KRUEGER GREENTOUCH INITIATIVE

PROMOTING SUSTAINABLE HVAC BUILDING







WWW.KRUEGER-HVAC.COM

Building Products for a Sustainable Future

Krueger believes it is not enough to just provide green solutions, but that it is equally important to educate HVAC professionals on system design to make sure that components work together to provide the full extent of energy savings, while still ensuring occupant comfort.

Our Committment

Krueger is committed to providing green solutions that promote energy-efficient, sustainable HVAC designs. Krueger's GreenTouch Initiative includes continually improving existing designs, pursuing more environmentally responsible product innovation, and reducing energy consumption in our plants and facilities.

By integrating Krueger green air distribution solutions, you will not only find it easier to support LEED prerequisites/credits and capture energy savings, but you are also helping to preserve our environment for future generations. Krueger's membership in the USGBC, as well as entrance into the chilled beam and displacement ventilation markets are just two signs of our commitment to sustainable building solutions. We look forward to the opportunities and challenges ahead as our GreenTouch Initiative shapes the future of our market.



Proud Member Since 2008

Saving Energy

KRU

Saving energy is a key goal in the design of new buildings. Krueger offers a full range of products and technologies that offer energy savings over traditional HVAC solutions, such as ECM motors in our fan powered terminal units and fan filter products, the revolutionary LineaHeat[™] time-proportional electric heat option, VAV diffusers, chilled beams, displacement ventilation, and underfloor products.

Supported by Krueger's selection software and other electronic tools, engineers have a wide variety of products and designs to choose from that will result in reduced energy consumption, regardless of the application.

Helping the Environment

Providing products that are energy-efficient is just one way of helping the environment. Ensuring that our manufacturing procedures in our facilities meet or exceed all environmental regulations is another.

Our plants work everyday to optimize recyclables, minimize scrap, and utilize environmentally safe paint and coating products and procedures.

By locating our manufacturing facilities throughout North America, it assures the shortest possible shipping distances to customer locations, reduces our carbon footprint, and allows us to provide timely deliveries.



Supporting Sustainable Green Building Design

Designing for the Occupant

Air Diffusion Performance Index

Krueger pioneered the use of ADPI Selection of diffusers by placing ADPI selection charts in our Product Catalog for every diffuser. These charts will assist you in achieving a design which will meet the ASHRAE 55* vertical stratification requirement. Our K-Select selection software has been updated to include additional ADPI calculation graphs to provide documentation to aid in achieving the LEED Comfort Point.

ADPI Selection Guidelines

Optimal comfort levels in a space can be estimated using the various outlet types and different room loads. The recommendation in the following example ADPI graph covers cooling loads of up to 80 Btuh/ft² of floor surface. The loading is distributed uniformly over the floor up to about 7 Btuh/ft², lighting contributes about 10 Btuh/ft² and a concentrated load against one wall that simulates a business machine or a large sun-loaded window supplies the remainder. The maximum ADPI condition is lower for the highest loads; however, the optimum design condition changes only slightly with the load.

For a given diffuser type, the ADPI performance as a function of room load and T50/L has been studied in ASHRAE research, and is available in the ASHRAE Handbook of Fundamentals. Below is the output from K-Select, Krueger's selection program for a model 1400 at specific conditions, supplying 400 sqft in this example.



Example: ADPI selection graph of typical 4-cone ceiling diffuser, Krueger 1400. *V4 LEED-NC Credit 7.1 may be awarded for complying with ASHRAE Standard 55-2013. This standard limits vertical temperature stratification, within the occupied zone to no greater than 5°F. Assuring an ADPI of no less than 80% will comply with a critical part of this requirement.

The real challenge for a building designer is to provide the occupant with a satisfactory environment.

In order for a design to be truly sustainable, the occupant's needs for health and comfort must be met. This involves a careful selection of air distribution elements, combined with a controlled air supply, to ensure freedom from drafts, hot and cold spots, and optimal ventilation. Krueger manufactures a selection of products designed to control such critical elements.

Complete with selection software, white papers, published articles, software, and spreadsheets, it is our goal to educate HVAC professionals on how best to provide occupant satisfaction while designing for a sustainable environment.



LEED V4 for Schools

LEED V4 for Schools now requires the calculation of HVAC sound levels.

AHRI 885 is one means of complying with this requirement. The AHRI 885 spreadsheet requires both the supply equipment and diffusers sound power. Krueger is the only manufacturer that publishes octave band sound power in their Product Catalog.

Products to Reduce Energy & Increase Efficiency



ECM Motors

Krueger offers energy-efficient ECM motors throughout its entire line of fan powered terminal units. We were the first manufacturer with an ECM motor option on parallel fan units. Whether you are meeting new municipal requirements, or the total building energy reduction requirements of both LEED -CI and -NC rating manuals, ECM motors can help.



AC Solid State Relays

Gone are the days when mercury contactors were the only option for silent staged heating. As part of our GreenTouch Initiative, Krueger is replacing mercury contactors with AC Solid State Relays. At no extra cost, we can offer you a better solution that is environmentally friendly.



DOAS Fan Powered Terminal Unit

Krueger's Dedicated Outdoor Air System (DOAS) unit offers a flexible design that lets you go green. The system easily adapts to changing occupancy requirements. Krueger's DOAS fan powered terminal unit features an ECM motor which allows for VAV fan operation and has the potential to radically reduce fan energy. Even better, it has a minimal inlet pressure (about 0.1" Ps). These features will significantly lower the DOAS total system pressure and provide more savings for the building owner.

