's preliminary and final filter options to enhance the life of your equipment. AAF gas-phase filtration can reduce corrosive gases to protect equipment from potential failures caused by corrosion. AAF gas-phase filtration will control gaseous contaminants for worker protection and procedure success.

Roof Top Ventilation Area

Air intake areas are especially important since the air brought in must be filtered to remove emissions from rooftop helipads, outside industries, and automobile emissions. It is also important to remove odors associated with helicopter exhaust, cooking exhaust, and outdoor-sourced pollutants to reduce complaints from guests and staff. AAF particulate and gas-phase filtration products help ensure the acceptability of outdoor air for building ventilation.

Cafeteria

We know there is a direct connection with the air we inhale, our health, and our general comfort. It is important not only to reduce the possibility of spreading infections, but also to maintain a comfortable environment by reducing or eliminating odors from cooking and cleaning. AAF total filtration solutions can control odors associated with cooking and cleaning activities.

Emergency Room

Critical procedure areas including operating theaters, outpatient surgery suites, labor and delivery units, and oncology procedure areas demand optimum protection against airborne contaminants. Comprehensive filtration systems including AAF particulate and gas-phase solutions are required to ensure a safe, effective procedure area.

Treatment Rooms

Minimize exposure to communicable diseases and protect immune compromised patients. AAF custom air filtration solutions can control airborne contaminants that may lead to adverse health effects for exposed personnel and patients.

Patient Waiting Areas

Airborne diseases and illnesses have increased the need for improved IAQ solutions. All buildings contain a mixture of chemical sources with varying effects. Most chemicals will cause irritation if the concentrations are high enough, so it is important to use the best filters to protect and improve IAQ for building occupants.

Loading Dock/Waste Removal

Remove emissions and smells from loading docks, maintenance, and waste incineration areas with AAF's comprehensive line of particulate and gas-phase filtration solutions. Emission sources can include idling delivery vehicles and dumpster odors.

Morgues

AAF particulate and gas-phase filtration solutions should be used to eliminate occupational exposure to infectious diseases and associated odors.

AAF Air Filtration Solutions

AAF specializes in airborne particulate and gaseous contaminant removal for healthcare applications. A complete variety of filters and gas-phase media are available. All AAF products are designed to comply with applicable standards and practices. In addition, AAF can custom design commercial air filtration products to meet the most demanding airflow and efficiency requirements.

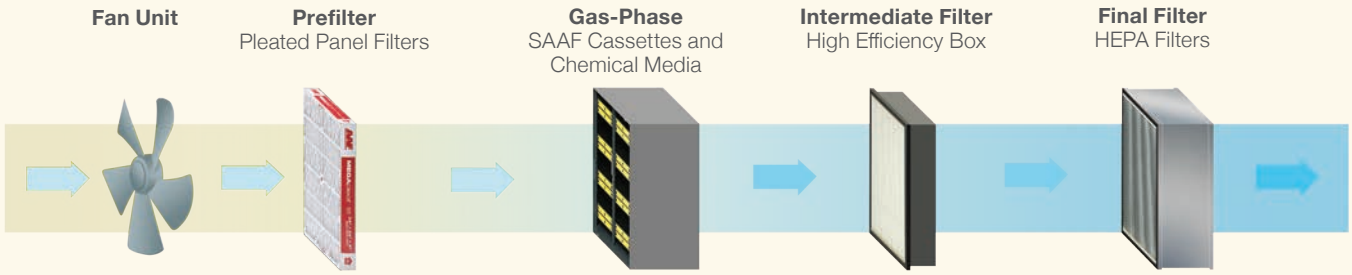


Illustration shows a variety of potential AAF Solutions that can be used in any filtration stage in a HVAC system. For more information on the best solution for your HVAC system, contact your local AAF Sales Representative.

HEPA Filtration Solutions

MEGAcel™ I

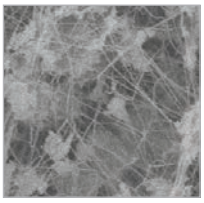
HEPA filters designed with Nelior® filtration technology combine ultra-high efficiency with the lowest pressure drop, durability, and tensile strength 8x that of traditional fiberglass media. Superior water resistance.

