Kimberly-Clark PROFESSIONAL*

Green Buildings

A Guide to Understanding the Role of HVAC in LEED® Certification

Buildings pursuing LEED® (Leadership in Energy and Environmental Design) certification need to evaluate many things relating to energy efficiency, water efficiency, indoor environmental quality and related materials and resource selection. But are they focusing on all the right things?

Consider the HVAC Air Filtration System

A building's HVAC air filtration system provides tangible ways to improve indoor air quality (IAQ) and energy efficiency – two main tenets of the LEED® program. In addition to contributing to the completion of LEED credits and prerequisites, careful selection of the right HVAC filter and filter media can actually save money in the long run – answering critics' charges that green buildings always have to cost more.

Effective air filtration provides the primary defense for building occupants and HVAC equipment against particular pollutants generated within a building as well as pollutants from air drawn into a building from the HVAC system. At the same time, air filters play a significant role in the energy consumed to operate the HVAC system. The higher the filter's resistance to air passing through it, the more energy is consumed to operate the HVAC system motors.

But even though we speak of air filters, it's really the filter media that has the biggest effect on providing clean air, protecting HVAC equipment, and minimizing energy consumption. That's why the right filter media strategy can help buildings become "greener" and meet LEED and other green building rating system criteria.

What is LEED®?

LEED® stands for Leadership in Energy and Environmental Design. A green building rating system developed by the U.S. Green Building Council, LEED provides a comprehensive framework for assessing a building's overall environmental performance.

Select the Right Filter

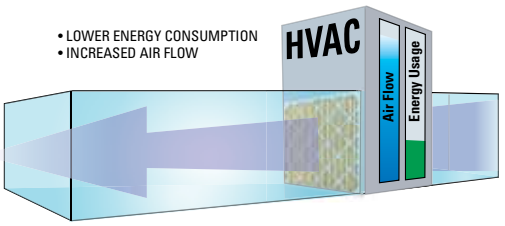
To understand how the right filter can help to achieve LEED prerequisites and credits, it's important to understand how filters should be selected to meet IAQ and energy efficiency requirements.

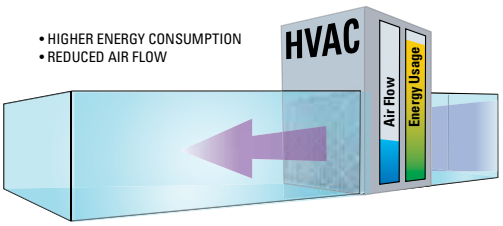
One of the biggest factors is filtration efficiency, which defines how well the filter will remove contaminants from air passing through the HVAC system.

The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) has developed two HVAC industry standards that characterize air filtration. Among other things, the ASHRAE 52.1-1992 standard measures the filter's pressure drop and dust holding capacity. A higher pressure drop means reduced air flow to the HVAC unit, requiring more energy to operate the system. And a higher dust holding capacity means a longer filter life.

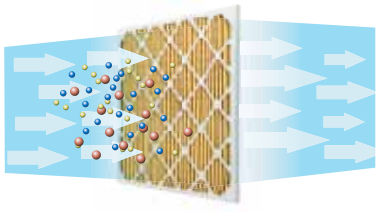
The ASHRAE 52.2-1999 standard measures the fractional particle size efficiency of an HVAC filter. A MERV, or Minimum Efficiency Reporting Value, is assigned to filters based on their minimum filtration efficiency at various particle sizes. A rating of one is least efficient, while a rating of 16 is most efficient.

HVAC systems typically account for about 40 percent of a commercial building's electricity expenses. An HVAC filter's energy efficiency depends on its pressure drop: the higher the filter's pressure drop, the more the HVAC system motor needs to work to deliver the required air flow. Fortunately, development of new filter media has given the industry a chance to produce lower pressure drop filters while maintaining high particle capture efficiencies, thereby providing the ability to improve IAQ and reduce electricity costs simultaneously. Switching to a lower pressure drop filter is one of the easiest changes to make in an effort to reduce energy costs.





