Dectron's Support for Your LEED® Projects

Quality Management ISO 9001:2008

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Leadership in Energy and Environmental Design (LEED®) are the green building rating systems developed by US Green Building Council (USGBC). There are four levels of LEED® certification based on the achieved credit points: certified, silver, gold, platinum.

LEED® 2009 Certification Requirements

LEED® Certification	Required LEED® Credit Points
Certified	**40-49**
Silver	**50-59**
Gold	**60-79**
Platinum	**80-110**

LEED® rating systems consist of six credit categories: Sustainable Sites (SS), Water Efficiency (WE), Energy & Atmosphere (EA), Materials & Resources (MR), Indoor Environmental Quality (IEQ), Innovation in Design (ID), and Regional Priority (RP).
Given the priority on the climate change and energy efficiency, Energy & Atmosphere and Sustainable Sites are major categories in LEED® 2009 systems.

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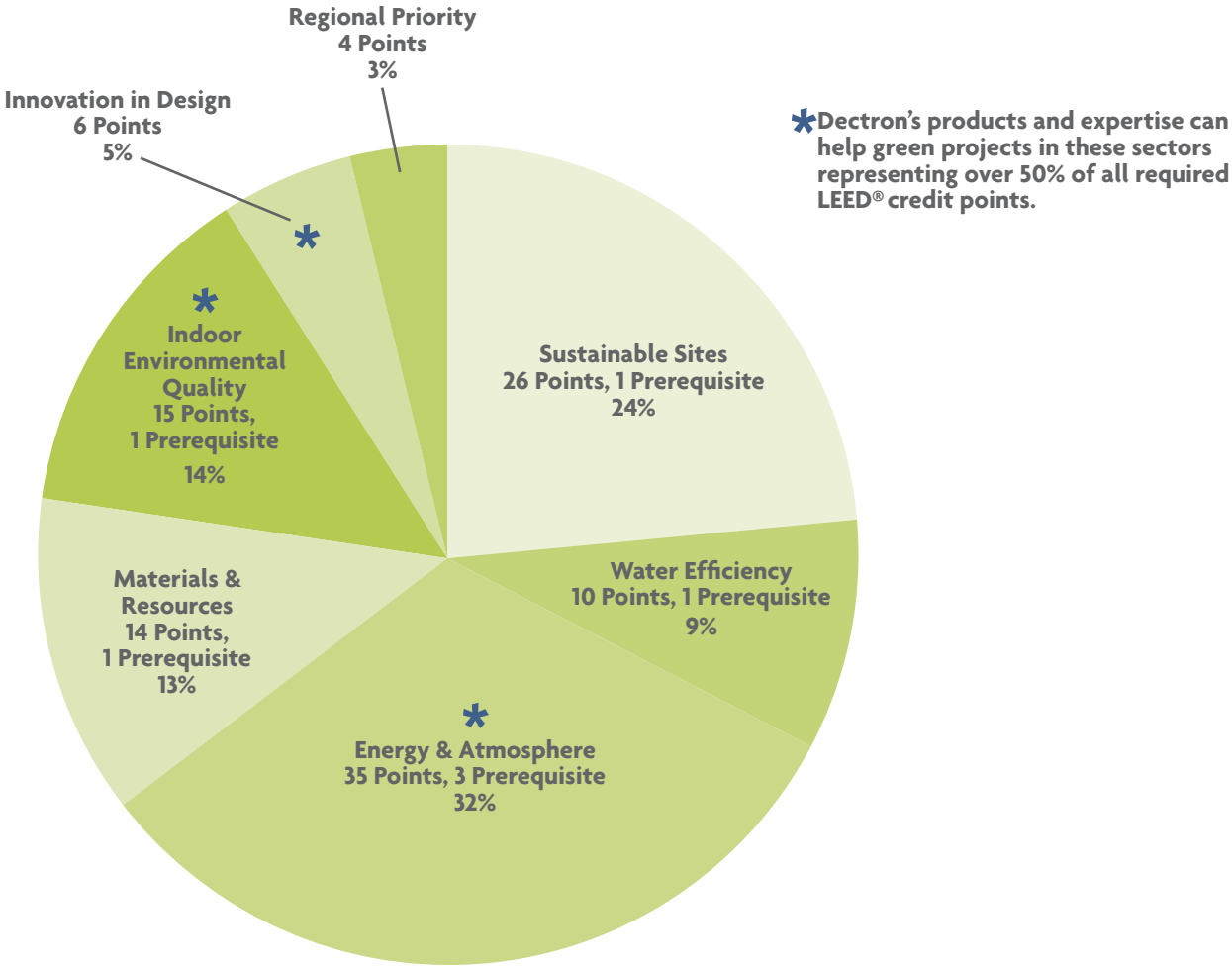