Typical Applications:
Isolation rooms, protective environment rooms, orthopedic, and bone marrow and organ transplant areas.

Brochure AFP-1-406

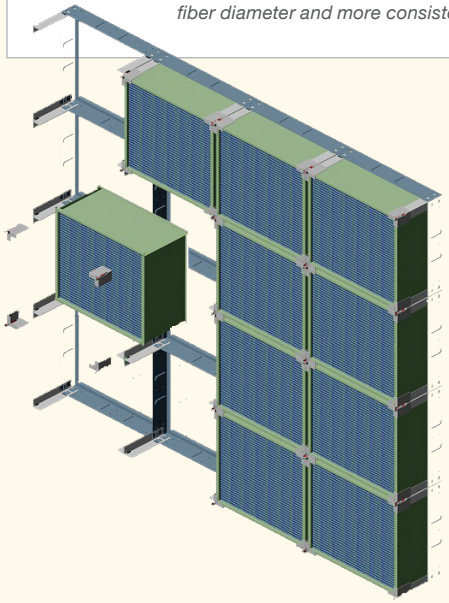
Configuration and Performance:

- 99.99% minimum efficiency on 0.3 µm particles
- Media: Nelior Filtration Technology
- Filter Frame: Galvanized Steel (additional options available)
- Seal: Urethane
- Temperature limit: 200°F (93°C)
- Gaskets: Optional



Photographed at 10,000x magnification this image illustrates the finer fiber diameter and more consistent composition of Nelior® media.

MEGAcel I with nelior Filtration Technology



HVAC Retrofit Solutions — Easy Upgrade to HEPA Filtration

AAF recommends MEGAcel I HEPA filters, combined with AAF HEPA holding frames, to decrease potential transmission of airborne diseases. AAF HEPA Holding Frames are designed for a tight seal to the MEGAcel I HEPA filter, eliminating bypass leakage and will not increase energy use. Easily upgrade to HEPA filtration without increasing energy use or modifying costly blowers. The existing MERV 14 final filters and frames are removed and replaced with MEGAcel I and HEPA Holding Frames. Since AAF HEPA Holding Frames are available in the same sizes as existing Universal HVAC frames, duct expansions and transitions are unnecessary.

Brochure AFP-1-406

HEPA Holding Frames are designed for a tight seal to the MEGAcel™ I HEPA filter, eliminating bypass leakage.

High Efficiency Filtration Solutions

MERV 13 and higher filters meet efficiency requirements established for LEED® Project Certification and Green Guide for Health Care.

BioCel® VXL

8-panel high efficiency filter. Excellent performance in difficult operating conditions. 200 square feet of media area. Lightweight and easy to install. Upgrade from MERV 14 efficiency without increased resistance.

Typical Applications:
Nurseries, ICU, patient care and treatment rooms, diagnostics, laboratories, sterile storage area, and minor surgical suites.

Brochure AFGP-1-118

Configuration and Performance:

- MERV 16
- Media: Ultrafine, moisture-resistant microglass
- Filter frame: High-impact polystyrene cell sides; extruded vertical components made of acrylonitrile butadiene
- Low initial pressure drop of .60″ w.g. @ 500 FPM
- Temperature limit: 176° F / 80° C
- Fully incinerable
- Available with Antimicrobial
- UL Classified

VariCel® VXL

High capacity, 8-panel, mini-pleat extended surface filter for operation up to 750 FPM with low resistance and long service life.

Typical Applications:
Nurseries, ICU, patient care and treatment rooms, diagnostics, laboratories, sterile storage area, and minor surgical suites.

Brochure AFP-1-162, also available VariCel VLXS AFP-1-163A

Configuration and Performance:

- MERV 15, 14, 13, and 11
- Media: Moisture-resistant, dual-density microglass
- Temperature limit: 176° F / 80° C
- Filter frame: High-impact polystyrene cell sides; extruded vertical components made of acrylonitrile butadiene
- Fully incinerable
- Antimicrobial available on MERV 15 and 14 models.
- UL Classified

VariCel® V

High capacity, 6-panel, mini-pleat extended surface filter for operation up to 750 FPM with low resistance and long service life.

Typical Applications:
Nurseries, ICU, patient care and treatment rooms, diagnostics, laboratories, sterile storage area, and minor surgical suites.

Brochure AFP-1-258

Configuration and Performance:

- MERV 15, 14, 13, and 11
- Media: Moisture-resistant, dual-density microglass
- Filter Frame: Plastic with aluminum structural supports
- Antimicrobial available on Merv 15 and 14 models
- Fully incinerable
- UL Classified

VariSorb® XL15

Particulate and gaseous contaminant removal. 8-panel high efficiency filter. Highest activity carbon = highest adsorption. Energy efficient mini-pleat design.

Typical Applications:
Food preparation areas, helipads, laboratories, morgues, waste removal, and loading dock areas.

Brochure GPF-1-141

Configuration and Performance:

- MERV 15
- Media: Mini carbon granulate embedded between two non-woven synthetic layers
- Filter frame: High-impact polystyrene cell sides; extruded vertical components made of acrylonitrile butadiene
- Temperature limits: 130° F / 54° C
- Fully incinerable

HEPA and High Efficiency Filtration Solutions

BioCel® M-Pak

6″-deep filter with the same media area and performance as the 12″-deep BioCel I filter. Space-saving design; reduced freight, storage, and handling costs.

Typical Applications: Nurseries, ICU, patient care and treatment rooms, diagnostics, laboratories, sterile storage area, and minor surgical suites.

Brochure AFP-1-117

Configuration and Performance:

- MERV 16
- Filter frame: High-impact polystyrene
- Media: Moisture resistant, ultrafine microglass
- Seal: Urethane
- Gaskets: Optional
- UL Classified

BioCel® M-Pak

VariCel® M-Pak

A compact 6″-deep filter design with the same media area and performance as the 12″-deep VariCel filters.

Typical Applications: Nurseries, ICU, patient care and treatment rooms, diagnostics, laboratories, sterile storage area, and minor surgical suites.

Brochure AFP-1-161

Configuration and Performance:

- MERV 14, 13, and 11
- Filter Frame: High-impact polystyrene
- Media: Moisture-resistant, dual-density microglass
- Seal: Urethane
- Gaskets: Optional
- UL Classified

AstroCel® I

Designed to meet all performance classes per the Institute of Environmental Sciences and Technology IEST RP-CC-001. Filters can be scan tested to eliminate pinhole leaks.

Typical Applications: Isolation rooms, protective environment rooms, orthopedic, bone marrow, and organ transplant.

Brochure AFP-1-110 **Radiation resistant microglass also available*

Configuration and Performance:

- HEPA and ULPA efficiencies
- Media*: Moisture-resistant, ultrafine microglass
- Filter frame: Wood and metal options
- Bond: Polyurethane
- Available with antimicrobial
- UL Classified

BioCel I®

Higher efficiency filter compared to other extended surface filters – 95% on 0.3 µm particles. Upgrade to higher efficiency in critical applications where HEPA filters are not required.

Typical Applications: Nurseries, ICU, patient care and treatment rooms, diagnostics, laboratories, sterile storage area, and minor surgical suites.

Brochure AFP-1-116

Configuration and Performance:

- MERV 16
- Media: Ultrafine microglass
- Filter frame: Galvanized steel
- UL Classified

VariCel®

Engineered for a variety of applications. Perfect for Variable Air Volume (VAV) systems. Rugged construction and a single piece steel header in 6″ and 12″ depths.

Typical Applications: Nurseries, ICU, patient care and treatment rooms, diagnostics, laboratories, sterile storage area, and minor surgical suites.

Brochure AFP-1-158

Configuration and Performance:

- MERV 14, 13, and 11
- Media: Water-resistant, dual-density microglass media
- Filter frame: Galvanized steel
- Antimicrobial available in MERV 14 and 11
- UL Classified

VariCel® RF/C and RF/C+SAAFOxi™

Particulate and gaseous (odorous) contaminants removal. Replace existing HVAC filters of the same type with no changes required for frames or latches.

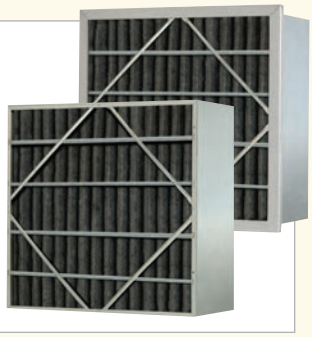
Typical Applications: Food preparation areas, helipads, laboratories, morgues, waste removal and loading dock areas.