During the filter selection process, remember that the cost of energy used by filters far outweighs the initial cost of the filter itself – up to 10 times for a standard pleated filter and 4-5 times for a higher-efficiency final filter. That's why it's important to take into account the entire lifecycle cost of the filter and not just its initial purchase price. To learn more about energy savings, visit www.kcfiltration.com and click on the energy savings calculator.



LEED Checklist

While no individual product or system in itself can be LEED-certified, the proper HVAC air filtration system and strategy can help contribute to the completion of LEED-EB (Existing Buildings) prerequisites and credits. Use the handy checklist included in this booklet to see how.

LEED EXISTING BUILDING PROGRAM

Rating Category	Air Filtration Strategy	Points Available
Energy & Atmosphere – Prerequisite 2: Minimum Energy Performance	Utilize Kimberly-Clark's Energy Analysis Tool to understand the impact of a filter's air flow resistance on HVAC system energy costs.	Required
Energy & Atmosphere – Credit 1.1 - 1.10: Optimize Energy Performance	Complete a life cycle and energy cost analysis on the HVAC filter system and switch to a lower resistance air filter, one of the easiest changes to make to reduce energy costs and loads.	10
Energy & Atmosphere – Credit 3.1: Building Operations and Maintenance – Staff Education	Educate maintenance staff on filtration fundamentals and application of various air filtration technologies by using programs offered by the National Air Filtration Association (NAFA).	1
Energy & Atmosphere – Credit 5.1 - 5.3: Performance Measurement – Enhanced Metering	Implement metering devices to measure air distribution, static pressure, and ventilation air volumes. Utilize pressure gauges to measure resistance to air flow to determine the appropriate changeout cycle for air filters.	3
Energy & Atmosphere – Credit 5.4: Performance Measurement – Emission Reduction Reporting	Utilize Kimberly-Clark's Energy Analysis Tool to determine the amount of energy saved and greenhouse gas emissions reduced by using low resistance air filters. Utilize high efficiency air filters (MERV 14 or 15) to reduce PM10 and PM2.5 particulate emission through outside air exhausts.	1
Materials & Resources – Prerequisite 1.1: Source Reduction and Waste Management - Waste Stream Policy and Waste Stream Audit	Switch from standard-capacity pleated air filters to high-capacity pleated filters, and/or bag-style to minipleat v-bank final filters. This extends filter life to reduce changeouts and waste streams while minimizing resistance to air flow.	Required
Indoor Environmental Quality – Credit 3: Construction IAQ Management Plan	Install MERV 8 air filters at each return air grill for air handlers used during construction. Conduct a 2-week building flush-out with new air filters and 100 percent outdoor air prior to occupancy.	1
Indoor Environmental Quality – Credit 4.1: Documenting Productivity Impacts - Absenteeism and Health Care Cost Impacts	Install MERV 14 or 15 air filters to help reduce the airborne irritants that can lead to health issues such as headaches, respiratory problems and other irritations. Document absenteeism after filter upgrades.	1
Indoor Environmental Quality – Credit 5.1: Indoor Chemical and Pollutant Source Control	Install MERV 13 air filters. Follow a regular schedule for air filter maintenance to keep unfiltered bypass air from entering the ductwork and breathing air. Utilize air filters made with synthetic media to minimize air flow resistance and eliminate chances of fiber shedding.	1
Indoor Environmental Quality – Credit 9: Contemporary IAQ Practice	Upgrade from MERV 13 to MERV 14 or 15 air filters, or upgrade to filters made with synthetic media, which typically have lower resistance to air flow and do not absorb moisture or promote microbial growth.	1
Innovation in Operations & Upgrades – Credit 1.1 - 1.4:	Document supplier source reductions, use air filters with recycled content, utilize gaskets on all filters and holding frames.	4
	Total	**23**

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For more information on

Kimberly-Clark Filtration Products,

visit us online at www.kcfiltration.com.

Reduce Today Respect Tomorrow*

Reduce Today, Respect Tomorrow* is the KIMBERLY-CLARK PROFESSIONAL* approach to sustainability. It begins with the understanding that the way we use resources today shapes the world of tomorrow. And it has led us to focus on reducing consumption at every stage of the product lifecycle – from design and manufacture to distribution and disposal. Reduction is the key to lowering the environmental impact of our activities as well as those of customers. To learn more, visit **www.kcpreducetoday.com.**

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