

PPG Paint, Glass and Coating Product Contributions to Green Building Projects



This document examines specific PPG paint, glass and coatings products and their potential to help architects and owners earn green certification for their buildings and make them more comfortable, healthier, safer and efficient.

All product contributions and environmental claims cited in this document reference the United States Green Building Council (USGBC) and its *Leadership in Energy and Environmental Design* (LEED) rating systems (Version 3.0, 2009 edition); however, contributions also are applicable to other green building rating systems such as GreenGlobes (USA), BREEAM (UK), CASBEE (Japan) and Green Star (Australia).

LEED and other green rating systems are designed to quantify the energy and environmental performance of a building through its design, construction and operations. They also give architects and owners useful tools for managing or reducing the environmental footprint of their buildings while enhancing the occupants' experience.

Driven by the foresight of building owners and the creativity of the architect/engineer (A/E) community, companies that provide construction services or make building products are continually advancing the principles and practice of green building. These advances are being further aided by market-based tax incentives, energy cost volatility, greater awareness of human chemical sensitivities and, in some cases, governmental mandates and legislation.

While green building rating systems and their governing organizations do not certify building products, they recognize that product selection can play an essential role in making a building compliant or certifiable to a green standard, or more operationally efficient.

PPG has a portfolio of architectural paint, glass and coating products known as *EcoLogical Building Solutions*sm that can be specified individually or as part of an overall green package. These products help:

- *Architects “green” their designs*
- *Engineers optimize building performance*
- *Contractors select environmentally responsible materials*
- *Facility managers maintain sustainable operations*

This document gives green building practitioners a brief overview of PPG paint, glass and coating products and how they can contribute to a green project.

This and other PPG documents that promote and support green building design and construction are available at www.ppgideascales.com/greenbuilding.

This document was developed while considering standards and guidelines regarding environmental claims. Sources include the LEED 2009 (BD&C, ID&C, EBOM) reference guides, Federal Trade Commission, Part 260 - Guides for the Use of Environmental Marketing Claims; ISO 14021: Environmental labels and declarations - Self-declared environmental claims (Type II environmental labeling); and ASTM E2129-05—Standard Practice for Data Collection for Sustainability Assessment of Building Products.

Architectural Coatings (Paint)

PPG Product Category	Sustainable Design Credit	Related PPG Product Solution
<p>Architectural Coatings (Paint)</p> <p>Master Format (typical)</p> <p>09 67 00 09 90 00 09 91 00 09 93 00 09 94 00 09 96 00 09 97 00 09 97 23 09 97 26</p>	<p>Indoor Environmental Quality (IEQ): Low-Emitting Materials for Paints & Coatings</p>	<p>A practical way to prevent indoor environmental quality problems is to specify materials that release fewer and less-harmful volatile organic compounds (VOCs).</p> <p>As a manufacturer of several national paint brands, PPG has products for all types of interior surfaces that comply with the VOC criteria of <i>Green Seal</i> GS-11, GC-03, and the South Coast Air Quality Management District (SCAQMD), Rule 1113.</p> <p>Most applicable to green building projects is the PPG <i>Speedhide</i>® line of primers and topcoats, which are available in multiple sheens and meet VOC content criteria. PPG also manufactures PPG <i>Pure Performance</i>® primers and topcoats, whose low-odor, zero-VOC formulations surpass LEED criteria.</p> <p>Additional product lines that meet VOC criteria include:</p> <ul style="list-style-type: none"> • PPG Paint: <i>Speedhide</i>®, <i>Super Tech</i>® Dry Fogs, <i>Speedcraft</i>®, <i>Speedpro</i>®, <i>Pitt Glaze</i>®, <i>Seal Grip</i>®, <i>Pitt-Tech</i>® Plus, <i>Aquapon</i>®, <i>Pitt-Guard</i>®, <i>MegaSeal</i>®, <i>Wall Supreme</i>®, <i>HomeVantage</i>™ Plus • PPG Pittsburgh® Paints: <i>WallHide</i>® and <i>Manor Hall</i>® • PPG Porter® Paints: <i>Silken Touch</i>®, <i>Hi-Hide</i>®, <i>Pro-Master</i>® <p>Note: VOC budgeting is permitted as an alternative compliance path for specialty applications for which there is no VOC-compliant option. VOC budgeting is a calculation comparing a baseline project scenario (VOC allowed) to an actual design scenario (VOC actual). The credit is satisfied when the total actual VOC content is less than what is permitted in the baseline scenario. If VOC budgeting is utilized, PPG recommends scheduling construction activities to minimize exposure of absorbent materials to VOC emissions (i.e., complete “wet” construction procedures such as painting before storing or installing “dry” absorbent materials such as carpet or ceiling tiles).</p> <p>Specifically for K–12 schools: Various PPG paints have undergone independent laboratory emission testing and comply with the requirements of California Department of Health Services’ <i>Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers</i>, Section 01350. This testing applies to LEED – <i>Schools</i> as well as Collaborative High Performance School (CHPS) projects. CHPS-compliant low-emitting materials also are recommended for healthcare projects.</p>
	<p>Materials & Resources: Construction Waste Management</p>	<p>Recycling of construction and demolition debris reduces demand for virgin resources and the environmental impacts associated with resource extraction, processing, transportation, landfill disposal and, in some cases, incineration activities.</p> <p>To help meet a contractor’s waste management plan, PPG offers recyclable quart, one-gallon and five-gallon paint containers that can be diverted from landfills.</p>

