



## **Understanding the LEED Program and the role of the Architectural Community in maintaining the integrity of Green Products in Design**



### **Learning Objectives**

- **Understand the role of LEED on design and product selection**
- **Understand What is Green/Earth Friendly/Sustainability**
- **How to be proactive in avoiding products that represent 'Green Washing'**

#### **Introduction**

In today's construction marketplace there is more emphasis than ever being put on Green Building. Architects, Engineers and the entire construction team are faced with learning new terminology and technology:

Green Power, Kyoto Protocol, Ecological Footprint, LEED, USGBC, Carbon Neutral, Intelligent Materials, Passive Solar, and Sustainable Development to name a few;

But what do all these mean, and how will the Green Movement impact our projects today, as well as tomorrow? In this CEU program we will review the learning objectives listed above, and provide some additional information so that the Design Professional has a higher level of understanding of what questions need to be answered when working on a Green Project. This article utilizes concrete and related materials for its' focus, though the thought process can be used throughout the building design process.

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# Understanding the LEED program

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# CONTINUING EDUCATION

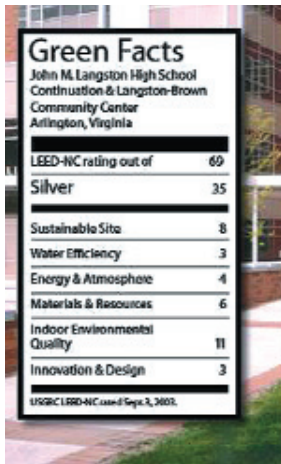
## Part 1: Understanding the role of LEED on design and product selection

### What is LEED?

#### "Leadership in Energy and Environmental Design".

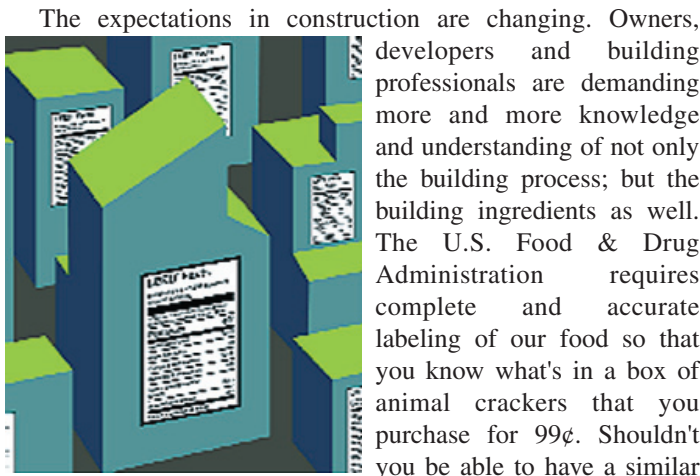
LEED is the leading-edge system for certifying DESIGN, CONSTRUCTION, & OPERATIONS of the greenest buildings in the world. LEED is a voluntary, consensus-based national standard for developing high-performance, sustainable buildings. The LEED Program was developed and is managed by the United States Green Building Council (USGBC).

The USGBC estimated in May of 2007 that the annual US Market for "green" building products and services would exceed \$12 Billion.



### LEED assesses in detail:

- 1.) Sustainable Sites
- 2.) Water Efficiency
- 3.) Energy and Atmosphere
- 4.) Materials and Resources
- 5.) Indoor Environmental Quality
- 6.) Innovation & Design Process



The expectations in construction are changing. Owners, developers and building professionals are demanding more and more knowledge and understanding of not only the building process; but the building ingredients as well. The U.S. Food & Drug Administration requires complete and accurate labeling of our food so that you know what's in a box of animal crackers that you purchase for 99¢. Shouldn't you be able to have a similar level of product knowledge when you walk into an \$99 million dollar building? The evolution of LEED and its impact on construction design is making that knowledge available.

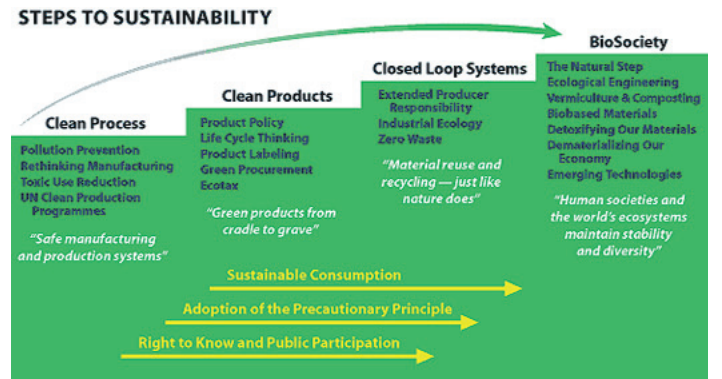
In 2002 there were roughly 80 million square feet of LEED projects in process; In 2006 this amount was estimated at 642 million square feet-an increase of over 700%, exponential growth which is expected to continue. This significant growth has shown how important sustainability has become.

