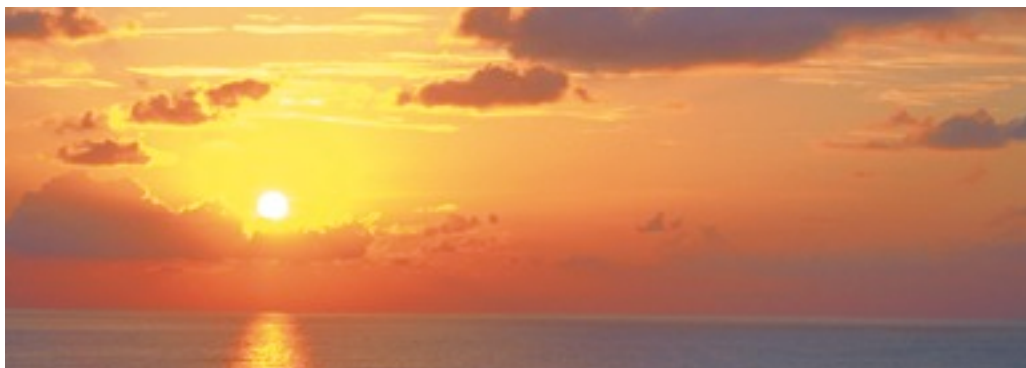




Green Initiatives

How Can a Clean Air Company Help You Achieve Your Green Initiatives?





What is Green?

What Does GREEN Mean?

What strategies will have a positive affect on our environment versus just making a lot of noise? How do you sort through all the products that claim to be 'GREEN' and determine which products can help achieve your GREEN goals?

A corporate initiative to promote Environmental Responsibility, Sustainability or High Performance Green Building certification can create a great deal of confusion. What steps are needed to accomplish the stated initiative and which products can help in achieving these goals? All the confusing rhetoric and product claims have made it even more difficult to determine what strategy should be implemented. The purpose of this guide is to provide some basic and clear guidance on how filtration can help achieve these corporate initiatives.

What does 'GREEN' mean? Unfortunately there is no clear, easy answer. A textbook answer is "concern with or supporting protection of the environment or avoiding harm to the environment". So the first step is to define what GREEN means to your corporate initiative. Depending upon your definition of GREEN and how the corporate goals for Sustainability are defined will determine the course of action that is needed.

This guide will look at several of the more common questions and how filtration can play a role in achieving these goals and more specifically how Tri-Dim Filter Corporation and our filtration products and services can accelerate achieving your GREEN goals.



What is LEED?

LEED certification has become recognized as the industry standard for Green Building Certifications. LEED (Leadership in Energy and Environmental Design) Green Building Rating System™ is a nationally accepted benchmark for the design, construction and operation of high performance green buildings. LEED is released and maintained by the U. S. Green Building Council (USGBC). The USGBC is nonprofit and is composed of members from all areas of the building industry.

LEED Certification, or at least compliance with LEED Rating System is one of the most common goals for Corporate GREEN Initiatives.

Does LEED Certify Products as GREEN?

No - the LEED Rating Systems and the USGBC only certify buildings and offer professional accreditations. It is important to note that no products can be certified under the current LEED Rating Systems.

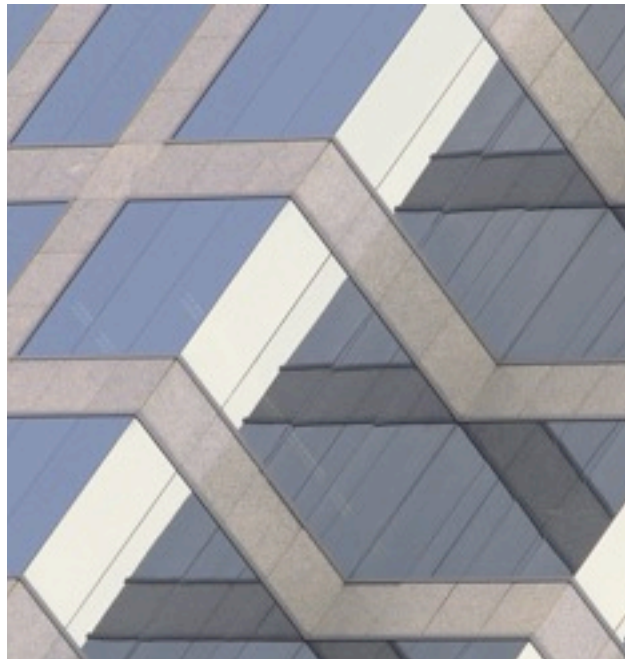
How Does LEED Work?

