Let Camfil show you how to reduce costs while improving indoor air quality.
WHAT’S IMPORTANT NOW?

Only Camfil can deliver value in all four categories.

REDUCE OPERATIONAL COSTS

Camfil can turn your air filter operation into a money making machine.

Cost has become the dominant factor in purchasing, and no operations item is exempt. Camfil, the world leader in air filtration technology for every application in healthcare, has a solution for managing the new, “Cost is King” reality we face. At its heart: a solid, proven strategy for achieving the air quality levels needed, while delivering significant and immediate savings in four critical areas:

- Direct dollar savings in HVAC energy costs.
- Reduced risk of hospital-acquired infections (HAI), and reduced risk of associated financial penalties as prescribed under the new Centers for Medicare and Medicaid Services (CMS) healthcare law.
- 50% or more annual reduction in filter waste sent to landfills, reducing disposal costs and in accordance with sustainability initiatives.
- Reduced facility labor costs related to the associated tasks involved with transporting, changing and disposing of filters.

The Camfil healthcare strategy is centered on value: delivering the best, proven solutions for each individual environment, so that unnecessary risks, particularly those that involve hospital acquired infections, are eliminated.

If our competitors’ filters were free, the hidden costs associated with energy, disposal and labor would make their cost of ownership three to four times that of Camfil filters.

For every $1 a hospital spends on air filtration, it spends $7 on fan energy to push air through those filters.
ENERGY SAVINGS
NEW OPPORTUNITIES
Significant and Immediate Reductions

The third largest energy cost item in a healthcare environment is the energy needed to move air through the heating and air conditioning systems. Air filtration is a large component of energy cost because filters, by nature, create resistance to airflow. This forces the air distribution fans to work harder and use more energy. So, the question becomes, “Is it possible to achieve optimum filtration in each area of the facility, maintain rated efficiency through the life of each filter, and reduce energy costs?”

In fact, it’s possible to accomplish this, and much more. Camfil’s 5-Star premium filters are engineered to significantly and immediately reduce HVAC energy expenditures, while maintaining high contaminant removal performance and requiring less frequent change-outs.

Selecting the proper filter based on average lifetime resistance to airflow and the filter’s ability to maintain rated efficiency can save a facility 50% of its HVAC fan energy costs.

The baseline comparison is with the minimal performance products typically purchased on a first cost basis. This 50% annual savings is a documented metric achieved in healthcare environments by Camfil’s 30/30® and Durafil® ES filters, two of the many filter technologies described later in this brochure.

Documentation for this savings was generated by Life Cycle Cost (LCC) analysis and validated by real world testing. This powerful modeling software factors-in multiple conditions specific to each installation, including hours of operation, utility rates, air contaminants, fan efficiency, labor and more.

Since its inception, LCC has helped thousands of healthcare facilities and other institutions around the world reduce both total energy expense and peak demand, by objectively comparing filters from all manufacturers, and identifying the most appropriate filter for each area. In short, LCC software allows filter selections and change out points to be optimized.

LCC calculates total cost of ownership (TCO), which includes all of the expenses associated with air filtration – the cost of the filters, the labor to install and remove them, filter disposal costs, and of course, the energy used to move air through the filters.

TCO is based on real-life performance, rather than simplistic mathematical charting. Most importantly, it allows discussions of filter alternatives to be based on science, rather than guesswork – or hope.

Lowering a filter’s resistance to airflow is one of the most effective and measurable ways to immediately reduce the total energy used by your HVAC system.

For every tenth of an inch of resistance saved, a facility can expect to save approximately $28 per year in energy costs per full size filter opening.

“With Camfil, savings of 0.5” of static pressure is routine with multi-stage filtrations systems typically found in hospitals.”
Healthcare Facilities

The Centers for Medicare and Medicaid Services are no longer reimbursing for the extra costs of treating patients for hospital-acquired infections that reasonably could have been prevented.

Sweeping environmental consciousness gained traction roughly 25 years ago and has since become a dynamic force. When fully realized, it became apparent that hospital energy consumption, waste, and greenhouse emissions could be dramatically reduced.

Hospitals, like other facilities, express the values of the owners and the community. LEED® certification for healthcare has become a laudable goal for new facilities, as well as existing hospitals that have served their communities for decades.

