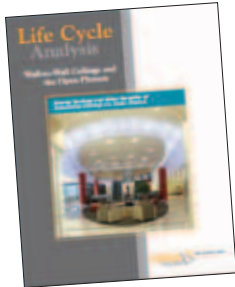


# LEED® Credits – Ceilings & Wall Systems

## Energy and Atmosphere

### Optimize Energy Performance

(EAc1.1 LEED NC, SCHOOLS, CS)  
(EAc1.1 & 1.3 – LEED CI)



▲ Life Cycle Analysis  
CISCA Study

A suspended ceiling design delivers energy savings over an open plenum/ducted air return design. The efficiencies in a suspended ceiling design is the use of a return air plenum with low static pressures and fan horsepower instead of a ducted air return with high static pressures and fan horsepower. Less materials are needed in the construction of the plenum.

A suspended ceiling with a return air plenum is also more effective in removing the heat generated by lighting (lay-in troffer type design), thereby reducing the air conditioning load on the space.

To aid in reducing lighting power density which lowers energy and maintenance costs, Armstrong High Light Reflectance ceilings and systems provide the same level of luminance with fewer luminaires. This will assist in reducing lighting and HVAC energy costs in new or existing building structures where a High Light Reflectance ceiling is installed along with indirect lighting. Also steps to reduce the number of fixtures and reduce the wattage of lamps should be taken. The number of LEED credits awarded for such improvements are different for new and existing building structures. An independent study by CISCA showed a reduction in total building energy consumption as high as 10.6% when optimizing the lighting layout with 90% reflective ceilings.

The TechZone Ceiling System combines High Light Reflectance ceilings with indirect lighting and a chilled beam option can contribute to EA Credit 1, pages 197-200. View our whitepapers regarding energy reduction at [armstrong.com/whitepapers](http://armstrong.com/whitepapers).

## Material and Resources

### Construction Waste Management

(MRc2.1, 2.2)  
Divert 50% to  
75% recycled

Armstrong is the first ceiling manufacturer with a closed-loop recycling program which redirects recovered ceilings back to the manufacturing process. This cradle-to-cradle process is a natural extension of our use of recycled materials and environmentally compatible manufacturing process that reduces our environmental footprint. Join us as we continue to refine and shape the program to make it easier for you to integrate into your building plans. Please contact the Armstrong Recycling Center at 1-877-276-7876 (Option 1, 8), or your local Armstrong Representative for more details on how this program works. An overview and a recycling specification to include in your waste management plan can be found at [armstrong.com/ceilings/recycling](http://armstrong.com/ceilings/recycling). Ceilings must be combined with other items to achieve this credit. Armstrong will provide verification of weight and plant return location for LEED submittal.

### Recycled Content

(MR Credit 4.1, 4.2)  
LEED NC, SCHOOLS, CS,  
CI – Specify 10% to 20%  
post-consumer + 1/2  
pre-consumer recycled  
content

Armstrong Ceiling, Suspension and Wall systems can be combined into systems that contribute to MRc4.

- Armstrong mineral fiber, fiberglass and wood ceiling products range from 47-92% recycled content.
- Armstrong High Recycled Content (HRC) Grid systems (63%) are available as standard options on Prelude® and Suprafine systems, and standard suspension systems contain 30% recycled content with the highest percentage of post consumer content in the industry (23%).
- High Recycled Content Drywall Grid and Framing System with selected items available in HRC contribute to Recycled Content with 61% (post consumer 53%, pre consumer 8%). For specific post-consumer/pre-consumer breakdowns, visit our Green Genie LEED Calculator online @ [armstrong.com/greengenie](http://armstrong.com/greengenie).
- Armstrong wall products range from 52-92%.

Some of our ceiling families are available with a higher recycled content option, Ceing-2-Ceiling items. These items contain the highest recycled content in the industry, and contain post consumer recycled ceilings from our closed loop process, contributing even more to MRc4.

