



Leadership in Energy and Environmental Design (LEED®)



Guide Book

July 1, 2010

The following guide gives a brief summary of the Leadership in Energy and Environmental Design program. Specifically, it gives an overview of the standards set by LEED and how GenFlex can contribute to a LEED certified project. It is important to note that the roofing system is only a part of the entire process. LEED encompasses the entire building envelope for certification. **Please refer to www.usgbc.org for the latest updates and changes.**

WHAT IS LEED?

Leadership in Energy and Environmental Design (LEED) Green Building Rating Program™ is a nationally recognized standard for the design, construction, and performance of green buildings. LEED provides building owners with the tools that they need to have an immediate and measurable impact on their building performance. Promoting a “whole-building” design approach to sustainability, LEED recognizes performance in five key areas:

- Sustainable site development
- Water savings
- Energy efficiency
- Materials selection
- Indoor environmental quality

HOW WAS LEED CREATED?

The LEED program was created in an effort to transform the building environment and shift the focus to sustainability by providing consistent standards for what constitutes green buildings. These standards were created using an open, consensus based process that has made LEED the green building choice for most Federal agencies and state and local governments.

WHAT IS LEED CERTIFICATION?

To earn certification, a building must meet certain requirements and performance benchmarks that relate to the building's environmental performance. Projects are awarded a Certified (26 points required), Silver (33 points required), Gold (39 points required) or Platinum (52 points required) certification, depending in the number of credits they achieve. These credits are achieved by meeting the criteria set forth in LEED standards.

WHAT TYPE OF BUILDING DOES THE LEED PROGRAM INCLUDE?

LEED provides standards and benchmarks for the following building types:

- New Construction and Major Renovations
- Existing Building Operations and Maintenance
- Commercial Interiors Projects
- Core and Shell Development Projects
- Guidelines for Multiple Buildings and On-Campus Building Projects
- Neighborhood Development
- LEED for Schools
- LEED for Retail
- Homes

WHAT IS LEED-NC VERSION 2.2?

First published in 1998, LEED for New Construction and Major Renovation is a green building rating system that was designed to establish a standard for high-performance commercial and institutional projects. Common buildings associated with this system are:

- Schools
- Multi-unit residential buildings
- Manufacturing plants
- Laboratories
- And many others

WHAT IS COVERED IN LEED-NC VERSION 2.2?

There are six categories dealing with environmental and energy design that is covered in LEED-NC. These are:

- Sustainable Sites (SS) – Max. 14 points
- Energy and Atmosphere (EA) – Max. 17 points
- Materials and Resources (MR) – Max. 11 points
- Water Efficiency (WE) – Max. 5 points
- Indoor Environmental Quality (EQ) – Max. 15 points
- Innovation and Design Process (ID) – Max. 5 points

HOW DO GENFLEX ROOFING PRODUCTS RELATE TO A NEW CONSTRUCTION PROJECT?

Typically, GenFlex roofing products can be associated with the following sections of LEED-NC.

- **SS Credit 6.1 – Storm Water Management**
 - EA Credit 1 – Optimize Energy Performance
 - MR Credit 3 – Resource Re-use
 - MR Credit 5 – Regional Materials
- **SS Credit 7.2 – Heat Island Effect**
 - EQ Credit 4 – Ozone Protection
 - MR Credit 4 – Recycle Content
 - MR Credit 2 – Construction Waste Management

LEED-NC VERSION 2.2 SYNOPSIS

In the LEED-NC Version 2.2 manual, there are two specific sections where the GenFlex roofing system can directly relate to the achieving a LEED credit. These two sections are SS 6.1 for storm water management and SS 7.2 relating to the Heat Island Effect. Should the architect correctly specify the proper system, a maximum of two (2) points can be awarded to the project.

Six other categories, as listed above, factor roofing into the specification. However, they do not solely rely on the roofing components for certification. The roofing components simply contribute to the overall benchmark that could lead to a point(s) being awarded to a project.

