GREEN PIECE

EVAPCO's Newsletter on Environmental Sustainability

September 9, 2009
GP #7

Update on LEED® v3

The LEED® Green Building Rating system was recently updated and re-introduced April 27, 2009 as LEEDv3. This Green Piece will outline the major changes to the LEED rating system and the categories where EVAPCO products will contribute to LEED® credits. It also addresses categories where our products do not contribute to the credit, but are included as part of the rating process.

The success of LEED® is evident in these numbers:

- As of June 2009 there were 24,769 LEED® registered projects.
- As of June 2009 there were 3,111 LEED® certified buildings.
- Green building is in demand with a projected $60 Billion market by 2010.

All projects registered after June 26, 2009 must be under the guidelines of LEEDv3. A LEEDv3 summary of changes:

The guideline now has a focus on urgent priorities like energy use and CO2 emissions with additional Energy and Atmosphere credits available to pursue.

LEEDv3 now operates on a new 100 point scale for each rating system of LEED for New Construction, Core & Shell and Schools. Regional priority credits worth 6 additional points are now available.

Certified	**40-49 points**
Silver	**50-59 points**
Gold	**60-79 points**
Platinum	**80 points and above**

The LEEDv3 Reference Guide for Green Building Design and Construction has been consolidated to include New Construction, Major Renovations, Core & Shell and Schools. This provides an easier method to cross reference credits between guidelines.

The USGBC has split off a separate entity called the Green Building Certification Institute or GBCI. GBCI administers LEED® project registration, certification as well as the LEED® AP program.

LEED Online: A faster and easier approach to registering and providing documentation for LEED projects.

AND

Green indicates that the EVAPCO product can influence the credit and prerequisite.

Blue indicates EVAPCO products are part of the scope, but do not directly influence the prerequisite or credit.

Grey indicates categories that do not apply to EVAPCO products.

Sustainable Sites

Credit Category	*Title*	*LEED NC*	*LEED for Schools*	*LEED Core & Shell*	*EVAPCO Product Contribution*
SS Prerequisite 1 to SS Credit 10					Not Applicable to EVAPCO Products

Water Efficiency

Credit Category	*Title*	*LEED NC*	*LEED for Schools*	*LEED Core & Shell*	*EVAPCO Product Contribution*
WE Prerequisite 1	Water Use Reduction	Required	Required	Required	Not applicable, only applies to plumbing fixtures.
WE Credit 1	Water Efficient Landscaping	2-4 Points	2-4 Points	2-4 Points	*Pulse*~Pure® with EVAPCO towers, coolers or condensers. Irrigate landscaping with blow down water.[1]
WE Credit 2	Innovative Waste Water Technologies	2 Points	2 Points	2 Points	*Pulse*~Pure® with EVAPCO towers, coolers or condensers. Divert blow down water to onsite cistern instead of water treatment plant.[1]
WE Credit 3	Water Use Reduction	2-4 Points	2-4 Points	2-4 Points	Not applicable, only applies to plumbing fixtures.
WE Credit 4	Process Water Use Reduction	NA	1 Point	NA	All evaporative cooled products and the WDW, ATWB/LSW/LRW with Finned Coils for Dry Operation.[2]

Energy & Atmosphere

Credit Category	Title	LEED NC	LEED for Schools	LEED Core & Shell	EVAPCO Product Contribution
EA Prerequisite 1	Fundamental Commissioning of Building Energy Systems	Required	Required	Required	EVAPCO products will be commissioned as part of this prerequisite.[3]
EA Prerequisite 2	Minimum Energy Performance	Required	Required	Required	EVAPCO products must comply with this requirement.[4]
EA Prerequisite 3	Fundamental Refrigerant Management	Required	Required	Required	Using EVAPCO Condensers with Natural Refrigerants will contribute to meeting this requirement.[5]
EA Credit 1	Optimize Energy Performance	1-19 Points	1-19 Points	3-21 Points	EVAPCO evaporative cooled product lines and Thermal Ice Storage with Extra-Pak® Ice Coils will help earn credits in this category.[6]
EA Credit 2	On-Site Renewable Energy	1-7 Points	1-7 Points	4 Points	Not Applicable to EVAPCO Products.
EA Credit 3	Enhanced Commissioning	2 Points	2 Points	2 Points	EVAPCO products are part of the HVAC commissioning requirement.[3]
EA Credit 4	Enhanced Refrigerant Management	2 Points	1 Point	2 Points	Using EVAPCO Condensers with Natural Refrigerants will contribute to meeting this requirement.[5]
EA Credit 5	Measurement & Verification	3 Points	2 Points	NA	EVAPCO products could be selected to be sub-metered to comply with this credit.[7]
EA Credit 5.1	Measurement & Verification	NA	NA	3 Points	EVAPCO products could be selected to be sub-metered to comply with this credit.[7]
EA Credit 5.2	Measurement & Verification-Tenant Sub-metering	NA	NA	3 Points	EVAPCO products could be selected to be sub-metered to comply with this credit.[7]
EA Credit 6	Green Power	2 Points	2 Points	2 Points	Not Applicable to EVAPCO Products.

