

Architectural Paints and Coatings

[MODEL SPECIFICATIONS »](#)

Product Subcategories Covered

- Architectural paints and primers
- Paint thinners
- Stains, varnishes and sealers
- Specialty paints
- Paint strippers

Issues and Impacts

Diversity of paints and coatings. There are many, many kinds of paints and coatings. The most familiar are architectural paints, which can be broadly separated into oil-based and water-based. While oil-based paints are somewhat more durable for certain applications, water-based paints are safer, easier to use and have much lower levels of VOCs. There are many architectural paints certified under the recommended certifications (below), which makes specification of safer products easier for purchasers. For specialty paints and high-performance industrial coatings – such as epoxy coatings, powder coatings, traffic paints and others – some certified products are available, but consultation with end users is essential.

Chemicals of Concern

Solvents: A variety of solvents are used in paint products, including toluene, xylene, methyl isobutyl ketone, and glycol ethers. Some of these solvents can cause cancer, and many have effects on the central nervous system, liver and kidneys. Most of these chemicals are considered volatile organic compounds (VOCs), so purchasing low- or no-VOC paints will reduce – but not eliminate – the hazards.

PFAS: Per- and poly-fluoroalkyl substances (PFAS) is a family of chemicals representing thousands of compounds. Some are very persistent in the environment and are linked to health impacts in women's reproduction and child development, hormone effects, and increased risk of cancer. PFAS may be added to paints to improve flow, spread, and glossiness, and to decrease bubbling and peeling. They are also used in specialty paints to give stain-resistant, graffiti-proof, and water-repellent properties.

Alkylphenol ethoxylates (APEs) are surfactants found in some paints. APEs break down into alkylphenols, with the most common being nonylphenol and octylphenol. Alkylphenols and



Volatile organic compounds (VOCs), which escape from paint formulations as they cure, present the most well-known health issues associated with paints. Buying no- or low-VOC paint is a big step towards reducing hazards, however, many other additives and adjunct products also impact human health and the environment.

Recycled paints allow the reuse of excess paint products, save money, and reduce the need for hazardous waste disposal. However, by nature they contain higher VOCs and more hazardous ingredients, which will vary widely by batch.

some APEs are known hormone disruptors with reproductive and developmental effects, and are highly toxic to aquatic animals. The US EPA has initiated a voluntary phase-out of nonylphenol ethoxylates in detergents.

Heavy metals, including antimony and chromium, are sometimes found in paint pigments. Heavy metal exposures are associated with numerous health issues, including damage to the functioning of the brain, lungs, kidney, liver, blood composition and other important organs. Heavy metals are also persistent and accumulate in the environment.

Methylene chloride is a carcinogen and developmental toxicant, and can damage the liver and kidneys. It is also highly toxic in short-term exposures, and has resulted in the deaths of painters, leading the US EPA to ban its use in consumer (but not professional) products. Its primary use is in paint strippers.

N-methylpyrrolidone (NMP) is another chemical used in paint strippers. Although less acutely toxic than methylene chloride, it is still a developmental toxicant that is corrosive to the skin and eyes.

Phthalates are plasticizers added to increase the paint's flexibility. When the paint dries, phthalates can enter the air or stick to dust particles. One type of phthalate used in paint, dibutyl phthalate, or DBP, has developmental effects and causes hormone disruption in animal studies.

Antimicrobials: Antimicrobial chemicals are often added to paints and promoted as protecting human health, however, these benefits are not supported by research. To date, the [EPA](#) has not approved any public health claims by manufacturers of antimicrobial paints. Antimicrobials may have adverse effects on beneficial

microorganisms and other living things. For example, **quaternary ammonium compounds** (quats) are associated with asthma, reproductive and developmental effects, and impacts on aquatic life, and **nano-silver** is toxic to aquatic life. Some antimicrobials are associated with promoting antibiotic resistant germs - a long-term human health threat.

Preservatives are used to extend the shelf life of the product, and there are many compounds used for this purpose, some of them antimicrobials. Although present in very small quantities, some preservatives can release formaldehyde, a known carcinogen.

SPLC Recommendations

Consult your painters regarding performance issues and needs, especially for specialty or high-performance industrial products. Durability is important for environmental reasons also - it results in less frequent painting, and therefore lower impacts in the long term.

Buy certified paints using credible, multi-attribute ecolabels that address toxicity and hazardous ingredients. These include [Green Seal GS-11](#), [MPI X-Green](#), and [Greenwise Gold](#). If no certified products are available in the desired product category, check the less stringent [Greenwise](#) (not gold) and MPI GPS-2, with [MPI GPS-1](#) as the least protective alternative.

Minimize VOCs. If the above certifications are not available for a product category, buy products identified as "no-VOC" if possible, or "low-VOC" otherwise. Low/no VOC products can be identified through certification by one of the following single attribute ecolabels: [SCS Indoor Air Quality Advantage Gold Certification](#), and [UL GREENGUARD Gold](#).

Prohibit methylene chloride and NMP in paint strippers. Work with painters for find serviceable alternatives. Products containing methyl acetate or benzyl alcohol have shown some promise.

Health Product Declarations provide transparency on the health hazards of all ingredients, and push the industry in the right direction. Consider requiring [HPDs](#) for all paint purchases. Another alternative is requiring the [Declare label](#) with the third-party certification option.

Avoid products advertised as "antimicrobial", "antibacterial", "antiviral" or "anti-odor". Despite marketing claims, the benefits are not supported by science.

If purchasing recycled paints, take special care. Purchase only products certified to Green Seal GS 43 AND require that the paint has been tested for hazardous content (especially lead and other heavy metals). Recycled paint should only be used for exterior projects in non-sensitive locations, and workers should be provided with appropriate personal protective equipment.

SPLC Category Guidance

SPLC's [Sustainable Procurement Resources for Paints and Coatings](#) offer in-depth information on performance criteria, case studies, and other resources.

Resources

- [Home Free guidance](#) by the Healthy Building Network provides an easy "spectrum" of paint hazards
- [Green Seal](#) provides lists of GS-11 third-party certified products
- [Master Painters Institute](#) (MPI) provides extensive lists of MPI GPS-1, GPS-2, and XTreme Green third-party certified products
- [Greenwise](#) is a manufacturers organization that provides list of Greenwise and Greenwise Gold certified products
- [SCS Indoor Air Quality Advantage Gold](#) and [UL GREENGUARD Gold](#) are third-party certifications of low- and no-VOC products, but without limitations on ingredients
- [Health Product Declaration Collaborative](#) promotes transparency on chemical hazards in products through a third-party certified program.
- [Living Future Institute's Declare](#) label promotes transparency of product ingredients, with the option to declare the product "red-list free," (free of hazardous chemicals listed on the LFI's red list) and/or "third-party verified."