

The following is a brief summary of the Leadership in Energy and Environmental Design program (LEED, Version 4) sections that Sika Sarnafil's roofing and waterproofing systems can either directly or indirectly contribute to point attainment. This guide can be used in conjunction with Sika Sarnafil's "LEED Products Spreadsheet" to help fill out any forms required by USGBC's LEED program for building certification.

WHAT IS LEED?

LEED is a green building certification system, providing third-party verification that a building or community was designed and built using strategies aimed at improving performance across the following metrics: energy savings, water efficiency, CO2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts.

Developed by the [U.S. Green Building Council \(USGBC\)](#), LEED provides building owners and operators with a framework for identifying and implementing measurable green building design, construction, operations and maintenance solutions.

WHAT IS LEED VERSION 4?

LEED V4 is the latest version of the LEED green building certification system approved by voters in July 2013. V4 is currently undergoing pilot testing and will be officially launched at Greenbuild in November 2013. **LEED 2009 (V3) may be used until June 2015 when it will be phased out of existence.**

HOW DOES A BUILDING GET CERTIFIED?

LEED points are awarded on a 100-point scale, and Credits are weighted to reflect their potential environmental impacts. Additionally, 10 bonus points are available. A project must satisfy all prerequisites and earn a minimum number of points to be certified. Projects are then awarded either a Certified (40+ points required), Silver (50+ points required), Gold (60+ points required) or Platinum (80+ points required) certification depending on the number of points they achieve.

DO SIKA SARNAFIL PRODUCTS AND SYSTEMS CONTRIBUTE TO LEED?

Whether your project is new construction or renovation, energy efficient roofing, water run-off management and renewable energy are all important points to consider - and Sika Sarnafil can help contribute to all three areas...as well as a few others. Below is an explanation of the LEED Credits Sika Sarnafil products can contribute to (up to 21 points possible) as well as an explanation of how that is achieved.

SIKA CORPORATION - ROOFING

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Sustainable Sites

Sika Sarnafil’s EnergySmart Roof® membranes and Green Roof systems can contribute to multiple points in LEED’s Sustainable Sites category. This is done by replacing natural landscape removed in the construction process with a green (vegetated) roof, encouraging regionally appropriate landscaping, controlling storm water runoff; and helping reduce the heat island effect. Below are the sections where Sika Sarnafil products can help you obtain points towards LEED certification:

SS CREDIT: SITE DEVELOPMENT—PROTECT OR RESTORE HABITAT

Intent

To conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Preserve and protect from all development and construction activity 40% of the greenfield area on the site (if such areas exist).

AND

Option 1. On-Site Restoration (2 points except Healthcare, 1 point Healthcare)

Using native or adapted vegetation, restore 30% (including the building footprint) of all portions of the site identified as previously developed. Projects that achieve a density of 1.5 floor-area ratio **may include vegetated roof surfaces in this calculation if the plants are native or adapted, provide habitat, and promote biodiversity.**

Sika Sarnafil Solution – Installing a Green “vegetated” Roof contributes to the possible 2 points.

SS CREDIT: OPEN SPACE

BD&C

1 point

This credit applies to
New Construction (1 point)
Core & Shell (1 point)
Schools (1 point)
Retail (1 point)
Data Centers (1 point)
Warehouses & Distribution Centers (1 point)
Hospitality (1 point)
Healthcare (1 point)

Intent

To create exterior open space that encourages interaction with the environment, social interaction, passive recreation, and physical activities.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Provide outdoor space greater than or equal to 30% of the total site area (including building footprint). A minimum of 25% of that outdoor space must be vegetated (turf grass does not count as vegetation) or have *overhead vegetated canopy*.

The outdoor space must be physically accessible and be one or more of the following:

- a pedestrian-oriented paving or turf area with physical site elements that accommodate outdoor social activities;
- a recreation-oriented paving or turf area with physical site elements that encourage physical activity;
- a garden space with a diversity of vegetation types and species that provide opportunities for year-round visual interest;
- a garden space dedicated to community gardens or urban food production; preserved or created habitat that meets the criteria of SS Credit Site Development—Protect or Restore Habitat and also includes elements of human interaction.