Materials and Resources

Credit Category	*Title*	*LEED NC*	*LEED for Schools*	*LEED Core & Shell*	*EVAPCO Product Contribution*
MR Prerequisite 1	Storage and Collection of Recyclables	Required	Required	Required	Not Applicable to EVAPCO Products.
MR Credit 1.1	Building Reuse-Maintain Existing Walls, Floors, and Roof	1-3 Points	1-2 Points	NA	Not Applicable to EVAPCO Products.
MR Credit 1	Building Reuse-Maintain Existing Walls, Floors, and Roof	N/A	N/A	1-5 Points	Not Applicable to EVAPCO Products.
MR Credit 1.2	Building Reuse-Maintain Interior Nonstructural Elements	1 Point	1 Point	N/A	Not Applicable to EVAPCO Products.
MR Credit 2	Construction Waste Management	1-2 Points	1-2 Points	1-2 Points	Skids and packing material must be salvaged or recycled to contribute to this credit. Contact EVAPCO for skid weight.
MR Credit 3	Materials Reuse	1-2 Points	1-2 Points	1 Point	Not Applicable to EVAPCO Products-New or existing. mechanical, electrical and plumbing cannot be included in this calculation. Only permanently installed materials.
MR Credit 4	Recycled Content	1-2 Points	1-2 Points	1-2 Points	Not Applicable to EVAPCO Products-New or existing mechanical, electrical and plumbing cannot be included in this calculation. Only permanently installed materials.
MR Credit 5	Regional Materials	1-2 Points	1-2 Points	1-2 Points	Not Applicable to EVAPCO Products-Mechanical, electrical and plumbing cannot be included in this calculation. Only permanently installed materials.
MR Credit 6	Rapidly Renewable Materials	1 Point	1 Point	N/A	Not Applicable to EVAPCO Products.
MR Credit 7	Certified Wood-FSC	1 Point	1 Point	N/A	Not Applicable to EVAPCO Products.
MR Credit 6	Certified Wood-FSC	N/A	N/A	1 Point	Not Applicable to EVAPCO Products.