Let’s begin at ground level.

Disposal costs for red-bagged waste can top $480 per ton or more – 19 times the cost of ordinary solid waste. Regulations in effect in many areas of the country demand that air filters used in medical facilities – high-efficiency filters and even simple pleated panel filters in some areas – must be redbagged. This is arguably unfair, but only a few states allow a less-costly classification, and the landfills are clearly in charge. To them, this is revenue, pure and simple. And as many landfills approach capacity or close, their ability to raise costs will only increase.

Given this reality, there is a compelling incentive to reduce the volume of solid waste heading for landfills – to use green thinking for meaningful source reduction.

Source reduction is a guiding principle for Camfil’s green filter technology. During a two-year period, a hospital using Camfil’s 5-Star premium filters can reduce the number of filters it sends to the landfill by 56%.

Disposal and labor to change filters is a huge, but reducible, cost. It can be reduced more quickly than perhaps any other line item on a hospital’s budget, while giving the hospital bragging rights on an issue that every patient, every board member, and every community and political leader, cares about.

During a two year period, a hospital using Camfil’s 5-Star premium filters can reduce the number of filters it sends to the landfill by 56%.

CAMERIT Acquired
INFECTION RISK OVERVIEW

The cost in lives and liability

In the U.S., one hospital patient in ten – two million patients per year – suffers a hospital-acquired infection. Cost estimates for this tragedy are approximately $10 billion annually.

One third of hospital-acquired infections are judged preventable. The Committee to Reduce Infection Deaths – RID – reports that as many as 92 percent of deaths from hospital infections could have been prevented.

Pneumonia is the most costly of all hospital-acquired infections. Fortunately it is among the most preventable, where proper levels of air filtration, and the appropriate number of air changes, are in place.

Camfil can provide a more comfortable environment for patients and staff, while lowering the total life cycle costs of filtration as well. Camfil’s 5-Star premium air filters are recognized for top-level performance in four critical areas important to healthcare facilities: energy savings, air quality, waste reduction, and environmental impact.

“The Centers for Medicare and Medicaid Services are no longer reimbursing for the extra costs of treating patients for hospital-acquired infections that reasonably could have been prevented.”

CARBON FOOTPRINT

Camfil’s 30/30®, Durafil® ES2 and Filtra® 2000 air filters have the lowest carbon footprints in the industry. For many healthcare facilities, they are an effective and simple way to comply with facility-wide initiatives to reduce carbon footprint.
“Do more with less" is the mantra that resonates throughout every healthcare facility today. It has become a catch phrase for penny-pinching, and a call for people to work harder with fewer resources. The origin of this common phrase, however, was to allow new tools to make work easier.

Budget cuts are on everyone’s mind, and one effective strategy for managing this reality is by choosing critical products by their true life cycle costs – what they cost, with all factors considered, compared to alternatives, over time.

Camfil has developed a family of air filtration products for every area of every healthcare environment with this principle in mind. We have well-engineered filtration solutions that satisfy every important healthcare requirement:

• energy savings
• performance at rated efficiency throughout the life of the filter
• low frequency of change-outs
• low labor and waste disposal

The 5-Star premium filters described in the pages that follow illustrate, in detail, how the filters deliver these advantages and present an intelligent alternative to the low-end commodity products pushed by many manufacturers and buying groups.

Camfil’s many healthcare case studies prove the depth of knowledge and experience behind the development of intelligent, cost-efficient filtration solutions for medical facilities.

Group Purchasing Organizations (GPO) are entities that negotiate contracts with healthcare manufacturers, distributors, and other suppliers, to purvey purchasing power over product selections, volume, and costs. Camfil is currently working with several GPOs. In each case, Camfil is on contract because of our strong Total Cost of Ownership (TCO) message and our proven ability to reduce overall cost. Moreover, Camfil has been proven to improve overall air quality!

The exhortation to “do more with less" has never been louder than it is today. But by understanding its original meaning – to let technology – new tools – lighten the burden, we think America’s hospitals, their patients, administrators, and purchasing professionals, will all breathe easier.

TESTS PROVE IT
Camfil air filters reduce fan energy costs for hospitals by 40% to 50%.