# LEED® Credits – Ceilings & Wall Systems

## Material and Resources

### Regional Materials

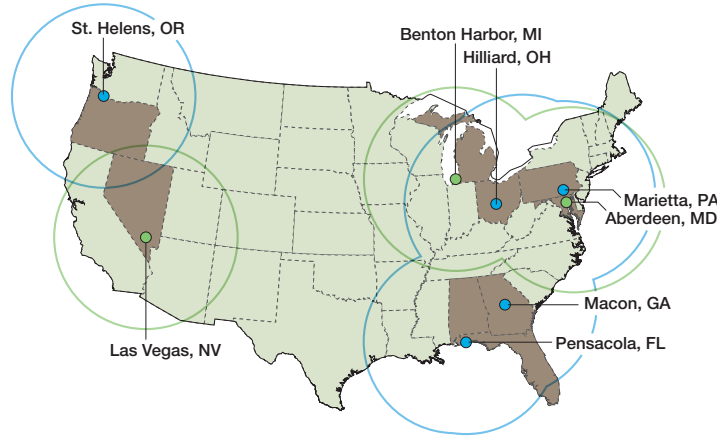
(MRc 5.1) LEED NC, SCHOOLS & CS – 10% to 20% extracted and manufactured; LEED CI – 20% Manufactured Regionally or 10% extracted and manufactured.

**Regional Materials (MRc 5.1) LEED NC, SCHOOLS & CS – 10% to 20% extracted and manufactured; LEED CI – 20% Manufactured Regionally or 10% extracted and manufactured.**

Armstrong has the largest number of Ceiling and Suspension plant locations in the US. Refer to the map showing our plant locations and the 500 mile radius. For specific project item detail, visit our Green Genie LEED Calculator online @ [armstrong.com/greengenie](http://armstrong.com/greengenie).

### Armstrong Ceiling and Suspension Systems Manufacturing Locations

- Ceilings
- Suspension Systems



### Rapidly Renewable Materials

(MRc6 – LEED NC, SCHOOLS & CS 2.5%; LEED CI 5%)

Mineral fiber panels contain cornstarch binders, biobased alternatives to petroleum based binders. Armstrong WoodWorks® Bamboo Ceilings can contribute to the rapidly renewable calculation. Look for our new platform of BioAcoustic options, featuring Tierra, the ceiling with the highest rapidly renewable content with natural jute fiber, seed to harvest in 90 days.

Visit our Green Genie LEED Calculator online @ [armstrong.com/greengenie](http://armstrong.com/greengenie) for specific item/project detail.

### Certified Wood

(MRc7 LEED NC, SCHOOLS, CS, CI -Specify 50% Certified Wood)

Armstrong offers standard and custom FSC-certified composite wood ceilings with a variety of veneers to meet the growing demands of sustainable design projects. WoodWorks FSC-certified options are available in 3 finishes for Tegular, Vector® and Linear ceilings. (Certificate Registration SW-COC-003601)

Our FSC-certified WoodWorks ceilings are the first in the industry with Class A fire rating, No-added formaldehyde and 92% pre-consumer recycled content.

USGBC LEED Credits	Material and Resources MR 4.1 & 4.2, MR 5.1 & 5.2, MR6 and MR7						Indoor Environmental Quality EQ \$.4		
	Total Recycled Content	Total Pre-consumer	Total Post-consumer	Regional Materials *	Rapidly Renewable	Certified Wood	No-Added Urea-Formaldehyde **	Meets CARB Criteria	Fire Performance
Armstrong Ceiling Product									
Standard and Custom WoodWorks ceilings	92%	97%	0%	Verify through TechLine or Green Genie	Yes, only with Bamboo veneer	Yes	Yes	Yes	Class A

\* If product is made within 500 miles of job. \*\* FSC-certified products only \*\*\* Fire performance is Class A for COMPOSITE product

[armstrong.com/sustainability](http://armstrong.com/sustainability)