MERV 8 Filter

A MERV 8 Filter is available on Krueger fan powered terminal units with an ECM motor. Placing a MERV 8 Filter on the induced air inlet of a fan box (during construction) will earn you a LEED-NC Point for IEQ Credit 3.1.



LineaHeat™

Krueger's patented LineaHeat[™] proportional electric reheat coil offers an inexpensive solution to meet the latest ASHRAE Standard 62.1, which limits the discharge air temperature to 90°F. The updated Standard 62.1–2013 lists overhead heating requirements in Table 6.2 and is referenced in both the LEED-NC and LEED-CI rating procedures in both IEQ Prerequisite 1 and IEQ Credit 2. LineaHeat[™] achieves energy savings by sending a pulse width modulated signal with infinite adjustment to provide the exact amount of heat required. In addition, an addenda to ASHRAE Standard 90.1 allows up to 50% of VAV cooling airflow if the system uses VAV heat starting at 20% and controls discharge temperature, which Krueger's LineaHeat[™] can provide.

Products to Reduce Energy & Increase Efficiency



Underfloor Air Distribution System

Krueger offers a complete line of underfloor pressurizedplenum air distribution (UFAD) products, including a unique mixing unit for supplying air to the underfloor plenum. These products are part of a system that is eligible for LEED points for both Occupant Environmental Control and Resource Reuse Credits.



VAV Diffusers

Krueger's VPQ architectural VAV plaque diffuser provides building occupants the ability to control their individual space based on their own comfort needs. HVAC systems designed to include these VAV diffusers will help to achieve 1 Point for IEQ Credit 6.2.



Chilled Beams

Chilled beam technology has recently gained the attention of our industry due to the potential energy savings associated with using water in combination with air to condition the space. By volume, water can transfer 10 times more energy than air thus providing more efficient chiller performance and up to 60% reduction in the required air handler CFM output. Additionally, chilled beams adapt easily to many different energy sources and provide the flexibility to meet many room layout applications. With the optional integral supplemental cooling valve, additional conditioned air can be supplied to the space during high occupancy periods, then reduced during unoccupied periods to minimize unnecessary energy consumption and sub-cooling of the space.



Displacement Ventilation

Displacement ventilation offers quality solutions for high ceiling applications such as lobbies, theaters, conference rooms, along with industrial applications where high contaminant loads exist. As the conditioned supply air moves across the floor, contaminants and excess heat are displaced into the stratified zone to be exhausted, resulting in a much cleaner occupied zone when compared to conventional overhead mixed air distribution systems. Additionally, due to their quiet operation, they have become a popular choice for classrooms and other applications where excessive noise may be undesirable. With slightly higher discharge air temperatures, compared to mixed systems, displacement ventilation systems require less cooling energy and take advantage of longer free cooling periods.

LEED V4-NC for New Construction and Major Renovations

LEED Certifications

LEED is an internationally recognized green building certification system, providing third-party verification that a building or community was designed using strategies aimed at improving performance across key metrics: energy savings, water efficiency, CO₂ emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts.

Industry Links

U.S. Green Building Council www.usgbc.org

LEED Rating Procedures www.usgbc.org/LEED

LEED V4-I New Constru- rewarded act Certified Silver Gold Platinum GBCI recogr levels with a	NC Certification Scale action, Core & Shell, and School certifications are cording to the following scale: 40 - 49 Points 50 - 59 Points 60 - 79 Points 80 Points + nizes buildings that achieve one of these rating formal letter of certification.	EC Motors - Fan Powered Terminal Units	EC Motors - Fan Filter Units	LineaHeat™	DOAS Fan Powered Terminal Units	MERV 8 Filter	Chilled Beams	Displacement Ventilation	Underfloor Air Distribution System	VAV Diffuser	ADPI Graphs, Air Distribution Products	Points Available
Energy & Atmosphere (EA)												
Prerequisite 1	Fundamental Commissioning of Building Energy System	x	х									Prerequisite
Prerequisite 2	Minimum Energy Performance	х	х		х			х	х	х		Prerequisite
Credit 1	Optimize Energy Performance	х	х		х			х	х	х		Up to 19
Credit 3	Enhanced Commissioning	х	х	х	х			х				2
Materials & Resources (MR)												
Credit 1	Building Reuse								х			2
Indoor Environmental Quality (IEQ)												
Prerequisite 1	Minimum IAQ Performance			х								Prerequisite
Credit 2	Increased Ventilation				х		х	х	х			1
Credit 3.1	Construction IAQ Management Plan -During Construction					х						1
Credit 6.2	Controllability of Systems, Thermal Comfort								х	х		1
Credit 7.1	Thermal Comfort, Design			х							х	1

Credits are referenced from the V4 Edition of the LEED Reference Guide for Green Building Design and Construction.



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www.facebook.com/KruegerHVAC

Krueger-HVAC.blogspot.com

Learn More About Other Krueger Air Distribution Solutions

Krueger continues to lead the industry in the development of innovative products and air distribution solutions. Contact your local Krueger Representative or visit us on the web at www.krueger-hvac.com to find more information on these and other Krueger air distribution products.

Diffusers

Plaque & Architectural Louvered Perforated Modular Core Linear Slot Plenum Slot Round Air Nozzles

Grilles & Registers Supply Return Linear Bar Security Industrial Duct Mounted Transfer

Stainless Steel

Terminal Units Single Duct Fan Powered Dual Duct Bypass & Retrofit

Fan Coils Horizontal Vertical / Stack **Critical Room Solutions**

Chilled Beams

Displacement Ventilation

Underfloor Underfloor Diffusers Underfloor Terminal Units

VAV Diffusers



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