The charts below represent actual results from the Case Study performed at the Texas Medical Center in Houston, Texas.

The area under these air filter loading curves is proportional to energy spend.

As you can see, the top three filters all maintain particle efficiency, while Brand A (Synthetic) does not.
THE FIRST STEP

COMMON AREA FILTRATION

Meeting the minimum filtration standard, along with the proper number of air changes for the space, significantly reduces the incidence of nosocomial transfer. In lieu of the minimum recommendation of MERV 7, Camfil recommends MERV 8 filtration based upon increased performance, product availability, and similar product cost.

Facilities should insist on "getting what they pay for." Specifically, they should demand that a MERV 14 filter perform as a MERV 14 filter at installation and throughout the filter’s life. Coarse fiber products lose efficiency over time. Fine fiber products, such as Camfil's 5-Star filters, maintain their efficiency over time.

Facility directors should ensure they are getting lifetime filter performance by stipulating that each filter should meet the equivalent value in both MERV and MERV-A and they should request that a corresponding test report be supplied with every quotation.


<table>
<thead>
<tr>
<th>Space Designation (According to Function)</th>
<th>Filter Bank No. 1 (MERV)*</th>
<th>Filter Bank No. 2 (MERV)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating rooms (Class B and C surgery); impatient and ambulatory diagnostic and therapeutic radiology; impatient delivery and recovery spaces</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>Inpatient care, treatment, and diagnosis, and those spaces providing direct service or clean supplies and clean processing (except as noted below); All rooms</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>Protective environment (PE) rooms</td>
<td>7</td>
<td>HEPA*</td>
</tr>
<tr>
<td>Laboratory, procedure rooms (Class A surgery), and associated semirestricted spaces</td>
<td>13</td>
<td>Not required</td>
</tr>
<tr>
<td>Administrative; bulk storage; soiled holding spaces; food preparation spaces; and laundries</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>All other outpatient spaces</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Nursing facilities</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Psychiatric hospitals</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Resident care, treatment, and support areas in inpatient hospice facilities</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Resident care, treatment, and support areas in assisted living facilities</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
* The minimum efficiency reporting value (MERV) is based on the method of testing described in ANSI/ASHRAE Standard 52.2. Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size (ASHRAE 2012).
* Additional prefilters may be used to reduce maintenance for filters with efficiencies higher than MERV 7.
* As an alternative, MERV 14 rated filters may be used in Filter Bank No. 2 if a tertiary terminal HEPA filter is provided for those spaces.
* High Efficiency Particulate Air (HEPA) filters are those filters that remove at least 99.97% of 0.3 micron-sized particles at the rated flow in accordance with the testing methods of NEST RP-CC001.3 (IEST [2005]) in Informative Appendix B.

HEPA filters are specified for air supplies serving protective environment rooms for treatment of patients with high susceptibility to infection.

HEPA filters are also specified for discharge air from fume hoods or safety cabinets in which infectious or radioactive materials are processed. The filter system should be designed to permit safe removal, disposal, and replacement of contaminated filters.

A HEPA filter, by definition, has an efficiency of at least 99.97% when tested on particles 0.3 micron in size. The key word is "tested." A HEPA filter must be tested and certified by the manufacturer as to efficiency, rated airflow, and resistance to airflow.

The Certificate of Conformance includes complete testing data and ensures that the manufacturer has built the product to the required specifications.

This certificate will eliminate vendors that would skip this important step, and those that "batch test," rather than individually test each filter.

Certificates of Conformance for each filter should be kept on file for evidence should liabilities arise and to support documentation for facility audits.

The air systems in patient rooms are engineered to protect the patient, employees, and visitors from infection transfer, and should have a minimum of six air changes per hour through a system that uses MERV 8 prefiltration and MERV 14 final filtration.

Corridors should have air supply through MERV 8 prefilters and MERV 14 final filters. Because of their intermittent occupancy, just two air changes per hour are required.

For systems that use HEPA filters in filter banks or housings, increased media filters such as the Absolute VG or Filtra 2000 can significantly reduce energy usage and increase airflow to the operating suite.

Camfil Absolute filter ceiling modules provide classroom level protection for the patient and employees in critical care operating suites and other locations where patients are immunocompromised.


