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- EQc2 | Increased ventilation

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- EQc4.2 | Low-emitting materials - paints and coatings
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- EQc4.4 | Low-emitting materials - composite wood and agrifiber products
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- EQc4.4 | Low-emitting materials - composite wood
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- EQc5 | Indoor chemical and pollutant source control
- EQc5 | Indoor chemical and pollutant source control
- EQc5 | Indoor chemical and pollutant source control
- EQc5 | Indoor chemical and pollutant source control
- EQc5 | Indoor chemical and pollutant source control
- EQc5 | Indoor chemical and pollutant source control
- EQc5 | Indoor chemical and pollutant source control
- EQc5 | Indoor chemical & pollutant source control
- EQc5 | Indoor chemical and pollutant source control
- EQc5 | Indoor chemical and pollutant source control
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- EQc5 | Enhanced combustion venting
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- EQc5 | Indoor chemical and pollutant source control
- EQc5 | Indoor chemical and pollutant source control
- EQc5.1 | Indoor chemical and pollutant source control - non-cleaning system reduce particulates in air distribution
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- EQc6 | Controllability of systems - lighting and thermal comfort
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- EQc6 | Enhanced garage pollutant protection
- EQc6 | Enhanced garage pollutant protection
- EQc6 | Controllability of systems, lighting and thermal comfort
- EQc6 | Controllability of systems - thermal comfort
- EQc6.1 | Controllability of systems - lighting
- EQc6.1 | Controllability of systems - lighting
- EQc6.1 | Controllability of systems - lighting
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- EQc6.1 | Controllability of systems - lighting
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- EQc6.2 | Controllability of systems - non-perimeter spaces
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- EQc7 | Thermal comfort - design and verification
- EQc7 | Thermal comfort - design
- EQc7 | Thermal comfort - design
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- EQc7 | Low-emitting products
- EQc7 | Thermal comfort - design
- EQc7.1 | Thermal comfort - design
- EQc7.1 | Thermal comfort - design
- EQc7.1 | Thermal comfort - design
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- EQc7.1 | Thermal comfort - compliance
- EQc7.1 | Thermal comfort: design
- EQc7.1 | Thermal comfort - compliance with ASHRAE 55-1992
- EQc7.1 | Thermal comfort - compliance with ASHRAE 55-1992
- EQc7.1 | Thermal comfort: design
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- EQc7.1 | Thermal comfort - design
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- EQc7.2 | Thermal comfort - verification
- EQc7.2 | Thermal comfort - verification
- EQc7.2 | Thermal comfort - employee verification
- EQc7.2 | Thermal comfort - employee verification
- EQc7.2 | Thermal comfort - verification
- EQc7.2 | Thermal comfort - monitoring
- EQc7.2 | Thermal comfort - permanent monitoring system
- EQc7.2 | Thermal comfort: verification
- EQc7.2 | Thermal comfort - permanent monitoring system
- EQc7.2 | Thermal comfort - permanent monitoring system
- EQc7.2 | Thermal comfort: employee verification
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- EQc7.2 | Thermal comfort - verification
- EQc8 | Contaminant control
- EQc8 | No environmental tobacco smoke

