

TECHNICAL BULLETIN

LEED® OPPORTUNITIES FOR WOOD & CLADDLED WOOD WINDOWS

LEED®-NC version 2.2

Date Issued: 07-17-07

Note; This information was not provided by USGBC.

The United States Green Building Council (USGBC) has developed a program to promote commercial building design, construction and material use that is sensitive to environmental issues. The program uses the acronym LEED®, which stands for Leadership in Energy and Environmental Design. The program sets guidelines for earning credits that go toward a certification for an environmentally sound building upon completion. While the LEED® program addresses many design and construction aspects of a building, this Bulletin's focus is on wood & claddled wood windows.

There are seven specific credits of the LEED® program applicable for wood & claddled wood windows. It is important to point out that contributing to credits by meeting guidelines for wood & claddled wood windows does not automatically grant the project a LEED® certification. All earned credits for the whole building are combined to determine the certification level. Listed below are the attributes with a basic description and intent. The following pages describe in much more detail the components of each credit.

Credit No.	Description	Intent
MR 4.1	10% Recycled Content	Increase demand for building products that incorporate recycled materials.
MR 4.2	20% Recycled Content	Increase demand for building products that incorporate recycled materials.
MR 5.1	10% Regional Materials	Use of materials that have been extracted and manufactured within 500 miles of the project site, promoting use of indigenous resources and reducing environmental impacts of transportation.
MR 5.2	20% Regional Materials	Use of materials that have been extracted and manufactured within 500 miles of the project site, promoting use of indigenous resources and reducing environmental impacts of transportation.
MR 6.0	Rapidly Renewable Materials	Reduce the use of finite or long cycle renewable resources in favor of rapidly renewable resources.
MR 7.0	Certified Wood	Encourage environmentally responsible forest management.
EQ 4.4	Low Emitting Materials	Eliminate or reduce formaldehyde emissions from composite wood, agri-fiber products and adhesives used in product construction.
EQ 6.2	Controllability of Systems	Thermal comfort can be achieved through the use of operable windows used in lieu of comfort controls for occupants by natural ventilation.
EQ 8.1	Daylight and Views	Daylight 75% of interior spaces with the use of operable or fixed windows.

EQ 8.2 Daylight and Views

Views for 90% of interior spaces with the use of operable or fixed windows.

Every project may earn different credits due to design and location. It is also important to note that credits should be calculated by the General Contractor or Project Manager, with cost information supplied by the distributor of the material, as the value of the material is based on the cost delivered to the project.

For more information contact:

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General Information:

LEED® Certification

There are 69 possible LEED® points. The four levels of certification are:

- LEED® Certified 26 - 32 points
- Silver Level 33 - 38 points
- Gold Level 39- 51 points
- Platinum Level 52+ points

Note only 26 of the 69 available points are needed to earn certification.

LEED®-NC Rating System

Credits	Points
• Sustainable Sites (SS)	14
• Water Efficiency (WE)	5
• Energy and Atmosphere (EA)	17
• Material and Resources (MR)	13
• Indoor Environmental Quality (EQ)	15
• Innovation and Design Process (ID)	4
• LEED® Accredited Professional	1

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LEED® CREDIT	LEED® CRITERIA	LEED® REQUIREMENTS	INTENT
Materials & Resources (MR)			
4.1	Recycled Content: 10% (post-consumer + 1/2 pre-consumer)	<p>Use materials with recycled content such that the sum of post-consumer plus one-half of the pre-consumer content constitutes at least <u>10% (based on cost) of the total value</u> of the materials in the project in CSI Master Format 1995 Divisions 2-10.</p> <p>The recycled content value of the material assembly shall be determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value.</p> <p><u>WDMA note:</u> The use of extruded aluminum billet consisting of a high percentage (example: 50-75%) recycled material used in extruded aluminum cladding of the wood windows. Roll form cladding – can also contain a high percentage (example: 65-70%) of recycled aluminum. Standard glass used in wood & wood cladded windows contain some percentage (example - 25-30%) of recycled content. The greater the recycled content of the wood & cladded wood window, the greater the contribution to the project.</p>	Increase demand for building products that incorporate recycled content materials, thereby reducing impacts resulting from extraction and processing of virgin material.
4.2	Recycled Content: 20% (post-consumer + 1/2 pre-consumer)	<p>Use materials with recycled content such that the sum of post-consumer plus one-half of the pre-consumer content constitutes at least <u>20% (based on cost) of the total value</u> of the materials in the project in CSI Master Format 1995 Divisions 2-10.</p> <p>The recycled content value of the material assembly shall be determined by weight. The</p>	Increase demand for building products that incorporate recycled content materials, thereby reducing impacts resulting from extraction and processing of virgin material.

