



Eco-Friendly Wood Finishes – The New Order?

Paint and coatings companies address toxic content and performance to meet green standards and remain competitive

Often criticized for being more expensive, difficult to apply and not nearly as durable, zero- and low-VOC finishes are gradually becoming mainstream. Eco-friendly paint and coatings are no longer associated with shortcomings in quality and performance. In fact, some manufacturers would argue that today many healthier paints could outperform their toxic peers.

As the use of and demand for zero- and low-VOC coatings becomes increasingly widespread, and regulations demand products that meet certain criteria, coatings companies are having to produce quality, eco-friendly, low-VOC products that release minimal pollutants making them better for people and the environment. Today, most manufacturers are complying with standards introducing their own lines of green paints and coatings.

Short for volatile organic compound, VOCs are used as a solvent to enhance paint performance and durability. Paints, stains and other architectural coatings produce about 9 percent of the volatile organic compound (VOC) emissions from consumer and commercial products, making them the second-largest source of VOC emissions after automobiles, according to the United States Environmental Protection Agency (EPA).

VOC levels are typically expressed in grams per liter or g/l. Up until 1999, the content in paints was pushing 1000

g/l but federal regulations have since set the VOC content limit in paint at 250 grams per liter.

Green Seal, the developer of environmental standards, certifies interior paints as low-VOC if the content is below 50 g/l for flat coat or 150 g/l for non-flat coat. Zero-VOC paints are paints that have a VOC content of 5 g/l or less. It recently updated its environmental standards for paint into a new GS-11, which aims to work harder to protect indoor air quality by increasing the number of prohibited chemicals, reducing allowable VOC levels for base paint and colorants, requiring a more accurate test to measure VOCs and including expanded consumer education criteria. The first edition of GS-11 prohibited 25 chemicals such as toluene, benzene and formaldehyde. But with the rapid growth of formulation technology, Green Seal wanted to expand this list to eliminate the possibility that a chemical could be used that was as harmful or potentially worse than the 25 chemicals on the list.

Types of Eco-Paints and Finishes

There are three general categories of non-toxic (or low-toxic) paints: natural paints, zero-VOC, and low-VOC.

Natural Paints and Finishes are typically made from natural raw matter, like water, plant oils and resins, clay,

chalk, talcum, bees wax and earth and mineral dyes. Natural brands include: Anna Sova; Aglaia; Auro USA; EcoDesign's BioShield; Green Planet Paints; Livos; The Real Milk Paint Company; and Weather-Bos.

Zero-VOC paints and finishes contain 5 grams VOC/litre or less – though it is important to note that these paints may still use colorants, biocides and fungicides with some VOCs. Adding a color tint can bring the VOC level up to 10 grams/liter. Common manufacturers in the zero-VOC category include: Allied PhotoChemical; American Formulating and Manufacturing (AFM) Safecoat; American Pride; Benjamin Moore Pristine EcoSpec; Best Paint Company; Devoe Wonder Pure; Ecoshield (Dunn-Edwards); Frazee Paint EnviroKote; Green Planet Paints; Homestead Paints; ICI Paints; Kelly-Moore Paints; Olympic Paint and Stain; Sampson Coatings; Sherwin Williams (Harmony); and Yolo Colorhouse.

Low VOC paints, stains and varnishes use water as a carrier instead of petroleum-based solvents, thus diminishing the levels of harmful emissions. The amount of VOCs among low-VOC products varies. Low-VOC brands include: Benjamin Moore Aura; Cloverdale Horizon and EcoLogic; Dutch Boy; Ecowise; Farrow and Ball; Fuhr Industrial; MAB Paints; Miller Paint; Pittsburgh Paints (PPG) Architectural Finishes; Southern Diversified Products (American Pride); and Vista Paint.

Eco-friendly wood finishes, specifically, boast a number of well-known brands – and that number is consistently increasing as more manufacturers develop zero- and low-VOC formulas. Perhaps the most well-known brand name in the green wood finish arena is AFM, though several North American brands have been producing low-VOC sustainable wood finishes for years, among them: Benjamin Moore Saman; CBR Products; Metaefficient Wood Stains; OS Color; Sansin Envirostains; SoyGuard (stains); Target Coatings; Timber Pro UV; Timber-Tek UV Wood Finishes; and Wood Restoration Professionals.

Products from the above manufacturers are increasingly being demanded – often for high-profile projects. Target Coatings – a Little Falls, NJ-based manufacturer and sup-

What do you need to know?

Timber Pro UV's Shari Steber says it's important that specifiers know the right questions to ask to determine how truly safe the product in question is.

She suggests visiting company Web sites and calling tech support lines will realize better answers than the ones you might get from clerks at store counters. Indeed, Steber continues, many higher-durability green and sustainable coatings can not be found on chain store shelves, but rather are sold factory direct or through specialty companies or sustainable building product stores such as Ecohaus (Seattle and Oregon), Eco Home Improvement (Berkeley), or the Green Building Center (Utah).

Below is Steber's informal checklist for determining true environmental product safety:

⊗ **What are the VOC levels of the product?**

The tag 'Low VOC' is simply not enough. Two hundred and fifty grams per litre minus water is considered low VOC, yet many companies are making finishes much lower than that. Ask the manufacturer for the actual numeric level of VOCs.

⊗ **What is the nature of the active ingredient?**

Or what is the ingredient that remains to protect the wood once the solvents and carriers have evaporated in the drying process? "One company I investigated said they used lemon oil and castor oil as their carrier (the liquid that pulls the active ingredient into the wood), and they were waving the bio-renewable resource banner," says Steber. "The active ingredient for this stain was actually a polyester resin which is not made from plant oil."

