

Sustainable Landscape Construction:

Materials and Products — Paints and Stains¹

Gail Hansen²

PENETRATING FINISHES FOR exterior use include water repellents, stains, oil finishes (linseed or tung oil), paints, varnish, and lacquer. Most finishes are typically water-based or solvent-based petroleum, and many still contain volatile organic compounds (VOCs) that evaporate or cure over a long period of time. Finishes with VOCs, chemicals and heavy metals pose the most health risks during the manufacturing and construction processes, but they also affect air quality on-site as they evaporate over time. However, most manufacturers now offer no- or low-VOC formulations, which are generally water-based formulations that require you to apply two coats for moisture protection. Natural formulations that have vegetable- or water-based solvents, vegetable-based binders, and natural mineral pigments are the most environmentally sound. Finishes for exterior applications include:

Water repellants and water repellent preservatives. These prevent penetration by water and have a six-month to two-year life span. They typically have organic solvents or water-based formulations that are low VOC, but they often contain a fungicide or mildewcide that can be toxic.

Semitransparent penetrating stains. These are pigmented, water repellent preservatives that protect wood from UV damage. Most of them have a three- to eighty-year lifespan. Oil-based types offer the best protection, but lower-VOC, water-based formulas are available.

Oils (Linseed and Tung). Natural oils are a penetrating finish that should be formulated with a mildewcide as the oils act as food for mildew. Most of these have a one- to two-year lifespan. Plant-based oils are non-toxic and water resistant but require several coats.

Clear wood finishes. These include lacquers and varnishes with a two- to three-year life span. Clear finishes are not very durable and should not be used for decks or other areas with high foot traffic. Most are petroleum based but newer formulations are water based with fewer VOCs.

Paints and Solid Color Stains. These finishes are either oil- or water-based and provide protection by blocking UV rays and moisture. They have a seven- to ten-year life span. Paints and stains work well for vertical surfaces but not on horizontal surfaces with heavy foot traffic. Most paints are now low- or no-VOC but often contain biocides. Use low-biocide formulations.

USE STRATEGIES:

Use safe-formula paints and stains. Choose no-VOC or low-VOC products and avoid paint with polyvinyl acetate (PVA).

Use wood that is pre-treated before delivery to the site.

Health risks are greater when treated on site by untrained “do-it-yourselfers.”

Review the material safety data sheets (MSDS). These sheets list the environmental and human health hazards and identify the hazardous ingredients or carcinogens that make up 1% or more of the formula.

Avoid products that warn of neurotoxic effects. Look for labels that reference California’s Proposition 65 warning of chemicals that may cause cancer, birth defects, or reproductive problems.

Use products listed in “Green Seal’s Choose Green Report: Wood Finishes and Stains.”

Adapted from:

Calkins, M. (2009). *Materials for sustainable sites: A complete guide to the evaluation, selection, and use of sustainable construction materials*. Hoboken, NJ: John Wiley & Sons, Inc.

Smith, C., Clayden, A. & Dunnett, N. (2008). *Residential landscape sustainability: A checklist tool*. Oxford, UK: Blackwell Publishing Ltd.

¹ This document is ENH 1144, one of a series of the Environmental Horticulture Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Original publication date, October 2009. Visit the EDIS Web Site at <http://edis.ifas.ufl.edu>.

² Gail Hansen, assistant professor, Environmental Horticulture Department, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL.