



Air Filtration for Healthcare



Typical Airborne Contaminants Found in Healthcare Facilities

- Bacteria - one-cell organisms that multiply by cell division
- Virus - multiply by entering a host cell, using the cell's DNA to manufacture clones of themselves
- Fungi - multiply through the formation of spores that separate from the parent

First Stage/Prefilters

Extended Surface Mini Pleat Filters

Extended Surface E-Pleat® Filters

Hepa and Near Hepa Filters



Patent #6,685,833 LPD

Patent #6,685,833 LPD

Hospital / Healthcare Air Filtration

Healthcare related expenditures represent as much as one-sixth of the economy of the United States. It is an industry that cannot compromise on cleanliness or air quality. From emergency treatment and in-patient stays, to regularly scheduled office visits, it is critical that healthcare procedures are delivered in a clean environment that does not support the development of nosocomial infections.

A clean healthcare environment is achieved through the development of a comprehensive indoor environmental quality program. One of the key components of any program is the selection, installation and maintenance of air filters. The Facility Guidelines Institute (FGI) has published the required levels of filtration for various patient treatment areas in healthcare facilities, and those guidelines are contained in this brochure (see opposite page).



Hospital air filtration is typically set up with two-stage or three-stage filtration banks. This ensures that the maximum amount of contaminants are removed. Each stage of air filtration will capture the particle sizes for which it is designed. This allows the higher efficiency filters installed in the final stage, to remove finer particulate and aerosols without being blinded by larger particles that shorten service life.

Air filtration for healthcare facilities has advanced dramatically. New media and filter designs have created products that can serve to upgrade filtration in healthcare applications. As an example, the new Airguard®



Microguard® LR series of high-efficiency filters provides removal efficiencies of 99% or greater on 0.3 micrometer at resistances comparable to, or lower than, some MERV 14 filters and at a lower cost than traditional 95% DOP and HEPA products. This provides facilities greater flexibility in choosing products when it is desirable to improve overall indoor air quality and deliver the maximum level of due diligence in protecting patients from airborne transmission of infectious contaminants.

An air filtration plan that is formulated by hospital engineering and infection control, under the direction of hospital management ensures compliance with applicable guidelines. Input from an Airguard air filtration professional ensures that the proper air filter is chosen, purchased, installed and maintained at the best total cost for the clean air your healthcare facility requires. This brochure provides information on Airguard® products manufactured for use in two-stage and three-stage air filtration systems designed for healthcare facilities.

Contact your local Airguard Distributor, Territory Manager or Airguard Technical Services group for additional information or to order.



Hospital Filtration

Filtration Efficiencies for Central Ventilation and Air-Conditioning Systems in General Hospitals

Area Designation	Minimum Number of Filter Beds	Filter Bank No. 1 (MERV ^a)	Filter Bank No. 2 (MERV ^a)
Orthopedic operating room, Bone marrow transplant operating room, Organ transplant operating room	2	7	HEPA ^b
General procedure operating rooms, Delivery rooms, Nurseries, Intensive care units, Patient care rooms, Treatment rooms, Diagnostic and related areas	2	7	14
Laboratories Sterile storage	1	13	–
Food preparation areas, Laundries, Administrative areas, Bulk storage, Soiled holding areas	1	7	–

^a MERV= minimum efficiency reporting value based on ASHRAE Standard 52.2-2007

^b HEPA filters or air outlets

* ASHRAE Handbook 2011 Applications

Minimum Filtration Efficiencies 2010 Guidelines

Space Designated (According to Function)	Filter Bank Number 1 (MERV) ¹	Filter Bank Number 2 (MERV) ²
Classes B and C surgery; inpatient and ambulatory diagnostic and therapeutic radiology; inpatient delivery and recovery spaces	7	14
Inpatient care, treatment, and diagnosis, and those spaces providing direct service or clean supplies and clean processing (except as noted below); All (rooms)	7	14
Protective environment rooms (PE)	7	17 (HEPA) ²
Laboratories; Class A surgery and associated semi-restricted spaces	13 ^b	N/R*
Administrative; bulk storage; soiled holding spaces; food preparation spaces; and laundries	7	N/R
All other outpatient spaces	7	N/R
Skilled nursing facilities	7	N/R

*N/R = not required

Note a: The minimum efficiency reporting value (MERV) is based on the method of testing described in *ANSI/ASHRAE Standard 52.2-2007, Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size* (see Informative Annex B; Bibliography).

