

ID	LL	SS	WE	EA	MR
					2

MR 2: Environmentally Preferable Products

Intent

Increase demand for environmentally preferable products and products or building components that are extracted, processed, and manufactured within the region.

Requirements

Prerequisites

2.1 **FSC-Certified Tropical Wood.** Meet the following two requirements, as applicable:

- a) Provide all wood product suppliers with a notice (see **Figure 1**, below) containing all of the following elements:
 - i. a statement that the builder's preference is to purchase products containing tropical wood only if it is FSC-certified;
 - ii. a request for the country of manufacture of each product supplied; and
 - iii. a request for a list of FSC-certified tropical wood products the vendor can supply.
- b) If tropical wood is intentionally used (i.e., specified in purchasing documents), use only FSC-certified tropical wood products. Reused or reclaimed materials are exempt.

Note: A species of wood is considered tropical for the purposes of this prerequisite if it is grown in a country that lies between the Tropics of Cancer and Capricorn.

Credits

2.2 **Environmentally Preferable Products** (0.5 point each, maximum 8 points). Use building component materials that meet one or more of the criteria below. Except as noted in **Table 1**, a material must make up 90% of the component, by weight or volume. A single component that meets each criterion (i.e., environmentally preferable, low emissions, and local sourcing) can earn points for each.

- a) Environmentally preferable products (0.5 point per component). Use products that meet the specifications in **Table 1**.

Note: Recycled content products must contain a minimum of 25% postconsumer recycled content, except as noted in Table 1. Postindustrial (preconsumer) recycled content must be counted at half the rate of postconsumer content.

AND/OR

- b) Low emissions (0.5 point per component). Use products that meet the emissions specifications in **Table 1**.

AND/OR

- c) Local production (0.5 point per component). Use products that were extracted, processed, and manufactured within 500 miles of the home.

Figure 1. Example Notice to Wood Products Suppliers

Notice to Vendors: [The company] prefers to purchase products that contain tropical wood only if they are certified according to the guidelines of the Forest Stewardship Council (FSC). Please provide the country of manufacture of each product you expect to supply to us. Also please provide a list of FSC-certified products you can supply.

ID	LL	SS	WE	EA	MR	E
2						

Table 2. Standards for Environmentally Preferable Paints and Coatings

Component	Applicable standard (VOC content)	Reference
Architectural paints, coatings, and primers applied to interior walls and ceilings	Flats: 50 g/L Nonflats: 150 g/L	Green Seal Standard GS-11, Paints, 1st Edition, May 20, 1993
Anticorrosive and antirust paints applied to interior ferrous metal substrates	250 g/L	Green Seal Standard GC-03, Anti-Corrosive Paints, 2nd Edition, January 7, 1997
Clear wood finishes	Varnish: 350 g/L Lacquer: 550 g/L	South Coast Air Quality Management District Rule 1113, Architectural Coatings
Floor coatings	100 g/L	
Sealers	Waterproofing: 250 g/L Sanding: 275 g/L All others: 200 g/L	
Shellacs	Clear: 730 g/L Pigmented: 550 g/L	
Stains	250 g/L	

Synergies and Trade-Offs

Products with low emissions of volatile organic compounds (VOCs) may improve indoor air quality. Such products are included in this credit rather than in the EQ section in order to consolidate information pertaining to materials selection, specification, and purchase.

A substantial amount of energy is used to transport materials from product manufacturing plants to home construction sites. Choosing local products will reduce the embedded transportation energy usage associated with construction.

ID	LL	SS	WE	EA	MR	EQ	AE
2							

Table 3. Standards for Low-Emissions Adhesives and Sealants (meet South Coast Air Quality Management District Rule #1168)