Architectural Coatings (Paint) *continued*

PPG Product Category	Sustainable Design Credit	Related PPG Product Solution
<p>Architectural Coatings (Paint) <i>(continued)</i></p>	<p>Materials & Resources: Construction Waste Management</p>	<p>One-quart and one-gallon buckets are Type 5 polypropylene (PP) recyclable containers. The five-gallon bucket is a Type 2 high-density polyethylene (HDPE) pail. Both types (PP and HDPE) are preferred plastics for recycling. The recycle code is molded into the container bottom, and the symbol is easily visible for sorting purposes. The accompanying metal container rings, lids and handles also can be recycled.</p> <p>Note: PPG has initiated a recovery program for five-gallon plastic pails used for water-based products. Dry, empty pails are returned to company-owned stores, consolidated and sent to distribution centers for shredding and recycling. In addition to its environmental benefits, this program reduces customer costs by eliminating the need to pay for empty-pail disposal.</p>
	<p>Materials & Resources: Regional Materials</p>	<p>Specifying products manufactured within 500 miles of the project site supports indigenous resources and reduces the environmental and energy impacts resulting from transportation. This credit considers both the final assembly point of the product as well as the source location for each component and raw material.</p> <p>Paint is a complex product with many ingredients and points of origin, which makes it difficult to determine precise contributions towards this credit. However, for waterborne paint, the water content, which may be up to 30 percent by weight, can "technically" be considered for regional materials credit. PPG can assist with compliance on a project-by-project basis; however, PPG does not actively endorse using water content for this credit.</p> <p>Specifically for LEED-Commercial Interiors (CI) projects: The definition of "regional materials" is less demanding for <i>Commercial Interiors</i> than for other LEED platforms due to the nature of interior "fit-out" projects and fewer available materials. As a result, LEED-CI projects are allowed to consider a manufacturing location's distance to the project site for LEED credit eligibility. Please see the map of PPG manufacturing facilities (page 7) to determine potential eligibility for this credit.</p>
	<p>(indirect contribution) Energy & Atmosphere: Optimizing Energy Performance & Indoor Environmental Quality: Daylight</p>	<p>Daylighting reduces the need for electric lighting, which lowers energy use. Natural daylight also enhances the productivity and performance of building occupants.</p> <p>Daylighting strategies can affect interior color schemes and reduce the need for electric lighting. An indirect contribution towards daylighting and energy performance may be realized by the Light Reflectance Values (LRVs) of paint.</p> <p>Color consultants, architects and designers use LRV data in several stages of color planning and specifying. In green building practice, colors with higher LRVs can support sustainable lighting plans by propagating daylight into a space and reducing the standard number of lighting fixtures required to optimize employee performance and safety.</p>