LEED® 2009 for New Constructions & Major Renovations

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These tables present how **Dectron**'s products and expertise can help the green building projects applying for the following LEED® rating systems:

LEED® 2009 for New Construction and Major Renovations (NC)
LEED® 2009 for Core and Shell Development (CS)
LEED® 2009 for Schools New Construction and Major Renovations (Sch)

Dectron can support 5 prerequisites and 15 credits which total more than 20 points in Energy and Atmosphere, Indoor Environmental Quality, and Innovation in Design categories.

Energy & Atmosphere (EA)

LEED® Criteria	LEED® Requirement	Dectron's Support
Fundamental commissioning of the building energy systems NC-EAp1 (Prerequisite) CS-EAp1 (Prerequisite) Sch-EAp1 (Prerequisite)	Commissioning must be completed for the energy-related systems including HVAC systems and associated controls.	All **Dectron** units are available with user-friendly Supervisaire® microprocessor controllers for programmable monitoring and control. Supervisaire® can be linked to a built-in local area network or building management systems. This enables on-site commissioning to be easier and faster.
Minimum energy performance NC-EAp2 (Prerequisite) CS-EAp2 (Prerequisite) Sch-EAp2 (Prerequisite)	Compared with the baseline building performance rating as defined in Appendix G of ANSI/ASHRAE/IESNA Standard 90.1, 10% improvement for new buildings and 5% for major renovations has to be demonstrated through whole building energy simulation. Or prescriptive compliance path can be adopted by complying with ASHRAE Advanced Energy Design Guide or Advanced Buildings™ Core Performance™ Guide.	**Dectron** provides a broad range of energy efficient units satisfying customers' various energy requirements. Saving energy and protecting the environment have been **Dectron**'s guiding philosophies from the day the first **DRY-O-TRON®**, the original energy recycling dehumidifier, was designed. **Dectron** also offers the engineering services to help design engineers and consultants to carry out whole building energy simulations as required in LEED® EAp2 & EAc1.
Fundamental refrigerant management NC-EAp3 (Prerequisite) CS-EAp3 (Prerequisite) Sch-EAp3 (Prerequisite)	New buildings must not use CFC-based refrigerants. When existing HVAC equipment is reused, a comprehensive CFC phase-out conversion is required.	All new **Dectron** units use non-CFC refrigerants.

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Energy & Atmosphere (EA)

LEED® Criteria	LEED® Requirement	Dectron's Support
Optimize energy performance NC-EAc1 (1-19* points) CS-EAc1 (3-21* points) Sch-EAc1 (1-19* points)	LEED® points are awarded depending on the percentage of improvement in the proposed building energy performance compared with the baseline building performance rating as described in EAp2. When a prescriptive compliance path is adopted, complying ASHRAE Advanced Energy Design Guide is eligible for 1 point, and complying Advanced Buildings™ Core Performance™ Guide can be eligible for 1 to 3 points.	**Dectron** offers extensive choice of energy efficient equipment satisfying the needs for green building projects. **Dectron**'s **DRY-O-TRON®** units with Smart Saver, Economizer and Econosaver configurations can reduce ventilation costs by up to 50 percent. New high-efficiency direct-drive plenum fans eliminate belt drive losses and can reduce fan energy requirement by 8 – 20 percent, with EC motors in VAV application the energy reduction is more than 50 percent. **Dectron**'s Make-up air units with energy recovery can reduce ventilation costs by up to 80 percent. Advanced Heat pump option with Variable Heat can reduce heating costs by up to 82 percent. Supervisaire® microprocessor control with custom programming availability can be used to program energy saving operating sequences.
Enhanced commissioning NC-EAc3 (2 points) CS-EAc3 (2 points) Sch-EAc3 (2 points)	This credit requires additional commissioning process activities in addition to the requirements of EAp1, starting from early in the design process to operation and maintenance phase.	All **Dectron** units are available with user-friendly Supervisaire® microprocessor controllers for programmable monitoring and control. Supervisaire® can be linked to a built-in local area network or building management systems. This enables commissioning process activities to be easier and faster.