Indoor Environmental Quality

Credit Category	Title	LEED NC	LEED for Schools	LEED Core & Shell	EVAPCO Product Contribution
IEQ Prerequisite 1	Minimum Indoor Air Quality Performance	Required	Required	Required	Not Applicable to EVAPCO Products.
IEQ Prerequisite 2	Environmental Tobacco Smoke (ETS) Control	Required	Required	Required	Not Applicable to EVAPCO Products.
IEQ Prerequisite 3	Minimum Acoustical Performance	N/A	Required	N/A	Super Low Sound Fan Option and UT Cooling Tower Line[8]
IEQ Credit 1	Outdoor Air Delivery Monitoring	1 Point	1 Point	1 Point	Not Applicable to EVAPCO Products.
IEQ Credit 2	Increased Ventilation	1 Point	1 Point	1 Point	Not Applicable to EVAPCO Products.
IEQ Credit 3.1	Construction Indoor Air Quality Management Plan During Construction	1 Point	1 Point	N/A	Not Applicable to EVAPCO Products.
IEQ Credit 3	Construction Indoor Air Quality Management Plan During Construction	N/A	N/A	1 Point	Not Applicable to EVAPCO Products.
IEQ Credit 3.2	Construction Indoor Air Quality Management Plan Before Occupancy	1 Point	1 Point	N/A	Not Applicable to EVAPCO Products.
IEQ Credit 4.1	Low-Emitting Materials-Adhesives and Sealants	1 Point	1 Point	1 Point	Not Applicable to EVAPCO products installed outside the weatherproofing system.[9]
IEQ Credit 4.2	Low-Emitting Materials-Paints and Coatings	1 Point	1 Point	1 Point	Not Applicable to EVAPCO products installed outside the weatherproofing system.[9]
IEQ Credit 4.3	Low-Emitting Materials-Flooring Systems	1 Point	1 Point	1 Point	Not Applicable to EVAPCO Products.
IEQ Credit 4.4	Low-Emitting Materials-Composite Wood and Agrifiber Products	1 Point	1 Point	1 Point	Not Applicable to EVAPCO Products.
IEQ Credit 4.5	Low-Emitting Materials-Furniture and Furnishings	N/A	1 Point	N/A	Not Applicable to EVAPCO Products.
IEQ Credit 4.6	Low-Emitting Materials-Ceiling and Wall Systems	N/A	1 Point	N/A	Not Applicable to EVAPCO Products.
IEQ Credit 5	Indoor Chemical and Pollutant Source Control	1 Point	1 Point	1 Point	*Pulse*~Pure® on evaporative cooled equipment.[10]
IEQ Credit 6.1	Controllability of Systems-Lighting	1 Point	1 Point	N/A	Not Applicable to EVAPCO Products.
IEQ Credit 6.2	Controllability of Systems-Thermal Comfort	1 Point	1 Point	N/A	Not Applicable to EVAPCO Products.
IEQ Credit 6	Controllability of Systems-Thermal Comfort	N/A	N/A	1 Point	Not Applicable to EVAPCO Products.
IEQ Credit 7.1	Thermal Comfort-Design	1 Point	1 Point	N/A	Not Applicable to EVAPCO Products.
IEQ Credit 7	Thermal Comfort-Design	N/A	N/A	1 Point	Not Applicable to EVAPCO Products.
IEQ Credit 7.2	Thermal Comfort-Verification	1 Point	1 Point	N/A	Not Applicable to EVAPCO Products.
IEQ Credit 8.1	Daylight and Views-Daylight	1 Point	1-3 Points	1 Point	Not Applicable to EVAPCO Products.
IEQ Credit 8.2	Daylight and Views-Views	N/A	1 Point	N/A	Not Applicable to EVAPCO Products.
IEQ Credit 9	Enhanced Acoustical Performance	N/A	1 Point	N/A	Super Low Sound Fan Option and UT Cooling Tower Line.[8]
IEQ Credit 10	Mold Prevention	N/A	1 Point	N/A	Not Applicable to EVAPCO Products.

Innovation in Design

Credit Category	Title	LEED NC	LEED for Schools	LEED Core & Shell	EVAPCO Product Contribution
ID Credit 1	Innovation in Design	1-5 Points	1-4 Points	1-5 Points	*Pulse*~Pure® for Non-Chemical Water Treatment
ID Credit 2	LEED® Accredited Professional	1 Point	1 Point	1 Point	LEED®AP on the team rewards one point
ID Credit 3	The School as a Teaching Tool	N/A	1 Point	N/A	N/A

Regional Priority

Credit Category	Title	LEED NC	LEED for Schools	LEED Core & Shell	EVAPCO Product Contribution
RP Credit 1	Regional Priority	1-4 Points	1-4 Points	1-4 Points	Could apply to the above EVAPCO products listed based on the project zip code.[11]

End Notes:

1) Review Green Piece No. 3 posted under the Sustainability section of the Reps-Only website- http://reps.evapco.com/login.aspx . GP#3 outlines how *Pulse*~Pure® can [illegible] Pu [(908 a0T2 evapor7(pco)-92 1 rg0 0 1 RG3p

3) Cooling towers, closed circuit coolers and water treatment systems must be included in the building commissioning plan. Commissioning verifies that the building's energy related systems are installed, calibrated and performing according to the owner's project requirements. A cooling tower commissioning plan will need to be submitted by the LEED® project team to meet the prerequisite and credit requirements. The commissioning process is addressed in ASHRAE Guideline 1-1996-The HVAC Commissioning Process and ASHRAE Guideline 0-2005 -The Commissioning Process.

   A sample cooling tower commissioning checklist can be obtained from the Building Commissioning Association, go to http://www.bcxa.org/.

4) To comply with this prerequisite, EVAPCO cooling towers must meet the mandatory provisions of ASHRAE Standard 90.1-2007 Section 6.4 and 10.4. EVAPCO products comply with these requirements for all cooling towers and closed circuit coolers and carry 90.1 compliant labels. Only open cooling towers are required to meet this prerequisite, but the project team can choose to use 90.1 addenda l and u which apply to closed circuit coolers and centrifugal fan cooling towers.