Understanding the steps involved in true sustainable design helps everyone on the construction team help in reaching a working program that achieves sustainability.

This is becoming even more evident when you consider the

LEED projects on file for new construction. As of May 2007, the following government entities had instituted green building programs: California; Colorado; Maryland; New York; Pennsylvania; Wisconsin; Alameda County California, Cook County, Illinois; Austin, Texas; Frisco, Texas; Boulder, Colorado; Portland, Oregon; Los Angeles, California; Santa Monica, California; San Jose, California; Scottsdale, Arizona; and Seattle, Washington. In fact, The state of California has issued an executive order that all buildings using state dollars must meet Silver Criteria starting in 2009.

Clearly government-funded projects are not the only ones considering using Green. Eight years ago the cost differential



between Green and Non-Green was ten to fifteen percent. Today the cost difference has basically evaporated—estimated at zero to less than two percent. When a snapshot was taken in Fall 2007 of LEED projects across the USA, less than ten percent were state or federal government projects, a significant change in 8 short years.

### LEED Certification

The LEED certification process is a method that allows all to evaluate the design and construction criteria so that the end result is an environmentally sustainable structure. The list below shows the levels as well as the areas and points that are typically allocated in a LEED certifiable project. Most Construction Suppliers can assist the design professional with LEED information. This support is usually in the form of LEED product or system certification. There are 6 categories where a project may acquire LEED points. Each category has subsets of information that define criteria for earning points in a given section.

LEED Certification	Point Allocation
Buildings that comply with these standards may qualify for one of the 4 LEED Certification Levels:	1.) Sustainable Sites - 14 points
1.) Certified - 26-32 points	2.) Water Efficiency - 5 points
2.) Silver - 33-38 points	3.) Energy & Atmosphere - 17 points
3.) Gold - 39-51 points	4.) Materials & Resources - 13 points
4.) Platinum - 52-69 points	5.) Indoor Environmental Quality - 15 points
	6.) Innovation & Design Process - 5 points

## Understanding the LEED program

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Many states, cities, school systems, and companies are setting LEED certification goals for new construction. LEED requires documentation verifying the LEED impact of the material and resources used on a project seeking LEED certification. Working with manufacturers and suppliers who understand the LEED process and who can provide this documentation will enable the design professional to be more focused on the "design", and less focused on the "supply". This partnering with manufacturers will ensure that appropriate LEED credits are credited while allowing the architect and engineer to primarily focus on better design and construction for the client.

Using concrete forming and related products as an example, here are some ways different products can qualify to help accumulate LEED credits for "Materials and Resources" LEED points. Note some non-traditional products including plastics and eco-friendly products can qualify for additional LEED credits:

- **Reusable Forming Systems:**
  - Use Recycled Steel and Aluminum (Forming Systems)
  - Reduce lumber usage (Rebar Chairs)
  - Reduce waste disposal (Re-usable forming and curb systems)
- **Cement Based Products:**
  - Incorporate fly ash (reducing ash disposal)
  - Incorporate fly ash (saving energy in processing)
- **Plastic Accessories:**
  - Use Recycled Plastics (bar supports in horizontal concrete)
- **Eco-friendly Products**
  - Form Releases, Curing Products and Sealers (Which can be made from locally-harvested soybeans)
- **Cement/Bagged Products**
  - Can be made from locally-harvested sands, cements etc.
  - Manufactured/blended locally

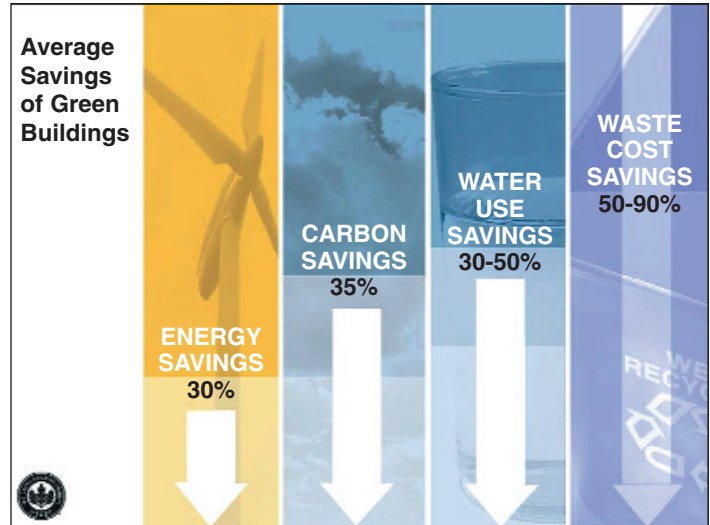
### Part 2. Understanding Green Terminology: Earth Friendly and Sustainability in Design and Construction

So just what constitutes GREEN?

