

# KRUEGER, LEED, AND ENVIRONMENTAL AWARENESS

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## OVERVIEW

The US Green Building Council's LEED (Leadership in Energy and Environmental Design) has finally hit the mainstream of the US Engineering community's awareness. In many engineering offices, we find that there are often several individuals who are "LEED Accredited Professionals", and many municipalities, organizations and building owners are demanding LEED qualification. Compliance with LEED requires as a prerequisite, that many ASHRAE Standards be fully complied with, especially ASHRAE Standard 62.1 (now 2010) VRP (Ventilation Rate Procedure).

Krueger is fully involved in updating the LEED requirements, ASHRAE and ISO standards for comfort, promoting excellence in building design, product evaluation, rating and advanced product design. Krueger personnel are involved in the IE TAG of USGBC, several ASHRAE and ISO committees, as well as AHRI Technical committees. Krueger has always been committed to providing the most environmental friendly, sustainable products that will provide customers with the most energy conscious products, and at the same time, utilizes the most advanced technology to provide optimum comfort and productivity for the occupants in spaces conditioned by Krueger products.

## LEED

Krueger is working closely with the Technical Advisory Groups (TAGs) within the US Green Building Council (USGBC- <http://www.usgbc.org/>) to assure that the requirements of the LEED Rating procedures ([http://www.usgbc.org/LEED/LEED\\_main.asp](http://www.usgbc.org/LEED/LEED_main.asp)) are both reasonable and practical. In this regard, Krueger has proposed several modifications to several LEED Rating modules. Included are direct references to the latest ASHRAE Standard 62.1 requirements for Air Change Effectiveness, replacing inappropriate references to other ASHRAE Standards. Krueger was involved in updating the ASHRAE Comfort Standard, changing the LEED certification requirements in that area.

In order to even qualify for a LEED rating, the latest ASHRAE Ventilation standard (62.1 2010) must be fully met (it is a prerequisite). Points can be gained for exceeding minimum ventilation rates by 30%. We are working with the IE Technical Advisory Group to ensure that reference to ADPI measures be incorporated in the Leadership in Energy and Environmental Design explanatory text for meeting the Comfort requirements. In fact, we believe that ADPI is the only way of assuring that a space will meet ASHRAE Standard 55's 5°F vertical temperature limitation, and using the Krueger catalog's ADPI graphs, and the KSelect selection program, one can easily show a design will provide acceptable ADPI values (and gain a thermal comfort point). We have added an additional ADPI print-out to KSelect (V10) specifically aimed at gaining the LEED comfort point

## ASHRAE

Krueger is active in several ASHRAE Standards and Technical Activities. Krueger suggested changes to ASHRAE Standard 62.1, which was recently updated to better reflect research on air distribution, especially in the area of overhead heating (which Krueger pioneered through advanced research and Standards development in the early 1980's). Krueger has available the patented LineaHeat™ proportional electric heater that has an optional discharge temperature sensor designed to meet these new requirements, and minimize outdoor air quantities. In addition, the use of solid-state relays eliminates the need for environmentally questionable mercury contactors when silent operation is desired. Krueger chaired the update to the 2004 ASHRAE Standard 55 on Comfort, which now includes a number of features that allow better prediction of occupant satisfaction, and make it possible to get LEED Comfort rating points without adding humidification systems.

We were instrumental in getting an addenda approved through Standard 90.1 allowing up to 50% reheat if VAV heating is implemented. With a controlled discharge temperature, this addendum will allow meeting ASHRAE Standard 62.1, 90.1 and 55.

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## ISO

As a participant in ISO Standard 205, Krueger is assisting in the preparation of the first international interior design standard. This Standard will be invaluable in providing consistent and consensus guidelines for designing interior environments that will provide both energy efficient and occupant acceptable spaces. It is expected that these guidelines will be incorporated into the LEED certification guidelines. Selection of diffusers using the ADPI guidelines outlined in Chapter 20, ASHRAE Fundamentals, is a key design validation technique that will be included in the ISO document. Krueger is also, of course, fully ISO 9000 Certified.

## AHRI

This industry organization is instrumental in rating the performance of HVAC products. Krueger has been a part of the AHRI Certification program since its inception in the early 80's. As chair of the acoustical application standard, AHRI Standard 885, Krueger has led the industry in providing accurate sound data. Revisions to AHRI Standards 880 and 885 were approved for 2008, with Krueger leading the ACDD Section, and catalog data is being reconfigured to reflect changes in the ARI Policy and Procedures manuals.

## PRODUCTS

- Krueger has pioneered the use of ADPI selection of diffusers by placing ADPI selection charts in the catalog for every diffuser produced. This will assist in certifying that a design will meet the ASHRAE 55 vertical stratification requirement of 5 deg F maximum. KSelect has been modified to provide additional ADPI calculation graphs to assist in achieving the LEED Comfort point.
- The patented LineaHeat™ proportional electric reheat coil offers a very inexpensive solution to meeting the new ASHRAE Standard 62.1 limitations on overhead heating. (Krueger pioneered the data acquisition techniques and procedures in the early 80's that are now the basis for much of the requirements,). The updated Standard 62.1–2010 lists overhead heating requirements in Table 6.2, and is referenced in both the proposed LEED-NC and current LEED-CI rating procedures in both EQ prerequisite and EQ-2 point ratings.
- The TAD radial flow diffuser, developed in the early 80's to provide a safe, draft free supply of conditioned air in a fume hood environment, has been supplemented with the new flush-face RadiaFlo diffuser. This is the first true radial flow diffuser that does not project into the room. While not a LEED issue, radial flow diffusers are required to avoid problems in passing the ASHRAE 110 test procedures at high supply airflow rates.
- Krueger has recently added the energy-efficient ECM motors throughout its entire line of Series fan powered terminals. Krueger continues to be the only manufacturer with an ECM motor option on its parallel fan units. ECM motors are already Code-required in several municipalities, and will assist in meeting the total building energy reduction requirements of both LEED -CI and -NC rating manuals.
- Krueger offers a complete line of underfloor pressurized-plenum 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 as well, both in occupant environmental control and as resource reuse credits.
- Krueger has become the exclusive distributor for Halton Displacement and Chilled beam products in North America. A leader in this technology in Europe, Halton is working with Krueger to develop special products for the US market, in addition to their complete line of DV and CB products.

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We have been asked by many Engineers how we comply with the Requirement for recycled materials. In that regard: LEED NC MRc4.1 says this:

**Requirements**

Use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes at least 10% (based on cost) of the total value of the materials in the project.

The recycled content value of a material assembly shall be determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value.

Mechanical, electrical and plumbing components and specialty items such as elevators shall not be included in this calculation. Only include materials permanently installed in the project. Furniture may be included, providing it is included consistently in MR Credits 3–7.

This says that HVAC ducts (mechanical components) “shall not be included.” The reference guide clarifies that these materials are excluded because their high value per pound would skew the calculations. It seems that some municipalities and organizations have adopted the recycled materials requirement without the exemption. Krueger is researching the sources of all raw materials to better comply with these requirements as they develop.

Krueger continues to be committed to the LEED process, and to engineering excellence and environmental awareness. Krueger became a member of the Green Building Council in 2008, and became a member of the IE TAG in 2009. .