SUSTAINABLE SITES

- **SS CREDIT 6.1 – Stormwater Management: Quality Control (1 pt.)**

The intent of SS Credit 6.1 is to limit the disruption of natural water by reducing or eliminating pollution from storm water runoff. By specifying vegetated roofs, the storm water can be retained on the roof and prevent increased pollution from storm water runoff.

GenFlex Solution: GenFlex Fully Adhered EPDM or TPO systems can be used in conjunction with the LiveRoof™ Pre-Vegetative Modular Roof System to create Vegetative Roof Gardens. For Additional information, please contact GenFlex Technical Service Department.

- **SS CREDIT 7.2: Heat Island Effect: Roof (1 pt.)**

The intent of SS Credit 7.2 is to reduce the heat islands to minimize the impact on the environment.

There are three options to fulfill this requirement as follows:

Option 1: Use Roofing Materials have a Solar Reflective Index (SRI) equal or greater than the following table for 75% of the roof surface:

Roof Type	Slope	SRI
Low Sloped Roof	≤ 2:12	78
High Sloped Roof	> 2:12	29

Solar Reflective Index:

The Solar Reflective index is a measure of the constructed surface's ability to reflect solar heat. To calculate the SRI for a given material, you must obtain the reflectance (ASTM E 903) and Emittance (ASTM E 408) values for a specific product. Once these values have been determined, the SRI can be calculated using ASTM E 1980.

Please refer to tables 2 for a listing of GenFlex products that have been tested by the Cool Roof Rating Council. Table 2 products qualify for Low Slope Roofing:

Cool Roof Rating Values

(Table 2)

Product Name and Product ID*	Solar Reflectance	Thermal Emittance	Solar Reflective Index
GenFlex TPO - White	.77	.87	95
GenFlex Peel & Stick TPO - White	.74	.84	90
GenFlex TPO Plus – White	.79	.85	97
GenFlex Fleece Backed TPO	.79	.78	96
GenFlex FlexWhite EPDM	.80	.84	99

Option 2: Install a Vegetated Roof for at least 50% of the roof area

Option 3: Install high albedo and vegetated roof surface that meet the following criteria $(\text{Area of SRI Roof} / 0.75) + (\text{Area of vegetated Roof} / 0.50) \geq \text{Total Roof Area}$



ENERGY AND ATMOSPHERE

- **EA CREDIT 1: Optimize Energy Performance (1-10 pts)**

The intent of EA Credit 1 is to achieve higher levels of energy performance throughout the entire building to reduce the environmental impacts for Energy overuse. In order to comply with this credit and to achieve the maximum number of points, the building must show a percentage increase in energy savings per ASHREA/ESNA.

GenFlex Solution: The use of GenFlex ISO roofing insulation can significantly add to the performance of the building's energy savings. In addition, the use of a Reflective or Vegetative Roof Systems can also increase the overall efficiency of the building.

Note: It is important to consider that Northern States may benefit from EPDM due to the increased heating days.

MATERIALS AND RESOURCES

- **MR CREDIT 2.1: Construction Waste Management: Divert 50% from Disposal (1 pt.)**

The intent of MR Credit 2.1 is to divert construction debris from disposal in landfills by recycling resources back into the manufacturing process. The goal of this credit is to recycle or salvage at least 50% of construction or demolition debris.

- **MR CREDIT 2.2: Construction Waste Management: Divert 75% from Disposal (2 pts.)**

The intent of MR Credit 2.1 is to divert construction debris from disposal in landfills by recycling resources back into the manufacturing process. The goal of this credit is to recycle or salvage at least 75% of construction or demolition debris.

- **MR CREDIT 3.1: Material Reuse: 5% (1 pt.)**

The intent of MR Credit 3.1 is to reuse building materials in order to reduce waste. Salvaged materials should constitute a minimum of 5% based on cost of the total value of materials on the project.

- **MR CREDIT 3.2: Material Reuse: 10% (2 pts.)**

The intent of MR Credit 3.1 is to reuse building materials in order to reduce waste. Salvaged materials should constitute a minimum of 10% based on cost of the total value of materials on the project.

GenFlex Solution: GenFlex suggests opportunities in reusing ballast, insulation (not wet or damaged).