Webster defines **Green Building** as, "the practice of increasing the efficiency of buildings and their use of energy, water, and materials, and reducing building impacts on human health and the environment through better site planning, design, construction, operation, maintenance, and removal - the complete building life cycle.

While good design is essential to green building, the actual operation, maintenance, and ultimate disposal or deconstruction of the building also have very significant effects on buildings' overall environmental impact. The result is significant savings throughout the entire life cycle of the building. Clearly, Green construction methods are more than just earth friendly...they are budget friendly as well.

## CONTINUING EDUCATION



### What Is Green Chemistry?

"Green chemistry is the design of chemical products and processes that reduce or eliminate the use and generation of hazardous substances." (Anastas and Warner, 2000).

Green chemistry is innovative, smart, and ethically responsible. The most successful companies of the future will be those who exploit its opportunities to their competitive advantage, and the most successful chemists of the future will be those who use green chemistry concepts in Research and Development, innovation and education.



### Part 3. How to be proactive in avoiding products that represent 'Green Washing'

#### How do you evaluate what is Green?

Is a product Green based on the package design or the design of what is in the package? Some manufacturers bend the green meaning, this is called "Green Washing". Green Washing is a term that is creating some havoc in the marketplace and can be a challenge for the building team. For Example, sulphuric acid omits very low or no VOC's but it is not what would normally be classified as Green. However if it is packaged in a container that contains recycled plastic, some manufacturers would claim it is a Green product. Not unlike the deluge of "lite" food products which may or may not truly be low calorie or healthful, with no clear guidelines or definitions for Green products, the potential for Green Washing of products that actually may harm the environment is abundant.

To avoid Green Washing, look for companies that always take the **Leadership position**-this way you never have to second-guess what is Green. A good example are Earth Friendly construction chemical products, which have less than 100 VOC gm/l, use a new environmentally responsible technology such as bio-based, and are packaged in recycled packaging. When you specify an Earth Friendly material, you know that this product

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exceeds all the VOC requirements across the USA, and your contracting community appreciates it because the technologies typically function like the petroleum based products they have used for years.

### Difficult Decisions for the Design Professional

Architects must decide what constitutes a green product. How do you do this? A good question. First is by developing strong performance based specifications. This helps both the client and the A/E firm have a product protocol that establishes the guidelines for successful LEED/ green projects.

Second, especially for chemicals, require that the MSDS sheets be submitted in addition to technical data sheets. This is the quickest and easiest way to ensure that there are no hazardous materials in the product. Green Washing can be done on data sheets, it is virtually impossible to do on a Material Safety Data Sheet.

Third, require all manufacturers submit LEED certification on their products. This can be as simple as a statement on their letterhead or email. With this, the MSDS and a performance based specification, the design professional will have a much easier time working with truly green products and not those that are kinda-sort of -not really green.

### Emerging Programs that help define what is Green

As mentioned earlier, technologies such as Earth Friendly usable by both A/E firm and contractor. These are Environmentally Responsible (VOC content <100 g/L) and utilize new innovative bio-based chemistry. Bio-based products have the desired performance of products that were previously solvent based, with the environmentally guided peace of mind of water base.



Bio-based products are Earth Friendly products and they comply with EVERY air quality standard across North America. Examples of bio-based construction products that utilize this technology include Form Release Agents, Cures & Cure & Seals, Concrete Maintenance & Repair Products, Sealers & Water Proofing Products, Diamond Polishing Concrete, and Cleaners and Strippers.

### Benefits of Bio-Based Products

Bio based products as defined by the USDA and the Biobased Manufacturers Association rely on plant and/or animal materials; are sustainable, renewable resources; and generally do not contain toxins, synthetics or environmentally damaging materials, making them generally healthier and safer for the user. Manufacturers and end-users reduce regulatory problems by replacing hazardous chemicals listed by the EPA's Toxic Release Inventory. Manufacturers and end-users improve worker safety by using bi-based products. Bio-based products are usually less toxic, less flammable and less corrosive than petroleum-based products.

Generally healthier for the environment. Using bio based products decreases the amount of upstream pollution generated from the extraction and processing of crude oil into chemicals. Most bio-based products are biodegradable and safe to dispose of.

Reduced dependence on imported oil. Bio-based products are becoming increasingly competitive with petroleum-based products. Manufacturers and end-users can also save money by avoiding special permits, compliance penalties and disposal cost.

### CONCLUSION

Less than ten years ago, no one was certain if Green products were here to stay or just a fad. At last years' National Home Builders Show, seventy percent of the respondents indicated that Green Products were an important design consideration. Needless to say, Green Products are going to continue to be a key part of the building process.