## Indoor Environmental Quality

<p><b>Acoustical Performance</b> (IEQ Prereq 3 - LEED FOR SCHOOLS)</p>	<p>Design classrooms and other core learning spaces to include sufficient sound absorptive finishes for compliance with reverberation time requirements as specified in ANSI Standard S12.60-2002 and confirm that 100% of ceiling area (excluding lay-in lights, diffusers, grills) in all classrooms and core learning spaces &lt; 20,000 cubic feet are finished with a material that has a Noise Reduction Coefficient (NRC) of 0.70 or higher. The calculation can also be of equivalent performance via a combination of ceiling and wall panels.</p>
<p><b>Low-Emitting Materials</b> (IEQc4.4 – LEED NC, SCHOOLS, CS, CI)</p>	<p>Armstrong WoodWorks ceiling products meet California Air Resources Board (CARB) levels and are available as a no-added formaldehyde composite product to meet LEED requirements for this credit (with the exception of Constants™ veneers).</p>
<p><b>Low-Emitting Materials</b> (IEQc4.6 – LEED FOR SCHOOLS)</p>	<p>Many Armstrong ceiling and wall systems will meet the low emitting material requirement. They comply with the testing practices of the CDPH Standard, and are listed on the CHPS High Performance Material Database, Low-Emitting Materials list. Visit our Green Genie LEED Calculator online @ <a href="http://armstrong.com/greengenie">armstrong.com/greengenie</a> for specific item/project detail.</p>
<p><b>Daylight and Views</b> (IEQc8.1, 8.2 – LEED NC, SCHOOLS, CS, CI)</p>	<p>Armstrong Hi-LR ceilings can aid in extending daylighting into the space. A typical acoustical ceiling reflects just 75% of the light striking the surface, while a high light reflectance ceiling is engineered to reflect up to 90% of the light striking the surface. Recent independent studies have shown a 10-15% daylighting effectiveness increase. A separate study concluded that a Hi-LR ceiling could achieve the LEED credit with up to 12% less glazing than with a standard ceiling with a light reflection of 75%. Factor Hi-LR ceilings into your daylight simulation model.</p>
<p><b>Acoustical Performance</b> (IEQ Prereq 3 – LEED FOR SCHOOLS)</p>	<p>Design classrooms and other core learning spaces to include sufficient sound absorptive finishes for compliance with reverberation time requirements as specified in ANSI Standard S12.60-2002 and confirm that 100% of ceiling area (excluding lay-in lights, diffusers, grills) in all classrooms and core learning spaces &lt; 20,000 cubic feet are finished with a material that has a Noise Reduction Coefficient (NRC) of 0.70 or higher. The calculation can also be of equivalent performance via a combination of ceiling and wall panels.</p>
<p><b>Enhanced Acoustical Performance</b> (IEQc 9 – LEED FOR SCHOOLS)</p>	<p>Design the classroom and core learning spaces to meet the Sound Transmission Class (STC) requirements of ANSI Standard S12.60-2002, “Acoustical Performance Criteria, Design Requirements and Guidelines for Schools.”</p> <p>Specific Armstrong ceiling and wall systems are designed to meet the requirements of the ANSI Standard and meet the requirements for this credit, NRC of 0.70 or higher. To learn more about the design guidelines for Classroom acoustics and ANSI S12.60, visit the Armstrong website or additional resources – <a href="http://armstrong.com/acoustics">armstrong.com/acoustics</a>.</p>
<p><b>Online Reverberation Tool</b></p>	<p>Armstrong has developed a simple on-line reverberation tool to aid in your selection of materials to meet this credit. This interactive tool helps you calculate reverberation time and hear the difference in five simple steps:</p> <ol style="list-style-type: none"> <li>1. Describe the space</li> <li>2. See recommended guidelines</li> <li>3. Select surface materials. For ceilings, select a higher performance ceiling (high NRC).</li> <li>4. The program will calculate the current reverberation time</li> <li>5. Select treatment materials for your space to meet the reverberation recommendation and hear the difference, before and after!</li> </ol>

## Innovation in Design

<p><b>Architectural Design Guidelines for Open Plan Offices</b></p>	<p>LEED Innovation Credits can be achieved when a project exceeds the criteria of the base requirements of the credit, or in the case of multi-tiered credits, the next tier.</p> <p>An Innovation Credit for Acoustics can be applied for demonstrating that the acoustical performance improvements of a building clearly enhance the indoor environment in ways consistent with the preservation of human health and maximization of occupant productivity. Contact your Armstrong representative for details on solutions to achieve a balanced acoustical design. Visit <a href="http://armstrong.com/sustainability">armstrong.com/sustainability</a> to view an example of Architectural design Guidelines for an Open Plan that achieved an Innovation Credit for acoustics in a LEED EB Platinum Building.</p>
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