Architectural Glass

PPG Product Category	Sustainable Design Credit	Related PPG Product Solution
<p>Architectural Glass</p> <p>Master Format (typical)</p> <p>08 00 00 08 06 50 08 06 80 08 41 00 08 42 00 08 42 00 08 43 00 08 44 00 08 80 00</p>	<p>Energy & Atmosphere: Optimizing Energy Performance</p>	<p>When considering integrated whole-building design and orientation, the selection of architectural glass is critical. The ideal architectural glass is one that permits the greatest amount of natural light to enter a building while reducing or eliminating the thermal effects of infrared energy and solar heat gain. Good light transmittance and solar control performance maximize energy efficiency by reducing demand on regulated energy systems (electrical and mechanical).</p> <p>When comparing proposed versus baseline energy consumption, fenestration types, u-factor, solar heat gain coefficient (SHGC) and visual light transmittance (VLT) are key energy model inputs. PPG manufactures various architectural glasses that meet design objectives and contribute to the environmental performance of an integrated, energy-efficient building envelope. These products include:</p> <ul style="list-style-type: none"> • <i>Solarban</i>[®] z50, <i>Solarban</i> 60, <i>Solarban</i> 70XL and <i>Solarban</i> 80 solar control low-e glasses • <i>Sungate</i>[®] 500 passive low-e glass • <i>Oceans of Color</i>[™] (<i>Atlantica</i>[™], <i>Azuria</i>[™], <i>Solexia</i>[™], <i>Pacifica</i>[™] and <i>Caribia</i>[®] glasses) and Earth & Sky (<i>Solarbronze</i>[®], <i>Solargray</i>[®], <i>Graylite</i>[®], <i>Optigray</i>[®] 23, <i>Optiblue</i>[®] and <i>Solarblue</i>[™]) tinted performance glasses • <i>Solarcool</i>[®] and <i>Vistacool</i>[®] reflective glasses • <i>Starphire</i>[®] ultra-clear, low-iron glass <p>A glass' ability to balance light and heat is quantified by its Light to Solar Gain (LSG) ratio. Any glass that achieves an LSG ratio greater than 1.25 is considered by the U.S. Department of Energy (DOE) to be <i>spectrally selective</i>. This designation is especially significant because the DOE, following a study by the Lawrence Berkeley National Laboratories (LBNL), now recommends that all commercial buildings in the U.S. be glazed with <i>spectrally selective</i> glass.</p> <p>Many architectural glasses from PPG, including products from <i>Oceans of Color</i> and Earth & Sky Performance Tints can function as <i>spectrally selective</i> glass when used alone or in combination with solar control or passive low-e coatings.</p>
	<p>Materials & Resources: Recycled Content</p>	<p>Products with recycled content reduce virgin materials use and solid waste volumes.</p> <p>PPG does not report recycled content within its glass. Although PPG does recycle site-generated "cullet" in its manufacturing process, it cannot be reported as recycled content according to referenced standards and guidelines relating to environmental marketing claims such as the <i>Federal Trade Commission - Part 260 and ISO 14021: Environmental Labels and Declarations – Self-Declared Environmental Claims</i> (Type II Environmental Labeling).</p>