Brochure GPF-1-122

SAAFWeb™ filter media.

Configuration and Performance

- MERV 8
- Media: VariCel RF/C — 60% activity granular activated carbon. VariCel RF/C+SAAFOxi — 50/50 blend of 60% activated carbon and proprietary activated alumina impregnated with potassium permanganate (KMnO4)
- Filter frame: Galvanized steel
- UL Classified



Pleated Panel Filters

MEGApleat® M8

Strongest and longest-lasting MERV 8 pleated filter. Lower pressure drop and higher dust holding capacity (DHC) means reductions in energy consumption and operating costs.

Typical Applications:
First stage prefiltration and post stage filtration in central air handling unit.

Brochure AFP-1-200

Configuration and Performance

- MERV 8
- Media: 100% uniform synthetic fiber
- Filter frame: High wet-strength beverage board
- Metal backing: Heavy-duty, galvanized expanded metal
- Available in 1″, 2″ and 4″ models
- UL Classified

PerfectPleat® Family of Filters

Ideal prefilters used to prevent the buildup of lint and dust on the face of SAAF cassettes and high efficiency filters. Mechanical efficiency. Environmentally friendly – no metals or dies.

Typical Applications:
Food preparation, laundry, bulk storage, and administration areas.

Brochures AFP-1-200, AFP-1-202, AFP-1-203

Configuration and Performance

- MERV 8
- Media: Self supporting, patent-pending DuraFlex®
- Filter frame: High wet-strength beverage board
- Available in 1″, 2″ and 4″ models
- Fully incinerable
- Antimicrobial available on ULTRA models
- UL Classified

AmAir®/C, AmAir®/C+SAAFOxi™, AmAir®/SAAFOxi™ and AmAir®/CP

Economical solutions to many gaseous contaminant problems including odors and corrosion control protection. Directly interchangeable with standard air filters.

Typical Applications:
Odorous areas of concern in hospitals, nursing homes, and laboratories.

Brochure AFP-1-158
Not shown: AmAir®/CE *Brochure GPF-1-124*

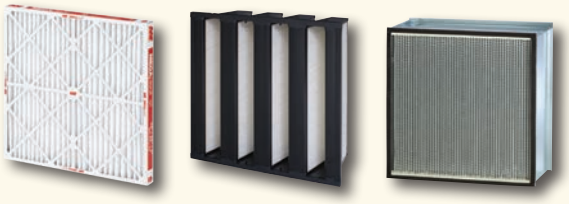
Configuration and Performance

- MERV 7 and 5
- Media: Activated carbon (C, CP), proprietary activated alumina impregnated with (SAAFOxi) potassium permanganate and 50/50 blend (C+SAAFOxi).
- Filter Frame: High wet-strength beverage board
- Available in 1″, 2″ and 4″ pleats, panels, and pads
- UL Classified

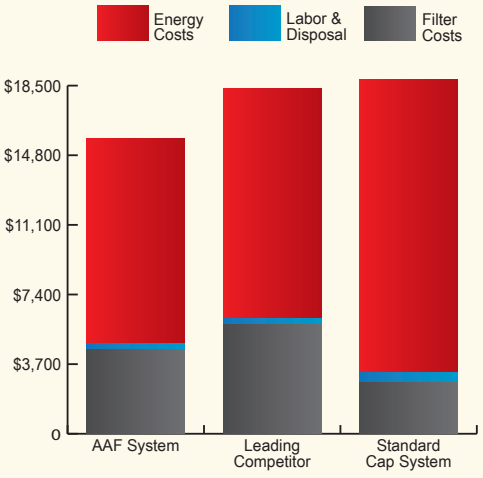
Total Systems Solutions

Looking at each stage of filtration is critical to optimizing the efficiency of a HVAC system. When employing a 3-stage system, the correct combination of AAF filters will minimize energy usage and cost. AAF offers an environmentally sustainable solution that can help you qualify for LEED® Energy and Atmosphere credits, by reducing the fan energy usage associated with HVAC systems.

