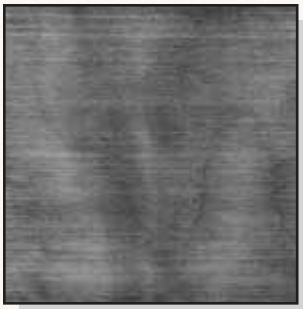
TECHNICAL BULLETIN #2



Extractive Bleeding: Not a Stain or Paint Failure

Staining woods are those which contain Tannic Acid and other extractives that are water-soluble. The most popular wood species in this category are Western Red Cedar, Eastern White Cedar, Redwood, Mahogany and Ipe. These water-soluble extractives impart the favorable properties of natural color, odor, taste, density and decay- and insect-resistance to the siding material, accounting for the popularity of these wood species among builders and homeowners alike. The total extractive content of wood may range from less than 1% up to 30%. Water-soluble extractives are found in the heartwood of most species, but high-grade, close-grained lumber from larger, older trees contain greater quantities of water-soluble extractives. Sidings and trim manufactured from second or third growth trees tend to have less heartwood and consequently less extractives.

The Problem

Tannins are a water-soluble, reddish-brown discoloration caused by the effects of moisture and sunlight. While aesthetically objectionable, this discoloration does not harm the siding or the paint/stain coating. However, if concentrations at the wood surface are high enough, the extractives may interfere with proper penetration, absorption and/or drying properties of any future finish.

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The Cause

Extractive bleeding is not paint or stain failure. When extractive discoloration occurs, tannins are dissolved by moisture and are then drawn to the surface of the stained or painted wood via the sun and hydrostatic pressure (osmosis). The presence of moisture usually occurs after the installation and painting of the siding and can originate from either interior or exterior sources. When the extractive discoloration is in a streaked or rundown pattern, which often occurs with lap siding, it indicates that moisture is entering the untreated back of the siding material from an interior source, such as humidifiers, cooking, hot tubs, bathing or general high-moisture vapor levels typical of new construction. Extractive problems commonly occur when interior humidity levels exceed 50%.

Extractive discoloration in a diffused pattern would indicate moisture is entering the wood surface from an external source. These external sources include rain, dew, condensation, irrigation and high humidity. Diffused discoloration can usually be attributed to a porous or thin coating which is either insufficient or inadequate to prevent water penetration. Problem areas can include roof leaks, gutter problems (or lack of gutters) and open joints in siding materials, such as where siding abuts window or door frames. If caulking and end priming are not done, or are done improperly, moisture can infiltrate the open endgrain of the wood at those points.

Cure

When extractives do appear, they can sometimes be removed by cleaning with a warm water detergent solution and a soft, non-metallic bristle brush. Cabot Problem-Solver® Wood Brightener #8003 concentrate, mixed in a 1:4 ratio with water, will easily remove unsightly discoloration stains. Apply using a garden-type sprayer and allow solution to remain wet on the surface for 10-15 minutes. Lightly scrub stubborn stains, then rinse with clear water.

(Continued on back)

Extractive Bleeding *(Continued from front)*

Prevention

To prevent extractive discoloration by water-soluble tannins, it is important that the siding to be stained has a moisture content below 15%. Prior to siding installation, all faces of the lumber should be stained. The prestaining or prepriming of the siding material will ensure the moisture content of the lumber is stabilized, reducing wood swelling and shrinkage while improving siding durability. Clear water-repellent finishes, semi-transparent and semi-solid stains do not offer reliable protection from extractive discoloration. Oil-based solid color stains produce thin films, providing more protection than clear or semi-transparent stains. Since all water-based latex stains or paints use water as a carrier, they can actually create extractive discoloration problems.

The most important step in preventing wood tannin discoloration is the application of a high-quality oil or alkyd based, stain-blocking primer. Cabot Problem-Solver® Primers #8111 and 8022 contain polymerized, natural, linseed oil modified with alkyd resin to provide a continuous film impervious to moisture, especially when applied to all faces of the lumber. Acrylic latex stain-blocking primers often require two coats to be effective. However, there is no guarantee when it comes to the prevention of extractive discoloration. Proper construction techniques, combined with the use of high quality coatings correctly applied, are your best assurances against the occurrence or recurrence of extractive discoloration.

Hints for Preventing Extractive Bleeding

* **Only stain/paint wood with a moisture content below 15%.**
* **Use proper construction techniques:**
  -Adequate overhangs of two or more feet.
  -Proper flashing above windows, doors and at wall and roof intersections.
* **Caulk correctly.** Use high performance, paintable exterior caulks with either acrylic or silicone acrylic, butyl, polysulfide or a polyurethane base. Avoid "bargain" or pure silicone caulks.
* **Ventilate internal moisture.** Use dehumidifiers and ventilation fans in bathrooms and kitchens. In northern climates, install a vapor barrier behind the drywall on the warm side of the wall.
* **Use a high quality oil or alkyd-based, stain-blocking primer,** applied to all faces of the siding lumber.
* **Apply primer and stain or paint at proper spread rates.**

Cabot®
Newburyport, MA 01950
Tel.: 800-US-STAIN
Fax: 1-800-998-3299

Visit the Cabot Home Page at:
cabotstain.com

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