Architectural Glass *continued*

PPG Product Category	Sustainable Design Credit	Related PPG Product Solution
Architectural Glass <i>(continued)</i>	Materials & Resources: Regional Materials	<p>Specifying products manufactured within 500 miles of a project site supports indigenous resources and reduces the environmental and energy impacts resulting from transportation. This credit considers both the final assembly point of the product as well as the source location for each component and raw material.</p> <p>PPG operates glass manufacturing facilities throughout the U.S., potentially permitting eligibility for regional materials credit(s). PPG has raw material (sand) suppliers with extraction locations near its glass manufacturing facilities. Typically, sand, which is the majority of glass' weight, is utilized when reporting compliance.</p> <p>Due to the complexity and/or proprietary nature of raw materials sourcing and supply for specified products, PPG recommends calling one of its green building representatives to compare a project's location to PPG's glass supply chain and determine eligibility for regional material credit. PPG's green building representatives calculate distances from a project's site location to raw material extraction sites, glass manufacturing plants, glass fabrication locations and other related variables.</p> <p>Specifically for LEED-Commercial Interiors (CI) projects: The definition of "regional materials" is less demanding for <i>Commercial Interiors</i> than for other LEED platforms due to the nature of interior "fit-out" projects and fewer available materials. As a result, LEED-CI projects consider the location of a product's final fabrication to the project site. PPG maintains a network of certified glass fabricators that regionally supply finished products to meet design specifications and construction schedules (www.ppgcfp.com). Also, please see the map of PPG manufacturing facilities (page 7) to determine potential eligibility for this credit.</p>
	Indoor Environmental Quality: Daylight & Views	<p>Daylighting is the controlled admission of natural light into a space to reduce or eliminate electric lighting and lower energy use. Natural daylight also increases occupants' productivity and reduces absenteeism and illness.</p> <p>If side-lighting the daylight zone, the transmission of visible light (VLT) is an important factor when determining luminance levels for occupied spaces. PPG architectural glasses exhibit high degrees of light transmission as well as excellent solar control, which permits flexibility in daylight and view design.</p> <p>Access to outside views provides occupant benefits equal to daylighting. Important considerations for vision glass include window size, spacing and glass selection, among others.</p>
	Innovation in Design	<p>As architects, builders and contractors introduce new strategies for sustainable development, opportunities for additional building-related environmental benefits continue to emerge.</p> <p>Products that are <i>Cradle to Cradle Certified</i> (C2C) by MBDC are eligible for potential LEED <i>Innovation in Design</i> credit. All PPG architectural glass products are C2C-certified at the Silver level. The certification encompasses all PPG glass substrates, including reflective glass, <i>Oceans of Color</i> and Earth & Sky tinted glasses, clear and low-iron glasses, as well as <i>Solarban</i> solar control, low-e coated glasses and <i>Sungate 500</i> passive low-e coated glass. For a complete list of C2C-certified products and USGBC LEED criteria, visit http://www.c2ccertified.com/.</p>

Exterior Metal Coatings (Coil & Extrusion)

PPG Product Category	Sustainable Design Credit	Related PPG Product Solution
<p>Exterior Metal Coatings (Coil & Extrusion)</p> <p>Master Format (typical)</p> <p>05 05 13 07 41 13 07 42 13 07 61 00 07 62 00 07 71 00 07 72 00 13 34 19</p>	<p>Sustainable Sites: Heat Island Effect</p>	<p>Dark, non-reflective surfaces absorb incoming solar radiation and increase ambient temperatures by heating surrounding areas, including buildings, which results in greater energy use for cooling.</p> <p>To combat heated microclimates, PPG manufactures coatings that combine the heat-reflective benefits of proprietary infrared-blocking technology with a wide spectrum of colors. Cool metal coating products include:</p> <ul style="list-style-type: none"> • <i>Durana</i>[®] <i>ULTRA-Cool</i>[®] (PVDF resin) • <i>Durana</i> <i>Sunstorm</i>[™] <i>ULTRA-Cool</i> (PVDF resin w/ mica flake) • <i>Super</i>[®] II <i>ULTRA-Cool</i> (SMP resin) <p><i>Durana</i> and <i>Super</i> II <i>ULTRA-Cool</i> coatings for roof and side wall metal assemblies are most applicable for this green building practice. <i>ULTRA-Cool</i> coatings contain IR-reflective pigments that reject solar energy and reduce surface temperatures in a palette of climate-appropriate colors. These coatings may be used for non-roof architectural devices or structures, under-cover parking and metal roofs requiring Solar Reflectance Index (SRI) levels of 78 for low-slope or 29 for steep-slope roofs. <i>ULTRA-Cool</i> coatings also meet <i>ENERGY STAR</i> reflectance levels.</p> <p><i>Durana</i> and <i>Super</i> II <i>ULTRA-Cool</i> coatings have more than 150 colors registered with <i>ENERGY STAR</i> and the Cool Roof Rating Council (CRRC). In addition to reducing the heat island effect when applied to exterior metal, <i>ULTRA-Cool</i> coatings can extend roof or side panel life expectancy by minimizing expansion and contraction of materials caused by fluctuating temperatures.</p>
	<p>Energy & Atmosphere: Optimizing Energy Performance</p>	<p>Energy consumption can be minimized through the use of climate-appropriate roof coatings that result in reduced operational costs. Roof reflectance is an energy model input when comparing proposed to baseline building designs. Solar-reflective <i>ULTRA-Cool</i> technology allows flexibility when selecting color aesthetics and energy performance for exterior metal surfaces. Even darker colors utilizing <i>ULTRA-Cool</i> technology can produce improved energy performance.</p> <p>The environmental benefits of cool roofs are well established. Research from the Oak Ridge and Lawrence Berkeley national laboratories can be found at the following websites: http://eetd.lbl.gov/Heatisland/CoolRoofs/ and http://www.ornl.gov/sci/roofs%2Bwalls/</p>
	<p>(credit interpretation)</p> <p>Indoor Environmental Quality: Low-Emitting Material</p>	<p>Note: This section refers to factory-applied coatings on metal (i.e., extrusions) that may be used within a building's interior or as part of the weatherproofing membrane.</p> <p>LEED neither rewards nor penalizes the use of factory-applied interior coatings. These products are not subject to indoor air low-emitting material criteria because it is assumed that the VOC content has been cured and emitted prior to arriving on-site. However, if during installation, damage occurs to factory-coated metal and field touch-up is required, the VOC content of the touch-up paint should be reported. This is especially important if the general contractor has a management plan for monitoring indoor air quality (IAQ) during construction. Depending on the amount of touch-up needed, it may be necessary to quantify the surface area and submit VOC budgeting for the low-emitting materials credit.</p>