The LEED Rating System is a third party certification program. The LEED Rating Systems are broken down into a variety of relevant categories (see diagram - below). Each of the LEED



Rating Systems take a whole-building approach and target key areas - sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality. These key target areas are the categories of available points within the LEED Rating System.

A third party, independent auditor, will substantiate that the criteria specified in the LEED Rating Systems have been fulfilled. Along with verification the auditor will substantiate that the steps taken are indeed helping the environment. LEED Certification can create valuable 'Goodwill' within the community and with your customers and could qualify for valuable tax incentives.



Are There Different Levels of LEED Certification?

Within the individual Rating Systems are four levels of certification - Platinum, Gold, Silver and Certified. These levels are achieved by obtaining specified levels of points that are defined within the Rating System.

Does LEED Give Precise Details on Requirements for Points?

The Rating System has some detailed criteria but most of the criteria of how to obtain points are, by design, rather generalized so creativity and the uniqueness of each facility can be utilized.

What Area/Points Do I Go After ?

The applicant can 'pick and choose' which of the target areas they will pursue for points based upon the desired certification level and the strengths and weaknesses of the individual facility.

Filtration in the LEED Rating System

from LEED for Existing Buildings: Operations and Maintenance April 2008

Requirement	Available Points	Rating Category	Strategy
If air-handlers must be used during construction, filtration media with MERV 8 must be used at each return air grille, as determined by ASHRAE 52.2-1999. Replace all filtration media immediately prior to occupancy. After construction ends and all interior finishes have been installed, install new filtration media and flush-out the affected space.	1	Indoor Environmental Quality - EQ Credit 1.5: IAQ Best Management Practices: Management for Facility Alterations and Additions	Tri-Dek #8 - MERV 8 Bulk Media and Media Pads - Imprinted with MERV 8 Efficiency for immediate verification.
Have in place filtration media with a minimum efficiency reporting value (MERV) greater than or equal to 13 for all outside air intakes and inside air recirculation returns during the performance period. Establish and follow a regular schedule for maintenance and replacement of these filters according to the manufacturer's recommended interval.	1	Indoor Environmental Quality - IEQ Credit 1.4: IAQ Best Management Practices: Reduce Particulates in Air Distribution	Tri-Dim offers a wide range of filters from MERV 13 up to MERV 16 - work with your local representative to find the filter that will achieve your specific GREEN goals.



What Specific References to Air Filters are in LEED?

The table at the bottom of the previous page gives the specific references to air filtration in the LEED Existing Building Rating System, the other LEED Rating Systems have very similar references.

Tri-Dim offers the total solution for both of these requirements. TRI-DEK® #8 MERV 8 Media is one option offered by Tri-Dim that offers compliance with the requirements for renovation and construction. TRI-DEK #8 Media is available in either bulk rolls or cut pads. The TRI-DEK #8 Media is imprinted with the filter efficiency (MERV) right on the filter for instant verification of the filter efficiency. Tri-Dim also offers a complete line of high efficiency filters that offer MERV 13 to MERV 16 efficiency to meet and exceed the IAQ requirements. Tri-Dim's TRI-CELL XLR Series is one example, it offers high efficiency, extended service life (less filters sent to the landfill) and is easily compressible to minimize landfill space.



Tri-Dek® #8



Tri-Cell™ XLR

What Additional Ways Can Air Filtration be used to Achieve LEED Points?

