

# LEED® 2009 NC – New Construction and Major Renovations

Credit Opportunities for Fiber Glass, Rock Wool  
and Slag Wool Insulation Products



INSULATION IS THE  
MOST ECONOMICAL  
SOLUTION FOR  
BUILDING ENERGY  
EFFICIENCY<sup>1</sup>



# What is LEED®?

LEED or Leadership in Energy & Environmental Design, developed by the U.S. Green Building Council® (USGBC®), is a green building certification program that recognizes best-in-class building strategies and practices. The intent is to promote healthful, durable, affordable and environmentally sound practices in building design and construction.<sup>1</sup> The rating system includes new construction, major renovations, core and shell development, existing buildings, operations and maintenance, schools and commercial interiors.

To receive LEED certification, building projects satisfy prerequisites and earn points to achieve different levels of certification. Prerequisites and credits differ for each rating system, and teams choose the best fit for their project. Prerequisites and Credits in the LEED 2009 green building rating system address seven topics in addition to pilot credits:<sup>2</sup>

- Sustainable Sites (SS)
- Water Efficiency (WE)
- Energy and Atmosphere (EA)
- Materials and Resources (MR)
- Indoor Environmental Quality (IEQ)
- Innovation in Design (ID)
- Regional Priority (RP)

## LEED and Insulation Products

Fiber glass, rock wool and slag wool insulation products save energy, help manage energy resources, and reduce pollutants and can contribute points to a LEED Certification in the categories of

- Energy and Atmosphere (EA)
- Indoor Environment Quality
- Materials and Resources (MR)
- Innovation in Design

Prerequisites and credits for each of the topics covered in the LEED Rating System are project rather than product focused. Therefore, it is the cumulative effect of products integrated within building systems and assemblies, and evaluated within the parameters of each of the topics.

## LEED Levels

LEED 2009 for New Construction and Major Renovations certifications are awarded according to the following scale:

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



Maximizing the R-values of your building insulation, roofing systems and mechanical insulation is one of the most cost-effective ways to optimize your building's energy performance.



# LEED® 2009 Credit Opportunities

## Energy and Atmosphere

Fiber glass, rock wool and slag wool insulation help reduce building energy demands and facilitate compliance with ASHRAE 90.1-2010 and local energy codes.

### EA Prerequisite 2 Minimum Energy Performance

**REQUIRED**

**Intent:** Establish the minimum level of energy efficiency for the proposed building and systems to reduce environmental and economic impacts associated with excessive energy use.

**Requirements:**

**OPTION 1:** Whole Building Energy Simulation. Demonstrate a 10% improvement in the proposed building performance rating for new buildings, or a 5% improvement in the proposed building performance rating for major renovations (compared to baseline performance rating). Schools must use EPA's Target Finding Tool.

**OPTION 2:** Prescriptive Compliance Path: ASHRAE Advanced Energy Design Guide. Comply with the prescriptive measures of the ASHRAE Advanced Energy Design Guide appropriate to the project scope and climate zone. Schools must comply with K-12 school buildings criteria.

**OPTION 3:** Prescriptive Compliance Path: Advanced Buildings™ Core Performance™ Guide developed by the New Building Institute.

### EA Credit 1 Optimize Energy Performance

**1-19 POINTS**

**Intent:** Achieve increasing levels of energy performance beyond the prerequisite standard to reduce environmental and economic impacts associated with excessive energy use.

**Requirements:**

**OPTION 1:** Whole Building Energy Simulation is performed to determine percentage improvement in the proposed building performance compared to the baseline building performance rating (1-19 for new construction and schools.)

- NC and Schools: 12% minimum improvement
- EB: 8% minimum improvement

Demonstrate a percentage improvement in the proposed building performance rating compared with the baseline building performance rating. Calculate the baseline building performance according to Appendix G of ANSI/ASHRAE/IESNA Standard 90.1-2007 (with errata but without addenda) using a computer simulation model for the whole building project. The minimum energy cost savings percentage for each point threshold is as follows:

Minimum Energy Lost Savings Threshold

| New Buildings | Existing Building Renovations | Points |
|---------------|-------------------------------|--------|
| 12%           | 8%                            | 1      |
| 14%           | 10%                           | 2      |
| 16%           | 12%                           | 3      |
| 18%           | 14%                           | 4      |
| 20%           | 16%                           | 5      |
| 22%           | 18%                           | 6      |
| 24%           | 20%                           | 7      |
| 26%           | 22%                           | 8      |
| 28%           | 24%                           | 9      |
| 30%           | 26%                           | 10     |
| 32%           | 28%                           | 11     |
| 34%           | 30%                           | 12     |
| 36%           | 32%                           | 13     |
| 38%           | 34%                           | 14     |
| 40%           | 36%                           | 15     |
| 42%           | 38%                           | 16     |
| 44%           | 40%                           | 17     |
| 46%           | 42%                           | 18     |
| 48%           | 44%                           | 19     |