Note b: Additional prefilters may be used to reduce maintenance for filters with efficiencies higher than MERV 7.

Note c: Filter Bank No. 2 may be a MERV 14 if a MERV 17 tertiary terminal filter is provided for these spaces.

Guidelines for Design and Construction of Health Care Facilities, The Facility Guidelines Institutes 2010 Edition, Table 6-1

First Stage / Prefilters

for Hospital HVAC Systems

The Role of Air Filtration

- Air filtration is a key component of a comprehensive plan to reduce the incidence of nosocomial infections in any healthcare facility
- Air filtration particulate removal efficiency is defined for each area of a healthcare facility
- Proper maintenance of air filters and air handling units (AHUs) is critically important
- Understanding positive and negative airflow is essential to infection control, isolation, and protection from airborne pathogens
- Achieving the level of clean air required for the application is the primary driver; unit cost of air filters is not!



XTREME+Plus™ Self Supported Pleated Filters

- 1", 2" and 4" thicknesses
- 100% Synthetic Media
- Self Supported
- Damage Resistant
- 16.4 (HC), 10.2 (SC) pleats per foot (2")
- No Metal
- Fully Incinerable
- Mechanical MERV 8 @ 492 FPM



DP® 40/ DP Max Pleated Filters

- 1", 2", 4" and 6" (only DP Max) thicknesses
- Die cut beverage board frame
- 100% Synthetic media
- 15.0 (DP40), 10.0 (DP Max) pleats per foot (2")
- Mechanical MERV 8 @ 492 FPM



PowerGuard™

- 1", 2" and 4" thicknesses
- Die cut beverage board frame
- 100% synthetic media
- 14.3 pleats per foot (2")
- MERV 11 @ 492 FPM



DP-green

- 1", 2" and 4" thicknesses
- 100% Synthetic Media
- 2" thickness
- 17.5 pleats per foot (2")
- LEED/Green Compliant
- MERV 13 @ 492 FPM

Second and Final Stage Filters

High-Efficiency ASHRAE Grade Filtration

Second & Final Stage Air Filtration

- Several options are available
- Typically the most efficient filters
- HEPA filters must be used where specified
- All Final Stage Filters must be protected by quality pre-filtration to ensure required performance



Patent #6,685,833 

Legacy[®]

- Low Resistance
- High Efficiency
- High Dust Holding Capacity
- 4" MERV 11 & 14
- 12" MERV 11 & 15
- 100% Synthetic Media
- Moisture Resistant
- Chemical Resistant
- All Plastic Construction
- Fully Incinerable
- Light Weight
- UL 900 Class 1

- MERV 14 & 15 models meet the efficiency requirements required to contribute points toward a LEED/Green Building certification.
- Airguard's "E-pleat" technology provides increased airflow and lower energy costs.

V-Force[®]

- All Plastic Construction
- 100% Synthetic Media
- Moisture and Chemical Resistant
- Fully incinerable
- Low Resistance
- UL 900 Class 1
- Three efficiencies -
MERV 14 @ 492 FPM
MERV 13 @ 492 FPM
MERV 11 @ 492 FPM



HEPA Grade Filtration

for Hospital HVAC Systems

Definition of a HEPA Filter

"Throwaway extended-medium dry-type filter in rigid frame having minimum particle-collection efficiency of 99.97% (that is a maximum particle penetration of 0.03%) on 0.3 micrometer particles of thermally-generated DOP particles or specified alternative aerosol." -*Institute of Environmental Sciences and Technology (IEST)*

HEPA in Healthcare

- Must meet established standards for particulate removal efficiency
- Minimum 99.7% removal of 0.3 micrometer particles
- Essential for capturing viruses
- Required in critical care areas e.g., isolation rooms; neonatal; burn units, etc.
- Requires HEPA level holding frames to ensure performance
- More resistance to airflow; higher operating costs when compared to lower-efficiency air filters

HEPA Filter Testing

HEPA filters should be factory tested to ensure the minimum efficiency 99.97% on 0.3 micrometer particles. Personnel installing/replacing should be trained in proper installation and proper personal protection. In-place challenging for integrity is highly recommended.

