

LEED® Certification

How composites made with resins that contain rapidly renewable and post-consumer recycled components contribute to LEED certification.

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Our Environment

It seems that the word “green”, when used with regard to activities that affect the environment, has become ubiquitous. From the “greening” of the Empire State Building to the “greening” of specific companies, products, and services, we cannot escape the reminders that we are stewards of the earth.

The construction industry has been affected by this trend to such an extent that many architects and developers are now designing and constructing so-called, “green” buildings. Since many composite materials are used in the construction industry, it is essential that composite manufacturers be aware of how their composite materials are viewed from an environmental standpoint.

The questions this brings up are: What does “green” mean to the composite industry? How can composite products’ environmental impact be reduced? How can we ensure that composite products become recognized as being good for the environment?

The main certification system for the construction industry is Leadership in Energy and Environmental Design (LEED), a program of the U.S. Green Building Council. We need to understand what this program is and how composite products can be used within it.



The first question that needs to be discussed is, "What does 'green' mean?" There are many marketing terms that are used to indicate concern for the environment: "Eco-friendly" is a general term for reduced environmental impact. "Low VOC" and "Zero VOC" denote the reduction or elimination of volatile organic chemicals. "Sustainable" is used to designate products that avoid the depletion of a specific natural resource. "Energy-Saving" refers to reducing the amount of energy used to manufacture a product or the amount of energy needed to heat and cool a building. "Low Carbon Footprint" products or processes are meant to reduce the amount of carbon dioxide emitted into the environment. "Recyclable" has to do with the products' ability to be recycled and the use of recycled materials as raw materials. "Bio-based" is a term that contrasts the use of oil or natural gas as raw materials with the use of renewable resources. The United Nations Environmental Program defines green as: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

Green Construction

The composite industry has the potential to impact the construction industry by providing green products for new construction and remodeling activities. In order for this to happen the composite industry needs to understand the green certification process for the construction industry. In its own words, "The U.S. Green Building Council is a 501 (c)3 nonprofit organization



The Composites Industry Needs to Understand the Green Certification Process.

The Value of Green Building Construction is Projected to Increase to \$60 Billion by 2010.

committed to a prosperous and sustainable future for our nation through cost efficient and energy saving green buildings." (www.usgbc.gov)

The LEED system was developed by the USGBC, "...for certifying the greenest performing buildings in the world" according to the USGBC website. This system has aspects that relate to site planning, water management, energy, material use, and indoor environmental quality.

There are four levels of certification in the LEED system: Certified,



Silver, Gold, and Platinum. These levels are attained based on points which are awarded in the certification process. On the USGBC website, designers and architects follow a process that involves

Project Registration, Technical Support, Optional Design Review, and Building Certification. For new construction and major renovation projects in existing buildings there are six specific areas in which to obtain points. These are: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, and Innovation and Design Process. The Materials and Resources category is one specific area where composite materials may contribute to LEED points. For the home rating system, there are eight areas: Innovation and Design Processes, Location and Linkages, Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, and Awareness and Education. Again, the Materials and Resources category is the specific area where composite materials may easily contribute to LEED points. Under the Materials and

Resources category, the credits that may certainly be applied toward points are the recycled content and rapidly renewable materials.

Materials and Resources

The intent of MR Credit 4.1-4.2 is to reduce the amount of post-consumer and pre-consumer waste material entering landfills. Obviously there are environmental benefits when material is diverted from a landfill and then used as a raw material.

The intent of MR Credit 6 is to reduce the use and depletion of finite raw materials and long-cycle renewable materials by replacing them with rapidly renewable materials. The definition of, "rapidly renewable" is usually considered to be ten or fewer years required for replacement of the resource.

Consequently, materials such as annual crops and even bamboo are defined as rapidly renewable.

There are three main approaches to marketing composite products that can give LEED certification points: submitting the products for third-party certifications, ensuring that products are listed on specification websites that designers and architects use, and marketing directly to designers, architects, and contractors. Third-party companies provide certifications for certain aspects of environmental impact. They also list products that provide contributions for LEED certification on their websites. These companies test the products, document the certificates, and publicize the products.

Scientific Certification Systems (SCS) documents specific properties such as recycled content. Greenguard tests and certifies products based on their contribution to indoor air quality. Green Seal certifies construction materials, household products, and other materials based on numerous categories including recycled material content. Eco Options is a part of Home Depot's website that lists products that are certified for categories such as recycled content. Cradle to Cradle certifies for numerous categories including recycled content.

In contrast to third-party certifications, construction specification websites document the specific characteristic that provides LEED credits. The recycled content or rapidly renewable content needs to be documented in the specifications.

The following is a list of ten construction specification websites:

- www.csinet.org
- www.greenformat.com
- www.products.construction.com
- www.arcat.com
- www.buildinggreen.com
- www.greenspec.com
- www.bsdssoftlink.com
- www.uniteddesign.com
- www.nwbuildnet.com
- www.constructionweblink.com

These organizations list products that have specifications that can contribute to LEED credits.



A partial list of third-party companies and their websites.

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|-------------------------|-------------------------------------------------------------------------------------|
| SCS | www.scs-certified.com |
| Greenguard | www.greenguard.org |
| Green Seal | www.greenseal.org |
| Eco Options | www.homedepot.com/ecoptions |
| Cradle to Cradle | www.c2ccertified.com |

Buildings Not Components

The important concept for LEED certification is that the *buildings* are certified, not the components of the buildings. The components are used to calculate credits. For example, credit points are awarded based on percent cost of the fraction of recycled or rapidly renewable materials. For each 10 percent of the construction material cost that is post-consumer recycled, one point is awarded. For every 2.5 percent of the construction material cost that is rapidly renewable, one point is awarded.

The motivation for designers and architects and designers to construct LEED-certified buildings is increasing. The USGBC website (www.usgbc.org/displayPage.aspx?CMSPageID=1852) lists the current Federal, State, Municipal/City, County, and School (higher education and K-12) edicts that require LEED certification. As municipalities, architects, and contractors become more familiar with LEED certification it is not a question of whether LEED certification will become the norm, it is only a question of when this will occur.

Reducing Environmental Impact

Resin suppliers are continuing to develop resins with reduced environmental impact. Our suppliers are providing an increasing variety of materials that are rapidly renewable, and we continue to use recycled plastics as raw materials for our resins. These resins that contain specified amounts of post-consumer recycled material and specified amounts of rapidly renewable materials are available now for the composite industry.

The industry should take advantage of these resins and specifications to document the reduced environmental impact of composite products. The use of third-party certifications, specification websites, and direct contact with architects are three excellent ways to spread the word. This will ensure that composite products are identified as environmentally friendly and contribute to LEED points.



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