



The LEED Green Building Rating System

What It Is and Why It's Important

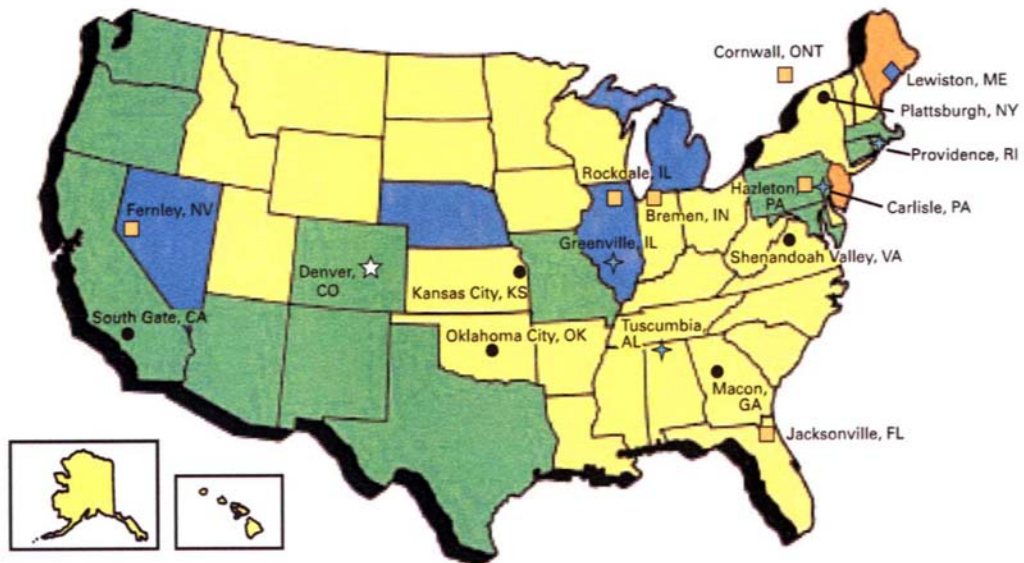
LEED (Leadership in Energy and Environmental Design) is the U.S. Green Building Council's (USGBC) green building point rating system. The USGBC is a non-profit coalition of building professionals working to promote the design and development of environmentally and economically responsible buildings. The USGBC developed LEED to further the expansion of their mission.

LEED has programs designed specifically for new construction (NC) and existing buildings (EB). The objective of LEED is to decrease the energy consumption and environmental impact of buildings. LEED points recognize the design and construction of energy efficient and environmentally responsible buildings.

Where LEED Is Encouraged

While LEED is voluntary, a number of state and local authorities require it for municipal construction projects as shown in Figure 1 below.

Figure 1. LEED Adoption By State and Johns Manville Manufacturing Locations

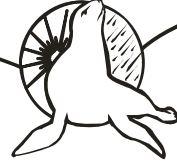


- LEED ADOPTION BY STATE:**
- - Silver
 - - Certified
 - - Fed New Construction
 - - Guidelines

- Johns Manville Manufacturing Locations:**
- Roof Insulations
 - Bituminous Membranes
 - ◆ Single Ply Membranes
 - ◆ Accessories
 - ☆ World Headquarters and Research Facilities

Energy Seal Coatings

Acrylic Coatings for Roof and Wall Applications



How the LEED Rating System Works

LEED is a points-based system with four levels of certification; LEED Certified, Silver, Gold and Platinum (see Table 1). The majority of points are allocated to five of the seven LEED categories (see Table 2); roofing materials can impact three of these: Sustainable Site, Energy and Atmosphere, and Materials and Resources.

Four additional innovation points may be awarded to buildings or products that exhibit exceptional performance above the standard LEED requirements (see Table 2 for specific points).

Table 1

LEED Certification	Points
LEED Certified	26-32 points
Silver Level	33-38 points
Gold Level	39-51 points
Platinum Level	52 points or more

Higher level certifications require additional points resulting in the incorporation of more energy efficient and environmentally sound designs. The higher the level, the more energy efficient the building resulting in higher energy savings over the life of the building.

Table 2

Category	Points
Sustainable Sites	14
Water Efficiency	5
Energy and Atmosphere	17
Materials and Resources	13
Indoor Environment	15
Sub-total	64
Design Process and Innovation	4
LEED Accredited Professional	1
Total Potential Points	69

Who's Responsible for What, in What Sequence

Responsible Party	Their Responsibility
Owner and Design Team	<ul style="list-style-type: none"> • Register the project during design phase; document green building technologies • Select qualified/certified products; document • Submit documentation at or near building occupancy
USGBC	<ul style="list-style-type: none"> • Project registration, technical support and building certification
Roofing Manufacturers	<ul style="list-style-type: none"> • Provide products that have been tested by accredited testing facilities and label accordingly

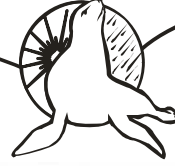
An Emerging Opportunity for the Roofing Industry

Selecting the right roofing product is one of the easiest ways to generate LEED points. JM roofing systems will give your company a competitive edge when working with corporations, universities and government agencies that are working to provide green buildings for better work environments and buildings that cost less to operate.