Medical facilities contend with numerous substances that produce odors and gaseous contaminants. Gaseous contaminants can also be introduced from outside or from hospital processes, or from loading docks.

Many areas are susceptible to unacceptably high levels of ozone which has an adverse effect on patients.

This chart shows the filtration that will be effective for removing gaseous contaminants from six specialized areas.

### SPECIAL CONCERNS:
### GASEOUS CONTAMINANTS

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This chart shows the filtration that will be effective for removing gaseous contaminants from six specialized areas.

### CONTROL OF MYCOBACTERIUM TUBERCULOSIS

Some key points relative to air filtration include:

- **Patient and treatment rooms** should be under negative pressure to prevent droplet nuclei from transferring to other areas, including adjoining interior rooms.
- **100% exhaust to atmosphere is needed, possibly through a HEPA filter, if exhaust is within 30 ft. of human habitation areas, or other means of reintroduction back into the building (windows, vents, doors, etc.).**
- **Containment housings and filtration equipment are required in some states – consult Camfil product sheets 3401/3402/3409.**

### PHARMACEUTICALS
### CLEANROOM CLASS LEVELS

In pharmaceutical preparation and storage areas, improved air quality is a critical factor to ensure that the possibility of contamination is controlled. Various cognizant authorities recommend cleanroom class levels for these areas. In areas requiring sterile practices, cleanroom level ISO 5 is recommended. ISO 5 is an environment that has less than 100 particles ½-micron or larger per cubic foot of air. For adjacent areas used for measuring, weighing, mixing and other non-sterile manipulations ISO Class 8 is recommended (less than 100,000 particles ½-micron or larger per cubic foot of air).

The Camfil Pharmaseal® Hood is designed specifically for pharmaceutical applications. Constructed of welded aluminum or stainless steel, it houses Camfil Absolute® filters to ensure clean space performance for the preparation of pharmaceutical components. Adjustments for airflow, ports for testing, and the ability to change filters are all available from the room side for service convenience.

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HEPA FILTER

SERVICE LIFE

Initial considerations concerning the service of HEPA filtration relate to minimizing pressure drop within the HVAC system for energy conservation, and extending the life of the HEPA filters. The chart here shows the typical life extensions of HEPA filtration when various levels of ASHRAE prefilters are used.

When the Life Cycle Cost of the HEPA is considered, MERV 13 or MERV 14 ASHRAE prefilter is the norm. A 5 micron size particle looks like a boulder to HEPA filtration media. The microfine glass fibers that make up the media of the HEPA filter have an operating fiber diameter of 0.67 micron. Large particles can block a relatively expansive area of the filter, increasing pressure drop prematurely and reducing the effectiveness and life of the filter.

ENCLOSURES

HEPA filters are available in a variety of enclosures, including galvanized steel, Galvaneal, stainless steel, wood and particle board. When a wooden framed filter expands or contracts with the rise and fall of moisture-laden air, the integrity of the filter seal may be compromised.

If HEPA filters with wood or particle board frames are used in HVAC systems, gasketing integrity, filter enclosure integrity, and gasketing torque compression should be checked every eight weeks. Where moisture or high humidity is involved, most facilities use metal casings to avoid the problems of wood components in a moisture-laden environment.

INFECTION SOURCES AND
THE IMPORTANCE OF AIR CHANGES

With the increased use of managed care, and incentives for outpatient care, hospitals have a concentrated population of seriously ill patients. Many are also immunosuppressed or being prescribed antibiotics which can encourage the evolution of drug-resistant pathogens.

These factors, along with lapses in sanitation protocols and the mobility of medical staff which provides a pathway for pathogens to spread, further confound a healthcare institution’s best efforts to prevent hospital-acquired infection.

The tables at the end of this brochure describe air filtration requirements for new construction in medical facilities as prescribed by AIA – the American Institute of Architects. Much of the same information is also available in the ASHRAE American Society of Heating, Refrigeration, and Air Conditioning Engineers Handbook.

A medical facility’s first line of defense against infections transfer is its filtration system.

