

MetroPaint™ and Green Building



Here in the Pacific Northwest more and more builders are turning to “green” building practices. Green Building focuses on a variety of ways to make construction and operation of commercial and residential buildings more environmentally sound and sustainable. Metro’s 100% recycled latex paint is an excellent choice for many green building projects, whether new construction, renovation, or maintenance, on housing, commercial, and industrial buildings.

This information sheet addresses MetroPaint’s performance on several environmental fronts:

- VOCs- Volatile Organic Compounds
- LEED and other green building certification systems
- Lifecycle benefits

Green building: *the practice of increasing the efficiency with which buildings and their sites use and harvest energy, water and materials, and reducing building impacts on human health and the environment, through better siting, design, construction, operation, maintenance, and removal — the complete building life cycle. (Wikipedia)*

VOCS – VOLATILE ORGANIC COMPOUNDS

Many green builders are concerned with the VOC content of the paint they use, as they are an important consideration for both environmental and human health impacts

What are VOCs? VOCs are a class of carbon-based chemicals that have the capacity to evaporate readily at room temperature. They can degrade air quality both in buildings and in the atmosphere, they may produce odors, and they contribute to smog. The health effects of different VOCs vary considerably. There are four VOC compounds that are widely used in the production of latex paint: ethylene glycol, propylene glycol, texanol, and butyl carbitol. All are considered low toxicity, though they can cause nose and throat irritation and other discomfort at high concentrations

What are EPA limits on VOCs in paints? The US Environmental Protection Agency air quality regulations (40CFR59.400 et. seq.) limit the VOC content of paint. These limits are intended to protect the environment by reducing the creation of photochemical smog in the atmosphere. For the class of paints that includes MetroPaint, the VOC content is limited to 250 grams per liter.

What is the VOC content of MetroPaint? In 2008 we tested batches of every color our paint for VOCs. The VOC content averaged **117 grams per liter**, and no batch was over 159 grams per liter, well under the EPA limit.

What are “Low VOC” paints? Some manufactures have developed latex paint products that are lower in VOCs. However there is no regulatory definition of Low VOC, so the VOC content of paints labeled as Low VOC can vary. Some are simply in compliance with EPA regulations. Others may be significantly lower, some are even close to zero and may be labeled as “No VOC” or “Zero VOC”. Green Seal, an international standards-setting organization for environmentally preferable products, has established VOC limits for virgin paints (www.greenseal.org). For interior paint their limits are 50 grams/liter for flat paints, 150 grams/liter for non-flat, for exterior the Green Seal limit is 100 grams/liter for flat, 200 grams/liter for non-flat.

When are Low VOC Paints a good choice? When a building interior is to be painted and there are concerns about indoor air quality, particularly with individuals that are sensitive to odors or chemicals that may be exposed during the first few days after painting. The most significant concentration of VOC vapors occurs within 100 hours after painting ¹.

When is MetroPaint a good choice for the environment? MetroPaint’s modest VOC content is appropriate for exterior applications and interior applications other than those with indoor air quality concerns. But VOCs are not the only environmental consideration- there are a number of other environmental benefits provided by recycled paint (see the section on Lifecycle below).

ADDITIONAL NOTES ABOUT VOCs:

- The VOC levels in EPA’s regulations and Green Seal’s virgin paint standards are intended to apply to paint before it is tinted at the point of sale. Colorants added at the point of sale contain VOCs as carriers. Darker colors in particular can have a lot of colorant added, and thus add a lot of VOCs. Recycled paint is at a disadvantage here, as post-consumer paint contains these colorants. Tinting can add as much as 80 grams/liter to the VOC content, so the VOC content of MetroPaint would be somewhat lower if it could be calculated the same way

¹ An EPA study concludes that the rate of off-gassing of the four main VOC compounds found in latex paint can vary considerably depending on the substrate. For non-porous surfaces such as stainless steel, nearly all of the VOCs are emitted within the first 100 hours after painting. In contrast, freshly painted porous surfaces, such as wood or sheetrock, release a relatively small amount of the VOCs in the initial “puff”, emitting the remaining VOCs at very low levels over time, possibly as long as 3.5 years.

However, the study found that even on porous surfaces the ethylene glycol vapors dropped to under 1 mg/m³ by 100 hours, and down to about 0.1 mg/m³ for most of the long off-gassing process. For comparison, OSHA allows occupational exposures of ethylene glycol up to 100 mg/m³. The other three VOCs were found in even smaller amounts after 100 hours, close to the lower limit of the test method’s ability to detect.

