How to Select Less-Toxic, Low-VOC Paints, Primers, Stains, and Coatings

Many conventional paints, primers, stains, and other types of surface coatings contain and emit volatile organic compounds (VOCs), which contribute to smog and can also "offgas" indoors and contribute to indoor air pollution. Healthier, low-VOC options are now widely available. According to the EPA, VOCs can cause respiratory problems, and some VOCs are known carcinogens. Problematic VOCs that are commonly found in conventional paints include formaldehyde, aldehydes, benzene, toluene, styrene, xylene, and dibutyl and biethyl phthalate, among others.

Latex paint, which is water-based, typically emits fewer VOCs than oil-based (e.g., enamel/alkyd) paint, which has petrochemical solvents. Additionally, latex painting materials can be cleaned off with soap and water, whereas most oil-based paints must be cleaned off with toxic, high-VOC solvents. Use oil-based paints only where necessary (for high-use or high-moisture areas that require a highly durable, glossy finish) and when purchasing an oil-based paint, look for the lowest-VOC product available that will do the job.

When selecting a latex paint, look for "low-VOC" or even "zero-VOC" paints and primers. (These usually have the added benefit of being low-odor, as well, as most of a paint's odor comes from its VOCs.) Almost every major paint manufacturer now has a low-VOC or zero-VOC product line. Your paint store should have at least one low-VOC paint line in stock; if not, they should be able to order it. Most low-VOC paints are interior paints, but a few low-VOC exterior paints are also available. Many low-VOC paints are in the same price range as their conventional counterparts.

Voluntary standards for low-VOC, low-toxic paints have been established. The non-profit certification organization **Green Seal** originally set VOC limits in 1993. In 2010, they updated the VOC limits in their paint standard (GS-11) to the following:

Paint/coating type	**VOC concentration limit for base paint (excluding water and tinting added at point of sale)**	**VOC concentration limit for final mixed product (including colorant added at point of sale)**
Flat	50 g/L	100 g/L
Non-flat (e.g., gloss, eggshell, satin, semi-gloss)	100 g/L	150 g/L
Primer or undercoat	100 g/L	150 g/L
Reflective wall	50 g/L	100 g/L
Reflective roof	100 g/L	150 g/L
Floor	100 g/L	150 g/L

White or light pastel-colored paints tend to contain fewer VOCs than paints with darker/richer pigments. (Rich pigments are also more likely to contain heavy metals.) In addition to setting VOC limits, Green Seal's paint standard also prohibits the use of **heavy metals and other ingredients of concern**, such as phthalates. (For the complete list of prohibited compounds, see the Green Seal GS-11 standard: www.greenseal.org/GreenBusiness/Standards.aspx.)

If a paint's VOC content is not reported on its label, you can find the VOC content by requesting the Materials Safety Data Sheet (**MSDS**) from the manufacturer or paint store, or finding it online; these sheets can often be downloaded from paint companies' websites.

As of mid-2011, **paints that have been certified by Green Seal** included: YOLO Colorhouse paints (all interior and exterior paints and primers); Master Paints' EcoPure interior and exterior paints and primer); Miller Paints' Acro Pure interior paints and primer. This is a partial list of certified paints. To see a complete and current list of paints that have been certified by Green Seal, visit:
www.greenseal.org/findaproduct/paints_coatings.cfm

Low-VOC and low-emissions paints are also certified by Scientific Certification Systems (SCS) and GreenGuard. As of mid-2011, **paints certified by SCS' Indoor Advantage Gold** program included: AFM Safecoat paints and finishes; and Kelly Moore's Enviro Coat, Acry Plex, and Green Coat paints. **Paints certified by GreenGuard's Children and Schools** certification program included: Sherwin-Williams' Harmony interior paints and primer, Pro Industrial zero-VOC paints, ProGreen200 low-VOC interior paints and primer, ProMar 200 zero-VOC interior paints, and Brilliance high-performance ceiling paint; Benjamin Moore's Aura interior paints; Devoe/Akzo Nobel's Wonder-Pure interior paints and primer; PPG's Pure Performance interior paints and primer; Glidden/Akzo Nobel's Spred interior paints; and Glidden Professional Lifemaster paints and primer. These are partial lists only; follow these links for complete and current listings of paints certified by SCS Indoor Advantage and GreenGuard:
www.scscertified.com/products/
www.greenguard.org/en/QuickSearch.aspx

Unfortunately, synthetic paints (even the low- and zero-VOC options) often contain other toxic compounds, such as phthalates (which are endocrine-disrupting chemicals), certain heavy metals, propylene glycol and glycol ethers (PGEs), and toxic biocides or fungicides. (Green Seal's certification standard prohibits the use of some of those compounds.) See the first Pharos link, in the Resources box at the end of this overview, for additional information on paint toxicity.