	Applicable standard (VOC content, g/L less water)
Architectural applications	
Indoor carpet adhesives	50
Carpet pad adhesives	50
Wood flooring adhesives	100
Rubber floor adhesives	60
Subfloor adhesives	50
VCT and asphalt adhesives	50
Drywall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Specialty applications	
PVC welding	510
CPVC welding	490
ABS welding	325
Plastic cement welding	250
Adhesive primer for plastic	550
Contact adhesive	80
Special-purpose contact adhesive	250
Structural wood member adhesive	140
Sheet-applied rubber lining operations	850
Top and trim adhesive	250
Substrate-specific applications	
Metal to metal	30
Plastic foams	50
Porous materials (except wood)	50
Wood	30
Fiberglass	80
Sealants	
Architectural	250
Nonmembrane roof	300
Roadway	250
Single-ply roof membrane	450
Other	420
Sealant primers	
Architectural nonporous	250
Architectural porous	775
Other	750

MR 2.1: FSC-Certified Tropical Woods

ID	LL	SS	WE	EA	MR	EQ
2.1						

Poor forestry practices continue to degrade many tropical rain forests, resulting in significant climate change impacts as well as irreversible harm to biological diversity. Many tropical woods can be replaced by nontropical woods. Where tropical woods are required to serve a particular function, the use of sustainably grown and harvested woods is required.

Certification by the Forest Stewardship Council (FSC) is a "green" seal of approval awarded to forest managers who adopt environmentally and socially responsible forest management practices and to companies that manufacture and sell products made from certified wood. This seal enables consumers to identify and procure wood products from well-managed sources and thereby use their purchasing power to influence and reward improved forest management activities around the world.

Tropical wood content can end up in a wide variety of products, unbeknownst to the purchaser. Providing a notice of intent to wood products suppliers clarifies the pursuits of the project team and raises exposure and awareness.

Approach and Implementation

Include FSC purchasing preference language (**Figure 1**) in all purchasing contracts and purchase orders.

In the early stages of design, identify any components of the home that might contain tropical woods. Identify lumber suppliers that have FSC chain-of-custody and work to procure certified tropical woods.

If FSC-certified tropical woods are unavailable or impractical, determine whether and how tropical woods might be avoided through the use of alternative products. Where tropical wood was included to serve a functional purpose, such as strength or pest resistance, consider alternative engineered designs or borate treatments.

Wood species can be identified accurately only by scientific (botanic) name and not by either common or proprietary name. A species of wood is considered tropical for purposes of this credit if it is grown in a moist tropical country that lies either in part or in its entirety between the Tropics of Cancer and Capricorn (23.5 degrees latitude north and south, respectively). See **Table 4** for a reference list by continent.

Table 4. Tropical Countries, by Continent

Continent	Tropical countries
Africa	All except Morocco, Tunisia, Algeria, Egypt, and Libya
Asia and Southeast Asia	All except Japan, North Korea, South Korea, and Russia
Australia and Oceania	All except New Zealand
Central America and Caribbean	All countries
Europe	None
Middle East	None
North America	Mexico
South America	All except Uruguay

ID	LL	SS	WE	EA	MR	EQ	AE
2.1							

“Resources,” below, lists Web sites that can help project teams identify tropical species, locate FSC products, and determine a product’s country of origin.

Calculations

No calculations are required.

Exemplary Performance

No additional points are available for exemplary performance.

Verification and Submittals

Builder / Project Team:

- Provide the required notice to all wood products suppliers.
- Present the wood supplier notice to the Green Rater.
- Sign an Accountability Form confirming that no tropical woods were used except those that were FSC-certified or reclaimed.

Green Rater:

- Visually verify that the wood supplier notice has been provided to vendors and that it meets the stated requirements.
- Verify that an Accountability Form has been signed by the responsible party.

Considerations

Environmental Issues

Poor forestry practices have numerous negative environmental impacts, including climate change, soil degradation, and loss of biodiversity. These impacts are even more pronounced in tropical areas, where rain forests hold significant biological wealth and local laws and regulations are difficult to enforce. The Forest Stewardship Council sets standards for sustainable forest management and

certifies sustainable forests and products from those forests.

Economic Issues

The limited supply of FSC-certified tropical wood in the United States has raised costs for certified wood products. Efforts are being made to increase the FSC-certified land base in the United States to make it more possible to buy FSC wood locally. Certified tropical wood also may generally cost more because of the associated costs of growing and harvesting wood in a sustainable manner.