For projects that achieve a density of 1.5 floor-area ratio (FAR), and are physically accessible, extensive or intensive vegetated roofs can be used toward the minimum 25% vegetation requirement, and qualifying roof-based physically accessible paving areas can be used toward credit compliance.

Sika Sarnafil Solution - Installing a Green “vegetated” Roof contributes to the possible 1 point.

SS CREDIT: RAINWATER MANAGEMENT

BD&C

1–3 points

This credit applies to

New Construction (1–3 points)

Core & Shell (1–3 points)

Schools (1–3 points)

Retail (1–3 points)

Data Centers (1–3 points)

Warehouses & Distribution Centers (1–3 points)

Hospitality (1–3 points)

Healthcare (1–2 points)

Intent

To reduce runoff volume and improve water quality by replicating the natural hydrology and water balance of the site, based on historical conditions and undeveloped ecosystems in the region.

Sika Sarnafil Solution – Installing a Green “vegetated” Roof contributes to the possible 3 points.

SS CREDIT: HEAT ISLAND REDUCTION

BD&C

1–2 points

This credit applies to

New Construction (2 points)

Core & Shell (2 points)

Schools (2 points)

Retail (2 points)

Data Centers (2 points)

Warehouses & Distribution Centers (2 points)

Hospitality (2 points)

Healthcare (1 point)

Intent

To minimize effects on microclimates and human and wildlife habitats by reducing heat islands.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Choose one of the following options:

Option 1. Nonroof and Roof (2 points except Healthcare, 1 point Healthcare)

Meet the following criterion:

Area of Nonroof	Area of High	Area of		
<u>Measuresr</u>	<u>Reflectance Roof</u>	<u>Vegetated Roof</u>	Total Site Paving	Total Roof Area
+	+	≥	+	
0.5	0.75	0.75		

Alternatively, an SRI and SR weighted average approach may be used to calculate compliance

High-Reflectance Roof

Use roofing materials that have an SRI equal to or greater than the values in Table 1. Meet the three-year aged SRI value. If three-year aged value information is not available, use materials that meet the initial SRI value.

Table 1. Minimum solar reflectance index value, by roof slope	Slope	Initial SRI	3-year aged SRI
Low-sloped roof	≤ 2:12	82	64
Steep-sloped roof	> 2:12	39	32

Vegetated Roof

Install a vegetated roof.

OR

Option 2. Parking under Cover (1 point)

Place a minimum of 75% of *parking spaces under cover*. Any roof used to shade or cover parking must (1) have a three-year aged SRI of at least 32 (if three-year aged value information is not available, use materials with an initial SRI of at least 39 at installation), (2) be a vegetated roof, or (3) be covered by energy generation systems, such as solar thermal collectors, photovoltaics, and wind turbines .

Sika Sarnafil Solution -

Option 1 - Installing an EnergySmart roof or a vegetated roof on the roof surface can obtain up to 2 points.

Option 2 – Covering 75% of parking spaces with an EnergySmart roof or a vegetated roof can obtain up to 1 point

SS CREDIT: PLACES OF RESPITE

BD&C

1 point

This credit applies to
Healthcare

Intent

To provide patients, staff, and visitors with the health benefits of the natural environment by creating outdoor places of respite on the healthcare campus.

Requirements

HEALTHCARE

Provide places of respite that are accessible to patients and visitors, equal to 5% of the *net usable program area* of the building.

Provide additional dedicated places of respite for staff, equal to 2% of the net usable program area of the building.

Places of respite must be outdoors, or be located in interior atria, greenhouses, solariums, or conditioned spaces; such interior spaces may be used to meet up to 30% of the required area if 90% of each qualifying space's gross floor area achieves a direct line of sight to unobstructed views of nature.