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		<p>recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value.</p> <p><u>WDMA note:</u> The use of extruded aluminum billet consisting of a high percentage (example: 50-75%) recycled material used in extruded aluminum cladding of the wood windows. Roll form cladding – can also contain a high percentage (example: 65-70%) of recycled aluminum. Standard glass used in wood & wood cladded windows contain some percentage (example - 25-30%) of recycled content. The greater the recycled content of the wood & cladded wood window, the greater the contribution to the project.</p>	
5.1	<p>Regional Materials: 10% Extracted, Processed & Manufactured Regionally</p>	<p>Use building materials or products that have been extracted, harvested or recovered, as well as manufactured within 500 miles of the project site for a minimum of <u>10% (based on cost) of the total materials value</u> in CSI Master Format 1995 Divisions 2-10.</p> <p>If only a fraction of a product or material is extracted, harvested, or recovered and manufactured locally, then only that percentage (by weight) shall contribute to the regional value.</p> <p><u>WDMA note:</u> The location of the harvest point of the raw materials in the wood & cladded wood window components and the location of the wood & cladded wood window manufacturer must be within 500 miles of the jobsite. <u>See Note on Regional Materials.</u></p>	<p>Increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the indigenous resources and reducing the environmental impacts from transportation.</p>
5.2	<p>Regional Materials: 20% Extracted, Processed & Manufactured</p>	<p>Use building materials or products that have been extracted, harvested or recovered, as well</p>	<p>Increase demand for building materials and products that are extracted and manufactured</p>

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	Regionally	<p>as manufactured within 500 miles of the project site for a minimum of <u>20% (based on cost) of the total materials value</u> in CSI Master Format 1995 Divisions 2-10.</p> <p>If only a fraction of a product or material is extracted, harvested, or recovered and manufactured locally, then only that percentage (by weight) shall contribute to the regional value.</p> <p><u>WDMA note:</u> The location of the harvest point of the raw materials in the wood & cladded wood window components and the location of the wood & cladded wood window manufacturer must be within 500 miles of the jobsite. <u>See Note on Regional Materials.</u></p>	<p>within the region, thereby supporting the indigenous resources and reducing the environmental impacts from transportation.</p>
6.0	Rapidly Renewable Materials	<p>Use rapidly renewable building materials and products (made from plants that are typically harvested within a ten-year cycle or shorter) for 2.5% of the total value of all the building materials and products used in the project, based on cost.</p> <p><u>WDMA note:</u> Since we acknowledge that wood is not listed under this LEED guideline because of the word “Rapid” and it’s 10 year or less cycle harvested requirement but expresses that wood which is used in the manufacturing of wood & cladded wood windows is one of the more renewable building products available today.</p>	<p>Reduce the use and depletion of finite raw materials and long-cycle renewable materials by replacing them with rapidly renewable materials.</p>

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7.0	Certified Wood	<p>Use a minimum of 50% wood-based materials and products, which are certified in accordance with the Forest Stewardship Council's (FSC) Principles and Criteria, for wood building components. These components include, but are not limited to, structural framing and general dimensional framing, flooring, sub-flooring, wood doors and finishes.</p> <p><u>WDMA note:</u> This is the only credit that requires third party certification. FSC requires 70% of the wood & clad wood window construction to be made with an FSC certified product. A "Chain-of-Custody" certification may be necessary to verify compliance.</p>	Encourage environmentally responsible forest management.

LEED® CREDIT	LEED® CRITERIA	LEED® REQUIREMENTS	INTENT
Indoor Environmental Quality (EQ)			
4.4	Low-Emitting Materials: Composite Wood & Agrifiber Products	<p>Composite wood and agrifiber products used on the interior of the building (defined as inside of the weatherproofing system) shall contain no added urea-formaldehyde resins. <u>Laminating adhesives to fabricate on-site and shop-applied composite wood and agrifiber assemblies shall contain no added urea-formaldehyde resins.</u></p> <p>Composite wood and agrifiber products are defined as particleboard, medium density fiberboard (MDF), plywood, wheatboard, strawboard, panel substrates and door cores.</p>	Reduce the quantity of indoor air contaminants that are odorous, irritating and/or harmful to the comfort and well being of installers and occupants.

