



Low- & No-VOC Paints

Introduction

Paints can have a dramatic impact on the overall aesthetics of a space; sometimes more than even flooring and furnishings, because of the enormous square footage of coverage.

Paints may also have a major negative impact on the indoor air quality of a building, because they may contain chemicals called Volatile Organic Compounds (VOCs) and other toxic components that evaporate into the air and are harmful to the health of the painters, the occupants and the environment. VOCs are a primary contributor to smog and ozone alerts.

Paint is applied wet and must undergo a drying process, and sometimes a chemical reaction, in order to form a solid paint film on the wall or other surface. It is during this drying or chemical process that VOCs and other paint components are released. Many paints contain a high percentage of VOCs so they will dry faster. Paints also continue to offgas somewhat for many days, weeks, and months after application and especially each time the temperature and humidity in the room rise.

Green Building Benefits

Health Benefits

Research conducted by the Environmental Protection Agency (EPA) shows that exposure to paints containing VOCs has serious implications for your health. Health problems that can arise from short-term exposure to VOC-based paints include eye and respiratory tract irritation, headaches, dizziness, visual disorders, or memory impairment. Long-term exposure to VOC-based paints can result in respiratory diseases and life threatening cancer.

Certain people are particularly susceptible including those with weakened immune systems or chemical sensitivities, asthmatics, young children and the elderly. Since low- or no-VOC paints have a lesser impact on air quality, they are excellent for use in buildings where it is desirable to have very low levels of toxicity, such as hospitals, schools, or the homes and workplaces of those who are chemically sensitive.

It is best to use, especially for those with extreme chemical sensitivities, no-VOC, least toxic paints with no mildewcides and fungicides such as milk-paint, or plant-based paint. Milk paint has no lead, no chemical preservatives, no fungicides and contains no hydrocarbons or any other petroleum derivatives. Plant-based paints are made from natural ingredients, not from petro-chemicals. These least-toxic products do not harm our natural environment during manufacture, use, or disposal.

Environmental Benefits

Low- or no-VOC paints help reduce ozone depleting contaminants, thus protecting the environment and its citizens. VOC content doesn't tell the whole story, however. Since EPA's regulations are based upon ozone reduction, toxic chemicals that do not form ozone are excluded from the required VOC calculations. Material Safety Data Sheets (MSDS) list hazardous ingredients and can be obtained by calling paint manufacturers or checking their websites. Be aware that additions of pigments and additives, such as biocides, also affect the relative toxicity of the final paint mix.

It is important to note that every major paint manufacturer produces paints meeting low-VOC (and most produce a no-VOC product) and environmentally preferable standards, and these paints are available from numerous distributors.

Recommended VOC Levels

Interior Paints	VOC content (grams/liter)
Non-flat paint	0 – 150
Flat paint	0 – 50
Exterior Paints	VOC content (grams/liter)
Non-flat paint	0 – 200
Flat paint	0 – 100

Affordability

Costs of low-VOC paints are comparable to mid-quality conventional paints. Prices for no-VOC paints are comparable to mid and upper quality conventional paints.

As an example of costs, a U.S. Army project proved that using low-VOC paint can yield significant

economic benefits. The Department of Defense’s pilot project at the Aberdeen Proving Grounds (APG) found that low-VOC paints were, on average, less expensive (\$1.76 per gallon) than other paints from the same manufacturers. In addition, since the APG’s paints were low in VOCs, the excess paint did not need to be classified as hazardous waste (as high-VOC paints must be) and APG realized additional savings in disposal costs.

Green vs. Conventional

Low- & No-VOC Paints	Conventional Paints
Cleaner air – reduced ozone depletion	Contribute to environmental pollution and ozone depletion
Minimal health risks	Significant health risks
Durability: same	Durability: same
Material cost: same as mid-quality paint	Material cost: comparable
Labor cost: same	Labor cost: same
O&M cost: same	O&M cost: same

Installation

There are no differences in application techniques for low- and no-VOC paints. However, first consider using materials and systems that need minimal finishing or none at all, like ceramic tile or natural plasters. Sometimes simply washing walls and/or using a little touch up paint can make them like new. When it is necessary to paint, favor low- or no-VOC products, and water-based paints over oil; this will also eliminate the need for toxic solvents for cleanup.

Do not be swayed by rumors that low- or no-VOC paints are inferior to conventional high-VOC paints. The very first generation of no-VOC paints were somewhat inferior, but we are now into the third and fourth generation of those products and many paint experts say these paints are far superior to high-VOC paints, because there has been extra attention and improvement put into the chemistries of these paints, while the chemistries of the conventional paints have stayed with older formulations.

Always use quality paint. Generally, you get what you pay in paints. Proper preparation is also critical for a durable and attractive paint application. All surfaces must be clean and dust free, with any visible cracking, peeling, or blistering removed. If there is old paint, determine what it is and appropriately prepare for the next coat. If it is lead-based paint,

follow known rules of careful handling. Be sure to choose primers and top coats that are compatible.

Apply paint when occupants are not present and always ventilate, even with water-based paints. Minimize the presence of soft materials (like fabrics, pillows, etc.) during and just after painting. If present, they will “absorb” some of the VOCs from the paints and release them into the air later.

Operation and Maintenance

Choose colors with versatility in mind and remember that a more durable paint is less expensive in the long run. Ten-year paint may cost a little more than a five-year, but there is only a one-time labor cost, which is the most expensive part of most paint jobs.

Safe Handling and Disposal

Always read and follow manufacturer’s instructions for safe handling of paints during application, storage, and disposal. Depending on the paint, removal or application method, you may need to use respirators, eye protection, masks, and face or body protection. When remodeling, be aware of potential lead-based paint hazards and use the appropriate handling and disposal methods.

Finally, be sure to store or dispose of any leftover paint in a responsible manner. Minimize leftovers by ordering only what you need. Ask the manufacturer if they have a “take back” policy. Tightly seal partial containers and store the minimum necessary in a cool and dry place, ventilated to the outside. Unused paint can be donated to a resale store, a favorite non-profit or school, or a paint recycling program.

Bay Area Suppliers

Low-VOC paints are available from every retail outlet that sells paint. No-VOC paints are available from almost every retail outlet that sells paint, as almost every major paint manufacturer produces a no-VOC paint product. Retailers will usually carry one to three different manufacturers’ no-VOC products such as the manufacturers listed below:

- Search the **Materials Database** from Bay Area Build It Green to find local suppliers and services: www.build-green.org
- **AFM Safecoat** “Flat Zero VOC” (www.afmsafecoat.com)
- **Benjamin-Moore** “Pristine Eco-Spec” (www.benjaminmoore.com)

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- **Bioshield** natural paints (www.bioshieldpaint.com)
 - **Devoe Paints** “Wonder Pure” (www.devoe.com)
 - **ICI/Dulux/Glidden** “Lifemaster 2000” (www.iciduluxpaints.com)
 - **Kelly-Moore** “Enviro-Kote” (www.kellymoore.com)
 - **Miller Paint** “Acro” and “Super-Acro” (www.millerpaint.com)
 - **Pittsburgh Paints** “Pure Performance” (www.pittsburghpaints.com)
 - **Sherwin-Williams** “Harmony” (www.sherwin-williams.com)

For More Information

- For more information about Green Building, visit our website at: www.greenaffordablehousing.org or call Bruce Mast at 510-271-4785.

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