Regional Variances

Lumber with the FSC logo, which warrants that the wood was harvested from a well-managed forest, can be obtained across the world from a variety of mill manufacturers, and distributors. Many well-known national retailers also stock FSC products. Local retailers can provide information on their FSC-certified products.

FSC Chain-of-Custody Requirements

FSC chain-of-custody (COC) certification enables tracking of wood that originates in FSC-certified forests all the way through the value chain into finished products. All companies that take legal ownership of FSC products and produce, sell, promote, or trade them need to be certified for COC. Thus, all FSC-certified wood products in LEED projects must be supplied by vendors that have the FSC COC certification. Vendors are defined as those companies that supply products to the project contractor or subcontractors.

For this prerequisite, in order to ensure that the requirements have been met, the project team will need to verify that the vendor invoices for any permanently installed tropical wood products purchased for the project conform to the following requirements:

- Each wood product, whether tropical or not, must be identified on a line-item basis and must state the product's country of manufacture;
- All wood products manufactured in moist tropical countries (i.e., countries that lie, either in part or in their entirety, between the Tropics of Cancer and Capricorn) must be FSC-certified and must be identified as such on a line-item basis;
- Any tropical wood products must be identified on invoices as "FSC Pure" or "FSC Mixed"; wood products identified as "FSC Recycled" or "FSC Recycled Credit" do not meet this requirement.
- The vendor's COC certificate number must be shown on any invoice that includes FSC-certified products.

Contractors and subcontractors are considered end consumers and do not need to have COC.

Resources

Please see the USGBC Web site, at www.usgbc.org/resources, for more specific resources on materials sources and other technical information.

Web Sites

Rainforest Alliance

SmartGuide to Green Building Wood Sources

www.rainforestalliance.org/smartguides

This site lists U.S. suppliers, manufacturers, and distributors of FSC-certified building products.

U.S. Forest Service

www2.fpl.fs.fed.us/TechSheets/tropical-wood.html

This is a free database of tropical hardwoods, listed both by common name and by genus and species. This list is not

comprehensive, but each species of wood has a fact sheet.

Forest Stewardship Council

www.findfsc.org

For help in locating FSC-certified products, fill out the form on this Web site and submit it to FSC-US; FSC will circulate it to certified companies, who then will contact you if they have your desired product(s) available.

The Wood Explorer

www.toolcenter.com/wood/index.html

This CD covers 1,650 wood species. It includes scientific and common names, origins, and properties.

ID	LL	SS	WE	EA	MR	EQ
2.1						

ID	LL	SS	WE	EA	MR	EQ	AE
2.2							

MR 2.2: Environmentally Preferable Materials

Environmentally preferable products have reduced environmental impact compared with conventional alternatives. Many new products are less harmful to the environment and to humans because they are sustainably produced, include recycled content, are rapidly renewable, or have lower emissions. Products procured from local sources require less transportation.

The use of these materials in place of conventional products can significantly improve the overall environmental performance of the home. Qualifying materials have one or more of the following attributes:

- a) FSC-certified wood products, or recycled or reclaimed content.
- b) Low or no emissions of volatile organic compounds (VOCs).
- c) Local production (the product was extracted, processed, and manufactured within 500 miles of the site).

This credit rewards the significant use of materials that have one of these attributes and can be shown to meet one of the environmentally preferable specifications shown in **Table 1**.

Approach and Implementation

Early in the design process, review each component with the project team to identify possible opportunities for replacing conventional materials with preferable materials, as listed in **Table 1**.

Identify suppliers that carry environmentally preferable products, including FSC-certified wood, recycled-content wood, and locally produced materials. If possible, use products that meet both the Environmentally Preferable Products and Local Production requirements; a single component that meets both requirements is worth 1 LEED point.

Work with suppliers to help them understand what is needed to fulfill the Environmentally Preferable Products and Local Production requirements and encourage them to expand their offerings to meet the growing demand for green products.

a) Environmentally Preferable Products

In LEED for Homes, an environmentally preferable product is a material or product that causes less environmental damage than the conventional alternative. Since the basis for comparison (the conventional alternative) varies by building component, the list of qualifying products differs by component (see **Table 1**). Points can be earned for each component. For example, if FSC-certified lumber is used for interior wall framing, floor framing, and exterior wall framing, 1.5 points are awarded (0.5 point for each component).