- **MR CREDIT 4.1 Recycle Content: 10% (1 pt.)**

The intent of MR Credit 4.1 is to increase the demand for building products that incorporate recycled content. Recycled material should constitute at least 10% based on the total value of the materials on the project.

- **MR CREDIT 4.2 Recycle Content: 20% (2 pt.)**

The intent of MR Credit 4.1 is to increase the demand for building products that incorporate recycled content. Recycled material should constitute at least 20% based on the total value of the materials on the project.

GenFlex Solution: GenFlex, in an effort to meet this requirement, uses the following amount of post industrial and post consumer waste: (metals may have more accurate percentages given if requested at time of order placement)

GENFLEX ROOFING SYSTEMS
MR CREDIT 4.1 AND 4.2: RECYCLED CONTENT
 (Table 3)

GenFlex Product	Post Industrial Waste	Post Consumer Waste
GenFlex TPO – White	3-5%	0%
GenFlex Peel & Stick TPO – White	0%	0%
GenFlex TPO Plus – White	0%	0%
GenFlex Fleece Backed TPO	15%	0%
GenFlex FlexWhite EPDM	0%	0%
GenFlex EPDM	0%	0%
GenFlex ISO Insulation	Average 19% (thickness dependant)	Average 15% (thickness dependant)
GenFlex ½” HD ISO	8.3%	0%

If more accurate recycle content is required, please contact GenFlex Roofing Systems prior to order placement.

- Note:**
- a) Please understand that this is only a small amount of GenFlex materials that may be used in a roofing assembly.
 - b) For further recycled contents, please refer to the corresponding Product Data Sheets located at www.genflex.com.

- **MR CREDIT 5.1: Regional Materials: 10% Regional Manufacturing (1 pt.)**

The intent of MR Credit 5.1 is to increase demand for local products and reduce the environmental impacts from transportation. This credit is achieved by using a minimum of 10% (based on cost) of the materials of the total sum of the building that have been manufactured within 500 miles of the project.

- **MR CREDIT 5.2: Regional Materials: 20% Regional Manufacturing (2 pts.)**

The intent of MR Credit 5.2 is to increase demand for local products and reducing the environmental impacts from transportation. This credit is achieved by using an additional 10% beyond MR Credit 5.1 (Total of 20% based on cost) of the materials of the total sum of the building that have been manufactured within 500 miles of the project.

GenFlex Solution: GenFlex has 11 manufacturing plants and distribution centers across the country in order to bring the highest quality products close to home.

GenFlex Roofing Systems
MR CREDIT 5.1 AND 5.2: REGIONAL MATERIALS

GenFlex Product	Manufacturing Location
GenFlex TPO – White	Muscle Shoals, AL
GenFlex Peel & Stick TPO – White	Muscle Shoals, AL
GenFlex TPO Plus – White	Muscle Shoals, AL
GenFlex Fleece Backed TPO – White	Muscle Shoals, AL
GenFlex EPDM (Black)	Prescott, AR; Kingstree, SC
GenFlex FlexWhite EPDM	Prescott, AR
Ace Coating	Rockford, MN
GenFlex Isocyanurate Insulation	Aurora, IL; Bristol, CT; Corsicana, TX; Florence, KY; Deforest, WI; Jacksonville, FL; Salt Lake, UT; Youngwood, PA
GenFlex Wood Fiber Insulation	International Falls, MN; Jarrat, VA; Marrero, LA; Sunbury, PA; Danville, VA

CONCLUSIONS

It is important to remember that the roofing assembly plays a minimal part in the overall certification of a LEED certified project. However, everyone from architects, real estate professionals, facility managers, engineers, construction managers and manufacturers play an integral part in obtaining LEED certification. GenFlex is committed to assist anyone who is interested in obtaining any further information on our products listed above.

For the latest updates and changes please refer to the following links:

- GenFlex Roofing Systems (Main Page) (www.genflex.com)
- U.S. Green Building Council (www.usgbc.org)
- Cool Roof Rating Council (www.coolroofs.org)

Note: LEED is a registered trademark of the U.S. Green Building Council.