Ultimately, your total cost of ownership is less than competitive systems, as shown in the graph.



Analysis based on a 3-stage filter system, running 20,000 CFM, over a 2 year time period. Energy costs based on the national average of 0.08 $/kW-hr. Filter selection was based on the most energy efficient filters available.

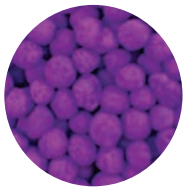
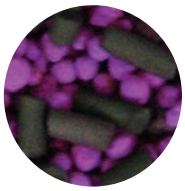


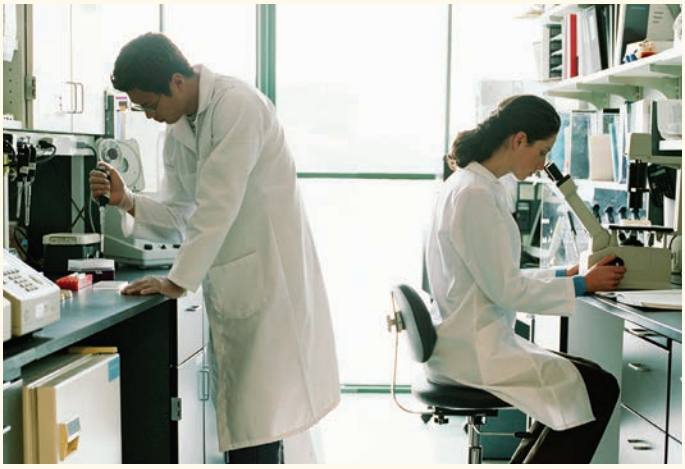
Gas-Phase Chemical Media

SAAF Chemical Media and Catalysts provide high efficiency filtration for effective removal of gas contaminants commonly found in healthcare facilities, including odorous contaminants. Media are designed to safely deliver superior gas removal effectiveness on a variety of target gases. Life analysis calculations may be performed to determine remaining media life. A variety of AAF energy efficient delivery mechanisms are available to easily incorporate media into airflow. Powerful enough to remove heavy odors and corrosive gases, SAAF chemical media and catalysts are designed for easy, cost-effective disposal solutions.

Brochure GPF-1-103

SAAF™ Media for Healthcare Applications

Media	Media Description	Typical Contaminants Addressed	Common Locations/Sources
	**SAAFCarb™** *Brochure GPF-1-110* Pelletized activated carbon that removes toxic and impure gases from the environment. The activated carbon is composed of bituminous coal substrate. UL Classified.	Formaldehyde Hydrocarbons (VOCs) Lower molecular weight aldehydes Nitrogen dioxide Organic acids Sulfur dioxide	Cleaning/disinfecting areas Food service areas Laboratories Morgues Refuse areas
	**SAAFOxidant™** *Brochure GPF-1-101* Spherical and porous pellets composed of activated alumina, binders, and potassium permanganate for maximized performance. UL Classified.	Chlorine Diesel fumes Hydrocarbons Nitrogen dioxide VOCs	Ambulance bays Emergency entrance canopies Helipads Urban outdoor pollution
	**SAAFBlend™ GP** *Brochure GPF-1-102* Manufactured from equal volumetric mix of SAAFCarb and SAAFOxidant media. UL Classified.	Formaldehyde Hydrogen sulfide Lower molecular weight aldehydes Nitric oxide Organic acids Sulfur dioxide	Ambulance bays Emergency entrance canopies Helipads Urban outdoor pollution



SAAF™ Media Remaining Life Analysis

AAF offers testing services to determine the remaining life or capacity of chemical filtration media in installed filter systems. This information can be used to determine the characteristics of an existing filter system, the system adequacy, filter replacement schedules, replacement filter ordering schedules, and filter inventory requirements.

Brochure GPF-1-133

Gas-Phase Equipment and Cassettes

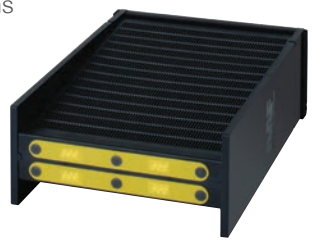
SAAF™ Cassettes

V-bank cassettes are pre-filled with SAAF chemical media. Rigid construction allows for better structural integrity and eliminates gas by-pass problems. Easily retrofit and outperform existing legacy cassettes by 25%.