Recycled content is material that includes at least 25% postconsumer or 50% preconsumer (postindustrial) recycled material. In the case of cabinets, counters, and trim, recycled-content materials must also contain no added ureaformaldehyde resins to earn the 0.5 point.

Reclaimed content is material that has been recovered from a demolition site. Reclaimed material can be considered locally produced and earn points accordingly if the reclamation takes place within 500 miles of the LEED home site. Only postconsumer material can be counted as reclaimed material, not construction leftovers.

FSC-certified wood comes from suppliers that have been granted chain-of-custody by the Forest Stewardship Council. See "Resources," below, for Web sites that can help project teams locate FSC-certified products.

ID	LL	SS	WE	EA	MR	EQ	A
2.2							

b) Low-Emissions Materials

This part of the credit applies to four types of materials: adhesives and sealants; paints and coatings; carpet and floor systems; and insulation.

For paints and coatings and for adhesives and sealants, limits are set on the amount of volatile organic compounds (VOCs) per given volume of the product. The threshold limits and the content within a particular product are generally expressed in grams per liter (g/L). Refer to **Tables 2 and 3** when selecting products tested for emissions and check emissions levels on product labels.

For carpet and floor systems, products that meet the requirements of either the Green Label Plus program or the FloorScore program can earn points. These programs use rigorous protocols to test products for emissions and maintain a high level of consistency.

For insulation, products must comply with California's Practice for Testing of VOCs from Building Materials Using Small Chambers. Insulation products that meet the standard are certified by either the California Collaborative for High Performance Schools (CHPS) program or the GreenGuard Environmental Institute Children & Schools program.

c) Local Production

Early in the design process, determine the availability of products that have been extracted, harvested, recovered, or manufactured locally (within 500 miles of the project site).

Work with subcontractors and suppliers to verify availability of local materials.

Reclaimed material can be considered locally produced if the reclamation takes place within 500 miles of the home site. In the case of gut rehab projects, material that is refurbished and reused on-site can be counted as reclaimed. Only post-consumer waste can be counted as reclaimed material.

Calculations

To earn 0.5 point, at least 90% of a given component (by weight or volume) must meet the requirements for Environmentally Preferable Products, Low-Emissions Materials, or Local Production. This can be achieved with multiple products that each meet the requirement. For example, if a project has 70% FSC-certified counters and 20% reclaimed counters, the project earns 0.5 point.

The only exception to the 90% requirement is for flooring:

- 45% of the floor area must meet the Environmentally Preferable Products requirements to earn 0.5 point;
- 90% of the floor area must meet the Environmentally Preferable Products requirements to earn 1 point; and
- 100% of the floor area must meet the Low-Emissions Materials requirements for hard flooring or for carpet and pad to earn 0.5 point.

Detailed calculations are not required for each component. Approximations are acceptable, and no calculations are necessary if the entirety of a component meets the requirements of the credit.

When calculating distances for Local Production, use either driving distance or "as the crow flies" distance. The latter is shorter, but the former may be easier to calculate. Averaging is not allowed; if any step in the production process (extraction, processing, or manufacturing) for a particular component is outside a 500-mile radius from the home, the credit cannot be awarded for that component.

Exemplary Performance

Projects that use more than 16 of the options in **Table 1** and earn more than the maximum 8 points can earn additional points, to be counted under Innovation & Design 3. Each additional measure is

ID	LL	SS	WE	EA	MR	EQ	AE
2.2							

worth 0.5 point, with a maximum of 4 exemplary performance points total.

Verification and Submittals

Builder / Project Team:

- Present any relevant product stamps, certification labels, web links, and/or literature to the Green Rater as needed to demonstrate that the credit requirements were met.
- Sign an Accountability Form to indicate that each product being counted in this credit represents the required minimum percentage of the applicable component.

Green Rater:

- Visually verify (using product stamps, labels, web links, and/or literature, as needed) that all products counted in this credit meet the relevant requirements and were used in the project.
- Verify that an Accountability Form has been signed by the responsible party.