Regional Sourcing Resources

Manufacturing Locations



- **Glass**
- Carlisle, PA
- Mt. Zion, IL
- Wichita Falls, TX
- Fresno, CA
- * Salem, OR (coating facility only)

- ★ **Coatings**
- Springdale, PA - All products
- East Point, GA - Workcells, Duranar, Polycron, Duracron
- Janesville, WI - Workcell, Polyesters
- Mojave, CA - Workcell, Duranar
- Grenada, MS - Workcell, Polyesters
- Delaware, OH - Workcell, Polyesters

- ▲ **Paint**
- Batavia, IL
- Dover, DE
- East Point, GA
- Houston, TX
- Louisville, KY
- Reno, NV

Regional Sourcing Resources

PPG promotes regional materials sourcing through a certified network of fabricators (insulated glass units), extrusion and coil applicators (liquid and powder applied coatings) and retail stores (paint). For information resources in your area, visit www.ppgideascales.com or call 1-888-PPG-IDEA (774-4332).

Green Certification Support

PPG is eager to help architects, building owners and contractors earn green certification for their projects, and to help them more effectively manage their buildings environmental, health and safety performance. Additional resources, including the following items, are available by visiting www.ppgideascales.com/greenbuilding:

Paint

- A sample spreadsheet to assist with VOC budget calculations
- A comprehensive, downloadable guide of VOC-compliant **PPG Pittsburgh Paints and Specifications for Section 9900, Interior Paint Schedule**
- CHPS-compliant paint products
- Paint container recycling program

Glass

- Link to architectural glass Cradle-to-Cradle (C2C) certified product list

Coatings

- SRI calculations for metal roof coatings
- Links to **ULTRA-Cool** product listings on Energy Star and Cool Roof Rating Council (CRRC) web sites

General

- Access to LEED-AP support for regional material contributions and LEED documentation
- Links to various “green” product directories
- National network of glass fabricators, coating applicators, metal panel manufacturers and paint stores



1.888.PPG.IDEA (774-4332)
www.ppgideascales.com



© 2009 PPG Industries, Inc. Pitt-Tech, Pittsburgh Paints, Porter Paints, Pure Performance, and Speedhide are registered trademarks of PPG Architectural Coatings, Inc. Atlantica, Azuria, Duranar, Oceans of Color, Pacifica, Solarban, Solarblue, Solexia, Sungate, Sunstorm, Superl, ULTRA-Cool, VARI-Cool, PPG and the PPG logo are trademarks owned by PPG Industries. EcoLogical Building Solutions, PPG Certified Fabricator, PPG Certified Applicator and PPG Certified Metal Panel Program are service marks owned by PPG Industries. Cradle to Cradle^{CM} is a certification mark of MBDC.

CMT100/10-09