Acrylic and latex stains usually use some form of petroleum in

the making of these resins but they are very low VOC and quite durable. With the advent of nanotechnology, new resins, both oil and acrylic, are coming into the chemical world which are amazingly durable and low VOC.

⊗ **What is the clean-up material for the finish?**

Consider that if you need to clean up the finish with mineral spirits, the clean-up material must be somewhat toxic and therefore must not be dumped down the drain. You can no longer assume that if the product is water clean up it is water-based. It could very easily be oil-based water borne which is water clean up.

⊗ **How long has the product been a low-VOC finish?**

If it is less than four years, it's possible the track record is yet unproven. Seek a finish that has been around for a while and has several years of R&D behind it to produce its current level of durability and sustainability.

www.timberprocoatings.com



Timber Pro UV's enviro-safe formulas were used on Clack cabin due to their durability and clarity.



Today's eco-friendly zero- and low- VOC finishes are available in a host of different colors.

plier of ultra-low VOC, waterborne wood coatings that focuses primarily on low-VOC and HAPS-free technologies – is currently underway with a unique application of its products at the Richmond Speed Skating Oval in British Columbia. The project – being built for the 2010 Olympic Games in conjunction with Structurlam Products of Penticton, B.C. – is being coat-

ed with Target's EM9300 Polycarbonate Urethane.

The Scene Today

It's largely due to the advent and acceptance of environmental legislation that low- and zero-VOC products are increasingly being specified, say pundits. Specifically, LEED has been a main factor driving growth in the category among designer and architects. The Green Seal standard sets the guidelines for the U.S. Green Building Council's LEED (Leadership in Energy and Environmental Design) program, which uses low-VOC finishes as well as natural ventilation and daylight to improve indoor environmental quality.

"We were definitely seeing increased interest – but specifically from homeowners. Homeowners are demanding it. But LEED has had a huge impact on driving designers and architect toward specifying and sourcing eco-friendly products," says Bill Willis, President of Vancouver-based CBR Products, which produces its Broda low VOC, waterborne line of products (and distributes AFM Safecoat in Canada).

"A few contractors have bought into this as well, but overall there is still a bit of a hangover from the early days when green products did not always work as well.

Our challenge is one of education. We need to convince designers, architects and contractors that today's eco-friendly products perform as well as, or better than, traditional products," he says.

CBR Products was originally started 15 years ago because owner and former log-home builder Willis wasn't satisfied with the performance of the products available to log-home

CASE STUDY

Adventures in Eco-Friendly Coating Technology



Photo by Lorne Craig

The Squamish Adventure Centre proved to be a great testing ground for the high-performance eco-friendly coatings of CBR. In working toward a LEED standard with this project, the numerous eco-friendly features of the Broda line of products created the initial interest for the specification. But the hard-working BC-formulated Broda technology solved several issues with the construction timing as well.

To begin with, the timbers, locally milled, were green or unseasoned. Furthermore, the centre would have to be painted

builders on the West coast. The company's Broda house brand is a series of products designed to perform in the most difficult environmental conditions (see "Adventures in Eco-Friendly Coating Technology" in this section), and has been used for some of the most exclusive log homes in world-famous Whistler.

Shari Steber, Vice President, Timber Pro Coatings, which manufactures and markets a water borne plant oil-based finish that is less than 100 g/l VOCs, agrees LEED has definitely had an impact. "Architects are searching for products to deliver LEED points. LEED-rated projects often garner lower loan interest rates for the project owners," she says. "The U.S. federal government has also instituted the USDA BioPreferred program which requires that governmental agencies give first preference to products and finishes made from biorenewable resources."

in January and February – notoriously wet months in a famously damp climate – all with no roof or glass yet installed.

While this moisture would be a challenge for solvent-based coatings, it is actually an advantage when working with the water borne formulations of the Broda line of products.

Maelstrom Restoration and Painting, an affiliate of CBR, recommended a system using Broda Pro-Tek-Tor DR 125, a water borne natural oil wood stain, with a top coat of Broda Clarity Wood Stone Clear, a 100% acrylic.

Even in those dark, damp winter months, the first coat of water borne Pro-Tek-Tor would dry quickly enough that if it rained, any damage would be easily repaired, as the water's natural affinity for wood carries the oil and pigment even deeper. The topcoat of Clarity

would dry enough in four hours that no rain would harm it. So Maelstrom needed only a 24-hour window without rain to apply the two coats. Interior trim work was stained with same color as the timbers, and top coated with Broda Pro-Thane Ultra Rich Cabinet Trim. The result is a solid combination of high performance and eco-friendly benefits. A natural fit for an environment that demands both.

www.cbrproducts.com

Timber Pro UV produces a Log & Siding formula, a Deck & Fence formula, and a Crystal Urethane finish. The company's transparent stain was chosen to restore all the original cedar siding on the publicly displayed "Gordon House" designed by architect Frank Lloyd Wright.

Unfortunately, continues Steber, Green Seal has not yet set up criteria to evaluate the environmental safety of exterior wood finishes and stains, only paint. It's especially important therefore, she says, that consumers, architect and designers know the right questions to ask when seeking out such products (see "What do you Need to Know?" in this section). Steber adds: "Even if you can find an agency that has set up a criteria, the evaluation is so expensive that many smaller companies who manufacture high-quality green and sustainable wood finishes may not be able to afford the certification process." 