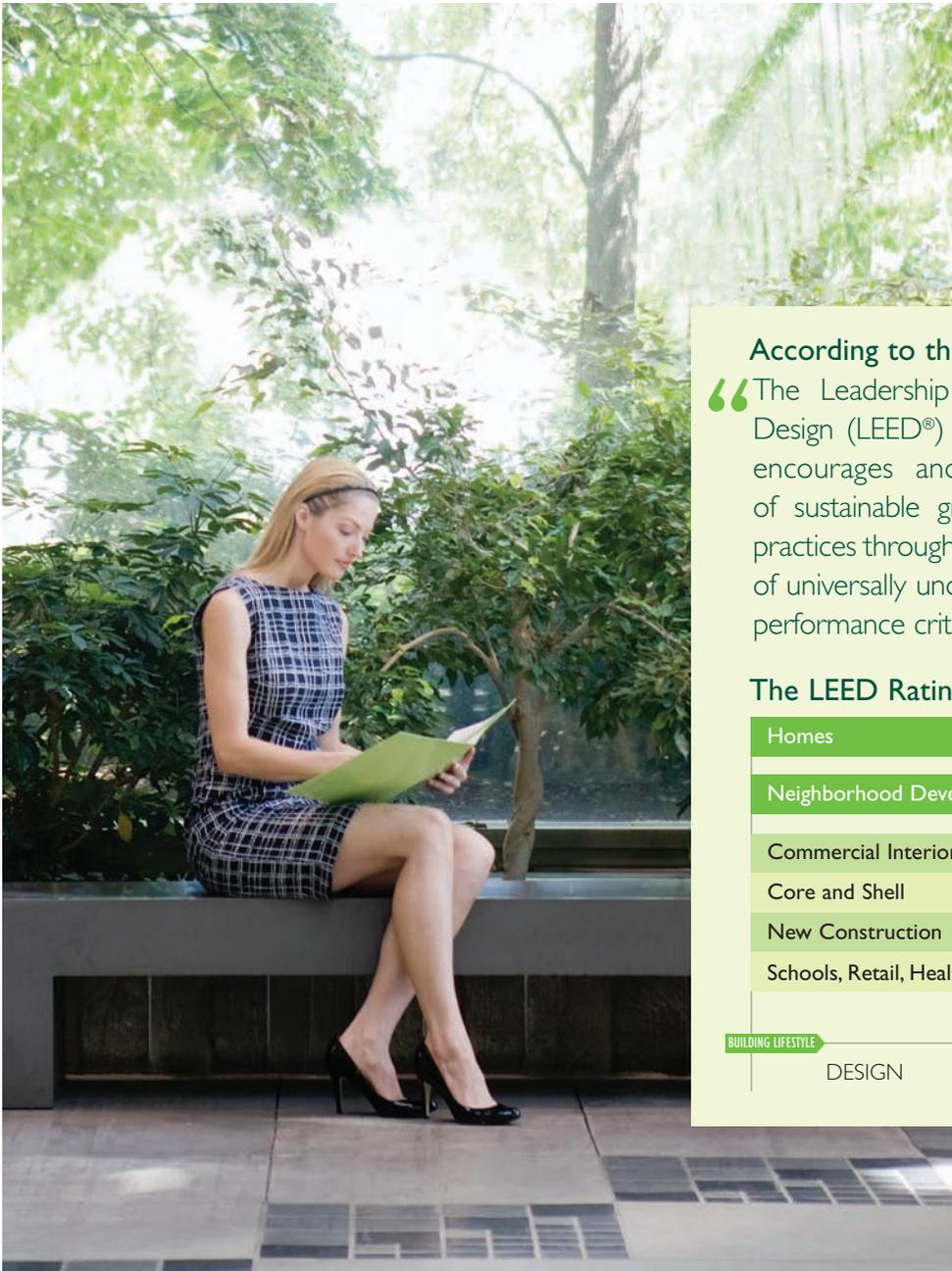


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U.S. Green Building Council LEED Certification System



According to the U.S. Green Building Council, “The Leadership in Energy and Environmental Design (LEED®) Green Building Rating System™ encourages and accelerates global adoption of sustainable green building and development practices through the creation and implementation of universally understood and accepted tools and performance criteria.”

The LEED Rating Systems are as follows:

Homes			
Neighborhood Development (in pilot)			
Commercial Interiors			
Core and Shell		Existing Buildings	
New Construction			
Schools, Retail, Healthcare			
BUILDING LIFESTYLE	DESIGN	CONSTRUCTION	OPERATIONS

1) "LEED Rating Systems: What is LEED?", 2008, <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=222>



LEED® is a voluntary, consensus-based national program for supporting and validating high-performance, sustainable buildings.¹

“What is Leed? LEED is a third party certification program and the nationally accepted benchmark for the design, construction and operation of high performance green buildings. LEED gives building owners and operators the tools they need to have an immediate and measurable impact on their buildings’ performance. LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality.”²

What is LEED for Existing Buildings and how does it differ from LEED?

“LEED is a voluntary performance standard for sustainable operations and maintenance of buildings and provides guidelines for sustainable upgrade over time.”³ LEED can be used to certify the following buildings:

- Non-LEED buildings seeking initial certification and ongoing certification
- LEED for New Construction, certified buildings seeking ongoing certification
- LEED for Core and Shell, certified buildings ongoing certification
- LEED for Existing Buildings, certified buildings seeking ongoing certification

Lighting accounts for a significant amount of the energy used in commercial buildings, therefore, now more than ever, the lighting industry recognizes the need for providing sustainable lighting solutions. All LEED programs encourage high-performance lighting, which may entail using more energy-efficient lamps, employing task lighting whenever possible, and using sensors and controls to reduce the use of unnecessary lighting. These practices can significantly reduce the energy and power demand in the building.