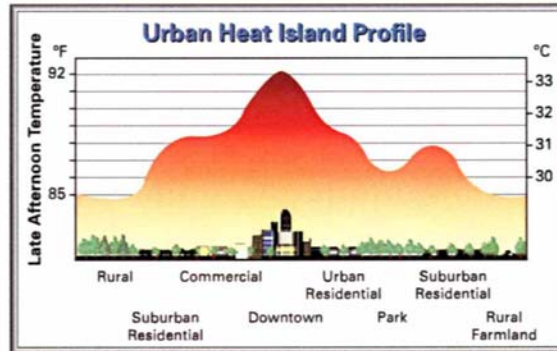
For LEED certified facilities, specifiers, designers and building owners can gain marketing exposure through the web site of the USGBC. In addition, organizations can qualify for state and local government incentives in states where they are offered.

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Cool roofs also help mitigate the “urban heat island effect”, which is a component of LEED. Heat islands occur where many buildings and paved surfaces in close proximity are designed with dark materials that absorb heat from the sun. Research indicates that this can cause cities to become 2° to 8°F warmer than the surrounding countryside, as shown in the illustration below.



Source: Illustration is a composite drawing of data obtained from Southern California Edison Company, Greg Sharp, AIA, IES.

Solar Reflective Index (SRI)

The Solar Reflective Index is a measure of the constructed surface’s ability to reflect solar heat, as shown by a small temperature rise. It is defined so that a standard black (reflectance 0.05, emittance 0.90) is 0 and a standard white (reflectance 0.80, emittance 0.90) is 100. SRI combines reflectance and emittance into one number.

How JM Can Help Get Your Project LEED Certified

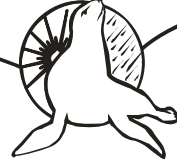
JM offers a wide range of products and expertise to help you attain LEED certification. Please visit the JM web site or contact your local JM sales representative for more detailed information. A list of those products includes:

- *TopGard® 4000 and TopGard® 5000* acrylic coatings: to secure energy performance credits for LEED points.
- *JM PVC with Elvaloy® and JM TPO* white single ply roofing systems that also secure energy performance credits for LEED points.
- *GlasKap® CR* white mineral surfaced, white acrylic coated, fiber glass cap sheet for use in built-up roofing systems. The unique surfacing provides protection to the underlying asphalt and membrane, as well as the benefit of a reflective, emissive surface.
- *JM Fesco® Boards* – low thermal, perlite roof insulation board and general-purpose cover board for use over closed cell foam insulation boards in BUR, modified bitumen and some single ply roofing systems. These products contain 25 percent recycled post-consumer content by weight; JM insulation boards with recycled content include *Fesco® Board, DuraBoard™, 1/2" Retro-Fit® Board, and Fesco® Foam* rigid insulation boards.

Points can also be earned if at least 20 percent of the total value of the building materials and products are manufactured within a radius of 500 miles of the project. JM has manufacturing facilities throughout the U.S. Depending on the project location, JM membrane, insulation and/or accessories may be eligible. (See Figure 1.)

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LEED Compared to Other Standards

As shown in Table 3, LEED roofing products require a certain level of reflectivity and emissivity to other standards, though those values are just the basis for calculating LEED's Solar Reflectivity Index (SRI). Below are some key points to help distinguish between each of the various programs that incorporate cool roofs.

- For the roofing industry in particular, all of these rating systems have one thing in common: they all set standards for cool roof reflectivity and/or emissivity. Below you will find a chart comparing these standards with the LEED SRI values highlighted in yellow.
- Some of these standards are voluntary, while others are mandatory.
 - Title 24 is mandatory in California.
 - LEED is highly encouraged among a growing list of city, state and federal agencies.
 - ENERGY STAR® is generally voluntary. However, meeting the ENERGY STAR standards for roofing reflectivity and emissivity can help earn points in the LEED rating system.

Table 3

Program	Requirement	Reflectivity	Emissivity	SRI***
Title 24 (CRRRC)	Mandatory	0.70	0.75	N/A
ENERGY STAR	Voluntary*	0.65	0.75**	N/A
LEED	Voluntary*	See SRI	See SRI	78

CRRRC lists product emissivity information according to ASTM C 1371.

LEED accepts products tested for emissivity according to ASTM E 1980.

Results may vary between test methods.

** Although voluntary, some local and state authorities are requiring designers to adhere to these guidelines for specific building types (i.e., government or state funded projects).*

*** ENERGY STAR emissivity standard not in effect until later 2006.*

**** SRI is determined by using the reflectivity values, emissivity values, and the steady state temperature equations defined in ASTM E 1980-01.*