   The Mandatory Provisions of 6.4 and 10.4 relating to our equipment are:

   a) 6.4.1.1g. Minimum Equipment Efficiencies

TABLE 6.8.1G Performance Requirements for Heat Rejection Equipment

Equipment Type[d]	Total System Heat Rejection Capacity at Rated Conditions	Subcategory or Rating Condition	Performance Required[a,b,c]	Test Procedure[~~d~~,e]
Propeller or Axial Fan Open-Circuit Cooling Towers	All	95°F Entering Water 85°F Leaving Water 75°F ~~wb *Outdoor air*~~ *Entering wb*	≥38.2 gpm/hp	CTI ATC-105 and CTI STD-201
Centrifugal Fan Open-Circuit Cooling Towers	All	95°F Entering Water 85°F Leaving Water 75°F ~~wb *Outdoor air*~~ *Entering wb*	≥20.0 gpm/hp	CTI ATC-105 and CTI STD-201
Propeller or Axial Fan Closed-Circuit Cooling Towers	All	102°F Entering Water 90°F Leaving Water 75°F *Entering wb*	≥14.0 gpm/hp	CTI ATC-105S and CTI STD-201
Centrifugal Closed-Circuit Cooling Towers	All	102°F Entering Water 90°F Leaving Water 75°F *Entering wb*	≥7.0 gpm/hp	CTI ATC-105S and CTI STD-201
ensers	All	125°F Condensing Temperature R-22 Test Fluid 190°F Entering Gas Temperature 15°F Subcooling 95°F Entering db	≥176,000 Btu/h·hp	ARI 460	Air-Cooled Cond

open-circuit cooling tower performance is defined as the water flow rating of the tower at the thermal rating condition listed in Table 6.8.1G divided by -motor nameplate power.
, *closed-circuit cooling tower performance* is defined as the process water flow rating of the tower at the thermal rating condition listed in Table 6.8.1G he fan motor nameplate power and the integral spray pump motor nameplate power.
, *air-cooled condenser performance* is defined as the heat rejected from the refrigerant divided by the fan ~~nameplate rated~~ motor nameplate power.
nplete specification of the referenced test procedure, including the referenced year version of the test procedure.
~~cooling towers listed in Table 6.8.1G are not applicable for closed-circuit cooling towers.~~ The efficiencies and test procedures for both open- and closed-re not applicable to hybrid cooling towers that contain a combination of separate wet and dry heat exchange sections.

[a] For purposes of this table, the fan ~~nameplate rated~~
[b] For purposes of this table, divided by the sum of t
[b,c] For purposes of this table
[d] Section 12 contains a cor
[d,e] ~~The efficiencies for open~~ circuit cooling towers a

b) 6.4.1.5 Labeling

6.4.1.5.1 Mechanical Equipment.

Mechanical equipment that is not covered by the U.S. National Appliance Energy Conservation Act (NAECA) of 1987 shall carry a permanent label installed by the *manufacturer* stating that the equipment complies with the requirements of Standard 90.1

c) The Mandatory Provisions of 10.4 relating to our equipment are:

10.4 Mandatory Provisions

10.4.1 Electric Motors.

Electric motors shall comply with the requirements of the Energy Policy Act of 1992 where applicable, as shown in Table 10.8.

TABLE 10.8 Minimum Nominal Efficiency for General Purpose Design A and Design B Motors[a]

	Minimum Nominal Full-Load Efficiency (%)					
	Open Motors			Enclosed Motors		
Number of Poles ==>	2	4	6	2	4	6
Synchronous Speed (RPM) ==>	3600	1800	1200	3600	1800	1200
Motor Horsepower						
1	–	82.5	80.0	75.5	82.5	80.0
1.5	82.5	84.0	84.0	82.5	84.0	85.5
2	84.0	84.0	85.5	84.0	84.0	86.5
3	84.0	86.5	85.5	85.5	87.5	87.5
5	85.5	87.5	87.5	87.5	87.5	87.5
7.5	87.5	88.5	88.5	88.5	89.5	89.5
10	88.5	89.5	90.2	89.5	89.5	89.5
15	89.5	91.0	90.2	90.2	91.0	90.2
20	90.2	91.0	91.0	90.2	91.0	90.2
25	91.0	91.7	91.7	91.0	92.4	91.7
30	91.0	92.4	92.4	91.0	92.4	91.7
40	91.7	93.0	93.0	91.7	93.0	93.0
50	92.4	93.0	93.0	92.4	93.0	93.0
60	93.0	93.6	93.6	93.0	93.6	93.6
75	93.0	94.1	93.6	93.0	94.1	93.6
100	93.0	94.1	94.1	93.6	94.5	94.1
125	93.6	94.5	94.1	94.5	94.5	94.1
150	93.6	95.0	94.5	94.5	95.0	95.0
200	94.5	95.0	94.5	95.0	95.0	95.0

a Nominal efficiencies shall be established in accordance with NEMA Standard MG1. Design A and Design B are National Electric Manufacturers Association (NEMA) design class designations for fixed frequency small and medium AC squirrel-cage induction motors.