* The maximum points allowed in the credit. This can be achieved from energy efficient whole building design by reducing energy demand, harvesting free energy, and increasing lighting and HVAC system efficiency. The actual achievable points depend on the specific building design, energy saving strategies, weather conditions and baseline building requirement.

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Energy & Atmosphere (EA)

LEED® Criteria	LEED® Requirement	Dectron's Support
Enhanced refrigerant management NC-EAc4 (2 points) CS-EAc4 (2 points) Sch-EAc4 (1 point)	This credit is awarded when refrigerants are not used or when refrigerant and HVAC equipment with minimum impact on ozone depletion and climate change are selected. The latter option requires a calculation using global warming and ozone depletion potentials of refrigerant, and equipment's life, refrigerant charge, leakage rate, and end-of-life refrigerant loss.	**Dectron**'s **DRY-O-TRON®** MAM, DA2 and DG series are qualified for EAc4. **Dectron**'s **DRY-O-TRON®** DS/DSV/RS, DA5/DV5/RA5, DK/RK and DA3 series can be qualified for EAc4.
Measurement & verification NC-EAc5 (3 points) CS-EAc5.1 (3 points) Sch-EAc5 (2 points)	Measurement and verification (M&V) plan has to be developed and implemented following Option D or Option B of International Performance Measurement Verification Protocol (IPMVP) volume III. It requires the installation of energy use metering equipment & diagnostics within the control system, and monitoring of significant energy systems.	All **Dectron** units are available with user-friendly Supervisaire® microprocessor controllers for programmable monitoring and control. Supervisaire® constantly monitors and evaluates the performance of **DRY-O-TRON®**. In the unlikely event of an alarm being triggered, our built-in Troubleshooting Guide is there to help pinpoint the cause of the error, thus minimizing service costs and unit downtime.

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Indoor Environmental Quality (IEQ)

LEED® Criteria	LEED® Requirement	Dectron's Support
Minimum IAQ performance NC-IEQp1 (Prerequisite) CS-IEQp1 (Prerequisite) Sch-IEQp1 (Prerequisite)	Mechanically ventilated spaces must meet the minimum requirements of Ventilation Rate Procedure (VRP) in ASHRAE Standard 62.1-2007 Ventilation for Acceptable Indoor Air Quality. Naturally ventilated spaces must comply with ASHRAE Standard 62.1-2007 Paragraph 5.1.	**Dectron** has wide selections of units that comply with your project ventilation requirements. All **Dectron** units satisfy the HVAC related requirements in section 5 of ASHRAE Standard 62.1-2007 (i.e., MERV 6 or higher filters, and coil, drain pan and air stream surface design that prevents microbial growth and erosion). Section 5.10 of ASHRAE Standard 62.1 specifies a 65% upper design limit for mechanical systems with dehumidifying capability. **Dectron**'s **DRY-O-TRON®** make-up air dehumidifier is a packaged solution to humidity problems caused by the introduction of outdoor air. **Dectron** offers wide selections of make-up air units that can treat humid air as high as 80°F wet bulb temperature. DK/DKV/RK/TMP series are available with energy recovery and DKH/RKH series are offered with heat pump.
Minimum acoustical performance Sch-IEQp3 (Prerequisite)	Classrooms and other core learning spaces have to be designed as specified in ANSI Standard S12.60-2002, Acoustical Performance, Design Requirements and Guidelines for Schools. The maximum background noise level from HVAC systems in those spaces is 45 dBA.	**Dectron** provides high efficient sound attenuators as an option for further noise reduction.
Outdoor air delivery monitoring NC-IEQc1 (1 point) CS-IEQc1 (1 point) Sch-IEQc1 (1 point)	Indoor CO_2 levels and outdoor airflow monitoring systems have to be permanently installed to ensure the effective ventilation.	All **Dectron** units are available with CO_2 and air flow sensors. These sensors can be connected to Supervisaire® to trigger corrective actions and alarms as required in IEQc1.