Sika Sarnafil Solution – Installing a Green “vegetated” Roof contributes to the attainment of 1 point.

Energy and Atmosphere

Sika Sarnafil's EnergySmart Roof membranes, Sarnatherm Insulation and Solar Roof systems can contribute to multiple points in LEED's Energy & Atmosphere category. This is accomplished by helping optimize energy performance and the use of renewable and clean sources of energy, generated on-site. Below are the sections where Sika Sarnafil products can help you achieve points towards LEED certification:

EA CREDIT: RENEWABLE ENERGY PRODUCTION

BD&C

1–3 points

This credit applies to

New Construction (1–3 points)

Core & Shell (1–3 points)

Schools (1–3 points)

Retail (1–3 points)

Data Centers (1–3 points)

Warehouses & Distribution Centers (1–3 points)

Hospitality (1–3 points)

Healthcare (1–3 points)

Intent

To reduce the environmental and economic harms associated with fossil fuel energy by increasing self-supply of renewable energy.



Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Use renewable energy systems to offset building energy costs. Calculate the percentage of renewable energy with the following equation:

Sika Sarnafil Solution – Installing a Solar Roof can reduce the need for fossil fuel energy use contributing to the possible 3 points.

MR CREDIT: BUILDING PRODUCT DISCLOSURE AND OPTIMIZATION—ENVIRONMENTAL PRODUCT DECLARATIONS

BD&C

1–2 points

This credit applies to

New Construction (1–2 points)

Core & Shell (1–2 points)

Schools (1–2 points)

Retail (1–2 points)

Data Centers (1–2 points)

Warehouses & Distribution Centers (1–2 points)

Hospitality (1–2 points)

Healthcare (1–2 points)

Intent

To encourage the use of products and materials for which life-cycle information is available and that have environmentally, economically, and socially preferable life-cycle impacts. To reward project teams for selecting products from manufacturers who have verified improved environmental life-cycle impacts.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Achieve one or more of the options below, for a maximum of 2 points.

Option 1. Environmental Product Declaration (EPD) (1 point)

Use at least 20 different permanently installed products sourced from at least five different manufacturers that meet one of the disclosure criteria below.

Product-specific declaration.

- Products with a publicly available, critically reviewed life-cycle assessment conforming to ISO 14044 that have at least a cradle to gate scope are valued as one quarter (1/4) of a product for the purposes of credit achievement calculation.

Environmental Product Declarations which conform to ISO 14025, 14040, 14044, and EN 15804 or ISO 21930 and have at least a cradle to gate scope.

- Industry-wide (generic) EPD -- Products with third-party certification (Type III), including external verification, in which the manufacturer is explicitly recognized as a participant by the program operator are valued as one half (1/2) of a product for purposes of credit achievement calculation.
- Product-specific Type III EPD -- Products with third-party certification (Type III), including external verification in which the manufacturer is explicitly recognized as the participant by the program operator are valued as one whole product for purposes of credit achievement calculation.

USGBC approved program – Products that comply with other USGBC approved environmental product declaration frameworks.

Sika Sarnafil Solution – The roofing industry is pursuing a generic PVC roofing EPD which will contribute to the attainment of ¼ to ½ point. Separately, Sika Sarnafil will pursue a product specific Type III EPD that will contribute to the attainment of 1 full point. Both EPDs are expected to be completed in 2014.

MR CREDIT: BUILDING PRODUCT DISCLOSURE AND OPTIMIZATION – SOURCING OF RAW MATERIALS

BD&C

1–2 points

This credit applies to

New Construction (1–2 points)

Core & Shell (1–2 points)

Schools (1–2 points)

Retail (1–2 points)

Data Centers (1–2 points)

Warehouses & Distribution Centers (1–2 points)

Hospitality (1–2 points)

Healthcare (1–2 points)

Intent

To encourage the use of products and materials for which life cycle information is available and that have environmentally, economically, and socially preferable life cycle impacts. To reward project teams for selecting products verified to have been extracted or sourced in a responsible manner.