In addition to the specific references to filtration in the Indoor Environmental Quality section, there are many other areas that Tri-Dim's filtration products can be used to help achieve valuable LEED points. A few examples are highlighted below:

Under *Materials and Resources MR Credit 1.1–1.3: Sustainable Purchasing: Ongoing Consumables (1–3 points)* it states that one of the definitions of a Sustainable Purchase is to contain at least 10% post-consumer recycled content.

The TRI-DEK® 3-ply and 4-ply Panel and Cube

filters have over 20%, by weight, of post-consumer recycled content. In addition TRI-DEK filters offer extended service life (reduced filters to the landfill and reduced transportation costs), and elimination of dirty air bypass (energy efficiency of coil, indoor environmental quality for clean coils).

The TRI-CUBE™ RFX Reverse Cube (pictured left) offers the maximum in surface area due to an innovative center pocket, all of the above benefits are maximized with the TRI-CUBE RFX



Reverse Cube



Tri-Dek® Panel



Tri-Dek® E8 Panel

Energy and Atmosphere EA Credit 1: Optimize Energy Efficiency Performance (2–15 points; 2 points mandatory) - To achieve an

This article is continued on page 6



Additional Ways to Get LEED Points - continued from page 5

increased level of operating energy efficiency performance. Filters with lower pressure drop (also called resistance) can reduce energy consumption - this topic is discussed in more detail later. Tri-Dim's PREDATOR Series features a low pressure drop that leads to improved Energy Efficiency as well as high efficiency and long service life.



Predator

Materials & Resources MR Credits 7.1 and 7.2: Solid Waste Management: Ongoing Consumables (1–2 points) - To facilitate the reduction of waste generated from the use of ongoing consumable products by building operations that are hauled to and disposed of in landfills or incineration facilities. Filters with longer service life and more compact design can help reduce

the quantity of materials added to the waste stream.



Tri-Dek E-Series Panel Filters

Even more opportunities to use filtration for LEED points exist.

What is ENERGY STAR®?

ENERGY STAR is a joint program of the Environmental Protection Agency (EPA) and the Department of Energy (DOE) helping all save money and protect the environment through energy efficient products and practices. ENERGY STAR certifies homes, commercial and industrial buildings. Commercial buildings and manufacturing plants gain certification by being in the top 25 percent of facilities in the nation for energy performance.

In addition to the certifications ENERGY STAR offers the Portfolio Manager, it is an interactive energy management tool that allows you to track and assess energy and water consumption in a secure online environment.

For more information on joining the ENERGY STAR program, having your building certified or the Portfolio Manager visit the ENERGY STAR website at www.energystar.gov.

Does ENERGY STAR® Certify Products?

ENERGY STAR does certify products in over 50 categories. Certification is achieved based upon the products ability to use less energy, save money, and help protect the environment. Main product headings include - Appliances, Heating and Cooling, Home Envelope, Home Electronics, Office Equipment, Lighting, Commercial Food Products and Other Commercial Products. It is important to note that ENERGY STAR does not currently have a program for the certification of air filters.

What about Recyclable and Recycled Products?

A worthwhile GREEN initiative is to purchase products that contain recycled content or that are recyclable or both. There are some important guidelines you should examine before investing in products that claim to be recyclable. Just because an individual component of a product is recyclable does not mean it will be recyclable once it is assembled. Many manufacturing processes add subcomponents or chemical treatments that may inhibit the recyclability. Also you will need to verify if your area has recycling centers for the recyclable items - not all locations offer appropriate recycling centers.



There is also some important information to consider before you purchase these items made with recycled content. Recycled content can be broken down into two specific categories - pre-consumer and post-consumer recycled content. Pre-consumer is any item recycled before it reached the consumer - typically this is scrap from the manufacturing process that can be put back into the process or shipped to recycling centers. Post-consumer content is made from items recycled after its use by the consumer. Products with post-consumer recycled content are generally considered more beneficial to the environment than products with pre-consumer recycled content.