Considerations

Environmental Issues

The use of materials with recycled content reduces demand for virgin materials (and the associated impacts of extraction or harvesting) and diverts material that would otherwise be sent to landfill. Choosing low-emitting materials will improve the health and comfort of occupants and reduce the demand for toxic materials that affect human health and the environment "upstream," at the manufacturing site. Volatile organic compounds in particular contribute to smog and can react with sunlight and nitrogen oxides in the atmosphere to form ground-level ozone, a chemical that has a detrimental effect on human health and the local environment. The use of local building

materials reduces transportation energy usage and the accompanying pollution associated with delivering materials to the job site.

Economic Issues

Currently, the cost of FSC-certified wood products is equal to or higher than that of conventional wood products, and availability varies by region. The price of FSC-certified wood products is expected to become more competitive as the industry adjusts. Many commonly used products are now available with recycled content. Most recycled-content products exhibit performance similar to products made with virgin-only materials and can be incorporated into building projects with ease and minimal cost. The cost of reclaimed material depends on the cost to refurbish the material. Reclaiming material from demolition projects reduces waste-hauling costs.

The construction market increasingly offers low-VOC alternatives to conventional building products. These low-VOC products are generally competitive with conventional materials, but some, particularly new products, are more expensive. Some types of low-VOC products may also be difficult to obtain. However, these problems will recede as application of low-VOC products becomes more commonplace.

Locally produced building materials should cost the same as or less than materials transported from long distances.

Regional Variations

Lumber with the FSC logo, which warrants that the wood came from a certified, well-managed forest, can be obtained across the world from a variety of mills, manufacturers, and distributors. Many well-known national retailers now stock FSC products. Local retailers can provide information on their FSC-certified products.

The availability of local building materials depends on the project location. In some areas the majority of products needed for the project can be obtained within a 500-mile radius. In other areas few materials may be locally sourced.

Chain-of-Custody Requirements

FSC COC certification is designed to enable tracking of wood that originates in FSC-certified forests all the way through the value chain into final products. All companies that take legal ownership of FSC products and produce, sell, promote, or trade them need to be certified for COC. Thus, all FSC-certified wood products in LEED projects must be supplied by vendors that have FSC COC certification. Vendors are defined as those companies that sell products to the project contractor or subcontractors.

In order to earn credit for the use of FSC-certified wood products, project teams must compile all vendor invoices for materials, both FSC-certified and non-certified, used in the component in question (e.g., roof framing). Each vendor invoice used for verification must conform to the following requirements:

- Each individual product must be identified on a line-item basis;
- FSC-certified products must be identified as such on a line-item basis;
- The quantity (e.g., number of units, square feet, lineal feet) of each line item must be shown;
- The vendor's COC certificate number must be shown on any invoice that includes FSC-certified products.

Except as otherwise noted in **Table 1** (e.g., for flooring, where the required minimum is 45 percent), at least 90 percent of a component must be FSC-certified in order to earn credit. Wood products that are identified on invoices as "FSC Pure" and "FSC Mixed Credit" should be counted at 100 percent. Wood products identified as

"FSC Mixed [NN]%" should be counted at the indicated percentage, e.g., a product identified as "FSC Mixed 75%," should be counted at 75 percent. Wood products identified as "FSC Recycled" or "FSC Recycled Credit" may not be counted as FSC-certified but can be counted as recycled content.

Contractors and subcontractors are considered end consumers and do not need to have COC.

Resources

Web Sites

a) Environmentally Preferable Products

Green Building Pages

www.greenbuildingpages.com/main_a.html

Green Building Pages, Inc., is an online, sustainable design and decision-making tool for building industry professionals and environmentally and socially responsible consumers. It includes articles, white papers, case studies, and other links and resources regarding green building practices, along with an extensive directory of products.

Green Building Resource Guide

www.greenguide.com/about.html

A database of more than 600 green building materials and products selected specifically for their usefulness to the design and building professions, rather than merely their green material content.

GreenHomeGuide

www.greenhomeguide.com

GreenHomeGuide is a web-based resource that includes a combination of tips, case studies, expert Q&A articles, and regional directories of products and services.