<table>
<thead>
<tr>
<th>Air Changes</th>
<th>Time (Minutes) Required for Removal</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>20</td>
<td>50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time Required for Removal</th>
<th>99% Efficiency</th>
<th>99.9% Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>33</td>
<td>60</td>
</tr>
<tr>
<td>4</td>
<td>66</td>
<td>138</td>
</tr>
<tr>
<td>6</td>
<td>99</td>
<td>207</td>
</tr>
<tr>
<td>8</td>
<td>144</td>
<td>278</td>
</tr>
</tbody>
</table>

Bold listings denote frequently cited air changes per hour for patient-care areas. Moving the air through the filtration system is as important as filter efficiency.

The tasks involved in changing HEPA filters, such as removing existing, ensuring the integrity of the holding mechanism, mounting the new units, certifying performance, and disposing of the old filters, add to the expense of a replacement HEPA filter. This chart shows the increase in life with various selected prefilters. Camfil recommends that HEPA filters be protected from high loading with MERV 8 or MERV 13 prefilters. If a total cost of ownership maintenance program is implemented, this methodology can also produce substantial energy savings.

Microorganism Associated with Airborne Transmission

<table>
<thead>
<tr>
<th>Fungi</th>
<th>Bacteria</th>
<th>Viruses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspergillus spp.</td>
<td>Mycobacterium</td>
<td>Measles (rubella)</td>
</tr>
<tr>
<td>Fusarium spp.</td>
<td>Tuberculosis</td>
<td>Vancillia-zoster virus</td>
</tr>
<tr>
<td>Pseudalleschkea</td>
<td>Acremonium spp.</td>
<td>Smallpox virus (v variola)</td>
</tr>
<tr>
<td>boiydii</td>
<td>Fusarium spp.</td>
<td>Influenza virus</td>
</tr>
<tr>
<td>Scedosporium spp.</td>
<td>Bacillus spp.</td>
<td>Respiratory syncytial virus</td>
</tr>
<tr>
<td>Sordinae cyanescens</td>
<td>Brucella spp.</td>
<td>Adenoviruses</td>
</tr>
<tr>
<td></td>
<td>Staphylococcus aureus</td>
<td>Norwalk-like virus</td>
</tr>
<tr>
<td></td>
<td>Group A streptococcus</td>
<td></td>
</tr>
</tbody>
</table>

Under investigation

| Coccidiodes immitis    | Coxiella burnetti   |
| Cryptococcus spp.      | (Q fever)           |

This chart shows the microorganisms associated with airborne transmission.

Duguid, et. al., 1954

The tasks involved in changing HEPA filters, such as removing existing, ensuring the integrity of the holding mechanism, mounting the new units, certifying performance, and disposing of the old filters, add to the expense of a replacement HEPA filter. This chart shows the increase in life with various selected prefilters. Camfil recommends that HEPA filters be protected from high loading with MERV 8 or MERV 13 prefilters. If a total cost of ownership maintenance program is implemented, this methodology can also produce substantial energy savings.
All filter recommendations meet the required MERV per Standard 52.2-2007 and the corresponding value of MERV A when evaluated per the procedure in Appendix J of the same standard.

In the near future, The United States Pharmacopoeia General Chapter 797 will likely become the standard of care for achieving ISO Cleanliness levels in pharmaceutical preparation areas. As of this writing, ten states require full or partial compliance, with others slated to follow.

Camfil has the products to elevate your pharmaceutical preparation area to ISO Cleanliness levels, while also generating substantial benefits in terms of HVAC-related energy costs. Camfil representatives are ready to assist with useful information and insights that can save time and effort during the pharmaceutical area design phase, whether the project is new construction or renovation.
HEALTHCARE FACILITIES

INDUSTRY RECOMMENDATIONS

REFERENCED IN STANDARDS OR GUIDELINES AS PUBLISHED BY COGNIZANT AUTHORITIES

CAMFIL RECOMMENDS THAT THE AIR FILTERS ALSO HAVE MATCHING MERV-A VALUES PER ASHRAE STANDARD 52.2 TO ENSURE LIFETIME EFFICIENCY OF THE INSTALLED PRODUCT.*

### Healthcare Facilities

**Footnotes (Additional notes on page 19):**

1. All air exhausted to the outside per ASHRAE 60.

2. A ventilation system that recycles air. HEPA filters can be used in lieu of exhausting the air from sensitive rooms to the outside. In the application, the return air shall be passed through the HEPA filters before it is introduced into any other spaces.

3. If it is not practical to exhaust the air from the airborne infection isolation room to the outside, the air may be returned through HEPA filters. This air handling system exclusively serves the isolation room. 4. Total air changes per hour for all rooms, lab/office/recovery rooms, and lab/office/tes/technology rooms can be reduced to four changes when supplemental heating and/or cooling systems exist to provide sufficient heating and cooling, baseline heating, etc. can be used.

5. The protected environment airflow design specifications protect the patient from common external airborne infectious microbes (i.e., Aspergillus spores). These special ventilation areas shall be designed to provide directed airflow from the cleanest patient care area to less clean areas. These special ventilation areas shall be designed and operated to minimize the risk of airborne spread of infectious diseases, such as measles, varicella, or tuberculosis. The design of airborne infection isolation rooms shall include the provision for normal patient care during periods not requiring isolation procedures. Supplemental recirculating devices may be used in the patient rooms, to increase the equivalent room air exchanges. However, such recirculating devices do not provide the outside air requirements. Air may be recirculated within isolated surgical rooms if HEPA filters are used. Rooms with irreversible airflow provisions for switching between protective environment and surgical functions are not acceptable.

6. Through a second stage is not required the inclusion of a secondary filter in this situation increases the life of the final HEPA filter significantly (see image on page 14). A minimum standard per ASHRAE 170 is present in MERV 8. Camfil recommends MERV 8 (see page 10). NR - No requirement OSA - Outside Air N - Negative Max. Maximum P - PFOA - PTFE Filter F - Fabriﬁed T - Total

**Specific supporting reference: Chapter 5, page 72 of the Mechanical Systems Handbook for Healthcare Facilities as published by the American Society of Healthcare Engineering.**
INFECTION CONTROL REFERENCE GUIDE

Staphylococcus aureus has a diameter of 0.8 micron to 1.0 micron. An air filter, having an efficiency of MERV 14, when rated under ASHRAE Standard 52.2, will remove more than 90% of this contaminant.

Tuberculosis has a diameter of 0.2 micron to 0.5 micron and a rod length of 1.0 micron to 4.0 microns. Although an ASHRAE MERV 14 filter should, in all probability, remove at least 90% of this contaminant, assurance can only be provided through the use of HEPA filtration.

Tuberculosis contaminant that approaches the media on a perpendicular may penetrate the filter based upon its diameter of 0.2 to 0.5 micron. HEPA filtration should be strongly considered in areas servicing tuberculosis patients. Filter selection should include consideration of the size and type of contaminant to be captured.

Aspergillus is easily removed by MERV 14 level filtration.

Airborne transmission occurs by dissemination of either airborne droplet nuclei (small-particle residue 5-micron or smaller in size of evaporated droplets containing microorganisms that remain suspended in the air for long periods of time), or dust particles containing the infectious agent. Therefore, special air handling and ventilation are required to prevent airborne transmission.

Legionella, Mycobacterium tuberculosis and the rubella and varicella viruses are also of concern. Room air cleanliness is always a function of filter efficiency and the number of air changes. Many nosocomial maladies are easily removed with a MERV 14 filter. Viruses and other sub-micron contaminants cluster and often adhere to larger items that easily become airborne such as skin flakes. Many are removed from the airstream when the larger particles are captured by the filter.

The chart on page 15 notes the time required to obtain a desired removal efficiency (99% and 99.9% listed). This removal efficiency is just a factor of moving air through the filters so the filters can do what they were designed to do; remove particles from the airstream.

Operating suites are designed with airflows of 15 air changes per hour or more. Some ultra-critical care suites have air changes of 30-50 per hour.

FRAMES AND HOUSING

A filter is only as effective as its holding mechanism. Deficient holding frames, or housings that have gaps or leak paths around the filter, can severely reduce filter performance.

A 1/4-inch gap around a 24-inch by 24-inch prefilter equates to 18% air bypass, or the equivalent of a 3-inch hole in the middle of the filter. A gap around a high efficiency filter is even worse.