LEED, the consensus-based national standard for developing high-performance, sustainable buildings, assesses six areas for certifying a building to meet LEED/Green standards. A big part of this assessment is outlined in the steps to sustainable building design. As we move forward, more and more entities are going to require green sustainable design. This is most evident in California where an executive order was passed that mandates Silver LEED Criteria for all state funded construction.

Design Professionals are the cornerstone to ensuring truly green products, such as Earth Friendly products, are properly specified, and that Green Washing does not occur. By developing a performance based specification, requiring an MSDS and supplier certification in writing, design professionals can have a significant impact on the project's overall environmental footprint.

The savings of Green design and construction are gaining traction every day. Today's professional needs to seek out the true supplier partners who embrace the benefits of green by actively supporting the vision of sustainable architecture. In doing so, and participating in continuing education programs, today's design professional can utilize their creative skills to provide award winning design solutions for each and every client.

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### About Dayton Superior.

Dayton Superior is the leading North American provider of specialized products consumed in non-residential, concrete and masonry construction, and is the largest concrete forming and shoring rental company serving the domestic, non-residential construction market. Dayton was the first construction chemical company to embrace bio-based technology and take an active role in promoting environmental responsibility as an industry leader. Our products can be found on construction sites nationwide and are used in non-residential construction projects,

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## Understanding the LEED program

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including: infrastructure projects, such as highways, bridges, airports, power plants and water management projects; institutional projects, such as schools, stadiums, hospitals and government buildings; and commercial projects, such as retail stores, offices and recreational, distribution and manufacturing facilities.

## CONTINUING EDUCATION Learning Objectives

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### ***Learning Objective:***

- Understand how cover boards enhance the performance of commercial roofing systems and assemblies.
- Identify several distinct cover board product types and their installation advantages.
- Evaluate important criteria when specifying cover boards for different environmental conditions.

### **ALA Continuing Education Questionnaire -**

### **Understanding the LEED Program and the role of the Architectural Community in maintaining the integrity of Green Products in Design**

#### **Program Title:**

*Understanding the LEED Program and the role of the Architectural Community in maintaining the integrity of Green Products in Design*

**ALA/CEP Credit:** This article qualifies for 1.0 LU's (health, safety, and welfare) of State Required Learning Units and may qualify for other LU requirements. (Valid through February 2009.)

#### **Instructions:**

- Read the article using the learning objectives provided.
- Answer the questions below by circling the correct letter(s).
- Fill in your contact information.
- Check whether logging of ALA/CEP credit (ALA members with logging privileges only) or certificate of completion is desired.
- Sign the certification.
- Submit questions with answers, contact information and payment to ALA by mail or fax to receive credit.
- Article and tests are also available online: [www.licensedarchitect.org](http://www.licensedarchitect.org)

1. How many areas does the LEED program assess?

2. What state has mandated all buildings that use state funding will be at least Silver LEED status starting in 2009?

3. Performance based specifications will help eliminate Green Washing?

True  False

4. An MSDS sheet is worthless in a Green Product submittal?

True  False

5. If a product is called "Earth Friendly" what is the highest amount of VOC's it can have? **VOC Content is less than 100 grams/liter**

6. In today's construction market, the cost of going green is near the same as traditional building with non green materials?

True  False

7. How many levels of certification are there in a LEED project?

8. Green Washing, misrepresenting a product does not harm the environment?

True  False

9. Earth Friendly products can be specified and used in all 50 states including California?

True  False

10. Plastic products in some cases can qualify for LEED credits?

True  False

**Contact Information:** \_\_\_\_\_

Last Name: \_\_\_\_\_

First Name: \_\_\_\_\_ Middle Initial: \_\_\_\_\_

Firm Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Tel.: \_\_\_\_\_ E-Mail: \_\_\_\_\_

Credit Card No: \_\_\_\_\_

(VISA or MASTERCARD only)

Expiration Date: \_\_\_\_\_

#### **PAYMENT: ALA/CEP Credit or Certificate of Completion:**

**Cost: \$10 (ALA Members) \$15 (non-members)**

Check or  Credit Card

Please send me a certificate of completion (required by certain states & organizations) that I may submit.

Please log me for ALA LU credit (ALA members with logging privileges only) .

Your test will be scored. Those scoring 80% or higher will receive 1 LU Credit.

Fax: 847-382-8380

Address: Association of Licensed Architects,

P.O. Box 687, Barrington, IL 60011

Attn: ALA/CEP Credit

**Certification:** (Read and sign below)

**I hereby certify that the above information is true and accurate to the best of my knowledge and that I have complied with the ALA Continuing Education Guidelines for the reported period.**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_