Requirements

NC, CS, SCHOOLS, RETAIL NC, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY NC, HEALTHCARE

Option 1. Raw Material Source and Extraction Reporting (1 point)**Option 2. Leadership Extraction Practices (1 point)**

Use products that meet at least one of the responsible extraction criteria below for at least 25%, by cost, of the total value of permanently installed building products in the project.

Materials reuse. Reuse includes salvaged, refurbished, or reused products. Products meeting materials reuse criteria are valued at 100% of their cost for the purposes of credit achievement calculation.

Recycled content. Recycled content is the sum of postconsumer recycled content plus one-half the preconsumer recycled content, based on cost. Products meeting recycled content criteria are valued at 100% of their cost for the purposes of credit achievement calculation

Sika Sarnafil Solution - Sika Sarnafil's S327 and G410 (5' and 10' models), Sikaplan, PVC Protection Layer and Sarnatred collectively contain an average of 10% recycled content and can contribute to the attainment of 1 point under this credit.

MR CREDIT: BUILDING PRODUCT DISCLOSURE AND OPTIMIZATION – MATERIAL INGREDIENTS

BD&C

1-2 points

This credit applies to

New Construction (1-2 points)

Core & Shell (1-2 points)

Schools (1-2 points)

Retail (1-2 points)

Data Centers (1-2 points)

Warehouses & Distribution Centers (1-2 points)

Hospitality (1-2 points)

Healthcare (1-2 points)

Intent

To encourage the use of products and materials for which life-cycle information is available and that have environmentally, economically, and socially preferable life-cycle impacts. To reward project teams for selecting products for which the chemical ingredients in the product are inventoried using an accepted methodology and for selecting products verified to minimize the use and generation of harmful substances. To reward raw material manufacturers who produce products verified to have improved life-cycle impacts.

Option 2: Material Ingredient Optimization (1 point)

Use products that document their material ingredient optimization using the paths below for at least 25%, by cost, of the total value of permanently installed products in the project.

GreenScreen v1.2 Benchmark. Products that have fully inventoried chemical ingredients to 100 ppm that have no Benchmark 1 hazards:

- o If any ingredients are assessed with the GreenScreen List Translator, value these products at 100% of cost.
- o If all ingredients are have undergone a full GreenScreen Assessment, value these products at 150% of cost.

Cradle to Cradle Certified. End use products are certified Cradle to Cradle. Products will be valued as follows:

- o Cradle to Cradle v2 Gold: 100% of cost
- o Cradle to Cradle v2 Platinum: 150% of cost
- o Cradle to Cradle v3 Silver: 100% of cost
- o Cradle to Cradle v3 Gold or Platinum: 150% of cost

International Alternative Compliance Path – REACH Optimization. End use products and materials that do not contain substances that meet REACH criteria for substances of very high concern. If the product contains no ingredients listed on the REACH Authorization or Candidate list, value at 100% of cost.

USGBC approved program. Products that comply with USGGBC approved building product optimization criteria.

Sika Sarnafil Solution – Sika Sarnafil roofing systems do not contain any substances that meet REACH criteria for substances of very high concern and therefore can contribute toward the attainment of

this point. We are in the process of determining the verification procedure and will communicate when available.

MR CREDIT: CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT

BD&C

1–2 points

This credit applies to

New Construction (1–2 points)

Core & Shell (1–2 points)

Schools (1–2 points)

Retail (1–2 points)

Data Centers (1–2 points)

Warehouses & Distribution Centers (1–2 points)

Hospitality (1–2 points)

Healthcare (1–2 points)

Intent

To reduce construction and demolition waste disposed of in landfills and incineration facilities by recovering, reusing, and recycling materials.

Sika Sarnafil Solution - Sika Sarnafil's Roof Recycling Program takes old PVC membranes (ours and any of our competitors), and any new material jobsite PVC scrap and recycles them back into new roofing and waterproofing membrane. This program can contribute to the possible 2 points for diverting one of several material streams.