- EQc8.1 | Daylight and views - daylight
- EQc8.1 | Daylight and views - daylight
- EQc8.1 | Daylight and views - daylight
- EQc8.1 | Daylight and views - daylight
- EQc8.1 | Daylight and views - daylight
- EQc8.1 | Daylight and views - daylight
- EQc8.1 | Daylight and views - daylight
- EQc8.1 | Daylight and views - daylight 75% of spaces
- EQc8.1 | Daylight and views - daylight 75% of spaces
- EQc8.1 | Daylight and views - daylight
- EQc8.1 | Daylight & views: daylight 75% of spaces
- EQc8.1 | Daylight and views - daylight 75% of spaces
- EQc8.1 | Daylight and views - daylight 75% of spaces
- EQc8.1 | Daylight and views - daylight 75% of spaces
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- EQc8.2 | Daylight and views - views
- EQc8.2 | Daylight and views - views
- EQc8.2 | Daylight and views - views
- EQc8.2 | Daylight and views - views
- EQc8.2 | Daylight and views - views
- EQc8.2 | Daylight and views - views for 90% of spaces
- EQc8.2 | Daylight and views - daylight 90% of spaces
- EQc8.2 | Daylight & views: views for 90% of spaces
- EQc8.2 | Daylight and views - views for 90% of spaces
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- EQc8.2 | Daylight and views - views
- EQc8.3 | Daylight and views - views for 90% of seated spaces
- EQc8.3 | Daylight and views - views
- EQc8.3 | Daylight and views, views for 90% of spaces
- EQc8.4 | Daylight and views - views
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- EQc9 | Enhanced acoustical performance
- EQc9 | Contemporary IAQ practice
- EQc9 | Enhanced acoustical performance
- EQp1 | Minimum indoor air quality performance
- EQp1 | Minimum indoor air quality performance
- EQp1 | Minimum indoor air quality performance
- EQp1 | Minimum indoor air quality performance
- EQp1 | Minimum indoor air quality performance
- EQp1 | Minimum indoor air quality performance
- EQp1 | Minimum indoor air quality performance
- EQp1 | Minimum indoor air quality performance
- EQp1 | Minimum IAQ performance
- EQp1 | Outdoor air introduction and exhaust systems
- EQp1 | Minimum IAQ performance
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- EQp1 | Minimum IAQ Performance
- EQp1 | Minimum IAQ Performance
- EQp1 | Minimum IAQ Performance
- EQp1 | Minimum IAQ performance
- EQp1 | Ventilation
- EQp1 | Minimum IAQ performance
- EQp1 | Minimum IAQ Performance
- EQp1 | Minimum indoor air quality performance
- EQp1 | Minimum indoor air quality performance
- EQp2 | Environmental tobacco smoke control
- EQp2 | Environmental Tobacco Smoke (ETS) control
- EQp2 | Environmental Tobacco Smoke (ETS) control
- EQp2 | Environmental Tobacco Smoke (ETS) control
- EQp2 | Environmental Tobacco Smoke (ETS) control
- EQp2 | Environmental Tobacco Smoke (ETS) control
- EQp2 | Environmental Tobacco Smoke (ETS) control
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- EQp2 | Environmental Tobacco Smoke (ETS) control
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- EQp2 | Environmental tobacco smoke (ETS) control
- EQp2 | Environmental Tobacco Smoke (ETS) control
- EQp2 | Environmental Tobacco Smoke (ETS) control
- EQp2 | Environmental Tobacco Smoke (ETS) control
- EQp2 | Environmental Tobacco Smoke (ETS) control
- EQp2 | Combustion venting
- EQp2 | Environmental tobacco smoke (ETS) control
- EQp2 | Environmental tobacco smoke (ETS) control
- EQp2 | Environmental Tobacco Smoke (ETS) control
- EQp3 | Green cleaning policy
- EQp3 | Green cleaning policy
- EQp3 | Minimum acoustical performance
- EQp3 | Hazardous material removal or encapsulation (renovations only)
- EQp3 | Green cleaning policy
- EQp3 | Asbestos removal or encapsulation
- EQp3 | Minimum acoustical performance
- EQp3 | Garage pollutant protection

- EQp4 | Polychlorinated biphenyl (PCB) removal
- EQp4 | Radon-resistant construction
- EQp4.1 | Asbestos removal or encapsulation
- EQp4.1 | Hazardous material removal or encapsulation
- EQp4.2 | Polychlorinated biphenyl removal
- EQp5 | Air filtering
- EQp6 | Environmental tobacco smoke
- EQp7 | Compartmentalization
- MEQc10 | Garage pollutant protection
- MEQc11 | Environmental tobacco smoke (ETS) control in mid-rise buildings
- MEQc12 | Compartmentalization of units in mid-rise buildings
- MEQc2 | Combustion venting in mid-rise buildings
- MEQc4 | Outdoor air ventilation in mid-rise buildings
- MEQc5 | Local exhaust in mid-rise buildings
- MEQc8 | Contaminant control in mid-rise buildings

Our "watch" feature allows you to stay current on all aspects of this specific credit. In your account, you can control what you get updated on and how you receive your notifications. Hide

LEED BD+C: Healthcare | v4 - LEED v4

Low emitting materials

Possible 3 points

1 result in**All** .

- Glossary

Intent

To reduce concentrations of chemical contaminants that can damage air quality, human health, productivity, and the environment.

Requirements

This credit includes requirements for product manufacturing as well as project teams. It covers volatile organic compound (VOC) emissions into indoor air and the VOC content of materials, as well as the testing methods by which indoor VOC emissions are determined. Different materials must meet different requirements to be considered compliant for this credit. The building interior and exterior are organized in seven categories, each with different thresholds of compliance. The building interior is defined as everything within the waterproofing membrane. The building exterior is defined as everything outside and inclusive of the primary and secondary weatherproofing system, such as waterproofing membranes and air- and water-resistive barrier materials.

Option 1. Product Category Calculations

Achieve the threshold level of compliance with emissions and content standards for the number of product categories listed in Table 2.