"Natural" paints are less likely to contain toxic ingredients. Natural paints and coatings are derived from plant and mineral materials, such as lime, clay, sand, earth pigments, or milk protein, and pine-, soy-, linseed-, or citrus-oils. Some natural paints, particularly the lime plaster paints, tend to create a textured "old world" or "wash" look. While most natural paints do contain some types of VOCs, their health effects are often less problematic than those of compounds released from petrochemical-based paints.

Recycled paint is another option. Several major manufacturers now sell recycled latex paint, and they do testing to ensure that those paints will perform as well as non-recycled paint. Green Seal also has a standard (GS-43) for certifying recycled paints.

It is best to purchase high-quality, durable paints (latex paints with 100% acrylic resin tend to be very durable), to prevent the need for frequent repainting.

Other Types of Coatings and Finishes

In addition to high levels of VOCs, many high-performance coatings contain significant amounts of other toxic chemicals. For example, two-part epoxy resin coatings are often made with bisphenol A (BPA, which is linked to reproductive and hormone problems) and epichlorohydrin (a carcinogen and reproductive toxicant). Other coatings sometimes contain nonyl phenol, which is a persistent bioaccumulative toxicant. Try to avoid products that contains those chemicals, and also look for low-VOC products.

Metal Coatings: When you need to purchase an anti-corrosive paint to apply to interior metal items, look for paints that do not exceed the specific VOC limits set by Green Seal for **anti-corrosive paints** (GS-03, 1997):

250 g/L (for the base paint, excluding water and tints), or
300 g/L (for the product at point-of-sale, with colorant added).

Wood (and Other) Coatings: When purchasing wood stains, lacquers, shellacs, varnishes, waxes, clear finishes, and sealers, look for low-VOC, water-based, solvent-free products with natural oils or biodegradable ingredients. Water-borne polyurethane clear finishes are generally a less toxic alternative to solvent-based finishes. Look at the product's label to see if it meets California's **South Coast Air Quality Management District (SCAQMD)** Coatings Rule #1113, or **Green Seal's standard** for stains and finishes (GS-47).

The VOC limits set by **Green Seal** in 2009 (and still current as of mid-2011) are as follows:

Coating type	**VOC content limit (in g/L)**
Stain	250
Sealer	200
Waterproof sealer	250
Low-solids coating	120
Finishes:	
Varnish	350
Conjugated oil varnish	450
Lacquer	550
Clear brushing lacquer	680
Shellac (pigmented)	550
Shellac (clear)	730

PAINTING PROCEDURES

Ventilation

Regardless of which paint products you use, it is always a good idea to keep some windows open while painting a room, to keep it well ventilated and to speed up the drying process. However, you may want to close the door to the room to keep fumes from entering other parts of the residence/building. It is also best to remove absorptive materials (such as upholstered furniture and rugs) from the room before painting. After painting, give the room a few days to air out before refurnishing and occupying it, if possible.

Cleanup

Never dump paint or wastewater from cleaning tools and brushes into street/storm drains, which flow directly to natural water bodies. Paint wastewater should go into the sewer system to be treated. Clean your brushes and tools in a bucket, and then dump the wastewater into your toilet, utility sink, or other known sewer drain.

Disposal

If you have extra paint left over, beyond what you need for future touch-ups, you may be able to have it recycled. Some hardware stores, paint stores, and hazardous waste facilities will collect leftover latex paint for recycling or proper disposal. Oil-based paint cans must be taken to a hazardous waste facility for proper disposal.

Resources for more information on low-toxic paints:

Pharos Project articles: "Beyond VOC Content"
www.pharosproject.net/index/blog/mode/detail/record/67/healthy-paint-beyond-voc
"Sorting Out the VOCs"
www.pharosproject.net/index/blog/mode/detail/record/32/Sorting-out-vocs

GreenHomeGuide.com Green Paints and Coatings Know-How
www.greenhomeguide.com/know-how/topic/14

Low-VOC and Zero-VOC Wall Paints (a product listing)
www.mlandman.com/gbuildinginfo/lowvocpaints.shtml

Green Seal certification
www.greenseal.org

SCS Indoor Advantage Gold certification
www.scscertified.com

GreenGuard certification
www.greenguard.org