As with all decisions, quality of the product and economics should play a part in the decision of whether to utilize a product that is recyclable or manufactured with recycled content. Quality and price of these products as compared to standard products are an important part of the decision. It is not uncommon for environmentally friendly items to require a larger investment than standard items. We all agree there is certainly value in helping to protect the environment but determining what that value is and where to draw the line can be a difficult decision.





Energy Savings is Huge - How Does Filtration Fit In?

Energy Savings have certainly become one of the leading 'GREEN Initiatives' with the recent dramatic rise in all energy related expenses it is not difficult to determine why. Along with the obvious economic benefits, saving energy definitely has many positive affects on the environment.

Research has documented that energy accounts for approximately 80% of the total life cost of an air filter and when you take into account that this research is several years old this number has certainly increased. Additional studies have documented that HVAC systems account for 30% of the total energy used in the average commercial building.

In the world of air filtration Energy Savings is most frequently discussed in terms of reduced resistance or pressure drop.

Pressure Drop is defined as the resistance of the flow of airflow through a filter.

Resistance is measured in inches of water gauge or in pascals. The simplified theory is that the lower the pressure drop of the filter, the less the HVAC system has to work to push or pull the air through the filters and the quicker the thermostat is satisfied.



This has resulted in a focus to remove filters with a high pressure drop and replace them with a lower pressure drop filter to realize these potential energy savings. Several different models for calculating Energy Savings have been utilized to approximate energy savings resulting from reduced pressure drop.

We are concerned that many of the Energy Savings models currently being utilized appear to grossly exaggerate the potential dollars that can be saved. Tri-Dim has performed 'real world' investigations that have shown dramatic discrepancies. In one particular study the pressure drop was lowered significantly by changing from a 'high' pressure drop filter to a 'low' pressure drop filter. If you take the same data and plug it into one of these Energy Savings models the estimated annual savings is in excess of \$2,000 and yet the actual dollar savings was in the neighborhood of \$500 per year. That is quite a difference.



So Are Energy Calculators Useless?

No - what we are saying is that HVAC systems are very complex with many factors affecting the energy consumption, so calculating the precise amount of Energy Savings is virtually impossible. An important fact to note is that these formulas simply provide an estimate and calculating the precise amount of energy used cannot be accomplished by a formula but would require sophisticated equipment. The formulas simply provide a best guess that in fact may be dramatically different than the energy savings actually realized.

In almost all applications a reduction in pressure drop will result in an energy savings but in many applications that dollar amount is grossly exaggerated. The reality is that with these large exaggerated savings, companies are using only one criteria for filter selection and failing to look at the big picture.



Before Duct Cleaning



After Duct Cleaning

What is this 'Big Picture'?

What we mean by the big picture is to not just focus on one aspect (i.e. - energy), but look at all the variables - efficiency of the filter, service life, filter expense, filter disposal, shipping and storage cost, dirty air bypass, pressure drop, etc - in other words we need to take a 'System Approach' where we take into account all of the variables.

The best way to make this point clear is to look at the possible consequences of only considering energy savings when selecting a filter. For example, if we focus only on energy consumption we

are likely to select a filter that offers extremely low pressure drop when compared to filters of similar rated efficiency. The issue is that some of these filters suffer from efficiency degradation so they will perform at their rated efficiency for only a very short period of time, then the efficiency will dramatically drop after just a few weeks of use. The results over time of reduced efficiency could equal the before picture of a recent duct cleaning job performed by Tri-Dim's service division. (Before and after pictures left). Reduced efficiency allows particulate to accumulate in the HVAC system possibly allowing for biological agents to grow and flourish in the system - reducing system efficiencies and compromising the health of the occupants.

Energy was saved - but at what cost?



How Can Tri-Dim Help Achieve My Green Goals?

In order to start the product selection process you must first determine your GREEN Goals. There are a lot of other variables that could affect this process - budget, guidelines or production demand for minimal efficiency levels, constraints of current HVAC system - just to name a few.

