

# Purolator™



## 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



# 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 Purolator® Ultra-Cell® LR series of

high-efficiency filters provides removal efficiencies of 99% or greater on 0.3 micron 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 a Purolator 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 Purolator products manufactured for use in two-stage and three-stage air filtration systems designed for healthcare facilities.

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



**Purolator**™



# Hospital Filtration

## ASHRAE - Hospital Filtration

Type/Location	Non-aseptic areas	Aseptic areas
<b>Prefilter</b> Before coil	<b>MERV 8</b> (25-40% dust spot)	<b>MERV 8</b> (25-40% dust spot)
<b>Pre/final filter</b> Before coil	<b>MERV 14</b> (80-85% dust spot)	<b>MERV 14</b> (80-85% dust spot)
<b>Final filter</b> After blower-terminal filter	<b>MERV 16</b> (95% DOP)	(≥99.97% on 0.3 micrometers)

## Minimum Filtration Efficiencies\*

Area Designation	Filter Bank No. 1 (MERV)	Filter Bank No. 2 (MERV)
Class B and C Surgery Inpatient and ambulatory diagnostic and therapeutic radiology; inpatient delivery and recovery spaces	<b>7</b>	<b>14</b>
Inpatient care, treatment, and diagnosis, and those spaces providing direct service or clean supplies and clean processing (except as noted below)	<b>7</b>	<b>14</b>
Protective environment rooms	<b>7</b>	(HEPA)
Laboratories, class A surgery	<b>13</b>	
Administration, bulk storage, soiled holding areas, food preparation areas, laundries, all outpatient spaces, skilled nursing facilities	<b>7</b>	

\* *Guidelines for Design and Construction of Hospital and Healthcare Facilities - Table 6.1*

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# 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!



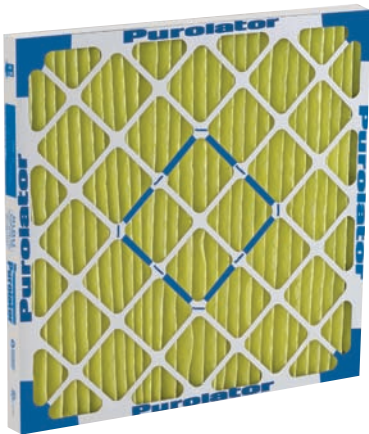
### Key Pleat™ Pleated Filters

- 1", 2" and 4" thicknesses
- Mechanical MERV 7
- 100% Synthetic Media
- Self Supported
- Damage Resistant
- No Metal
- Fully Incinerable



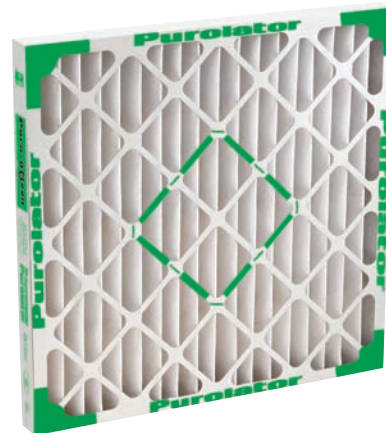
### Hi-E40/Defiant Mark 80 Pleated Filters

- 1", 2", 4" and 6" (only Hi-E40) thicknesses
- Die cut beverage board frame
- 100% Synthetic media
- 15.0 ( DMK80), 10.0 (Hi-E40) pleats per foot (2")
- Mechanical MERV 8



### PAF 11 Filter

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



### Puro-green

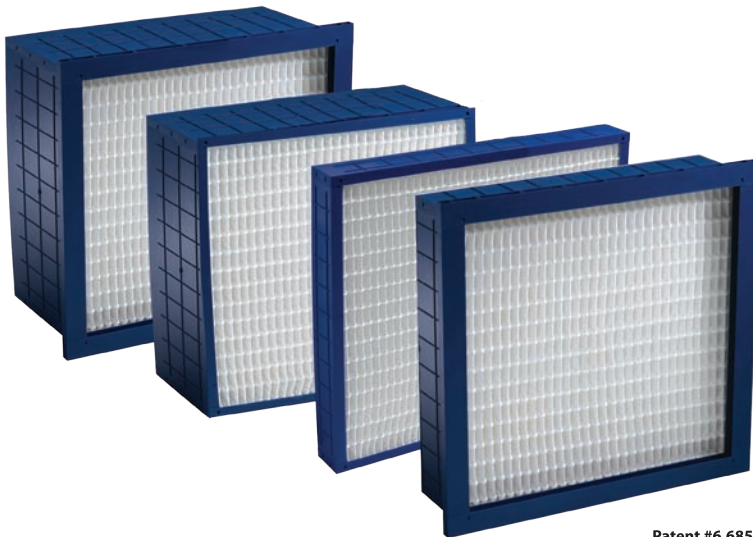
- 1", 2" and 4" thicknesses
- 100% Synthetic Media
- 2" thickness
- 17.5 pleats per foot (2")
- LEED/Green Compliant
- MERV 13