The roof recycle program is possible for any PVC roof that was part of a ballasted or mechanically-attached roof system. No adhered roofs can be recycled at this time.

EQ PREREQUISITE: MINIMUM ACOUSTIC PERFORMANCE

Required

BD&C

This prerequisite applies to

Schools

Intent

To provide classrooms that facilitate teacher-to-student and student-to-student communication through effective acoustic design.

Requirements

SCHOOLS

HVAC Background Noise

Achieve a maximum background noise level of 40 dBA from heating, ventilating, and air-conditioning (HVAC) systems in classrooms and other core learning spaces. Follow the recommended methodologies and best practices for mechanical system noise control in ANSI Standard S12.60–2010, Part 1, Annex A.1; the 2011 HVAC Applications ASHRAE Handbook, Chapter 48, Sound and Vibration Control (with errata); AHRI Standard 885–2008; or a local equivalent for projects outside the U.S.

Exterior Noise

For high-noise sites (peak-hour Leq above 60 dBA during school hours), implement acoustic treatment and other measures to minimize noise intrusion from exterior sources and control sound transmission between classrooms and other core learning spaces. Projects at least one-half mile (800 meters) from any significant noise source (e.g., aircraft overflights, highways, trains, industry) are exempt.

Sika Sarnafil Solution - Sika Sarnafil roofing systems with Roxul stone wool insulation will contribute to the attainment of 1 point.

EQ CREDIT: LOW-EMITTING MATERIALS

BD&C

1–3 points

This credit applies to

New Construction (1–3 points)

Core & Shell (1–3 points)

Schools (1–3 points)

Retail (1–3 points)

Data Centers (1–3 points)

Warehouses & Distribution Centers (1–3 points)

Hospitality (1–3 points)

Healthcare (1–3 points)

Intent

To reduce concentrations of chemical contaminants that can damage air quality, human health, productivity, and the environment.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

This credit includes requirements for product manufacturing as well as project teams. It covers volatile organic compound (VOC) emissions into indoor air and the VOC content of materials, as well as the testing methods by which indoor VOC emissions are determined. Different materials must meet different requirements to be considered compliant for this credit. The building interior and exterior are organized in seven categories, each with different thresholds of compliance. **The building interior is defined as everything within the waterproofing membrane. The building exterior is defined as everything outside and inclusive of the primary and secondary weatherproofing system, such as waterproofing membranes and air- and water-resistive barrier materials.**

Healthcare and Schools	At least 90%, by volume	Exterior Applied Products
Projects only: Exterior applied products		

Healthcare, Schools only

Additional insulation requirements. Batt insulation products may contain no added formaldehyde, including urea formaldehyde, phenol formaldehyde, and urea-extended phenol formaldehyde.

Exterior applied products. Adhesives, sealants, coatings, roofing, and waterproofing materials applied on site must meet the VOC limits of California Air Resources Board (CARB) 2007 Suggested Control Measure (SCM) for Architectural Coatings, and South Coast Air Quality Management District (SCAQMD), Rule 1168, effective July 1, 2005. Small containers of adhesives and sealants subject to state or federal consumer product VOC regulations are exempt.

Projects outside North America may use either the jurisdictional VOC content requirements or comply with the European Decopaint Directive (2004/42/EC, to be updated to most current version when available) Phase II, for water-borne coatings, as analyzed according to ISO 11890 parts 1 and 2, instead of the CARB and SCAQMD regulatory standards.

Two materials are prohibited and do not count toward total percentage compliance: hot-mopped asphalt for roofing, and coal tar sealants for parking lots and other paved surfaces.



Sika Sarnafil Solution - Sika Sarnafil has a number of low and No VOC emitting roofing adhesives and coating solutions that can be used to obtain up to 3 points by not contributing to possible fumes and/or odors during building construction.