HEPA Filter Integrity Testing

- In-situ integrity
- Full media scan
- Also includes joints, frames, ceiling, gaskets and other seals



Microguard® 99 & SC - Series

- Ultrafine microglass paper media
- Wood and Metal construction
- Gasket seal and gel-seal models
- Wide variety of cell side configurations
- Corrugated aluminum separators
- Three efficiencies 99.97%, 99.99%, 99.999% on 0.3 micrometers
- Microguard SC has fewer pleats & an efficiency of 99.97% on 0.3 micrometers

Microguard® 2000

- Ultrafine microglass paper media
- Wood and metal construction
- Gasket seal and gel seal models
- Wide variety of cell side configurations
- Corrugated aluminum separators
- 500 FPM @ 1.35" W.G.
- 99.97% and 99.99% efficiencies



Hospital / Healthcare Air Filtration

MicroPleat

- Ultrafine microglass paper media
- Anodized extruded aluminum cell sides
- Gasket seal, gel seal and knife edge models
- Continuous bead mini-pleat adhesive separators
- Four efficiencies 99.97%, 99.99% and 99.999% on 0.3 micrometers; 99.9995% on 0.12 micrometers



MicroPleat™ Disposable Ducted Ceiling Modules

- Anodized extruded aluminum construction
- 2' x 2' and 2' x 4' sizes
- Low profile design - 5" deep. Fits into T-bar ceiling grid
- Fixed or adjustable diffuser/damper
- Three efficiencies - 99.99% and 99.999% on 0.3 micrometers; 99.9995% on 0.12 micrometers

Micro+Plus™ Replaceable Filter Ducted Ceiling Modules

- Permanent housing with room side replaceable HEPA filter
- Ducted inlet design
- Extruded aluminum construction or all welded aluminum or stainless steel construction



Micro-V™ 2000

- 500 FPM @ 1.2" W.G.
- 99.97% and 99.99% efficiencies @ 500FPM
- 99.999% efficiency @ 400 FPM

Near-HEPA Grade Filtration

for Hospital HVAC Systems



In applications where HEPA filters are not specified but a high level of efficiency is necessary, Airguard offers the near-HEPA, Microguard LR. The LR provides 99% plus efficiency on 0.3 micrometer particles without the high cost and resistance to air flow associated with true HEPA filters.


The LR provides a sensible, cost-effective due diligence approach to air filtration where high efficiency is needed but HEPA is not required.

Microguard® LR

- 99%+ efficiency on 0.3 micrometer particles
- U.L. Class 2
- E-pleat® media pack with proprietary CLCAir media technology
- Standard dove-tail interlocking gasketing
- Available in High-Impact Plastic (HIPS) cell side model in single header and box-style, metal sides also available - incinerable to ash - similar to cellulose
- Plastic cell side available in 4 sizes; metal cell side available in 6 sizes



Microguard LR filters
available in metal and
HIPS cell sides

Patent #6,685,833 



www.airguard.com



CLARCOR Air Filtration Products
100 River Ridge Circle • Jeffersonville, IN 47130
Customer Care Team: 1-866-247-4827 • Fax: 1-800-784-3458
Email: mailbag@airguard.com • www.airguard.com

A-HEALTHCARE-1111

Distributed by:

© 2010 CLARCOR Air Filtration Products.
CLARCOR Air Filtration Products has a policy of continuous product research and development and reserves the right to change design and specifications without notice.
Terms and Conditions of Sale can be accessed in the "LOGIN" section at www.airguard.com