Lamp manufacturers and control companies are continually assessing their product portfolios and aim to make improvements for their customers, many of whom may consider applying for LEED certification.

The biggest concern among facility managers considering green design—for new construction or for existing buildings—is cost.

In fact, constructing or maintaining a sustainable building may be a financial investment. The October 2003 report developed by California’s Sustainable Building Task Force entitled, “The Cost and Financial Benefits of Green Buildings,”

finds that a minimal upfront investment of about two percent of construction costs typically yields life cycle savings of over 10 times the initial investment.⁴

In LEED, specific lamps may contribute towards the achievement of various LEED credits. This score is known as the picogram per lumen-hour score. To determine the picogram per lumen-hour score you need the following information: the amount of mercury in the lamps, the life rating of the lamps based on 3 hour starts and the design lumens of the lamps. A calculation can be performed to determine the picogram per lumen-hour score using this data. There is a possibility of being awarded 2 points if your purchasing specifications include lamps with the average picogram score below 70 picograms per lumen-hour.

As stated by the U.S. Green Building Council in discussing material and resource credits with respect to lamps:

Intent

“To establish and maintain a toxic material source reduction program to reduce the amount of mercury brought onto the building site through purchases of lamps.

Requirements

Develop a lighting purchasing plan that specifies maximum levels of mercury permitted in mercury-containing lamps purchased for the building and associated grounds. The purchasing plan must specify a target for the overall average of mercury content in lamps of 90 picograms per lumen-hour or less. The plan must include lamps for both indoor and outdoor fixtures, as well as both hard-wired or portable fixtures. The plan must require that at least 90% of purchased lamps comply (as measured by the number of lamps).

Calculations Made Easy

At Philips we provide a wide range of low-mercury, long life, high lumen, high performance or optimized performing lamps. To help calculate the picograms of mercury per lumen hour for lighting systems in facilities considering LEED certification, Philips Lighting has created a unique combination worksheet and calculator tool. Facility managers can visit <http://www.nam.lighting.philips.com/us/sustainability> to use the online tool.

This tool can help customers calculate mercury content per lumen-hour ratio of their lamp operations and provide lamp alternatives to reduce the overall lamps mercury content. It also allows them to enter their lamp specifications and rate their lighting operations against LEED standards. After they conduct their individual calculations, customers can make informed lighting purchasing decisions.

Sample Calculation Results

25W T8 XLL ALTO II™	20 pg/lm-hr
32W T8 XLL ALTO II™	17 pg/lm-hr
32W T8 ALTO II™	25 pg/lm-hr
150W MasterColor® ED 23.5	52 pg/lm-hr
70W MHC ED 17	86 pg/lm-hr



Philips T8 25W Extra Long Life Lamps featuring ALTO II™ Technology have a picogram per lumen-hour score of 20.

Lamps containing no mercury may be counted toward plan compliance only if they have energy efficiency at least as good as their mercury-containing counterparts.

Implement the lighting purchasing plan during the performance period. One or two points are awarded to the projects for which at least 90% of all mercury-containing lamps purchased during the performance period (as measured by the number of lamps) comply with the purchasing plan and meet the following overall targets for mercury content:

- MR Credit 4.1 (1 point): 90 picograms per lumen-hour
- MR Credit 4.2 (2 points): 70 picograms per lumen-hour

A template calculator to aid in documenting performance for the MR Credits 4.1 and 4.2 is available in the LEED for Existing Buildings: Operations & Maintenance Reference Guide.

Exception: Screw-based, integral compact fluorescent lamps (CFLs) may be excluded from both the plan and the performance calculation if they comply with the voluntary industry guidelines for a maximum mercury content published by the National Electrical Manufacturers Association (NEMA), as described in the LEED for Existing Buildings: Operation & Maintenance Reference Guide. Screw-based, integral CFLs that do not comply

with the NEMA guidelines must be included in the purchasing plan and the performance calculation.

Performance metrics for lamps—including mercury content (mg/lamp), mean light output (lumens) and rated life (hours)—must be derived according to the industry standards, as described in the LEED for Existing Buildings: Operation & Maintenance Reference Guide. Mercury values generated by toxicity characteristic leaching procedure (TCLP) tests do not provide the required mercury information for LEED for Existing Buildings: O&M and cannot be used in the calculation.

LEED credits under LEED for Existing Buildings: O&M can be achieved for lighting performance during the performance period of the building.

Mercury-containing lamps (or their high-efficiency counterparts) must be purchased during the performance period to earn points in this credit.

Potential Technologies & Strategies

Establish and follow a lamp-purchasing program that sets a minimum level of mercury content and life for all mercury-containing lamp types. Work with suppliers to specify these requirements for all future purchases.”⁵

5) “LEED for Existing Buildings, Operations and Maintenance” January 2008, pgs. 51–52. <https://www.usgbc.org/ShowFile.aspx?DocumentID=3617>

1) “Building Momentum: National Trends and Prospects for High-Performance Green Buildings”, April 2002, p. 2. http://www.usgbc.org/Docs/Resources/043003_hpgb.whitepaper.pdf

2) LEED Rating Systems: What is LEED?, 2008, <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=222>

3) Green Building Rating System for Existing Buildings - Upgrades, Operations & Maintenance.

Version 2, Updated July, 2005. <https://www.usgbc.org/ShowFile.aspx?DocumentID=913>

4) “The costs and financial benefits of green buildings”. October, 2003, pg ii. <http://www.scsa.ca.gov/documents/publications/costs-financials.pdf>

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