Table 1. Thresholds of compliance with emissions and content standards for 7 categories of materials

Category	Threshold	Emissions and content requirements
Interior paints and coatings applied on site	At least 90%, by volume, for emissions; 100% for VOC content	• General Emissions Evaluation for paints and coatings applied to walls, floors, and ceilings • VOC content requirements for wet applied products
Interior adhesives and sealants applied on site (including flooring adhesive)	At least 90%, by volume, for emissions; 100% for VOC content	• General Emissions Evaluation • VOC content requirements for wet applied products
Flooring	100%	General Emissions Evaluation
Composite wood	100% not covered by other categories	Composite Wood Evaluation
Ceilings, walls, thermal, and acoustic insulation	100%	• General Emissions Evaluation • **Healthcare, Schools only** Additional insulation requirements
Furniture (include in calculations if part of scope of work)	At least 90%, by cost	Furniture Evaluation
Healthcare and Schools Projects only: Exterior applied products	At least 90%, by volume	Exterior Applied Products

Table 2. Points for number of compliant categories of products

Compliant categories	Points
NC, CS, NC Retail, DC, WDC, NC Hos projects without furniture	
2	1
4	2
5	3
NC, CS, NC Retail, DC, WDC, NC Hos projects with furniture, CI, CI Retail, CI Hos	
3	1
5	2
6	3

Schools, HC without furniture	
3	1
5	2
6	3
Schools, HC with furniture	
4	1
6	2
7	3

Option 2. Budget Calculation Method

If some products in a category do not meet the criteria, project teams may use the budget calculation method (Table 3).

Table 3. Points for percentage compliance, under budget calculation method

The budget method organizes the building interior into six assemblies:

- flooring;
- ceilings;
- walls;
- thermal and acoustic insulation;
- furniture; and
- exterior applied products.

Include furniture in the calculations if it is part of the scope of work. Walls, ceilings, and flooring are defined as building interior products; each layer of the assembly, including paints, coatings, adhesives, and sealants, must be evaluated for compliance. Insulation is tracked separately.

Determine the total percentage of compliant materials according to Equation 1.

Equation 1. Total percentage compliance

Equation 2. System percentage compliant

Equation 3. Furniture systems compliant, using ANSI/BIFMA evaluation

Calculate surface area of assembly layers based on the manufacturer's documentation for application.

If 90% of an assembly meets the criteria, the system counts as 100% compliant. If less than 50% of a assembly meets the criteria, the assembly counts as 0% compliant.

Manufacturers' claims. Both first-party and third-party statements of product compliance must follow the guidelines in CDPH SM V1.1–2010, Section 8. Organizations that certify manufacturers' claims must be accredited under ISO Guide 65.

Laboratory requirements. Laboratories that conduct the tests specified in this credit must be accredited under ISO/IEC 17025 for the test methods they use.

Emissions and Content Requirements

To demonstrate compliance, a product or layer must meet all of the following requirements, as applicable.

Inherently nonemitting sources. Products that are inherently nonemitting sources of VOCs (stone, ceramic, powder-coated metals, plated or anodized metal, glass, concrete, clay brick, and unfinished or untreated solid wood flooring) are considered fully compliant without any VOC emissions testing if they do not include integral organic-based surface coatings, binders, or sealants.

General emissions evaluation. Building products must be tested and determined compliant in accordance with California Department of Public Health (CDPH) Standard Method v1.1–2010, using the applicable exposure scenario. The default scenario is the private office scenario. The manufacturer's or third-party certification must state the exposure scenario used to determine compliance. Claims of compliance for wet-applied products must state the amount applied in mass per surface area.

Manufacturers' claims of compliance with the above requirements must also state the range of total VOCs after 14 days (336 hours), measured as specified in the CDPH Standard Method v1.1:

- 0.5 mg/m3 or less;
- between 0.5 and 5.0 mg/m3; or
- 5.0 mg/m3 or more.

Projects outside the U.S. may use products tested and deemed compliant in accordance with either (1) the CDPH standard method (2010) or (2) the German AgBB Testing and Evaluation Scheme (2010). Test products either with (1) the CDPH Standard Method (2010), (2) the German AgBB Testing and Evaluation Scheme (2010), (3) ISO 16000-3: 2010, ISO 16000-6: 2011, ISO 16000-9: 2006, ISO 16000-11:2006 either in conjunction with AgBB, or with French legislation on VOC emission class labeling, or (4) the DIBt testing method (2010). If the applied testing method does not specify testing details for a product group for which the CDPH standard method does provide details, use the specifications in the CDPH standard method. U.S. projects must follow the CDPH standard method.