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		<p><u>WDMA note:</u> Wood and cladded wood windows may include head and seat boards along with insulated platforms for their bow and bay systems which are comprised of composite wood and/or agrifiber products.</p>	
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LEED® CREDIT	LEED® CRITERIA	LEED® REQUIREMENTS	INTENT
Indoor Environmental Quality (EQ)			
6.2	<p>Controllability of Systems for Thermal Comfort:</p>	<p>Provide individual comfort controls for 50% (minimum) of the building occupants to enable adjustments to suit individual task needs and preferences. Operable windows can be used in lieu of comfort controls for occupants of areas that are 20 feet inside of and 10 feet to either side of the operable part of the window. The areas of operable window must meet the requirements of ASHRAE 62.1-2004 paragraph 5.1 Natural Ventilation. AND Provide comfort system controls for all shared multi-occupant spaces to enable adjustments to suit group needs and preferences. Conditions for thermal comfort are described in ASHRAE Standard 55-2004 to include the primary factors of air temperature, radiant temperature, air speed and humidity. Comfort</p>	<p>Provide a high level of thermal comfort system control by individual occupants or by specific groups in multi-occupant spaces (i.e. classrooms or conference areas) to promote the productivity, comfort and well-being of building occupants.</p>

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		<p>system control for the purposes of this credit is defined as the provision of control over at least one of these primary factors in the occupant’s local environment</p> <p><u>WDMA note:</u> Wood and cladded wood windows can be used to provide operable windows for controlled natural ventilation.</p>	
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Indoor Environmental Quality (EQ)			
8.1	<p>Daylight & Views: Daylight 75% of Spaces.</p>	<p>OPTION 1 — CALCULATION</p> <p>Achieve a minimum glazing factor of 2% in a minimum of 75% of all regularly occupied areas.</p> <p>The glazing factor is calculated as follows: Glazing Window Area [SF] Window Actual Tvis Window Factor = Floor Area [SF] x Geometry Factor x Minimum Tvis x Height Factor.</p> <p>OR</p> <p>OPTION 2 — SIMULATION</p> <p>Demonstrate, through computer simulation, that a minimum daylight illumination level of 25 footcandles has been achieved in a minimum of 75% of all regularly occupied areas. Modeling must demonstrate 25 horizontal footcandles under clear sky</p>	<p>Provide for the building occupants a connection between indoor spaces and the outdoors through the introduction of daylight and views into the regularly occupied areas of the building.</p>

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		<p>conditions, at noon, on the equinox, at 30 inches above the floor.</p> <p>OR OPTION 3 — MEASUREMENT</p> <p>Demonstrate, through records of indoor light measurements, that a minimum daylight illumination level of 25 footcandles has been achieved in at least 75% of all regularly occupied areas. Measurements must be taken on a 10-foot grid for all occupied spaces and must be recorded on building floor plans. In all cases, only the square footage associated with the portions of rooms or spaces meeting the minimum illumination requirements can be applied towards the 75% of total area calculation required to qualify for this credit.</p> <p><u>WDMA note:</u> Wood and cladded wood windows can be used to provide the required daylighting.</p>	
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Indoor Environmental Quality (EQ)			
8.2	Daylight & Views: Views for 90% of Spaces.	<p>Achieve direct line of sight to the outdoor environment via vision glazing between 2'6" and 7'6" above finish floor for building occupants in 90% of all regularly occupied areas. Determine the area with direct line of sight by totaling the regularly occupied square footage that meets the following criteria:</p> <ul style="list-style-type: none"> • In plan view, the area is within sight lines drawn from perimeter vision glazing. • In section view, a direct sight line can be drawn from the area to perimeter vision glazing. 	Provide for the building occupants a connection between indoor spaces and the outdoors through the introduction of daylight and views into the regularly occupied areas of the building.

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		<p>Line of sight may be drawn through interior glazing. For private offices, the entire square footage of the office can be counted if 75% or more of the area has direct line of sight to perimeter vision glazing. For multi-occupant spaces, the actual square footage with direct line of sight to perimeter vision glazing is counted.</p> <p><u>WDMA note:</u> Wood and cladded wood windows can be used to provide the required views.</p>	
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LEED®-NC Rating System

Credits

Points

- Sustainable Sites (SS)

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Notes:

Regional Materials

- Manufacturing refers to the final assembly of components into the building product that is furnished and installed by the tradesman.
- Credits MR 5.1 and 5.2 have changed significantly due to the addition of "extraction, harvested or recovered" of the building materials.

Adhesives

- EQ Credit 4.1: Low-Emitting Adhesives and Sealants are only applicable for on-site applications; it is not applicable for wood & cladded wood window manufacturers.
- EQ Credit 4.4 has added a statement that laminating adhesives shall contain no added urea-formaldehyde resins. This is applicable for on-site and shop applied laminates.

Finishing

- EQ Credit 4.2 Low-Emitting Materials: Paints and Coatings are only applicable for on-site applications; it is no longer applicable for wood & cladded wood window manufacturers.

Other components

- HPDL, MDO, HDF crossbands, hardboard, molded skins and composite moulding materials may contain added urea-formaldehyde resins that will prevent obtaining the LEED® Credit 4.4. Consult with the component supplier for verification.