NOTE: LEED® guidelines require the HVAC system design to show a minimum 10% performance improvement (energy use or energy cost as established by the Rating Authority) for new buildings, using the building performance rating method in Appendix G of ASHRAE Standard 90.1-2007.

Selecting a tower or cooler with an efficiency rating higher than shown above in Table 6.8.1g will provide a greater contribution to the overall system efficiency calculation, ensuring that it beats the baseline building performance by 10%.

5) There are HVAC systems that use natural refrigerants including water, carbon dioxide and ammonia. These naturally occurring compounds have a much lower potential for atmospheric damage than manufactured chemical refrigerants. Projects using natural refrigerants are eligible for this prerequisite and credit. *EVAPCO evaporative condensers with ammonia can contribute to this credit.*

6) To receive Energy & Atmosphere points in this credit category, LEED® guidelines specify increasing reductions in energy costs of a proposed building design compared to a baseline. At a minimum, for one credit, the HVAC system design must show a 12% energy cost savings for new buildings and an 8% energy cost savings for existing buildings, using the performance rating method in Appendix G of ASHRAE Standard 90.1-2007. This calculation must be performed using a computer simulation model such as E-Quest, DOE-2 or DOE Energy Plus.

EVAPCO can help improve the system efficiency and reduce energy costs by providing a tower or cooler with an efficiency rating (gpm/hp) higher than shown in the ASHRAE 90.1-2007 Table 6.8.1g or by selecting a tower for free cooling:

- Consider over sizing a tower or cooler and using a lower HP fan motor to improve the efficiency rating.
- To reduce energy costs and energy consumption consider selecting the tower for free cooling in a region where temperatures will allow this mode of operation.

Lowering the cost of energy for a building is the basis for this credit calculation. Another method to lower energy costs is a Thermal Ice Storage system. Thermal ice storage uses less expensive off-peak power to build ice at night, and then melts it during the day, supplying chilled water without high horsepower chillers in operation. To take maximum advantage of Thermal Ice Storage energy cost savings your power supplier must have time-of-use (TOU) rates and impose ratchet or demand charges.

For large scale District Energy applications of Thermal Ice Storage, consult these documents published by the USGBC to learn how District Energy plants, Combined Heat and Power and Multi-Building Campuses using Thermal Ice Storage apply to LEED ® credits

http://www.usgbc.org/ShowFile.aspx?DocumentID=4176

http://www.usgbc.org/ShowFile.aspx?DocumentID=1354

http://www.usgbc.org/ShowFile.aspx?DocumentID=1097

7) "You can't manage what you can't measure" applies to this credit. For a building to comply with this credit category of Measurement and Verification, sub-metering of all energy consuming components in a HVAC system will be required to comply with this credit. It is possible that the electrical contractor will meter cooling tower fan and pump motors as part of this credit. Contact EVAPCO for the best approach to metering our products.

8) Super Low Sound Fans reduce the acoustical signature of a cooling tower and its sound transmitted through a building. Consult Green Piece No. 6 posted under the Sustainability section of the Reps-Only website- http://reps.evapco.com/login.aspx to learn more about specifying Super Low Sound Fans for your next school project.

9) If a cooling tower or cooler will be assembled and located inside the weatherproofing system of a building contact EVAPCO for information on our paints, adhesives and caulks.

10) The intent of this credit is " To minimize building occupant exposure to potentially hazardous particulates and chemical pollutants." Specify *Pulse*~Pure® to eliminate chemical water treatment of the condenser water loop, chemical containment systems and separate ventilation systems . These are NOT required for *Pulse*~Pure® systems. *Pulse*~Pure® will reduce the cost of the building, provide more space for other equipment and create a safe work environment. A Credit Interpretation Request will have to be submitted to obtain a credit in this category. Consult EVAPCO for assistance in applying for this credit.

11) Additional credits can be awarded based on the project's zip code. For example, using a WDW will help to achieve more credits in a drought stricken area. Go to http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1984 for detailed credit availability based on zip code.

Our products will continue to be part of a High Performance, Green Building design and will contribute to LEEDv3 credits per the above chart. Review this Green Piece with your consulting engineer to assist them in specifying our products on LEED® projects.

Contact me with any questions regarding this newsletter, for more information on LEEDv3, go to this link on the USGBC website http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1970.

Be green!

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