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Indoor Environmental Quality (IEQ)

LEED® Criteria	LEED® Requirement	Dectron's Support
Increased ventilation NC-IEQc2 (1 point) CS-IEQc2 (1 point) Sch-IEQc2 (1 point)	For mechanically ventilated spaces, the outdoor air ventilation rates have to be increased by minimum 30% above those of VRP in ASHRAE Standard 62.1-2007 as determined by IEQp1. Naturally ventilated spaces have to meet the recommendations in Carbon Trust Good Practice Guide 237 (1998).	**Dectron DRY-O-TRON®** units are available from 400 cfm to 65,000 cfm to satisfy the increased ventilation need of IEQc2. To minimize the additional energy consumption associated with higher ventilation rates, **Dectron** offers **DRY-O-TRON®** units with heat recovery systems using enthalpy wheels, fixed plates or heat pipes.
Construction indoor air quality management plan - *During construction* NC-IEQc3.1 (1 point) CS-IEQc3 (1 point) Sch-IEQc3.1 (1 point)	IAQ management plan for construction and preoccupancy phases has to be adopted to protect HVAC system, control pollutant sources and interrupt contaminant pathways. If permanently installed air handlers are used during construction, MERV 8 filters must be installed at return air grills and replaced prior to occupancy.	All **Dectron** equipment is available with MERV 8 filter as a prefilter.
Construction indoor air quality management plan - *Before occupancy* NC-IEQc3.2 (1 point) Sch-IEQc3.2 (1 point)	Prior to occupancy after construction ends, the building has to be flushed out with given outdoor air while maintaining indoor temperature of at least 60°F and the maximum relative humidity of 60%. The other option for this credit is air testing. The measured indoor pollution levels have to be below the limits.	**Dectron DRY-O-TRON®** units are available with Purge Mode configuration with motorized control of outdoor air face and bypass dampers. The Purge Mode enables 100% of conditioned outdoor air to be supplied into the space to purge out the indoor air pollutants.
Indoor chemical & pollutant source control NC-IEQc5 (1 point) CS-IEQc5 (1 point) Sch-IEQc5 (1 point)	The entry of pollutants into the building and cross-contamination of occupied areas have to be minimized and controlled. In mechanically ventilated buildings, MERV 13 or higher air filters have to be installed prior to occupancy to treat return and outside air streams.	**Dectron** units are available with MERV 13 or higher filters and the differential pressure switch sensors to monitor the pressure drop across the filters. Supervisaire® can signal "dirty-filter" alarm to ensure the integrity of filtration and equipment performance.

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Indoor Environmental Quality (IEQ)