ID	LL	SS	WE	EA	MR	EQ	AE
2.2							

Green Seal

www.greenseal.org/index.cfm

An independent nonprofit organization dedicated to safeguarding the environment and transforming the marketplace by promoting the manufacture, purchase, and use of environmentally responsible products and services. Products and manufacturers that comply with its published paint standards are listed on the site.

Oikos Green Building Source

www.oikos.com/green_products/index.php

A Web site dedicated to sustainable and energy-efficient construction: Green Building News, Product Database, Product Gallery, Energy Source Builder Newsletter, and more.

Rainforest Alliance

SmartGuide to Green Building Wood Sources

www.rainforestalliance.org/smartguides

This site lists U.S. suppliers, manufacturers, and distributors of FSC-certified building products.

U.S. Forest Service

www2.fpl.fs.fed.us/TechSheets/tropical-wood.html

This is a free database of tropical hardwoods, listed both by common name and by genus and species. This list is not comprehensive, but each species of wood has a fact sheet.

Salvaged Building Materials Exchange

Green Building Resource Guide

www.greenguide.com/about.html

A searchable database of salvaged building materials.

Used Building Materials Exchange

www.build.recycle.net

(519) 767-2913

A free marketplace for buying and selling recyclables and salvaged materials.

National Wood Recycling Directory

American Forest and Paper Association

www.afandpa.org/recycling/recycling.html

(202) 463-2700

A searchable directory of outlets for recycling construction lumber. Also find the AF&PA directory of wastepaper dealers and recycling centers on this site.

Reuse Development Organization

www.redo.org

(410) 669-7245

ReDO is a national nonprofit in Indianapolis that promotes reuse as an environmentally sound, socially beneficial, and economical means of managing surplus and discarded materials. See the "Find a ReUse Center" link for state-by-state lists of reuse and recycling centers.

Forest Stewardship Council

www.fscus.org/faqs/fsc_products.php

www.findfsc.org

For help in locating FSC-certified products, fill out the form on this Web site and submit it to FSC-US; FSC will circulate it to certified companies, that then will contact you if they have your desired product(s) available.

The Wood Explorer

www.toolcenter.com/wood/index.html

This CD covers 1,650 wood species. It includes scientific and common names, origins, and properties.

b) Low Emissions Materials

CRI Green Label

The Carpet and Rug Institute

www.carpet-rug.org/commercial-customers/green-building-and-the-environment/green-label-plus/index.cfm

CRI has created its own set of standards for rating low-emitting carpets, adhesives, and pads. This site describes the standards

and has a directory of products that meet them.

Greenguard Environmental Institute's Children & Schools Certified Products

www.greenguard.org

This site includes a listing of all products that are certified according to the Greenguard Children & Schools program. Any insulation products that have earned this certification automatically meet the low emissions criteria for LEED for Homes, as stipulated in an agreement between Greenguard and the State of California.

California Collaborative for High Performance Schools (CHPS) Program

www.chps.net/manual/lem_table.htm

This site includes a list of products that have been certified to meet the CHPS low-emitting materials criteria. This list includes insulation, carpet, rug, and flooring products that meet the requirements of LEED for Homes.

Carpet & Rug Institute Green Label Plus Program

www.carpet-rug.org

This Web site includes information about the CRI Green Label Plus program. Details are provided under "Commercial Customers," within "Green Building and the Environment."

Scientific Certification System FloorScore Program

www.scscertified.com/iaq/floorscore.html

This Web site includes information about the SCS FloorScore program, as well as a list of certified products that is updated regularly.

Print Media

Green Building Products: The GreenSpec Guide to Residential Building Materials. BuildingGreen, Inc., and New Society Publishers. Available online, at www.

buildinggreen.com/ecommerce/gbp.cfm

Making Better Concrete: Guidelines to Using Fly Ash for Higher Quality, Eco-Friendly Structures, by Bruce King, P.E. Green Building Press. Learn more at www.greenbuildingpress.com/mbc/index.htm

ID	LL	SS	WE	EA	MR	EQ	AE
2.2							