Additional VOC content requirements for wet-applied products. In addition to meeting the general requirements for VOC emissions (above), on-site wet-applied products must not contain excessive levels of VOCs, for the health of the installers and other tradesworkers who are exposed to these products. To demonstrate compliance, a product or layer must meet the following requirements, as applicable. Disclosure of VOC content must be made by the manufacturer. Any testing must follow the test method specified in the applicable regulation.

- All paints and coatings wet-applied on site must meet the applicable VOC limits of the California Air Resources Board (CARB) 2007, Suggested Control Measure (SCM) for Architectural Coatings, or the South Coast Air Quality Management District (SCAQMD) Rule 1113, effective June 3, 2011.
- All adhesives and sealants wet-applied on site must meet the applicable chemical content requirements of SCAQMD Rule 1168, July 1, 2005, Adhesive and Sealant Applications, as analyzed by the methods specified in Rule 1168. The provisions of SCAQMD Rule 1168 do not apply to adhesives and sealants subject to state or federal consumer product VOC regulations.
- For projects outside the U.S., all paints, coatings, adhesives, and sealants wet-applied on site must either meet the technical requirements of the above regulations, or comply with applicable national VOC control regulations, such as the European Decopaint Directive (2004/42/EC), the Canadian VOC Concentration Limits for Architectural Coatings, or the Hong Kong Air Pollution Control (VOC) Regulation.
- If the applicable regulation requires subtraction of exempt compounds, any content of intentionally added exempt compounds larger than 1% weight by mass (total exempt compounds) must be disclosed.
- If a product cannot reasonably be tested as specified above, testing of VOC content must comply with ASTM D2369-10; ISO 11890, part 1; ASTM D6886-03; or ISO 11890-2.
- For projects in North America, methylene chloride and perchloroethylene may not be intentionally added in paints, coatings, adhesives, or sealants.

Composite Wood Evaluation. Composite wood, as defined by the California Air Resources Board, Airborne Toxic Measure to Reduce Formaldehyde Emissions from Composite Wood Products Regulation, must be documented to have low formaldehyde emissions that meet the California Air Resources Board ATCM for formaldehyde requirements for ultra-low-emitting formaldehyde (ULEF) resins or no added formaldehyde resins. For projects outside the U.S., composite wood must be documented not to exceed a concentration limit of 0.05 ppm of formaldehyde (0.06 mg/m^2-h when expressed as emission rate) as tested following either EN-717-1:2004, following ISO 16000-3: 2010, ISO 16000-6: 2011, ISO 16000-9: 2006, ISO 16000-11:2006, or following CEN/TS 16516: 2013 either in conjunction with AgBB or with Belgian or French legislation on VOC emission class labeling.

Salvaged and reused architectural millwork more than one year old at the time of occupancy is considered compliant, provided it meets the requirements for any site-applied paints, coatings, adhesives, and sealants.

Furniture evaluation. New furniture and furnishing items must be tested in accordance with ANSI/BIFMA Standard Method M7.1–2011. Comply with ANSI/BIFMA e3-2011 Furniture Sustainability Standard, Sections 7.6.1 and 7.6.2, using either the concentration modeling approach or the emissions factor approach. Model the test results using the open plan, private office, or seating scenario in ANSI/BIFMA M7.1, as appropriate. USGBC-approved equivalent testing methodologies and contaminant thresholds are also acceptable. For classroom furniture, use the standard school classroom model in CDPH Standard Method v1.1. Documentation submitted for furniture must indicate the modeling scenario used to determine compliance.

Salvaged and reused furniture more than one year old at the time of use is considered compliant, provided it meets the requirements for any site-applied paints, coatings, adhesives, and sealants.

Additional insulation requirements. Batt insulation products may contain no added formaldehyde, including urea formaldehyde, phenol formaldehyde, and urea-extended phenol formaldehyde.

Exterior applied products. Adhesives, sealants, coatings, roofing, and waterproofing materials applied on site must meet the VOC limits of California Air Resources Board (CARB) 2007 Suggested Control Measure (SCM) for Architectural Coatings, and South Coast Air Quality Management District (SCAQMD), Rule 1168, effective July 1, 2005. Small containers of adhesives and sealants subject to state or federal consumer product VOC regulations are exempt.

Projects outside North America may use either the jurisdictional VOC content requirements or comply with the European Decopaint Directive (2004/42/EC, to be updated to most current version when available) Phase II, for water-borne coatings, as analyzed according to ISO 11890 parts 1 and 2, instead of the CARB and SCAQMD regulatory standards.

Two materials are prohibited and do not count toward total percentage compliance: hot-mopped asphalt for roofing, and coal tar sealants for parking lots and other paved surfaces.

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