Reference: Chang, John C.S., “Capstone Report on the Development of a Standard Test Method for VOC Emissions from Interior Latex and Alkyd Paints.” US EPA 2001. EPA/600/R-01/093

- Under EPA's air quality regulations latex paint recycling is encouraged, and recyclers are allowed to use an "adjusted VOC content" calculation, taking into account the percentage of paint that is recycled from post-consumer sources. If MetroPaint used this calculation, our adjusted VOC content would be between 0 and 68 grams/liter.
- Green Seal recently published a standard for recycled paints, including the requirement that the VOC content of recycled paints be under 250 grams/liter. MetroPaint complies with this limit.
- EPA's VOC regulations are targeted at atmospheric pollution, and not all harmful chemicals are included in their definition of VOCs, so a paint that is labeled as Low or No VOC may still emit some vapors that are harmful to human health. A 2001 EPA study found that "... certain paints marketed as low-VOC may still emit significant quantities of air pollutants" (see reference in footnote 1 on previous page). In some cases the overall quantity of VOCs was quite low, but significant amounts of specific compounds were nevertheless emitted.
- The VOCs in recycled paint have already been manufactured and will enter the environment one way or the other, and when it is used instead of virgin paint recycled paint reduces the need to manufacture new VOCs.

LEED AND OTHER CERTIFICATIONS

LEED, or Leadership in Energy and Environmental Design, is a benchmarking system developed by the US Green Building Council (www.usgbc.org) to certify high performance green buildings. Building projects accumulate points toward certification in a variety of different categories. In commercial buildings the use of MetroPaint can help garner points for LEED certification in a couple of ways:

- Under the Recycled Content credits (MR4.1/4.2), use of recycled paint, and especially 100% recycled paint, can help qualify for credits.
- Under the Regional Materials credits (MR5.1/5.2), use of paint that is manufactured regionally helps gain credits. This is defined as within 500 miles, which includes much of the Pacific Northwest for Metro's Portland-based plant.

In the recently-released LEED for Homes, credit is specifically awarded for use of recycled paint that is certified by Green Seal™. MetroPaint is the first paint recycler in the world to offer Green Seal certified recycled paint.

There are other green building certification systems, such as the guidelines developed by the National Association of Home Builders (NAHB) for residential construction (www.nahb.org), and the Green Globes Standards (www.greenglobes.com). These guidelines are similar to LEED in that points are available for both recycled content building materials and regionally-manufactured materials.

LIFECYCLE BENEFITS

For years environmental advocates have been promoting recycling of various household commodities, such as newspaper, glass, aluminum, etc. The environmental benefits of recycling these materials are that less energy, water and raw materials are used, less pollution is generated, and less landfill space is used. Because less energy is used less greenhouse gases are emitted, and global warming is reduced. All of these benefits hold true for paint as well.

Production of new paint uses resources and generates pollution during the extraction of raw materials, the manufacturing process, and transportation of final products. Every time a gallon of MetroPaint is used instead of a gallon of new paint, a number of benefits are obtained:

- **An estimated 100 kilowatt-hours (kWh) of energy is saved.** Recycling paint actually saves more energy per pound than other construction materials, such as steel, glass, and lumber. 100 kWh is enough energy to power a refrigerator for two months or a clock for two years. Because of the energy savings, an estimated 115 pounds of carbon dioxide emissions are reduced when recycled paint is used instead of new.
- **Various types of pollution are not generated.** A significant percentage of the ingredients in latex paint are derived from petrochemicals, the extraction of which results in various environmental impacts, notably air emissions and waste discharges to surface waters. The extraction of titanium dioxide, another important latex paint ingredient, results in the production of significant quantities of sulfuric acid, metal sulfates, and metal chlorides, wastes which are commonly disposed of in the ocean, or via deep well injection
- **Less water and raw materials are used.** Quantitative information on the relative amounts of water and raw materials utilized in the course of paint recycling vs. virgin paint manufacture are not currently available, but it is clear that ingredient extraction, the manufacturing process, and transportation of virgin paint require substantial raw materials and water, while the relatively simple recycling process uses significantly less.
- **Landfill space is conserved.** At the MetroPaint facility over 500,000 containers of paint are opened each year. Paint that is recyclable is made into our recycled product, and steel and plastic paint cans and pails are sent to recyclers. This keeps about 500 tons of paint and about 250 tons of containers out of the landfill each year.

THE BOTTOM LINE

MetroPaint 100% recycled latex paint provides a number of environmental benefits, has a very modest VOC content, and can help green building projects get certified. The environmental benefits are substantial enough that the independent environmental certifying organization Green Seal has certified MetroPaint. For all these reasons MetroPaint deserves a prominent place in the green builder's toolkit.

For more information on Metro's 100% Recycled Paint, see www.metropaint.info, or call 503/234-3000 funds for other green building considerations. It deserves a prominent place in the green builder's toolkit.

For more information on Metro's 100% Recycled Paint, see www.Metro-region.org/paint, or call (503) 234-3000.