**OPTION 2:** Comply with ASHRAE Advanced Energy Design Guide appropriate to the project scope. Project scope is based on building size. **1 Point**

**OPTION 3:** Comply with the prescriptive measures identified in the Advanced Buildings™ Core Performance™ Guide. **1-3 Points**

## Materials and Resources

Fiber glass contains an average of 50% (up to 70%) pre- and post-consumer glass (known as cullet). Slag wool contains an average of 70% blast furnace slag. Typically, rock wool insulation is comprised of a minimum of 70-75% rock. The remaining volume of raw material is blast furnace slag.

### MR Credit 4 Recycled Content

1-2 Points

**Intent:** Increase demand for building products that incorporate recycled content materials, thereby reducing impacts resulting from extraction and processing of virgin materials.

**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% or 20% (based on cost) of the total value of the materials in the project. For more information regarding recycled content, see product packaging or visit the manufacturer's website.

**10% – 1 Point**

**20% – 2 Points**

Do not include mechanical, electrical and plumbing components or appliances and equipment in the calculations for this credit.\*

### MR Credit 5 Regional Materials

1-2 Points

**Intent:** Increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the use of indigenous resources and reducing the environmental impacts resulting from transportation.

**Requirements:**

Use building materials or products that have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the project site for the minimum of 10% or 20% (based on cost) of the total material value. To determine the proximity of the insulation product's manufacturing facility to the building site, contact the product manufacturer.

**10% – 1 Point**

**20% – 2 Points**

Do not include mechanical electrical and plumbing components or appliances and equipment in the calculation for this credit.\*

Many areas of the U.S. and Canada are within 500 miles of a fiber glass or rock wool and slag wool plant. Most fiber glass, rock wool and slag wool insulation plants are in close proximity to their raw materials and secondary material sources.

### MR Credit 6 Rapidly Renewable Materials

1 Point

**Intent:** Reduce the use and depletion of finite raw materials and long-cycle renewable materials by replacing them with rapidly renewable materials.

**Requirements:**

Use rapidly renewable building materials and products (made from plants that are typically harvested within a 10-year cycle or shorter) for 2.5% of the total value of all building materials and products used in the project, based on cost.

Do not include mechanical, electrical and plumbing or appliances and equipment in the calculation of this credit.\*

\*LEED Reference Guide for Green Building Design and Construction 2009 Edition.



Fiber glass duct board systems, duct liners, duct wraps, and commercial insulation boards contribute to indoor environmental quality (IEQ) and occupant comfort in residential, commercial, industrial, and public buildings of all kinds.

These include homes, apartments, schools, hotels, motels, medical facilities, theaters, shopping centers, office and government buildings, factories, and many other types of structures where occupant comfort and indoor environmental quality are important criteria.

## Indoor Environmental Quality

Fiber glass, rock and slag wool insulation may contribute to Indoor Air Quality (IAQ) points. A wide range of products contain no added formaldehyde or are certified for low emissions by GREENGUARD. In addition, fiber glass, rock and slag wool insulation reduce noise transfer through building assemblies and can significantly improve acoustic performance.

### Indoor Environmental Quality (IEQ)

#### IEQ Credit 2.3 Construction IAQ Management Plan: Before Occupancy

1 Point

**Intent:** Reduce indoor air quality problems resulting from the construction/renovation process in order to help sustain the comfort and well-being of construction workers and building occupants.

**Requirements:**

Develop and implement an Indoor Air Quality (IAQ) Management Plan for the post-construction and pre-occupancy phase.

**OPTION 2:** Air Testing (maximum LEED-allowed formaldehyde air concentration: 27 ppb).

#### Additional Credits for Schools

### IEQ Credit 4.6

#### Low-emitting Materials

1 Point

**Intent:** Reduce the quality of indoor air contaminants that are odorous, irritating and/or harmful to the comfort and well-being of installers and occupants.

**Requirements:**

**OPTION 6: CEILING AND WALL SYSTEMS** All gypsum board, insulation, acoustical ceiling systems and wall coverings installed in the building interior shall meet the testing and product requirements of the California Department of Health Services *Standard Practice for Testing of Volatile Organic Emissions from Various Sources Using Small-scale Environmental Chambers*, including 2004 Addenda. To determine if the product is a low-emitting material, contact the manufacturer.