Camfil housings and frames include the highest quality gasketing material to ensure that all of the air moving through the system is treated by the air filters. With Camfil designed housings, we guarantee less than 1/2 of 1% leakage across the installed filters.

GASKETING

The HEPA filter should be aligned properly, assuring that the gasketing, when compressed, will seal all surfaces from air bypass. The filter sealing mechanism should compress the gasketing material to 50% of its original depth.

Camfil HEPA filters include a unique poured-in-place seamless gasket that prevents leaks through gasketing junctures as found in competitive filters. (Seamless corner shown in photo right.)

In systems using crank-type housings, torque adjustment should be checked with each filter change. Where a fluid sealing method is used, the knife edge should uniformly penetrate half the depth of the sealant.

Healthcare Facilities
Camfil participates in several guideline and standards bodies whose logos are shown below. Our goal: to ensure that the air filtration industry creates healthy environments for people and processes worldwide.

The American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE)

Advances technology to serve humanity and promote a sustainable world. www.ashrae.org

American Society for Healthcare Engineering (ASHE)
The American Society for Healthcare Engineering (ASHE) is one of the personal membership groups of the American Hospital Association (AHA). ASHE represents a diverse network of 9,400 members dedicated to optimizing the healthcare physical environment.

Institutes of Environmental Sciences & Technology (IEST)
Founded in 1953, IEST is a multi-disciplinary, international society whose members are internationally recognized for their contributions to the environmental sciences. www.iest.org

European Committee for Standardization (CEN) was founded in 1961 by the national standards bodies in the European Economic Community and EFTA countries. www.cen.eu

International Organization for Standardization (ISO) tests products for compliance to national and international standards, and issues certification marks for qualified products.

The Canadian Healthcare Engineering Society (CHES)
CHES exists to help its members manage the environment which is essential for efficient and effective healthcare delivery. They publish information to assist their members in providing the best medical facility care possible.

Camfil is a proud member of the United States Green Building Council (USGBC)
Its mission is to transform the way buildings and communities are designed, built, and operated, enabling an environmentally and socially responsible, healthy, and prosperous environment that improves the quality of life.

www.usgbc.org

Camfil participates in several guideline and standards bodies in the European Economic Community and EFTA countries.

CEN

International Organization for Standardization (ISO)

The Canadian Healthcare Engineering Society (CHES)

CSA International

CSA International tests products for compliance to national and international standards, and issues certification marks for qualified products.

The Canadian Healthcare Engineering Society (CHES)

CHES exists to help its members manage the environment which is essential for efficient and effective healthcare delivery. They publish information to assist their members in providing the best medical facility care possible.

5-Star ECI Rating
Camfil’s filters are rated as 5-Star filters through the Energy Cost Index (ECI) program. Based upon a five-star scale, the Energy Cost Index is an indicator of what a filter will cost over its lifetime. The best rating – five stars – indicates that the filter is the most energy-efficient, longest lasting filter available.

PRODUCT PERFORMANCE GUARANTEED

The Camfil Farr 30/30®
The Camfil Farr 30/30® pleated panel filter comes fully guaranteed to last twice as long as any other pleated panel filter. Since its development in 1963, this uniquely designed product has been providing “sustainable” advantages in energy savings, reduced waste and reduced carbon footprint. No other MERV 8 panel filter can perform like the 30/30. The 30/30 is a 5-Star rated energy cost index filter.

Guaranteed1 to provide the following:
Camfil guarantees the 30/30 will last twice as long as any other pleated panel filter, at the same or lower resistance to airflow than any competitor’s product. Camfil also guarantees the 30/30’s MERV 8 particle capture efficiency throughout the life of the filter. Its mission is to transform the way buildings and communities are designed, built, and operated, enabling an environmentally and socially responsible, healthy, and prosperous environment that improves the quality of life.

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www.camfil.com
Our Healthcare Commitment

Camfil is dedicated to the principle that America’s healthcare providers, their patients, and their communities are best served by exceptionally high quality air filtration, tailored to individual areas, that promotes the health and well-being of everyone.

Take a moment to learn more about the CamField mobile lab, In-situ testing units for individual AHUs, and Life Cycle Cost analysis software. Put them to work to help you determine the best performance outcome, and the best value, for your healthcare facility. Call your Camfil representative today.