# 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



### Dominator®

- 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.**
- **The Purolator "E-pleat" technology provides increased airflow and lower energy costs.**

### SERVA-CELL® 2VS

- All Plastic Construction
- 100% Synthetic Media
- Moisture and Chemical Resistant
- Fully incinerable
- Low Resistance
- UL 900 Class 1
- Three efficiencies -  
90 -95%, (MERV 14)  
80 - 85%, (MERV 13)  
60 - 65%, (MERV 11)



# HEPA Grade Filtration

## 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  $\mu\text{m}$  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  $\mu$  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



## ULTRA-Cell® HEPA Filters

- 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 .3 microns

## ULTRA-Cell® 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



## ULTRA-Cell® V

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



# Hospital / Healthcare Air Filtration

## MICROPAK™

- 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 .3 microns; 99.9995% on .12 microns

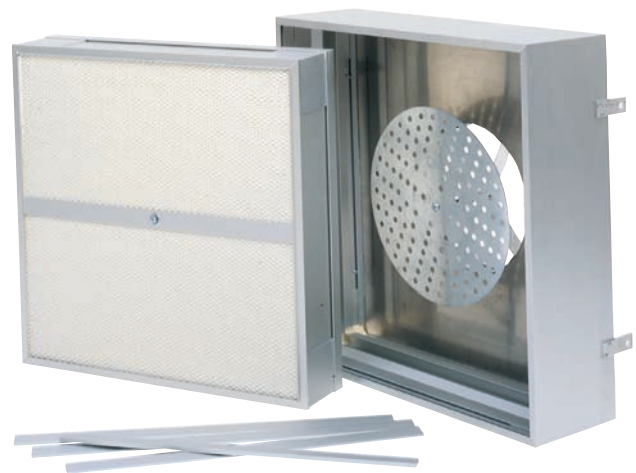


## MICROPAK™ Disposable Ducted Ceiling Modules

- 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 .3 microns; 99.9995% on .12 microns

## MICROPAK™ Permanent Economy Hood

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



## MICROPAK™ Mini Pleat

- 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 .3 microns; 99.9995% on .12 microns

# Near-HEPA Grade Filtration

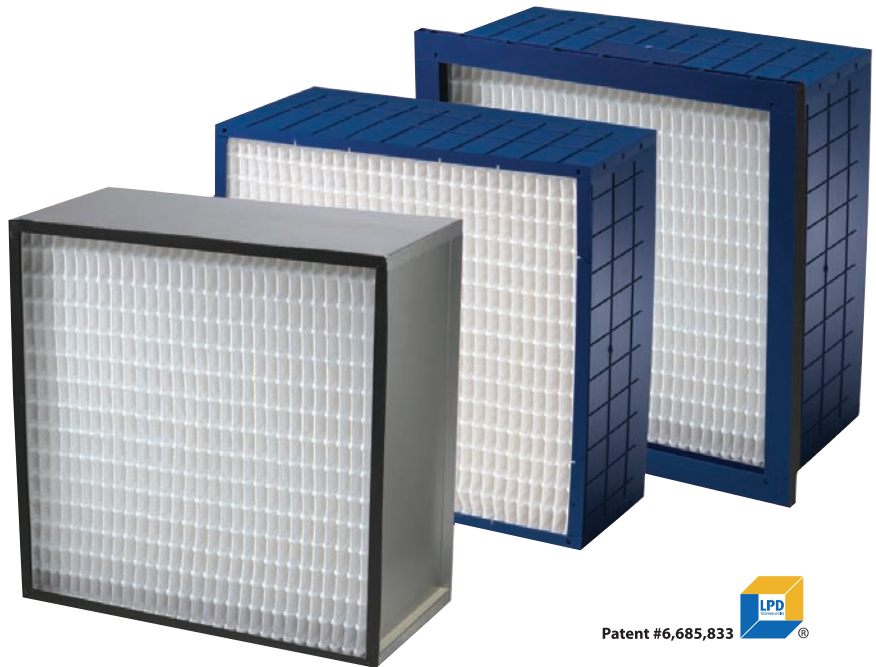
for Hospital HVAC Systems



In applications where HEPA filters are not specified but a high level of efficiency is necessary, Purolator offers the near-HEPA, Ultra-Cell LR. The LR provides 99% plus efficiency on .03 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.

## Ultra-Cell® LR

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



Patent #6,685,833 



[www.purolatorair.com](http://www.purolatorair.com)



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