LEED® Criteria	LEED® Requirement	Dectron's Support
Controllability of systems - *thermal comfort* NC-IEQc6.2 (1 point) CS-IEQc6 (1 point) Sch-IEQc6.2 (1 point)	Individual thermal comfort controls should be provided to the minimum 50% of the building occupants. Individual controls may involve operable windows, thermostat controls, local diffusers or other means integrated into overall building thermal comfort systems and energy systems.	A state-of-the-art Supervisaire® control system offers maximum design flexibility, networkable units, BACnet®, LonWorks® and MODBUS® compatibility, remote monitoring from a display panel, personal computer or via modem, and alarm and event loggings. Supervisaire® can be easily integrated into overall building thermal comfort control systems.
Thermal comfort - design NC-IEQc7.1 (1 point) CS-IEQc7 (1 point) Sch-IEQc7.1 (1 point)	HVAC systems and building envelope design must meet the requirements of ASHRAE Standard 55-2004 Thermal Comfort Conditions for Human Occupancy. In LEED® for School, natatoriums should comply with the "Typical Natatorium Design Conditions" defined in Chapter 4 (Places of Assembly) of the ASHRAE HVAC Applications Handbook (2003).	As a world leader in dehumidification and precision comfort control, **Dectron** can help achieve ASHRAE Standard 55-2004 complying design as specified in IEQc7.1. **Dectron**'s **DRY-O-TRON®** systems can ensure continuous simultaneous control of temperature, humidity and air flow to satisfy thermal comfort requirements. As the pioneer and leader of natatorium design and energy recycling dehumidification, **Dectron** has led the creation and upgrades of ASHRAE natatorium design guidelines. **Dectron** offers a wide range of **DRY-O-TRON®** indoor pool dehumidification units, which can lead to ultimate indoor pool environment beyond the requirement of Sch-IEQc7.1.

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Indoor Environmental Quality (IEQ)

LEED® Criteria	LEED® Requirement	Dectron's Support
Thermal comfort – *Verification* NC-IEQc7.2 (1 point) Sch-IEQc7.2 (1 point)	Achieve IEQc7.1 by providing a permanent monitoring system to ensure the building performance meets the desired thermal comfort criteria, and by conducting a thermal comfort survey of building occupants.	All **Dectron** units can be provided with various sensors including precise temperature sensors, relative humidity transmitters, and airflow switches. These sensors connected to Supervisaire® control system can offer continuous monitoring, optimized control and corrective action systems.
Enhanced acoustical performance Sch-IEQc9 (1 point)	Building shell, classroom & other core learning space partitions should meet the Sound Transmission Class (STC) requirements of ANSI Standard S12.60-2002, Acoustical Performance criteria, Design Requirements and Guidelines for Schools, which must meet a STC rating of minimum 35. And the background noise levels from HVAC systems in classrooms and other core learning spaces have to be reduced 40dBA or less.	In order to meet the customers' various sound requirements, **Dectron** provides a variety of options including air inlet acoustic louver, inlet silencer, discharge silencer, perforated liners and acoustic discharge plenum.
Mold prevention Sch-IEQ10 (1 point)	The project must get the following credits: Sch-IEQc3.1, Sch-IEQc7.1 and Sch-IEQc7.2. It must provide HVAC systems and control design to limit space relative humidity to 60% or less during all load conditions, both occupied and unoccupied. Also, IAQ management program based on EPA's Building Air Quality: A Guide for Building Owners and Facility Managers (1991) has to be developed and implemented.	**Dectron**, a world leader of dehumidification, provides a wide range of dehumidification systems. **Dectron**'s **DRY-O-TRON®** systems offer year-round dehumidification without overcooling the space.

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Innovation in Design (ID)

LEED® Criteria	LEED® Requirement	Dectron's Support
Innovation in design NC-IDc1 (1-5 points) CS-IDc1 (1-5 points) Sch-IDc1 (1-4 points)	There are three paths to achieve Innovation in Design credit: **1.** achieve significant measurable environmental performance using a strategy not addressed in LEED® v.3. (1-5 points) **2.** accomplish exemplary performance in the existing LEED® v.3 prerequisites or credits. (1-3 points) **3.** participate in a pilot credit and completing the required documentation. (1 point)	As a world leader in dehumidification, **Dectron** provides innovative solutions that can be applied for Innovation in Design credits. For example, **Dectron** units are available with optional air purification not only for particulate matter removal but also for various gaseous contaminants and microbial contaminants removal. Various gas-phase filters including CHLORAGUARD® are available with complementary TECH-CHEK™ service. This can significantly enhance the indoor air quality of the building.

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This material is prepared for general information purposes only.
The actual LEED® pre-requisites and credits achieved by the use of Dectron products depends on a specific project. For more information, contact Dectron Inc.

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