Typical Applications:
Food preparation areas, helipads, laboratories, morgues, waste removal, and loading dock areas.
Brochures GPF-1-111, GPF-1-109, and GPF-1-108

Configuration and Performance

- Media: Various application specific options
- Frame: High-impact polystyrene
- Available in Heavy Duty, Medium Duty and Cleanroom models
- UL Classified



SAAF™ Front Access Housings

Excellent for quick retrofit solutions. Patent-pending SAAF Seal. Energy efficient design reduces operating costs allowing the maximum recirculation of tempered air.

Typical Applications:
Food preparation areas, helipads, laboratories, morgues, waste removal, and loading dock areas.
Brochure GPF-1-115

Configuration and Performance

- Stand-alone system
- Easily integrated into new and existing air handling units
- Patent-pending SAAF Seal
- Energy efficient design
- Built for 2″ prefilter option

SAAF™ Side Access Housings

Stand-alone, multi-stage systems designed to remove particulate and gaseous contaminants from confined spaces, while reducing the amount of outside air needed to dilute contaminants.

Typical Applications:
Food preparation areas, helipads, laboratories, morgues, waste removal, and loading dock areas.
Brochure GPF-1-106

Configuration and Performance

- Suitable for in-room or sheltered outdoor installations
- No special ducting or installation required
- Ultra-modern construction
- Options allow easy blending with room's aesthetics.

SAAF™ Air Purification Systems
SAAF™ Recirculation Unit – Pressurization and Recirculation Unit

Designed to support SAAF media cassette filters, prefilters, after-filters, and high efficiency particulate filters all in one self-contained unit

Typical Applications: Food preparation areas, helipads, laboratories, morgues, waste removal, and loading dock areas.
Brochure GPF-1-107

Configuration and Performance

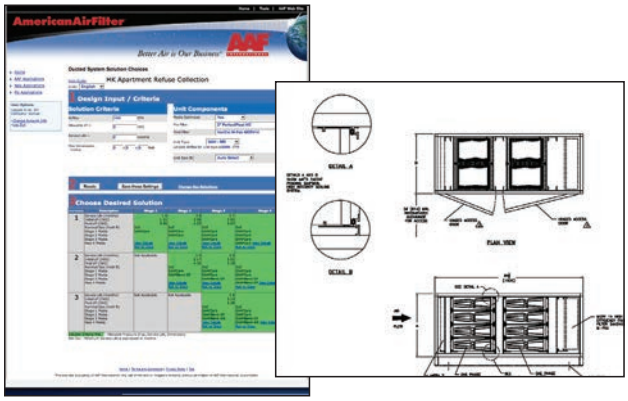
- Available in several different sizes and combinations
- Accommodates air volumes ranging from 1,000 to 40,000 CFM

Filtration Tools for Healthcare

SAAF™ Tech Tools

AAF's exclusive SAAF Tech Tools is the filtration industry's most sophisticated and complete decision-sciences software for configuring clean air products to remove airborne gaseous contaminants. Extremely flexible, SAAF Tech Tools provides extensive customization and multiple solutions.

SAAF Tech Tools provides detailed information on contaminants, adsorbers, oxidants, and links to industry information relevant to specific applications.



Select and compare media and equipment solutions using SAAF™ Tech Tools.

Life Cycle Valuation Program

According to the EPA, healthcare is one of the most energy intensive industries in the U.S. AAF Sales Representatives are trained to help you meet today's constant challenge to reduce costs while improving energy efficiency. We use an AAF exclusive software tool, Life Cycle Valuation (LCV), to tailor AAF solutions to your unique healthcare setting and create an optimized filtration maintenance schedule for your system. LCV puts your costs into perspective by considering all aspects of your facility and assessing a broad range of variables. It can be easily customized and adapted to create unique solutions.

In addition to budgetary information, this tool provides solutions for multiple systems showing the cost comparison in a clear and concise summary.

Contact your local sales representative for a complete listing of AAF products available for the Healthcare industry

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AAF has a policy of continuous product research and improvement and reserves the right to change design and specifications without notice.

ISO Certified Firm

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