### IEQ Credit 7.1

#### Thermal Comfort—Design

1 Point

**Intent:** Provide a comfortable thermal environment that promotes occupant productivity and well-being.

**Requirements:**

Design HVAC systems and the building envelope to meet the requirements of ASHRAE Standards 55-2004.

### IEQ Credit 9

#### Enhanced Acoustical Performance

1 Point

**Intent:** Provide classrooms that facilitate better teacher-to-student and student-to-student communications.

**Requirements:**

Design building shell, classroom partitions and other core learning spaces to meet Sound Transmission Class requirements of ANSI Standard S12.60-2002, Acoustical Performance Criteria, Design Requirements and Guidelines for Schools, excepting windows, which must meet an STC rating of at least 35.



## Innovation in Design

Fiber glass, rock wool and slag wool can be used in innovative designs that contribute to maximum thermal and acoustical efficiency of the building envelope and have environmental, safety and health benefits.

### ID Credit 1 Innovation in Design

**1-5 Points**

**Intent:** To provide design teams and projects the opportunity to be awarded points for exceptional performance above the requirements set by the LEED Green Building Rating System and/or innovative performance in Green Building categories not specifically addressed by the LEED Green Building Rating System.

#### Requirements:

Credit can be achieved through any combination of Innovation in Design and Exemplary Performance paths as described below:

#### **PATH 1. Innovation in Design (1-5 Points)**

Achieve significant, measurable environmental performance using a strategy not addressed in the LEED 2009 for New Construction and Major Renovations Rating System.

One point is awarded for each innovation achieved. No more than 5 points under IDc1 may be earned through PATH 1 – Innovation in Design:

Identify the following in writing:

- The intent of the proposed innovation credit
- The proposed requirement for compliance
- The proposed submittals to demonstrate compliance
- The design approach (strategies) used to meet the requirements

#### **PATH 2. Exemplary Performance (1-3 Points)**

Achieve exemplary performance in an existing LEED 2009 New Construction and Major Renovations prerequisite or credit that allows exemplary performance as specified in the *LEED Reference Guide for Green Building Design and Construction, 2009 Edition*. An exemplary performance point may be earned for achieving double the credit requirements and/or archiving the next incremental percentage threshold of an existing credit in LEED.

One point is awarded for each exemplary performance achieved. No more than 3 points under IDc1 may be earned through PATH 2 – Exemplary Performance.

#### **Potential Technologies & Strategies**

Substantially exceed LEED 2009 for New Construction and Major Renovations performance credit such as energy performance. Apply strategies or measures that demonstrate a comprehensive approach and quantifiable environmental and/or health benefits.

\**LEED Reference Guide for Green Building Design and Construction, 2009 Edition.*

DISCLAIMER: NAIMA cannot and does not guarantee compliance with LEED through the use of its members' products. For guidance on qualifying for LEED, work with your LEED AP consultant.

<sup>1</sup> A Cost Curve for Greenhouse Gas Reductions, *The McKinsey Quarterly*, No. 1, 2007.

<sup>2</sup> LEED 2009 Green Building Rating System for New Construction and Major Renovations, U.S. Green Building Council, Inc.



### **Document the Energy Efficiency of Added Mechanical Insulation**

Exceeding code requirements for mechanical insulations can significantly improve the energy efficiency of buildings. To demonstrate the benefits of added mechanical insulation during LEED certification, can supplement the Whole Building Energy Simulation with other modeling, like NAIMA's 3EPlus®—a pipe and equipment insulation thickness software program that can:

- Calculate the thermal performance of both insulated and uninsulated piping, ducts and equipment
- Convert Btu losses into actual dollars
- Calculate greenhouse gas emission and reductions



Download the program free of charge at [www.pipainsulation.org](http://www.pipainsulation.org).

*The use of existing energy-efficiency technologies, such as insulation, is fundamental to sustainable development.*

*Manufacturers of fiber glass and rock and slag wool insulation are actively engaged in efforts to reduce emissions, demand for natural resources and energy use at manufacturing plants*

### **Fiber Glass, Rock Wool and Slag Wool Insulation Have a High Percentage of Recycled Content**

Fiber glass is made from silica sand, one of the most abundant and renewable minerals on Earth, and an average of 50% (up to 70%) pre- and post-consumer recycled content.