Tri-Dim Filter offers the complete package for assisting you in achieving your green goals. Tri-Dim manufactures a complete line of HVAC filtration products that offer a variety of GREEN solutions - only a few have been highlighted in this brochure. In addition Tri-Dim continues to search the marketplace for innovative products like the GREEN water treatment system, eH2O, that can assist our customers in achieving their goals.

Tri-Dim also features our Service Department that can perform HVAC hygiene cleaning, filter changing and other services. Tri-Dim prides itself on our factory trained sales staff that can come to your facility and perform a complimentary system audit. Tri-Dim also has a support staff of customer service representatives and an engineering support staff to assist with technical issues.

Is it Important that Your Vendors do More Than ‘Talk the Talk’?

Tri-Dim believes it is important that you purchase from vendors that share the same concern for the environment as you do. Unfortunately there are a lot of companies just trying to ‘capitalize’ on an opportunity. Tri-Dim has a long history of environmental focus. A few of these initiatives include: Waste Reduction Program (see *Case Study below for more details*), elimination of harmful chemicals, replacement of raw materials with environmentally friendly options, more energy efficient lighting, etc. The case study (*below*) highlights this long-term commitment.

Tri-Dim continues to look for innovative ways to protect our environment and to assist our clients in their Green Initiatives goals.

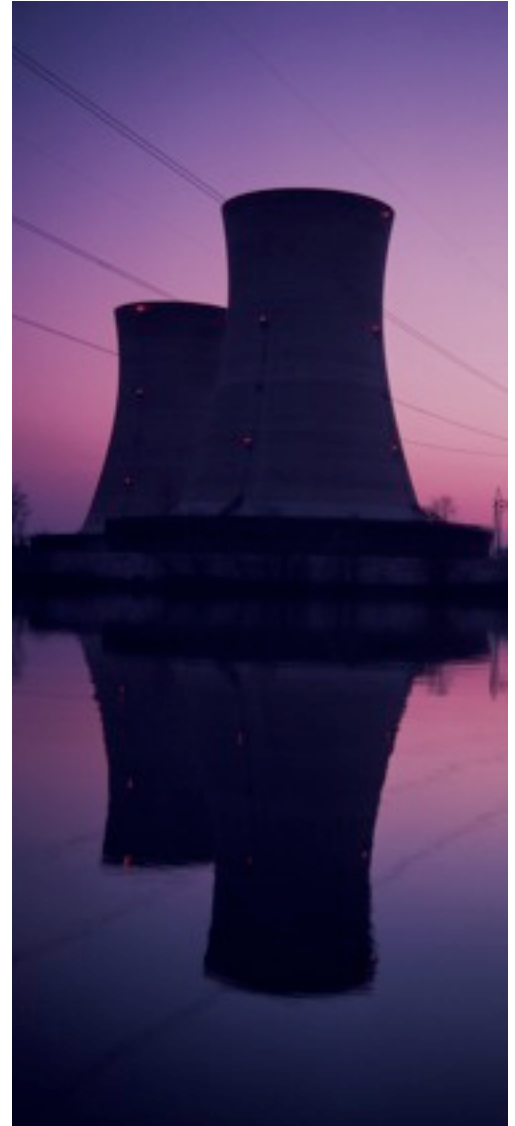


CASE STUDY - MANUFACTURING WASTE REDUCTION 2006 - 2008

Tri-Dim began a concerted effort to reduce the flow of waste from our manufacturing processes to the local landfill. This effort has been a major focus of our manufacturing group with monthly updates posted throughout the plant. Tri-Dim’s manufacturing group sought innovative ways to reduce waste - reduced packaging waste (reduced size of cardboard box), set-up reductions, improved scheduling and production, recycle metal scrap, repair before scrap on certain components (reduced scrap rate to 1.5% in our wire department) and more.

The result of this focus had paid huge dividends with waste being reduced by over 40% from 2006 to 2008.





Tri-Dim Filter Corporation is committed to continual product development – all descriptions, specifications and performance data are subject to change without notice.
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