Rock and slag wool insulation is made of natural rock and recycled blast furnace slag.



| NAIMA MEMBER  | INSULATION PRODUCTS   | NAIMA MEMBER  | INSULATION PRODUCTS  |
|---|---|---|--|
| <b>Aislantes Minerales, S.A. de C.V.</b><br>Descartes #104,<br>Neuva Anzures<br>11590 D.F., México<br>Tel: 52-55-1036-0640<br>Fax: (52 + 55) 5303-4739<br>www.rolan.com | <ul style="list-style-type: none"> <li>• Mineral wool pipe insulation</li> <li>• Loose mineral wool insulation</li> <li>• Mineral wool insulation boards</li> <li>• OEM insulation fabrication</li> </ul>   | <b>Knauf Insulation</b><br>One Knauf Drive<br>Shelbyville, IN 46176<br>800-825-4434<br>www.knaufinsulation.us               | <ul style="list-style-type: none"> <li>• Fiber glass building insulations</li> <li>• Fiber glass pipe and board insulations</li> <li>• Fiber glass duct insulations</li> <li>• Fiber glass metal building insulations</li> </ul> |
| <b>Armstrong World Industries</b><br>2500 Columbia Ave<br>Lancaster, PA 17603<br>717-397-0611<br>www.armstrong.com  | <ul style="list-style-type: none"> <li>• Mineral wool ceiling board insulation</li> </ul>   | <b>Owens Corning</b><br>One Owens Corning Parkway<br>Toledo, OH 43659<br>800-GET-PINK<br>www.owenscorning.com               | <ul style="list-style-type: none"> <li>• Fiber glass building insulations</li> <li>• Fiber glass pipe and board insulations</li> <li>• Fiber glass duct insulations</li> <li>• Fiber glass metal building insulations</li> </ul> |
| <b>CertainTeed Corp.</b><br>750 E. Swedesford Road<br>Valley Forge, PA 19482<br>800-233-8990<br>www.certainteed.com/insulation  | <ul style="list-style-type: none"> <li>• Mineral wool ceiling board insulation</li> <li>• Fiber glass building insulations</li> <li>• Fiber glass pipe and board insulations</li> <li>• Fiber glass duct insulations</li> <li>• Fiber glass metal building insulations</li> </ul> | <b>Rock Wool Manufacturing Co.</b><br>203 7th Street, N.E.<br>Leeds, AL 35094<br>205-699-6121<br>www.deltainsulation.com    | <ul style="list-style-type: none"> <li>• Slag wool building insulations</li> <li>• Slag wool pipe and board and blanket insulations</li> <li>• Slag wool commercial</li> </ul>   |
| <b>Industrial Insulation Group, LLC</b><br>2100 Line Street<br>Brunswick, GA 31520<br>912-264-6372<br>www.iig-llc.com   | <ul style="list-style-type: none"> <li>• Mineral wool board, pipe and blanket insulations</li> <li>• Mineral wool marine insulations</li> <li>• Mineral wool commercial insulations</li> <li>• Mineral wool blowing insulation</li> </ul>   | <b>Roxul Inc.</b><br>420 Bronte St., South, Suite 105<br>Milton, Ontario<br>Canada L9T 0H9<br>905-878-8474<br>www.roxul.com | <ul style="list-style-type: none"> <li>• Rock wool building insulations</li> <li>• Rock wool pipe and board and blanket insulations</li> <li>• Rock wool roof insulations</li> </ul>   |
| <b>Johns Manville</b><br>717 17th Street<br>Denver, CO 80202<br>800-654-3103<br>www.jm.com  | <ul style="list-style-type: none"> <li>• Fiber glass building insulations</li> <li>• Fiber glass pipe and board insulations</li> <li>• Fiber glass duct insulations</li> <li>• Fiber glass metal building insulations</li> <li>• Fiber glass aerospace insulation</li> </ul>      | <b>Thermafiber, Inc.</b><br>3711 Mill Street<br>Wabash, IN 46992<br>888-834-2371<br>www.thermafiber.com                     | <ul style="list-style-type: none"> <li>• Slag wool commercial building insulation</li> <li>• Slag wool industrial and OEM fibers and insulations</li> </ul>  |
|   |   | <b>USG Interiors, Inc.</b><br>550 West Adams Street<br>Chicago, IL 60661-3676<br>312-436-4000<br>www.usg.com                | <ul style="list-style-type: none"> <li>• Slag wool ceiling tiles</li> <li>• Mineral fiber board</li> </ul>   |



### About NAIMA

NAIMA is the association for North American manufacturers of fiber glass, rock wool, and slag wool insulation products. Its role is to promote energy efficiency and environmental preservation through the use of fiber glass, rock wool, and slag wool insulation, and to encourage the safe production and use of these materials.

**For more information, contact:**



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**www.naima.org • www.insulationinstitute.org • www.pipeinsulation.org**



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