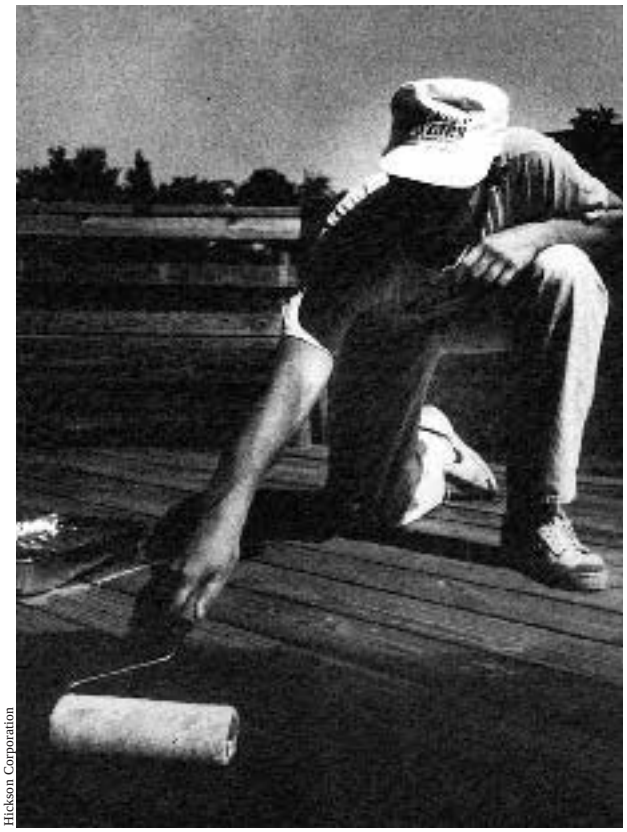
Sealing & Painting Treated Wood

By David Bowyer

Treated wood is safe from bugs and rot. But it will still warp, split, and deteriorate prematurely unless you finish it correctly.



Hickson Corporation

A painter rolls on a water-repellent coating to protect the pressure-treated decking from weathering.

Preservatives make pressure-treated wood resistant to insect attack and rot, but the chromated-copper-arsenate (CCA) treatment does not prevent cupping, cracking, warping, or checking. This kind of damage is caused by water and sunlight, not biological activity (see "What Ages Wood?", next page). To shield the wood's surface from water and sunlight, and keep it looking good, you need to protect it with sealers and stains or paints.

Sealers

Sealers are penetrating coatings, generally clear or lightly tinted, that repel moisture. Their effective service life is only one to two years, with most manufacturers recommending an annual reapplication. Sealers make good undercoats for stains or good preprimers for paints. Many paint manufacturers are now recommending sealing before priming. A few sealers cannot be stained or painted over, so check the label before you buy.

Some sealers have preservatives added (see "Sealer Sources"). Even though you're sealing treated wood, these are worth the small extra cost if you have a lot of site-cut ends (of course you should seal all site-cut ends with full-strength preservative first).

Another extra worth paying for, especially if you want the wood to keep a fresh looking appearance, is an ultraviolet (UV) inhibitor and other transparent solids. These are found in the higher quality clear or lightly tinted finishes that have traditionally been used to protect natural wood sidings like cedar, when maintaining the natural look is a primary concern. They protect the wood by absorbing or reflecting UV rays. They last longer than standard waterproofing sealers, with some manufacturers claiming an effective life of six years and longer.

Application. Sealers can be applied to treated lumber as long as the surface of the wood is dry (see Figure 1). Don't worry about the wood having a high internal moisture content. Sealers let the wood dry to the moisture content of the environment. Because they slow the drying process, stress in the wood is minimized.

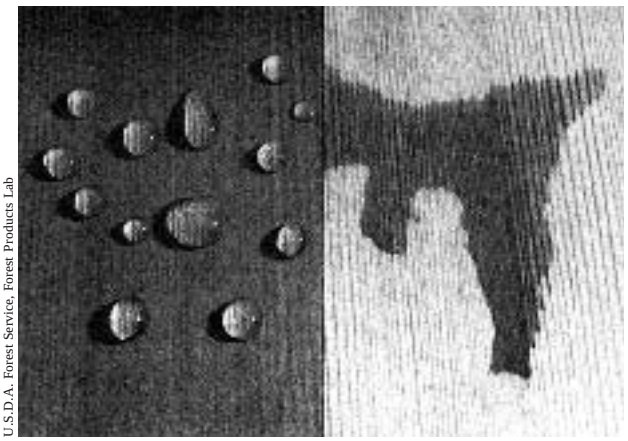
You can brush, roll, or spray on the sealer, but dipping works best. The size of the pieces limits what you can dip, but for a project with small pieces, such as 2x2 porch balusters, you can use a section of gutter with two end caps for a dipping tank.

For large projects, I prefer a sprayer to get the sealer on and a brush to work it in. Because of their low solids/pigment content, sealers can easily be applied with a low-pressure sprayer like the one you would use in your garden (see Figure 2). I work with a spray wand in one hand and a brush with a 2- to 3-foot handle extension in the other.

I've been told that the internal workings of some sprayers are not compatible with the chemical make-up of some sealers. Their use may gum up the sprayer, so check the directions, and make sure you have solvent on hand before you fill the spray tank.

I've used the same inexpensive plastic two-gallon sprayer with a 12-foot hose extension for several years now, and have put many different sealers and semi-transparent stains through it with no adverse effects. I do, however, thoroughly clean the sprayer and relube all the plungers, seals, and valves when I am done using it.

When to use. I recommend using a waterproofing sealer on every treated wood project because it controls the



U.S.D.A. Forest Service, Forest Products Lab

Figure 1. *The wood surface at left was brush-treated with a water repellent. The untreated wood surface at right absorbs water quickly.*

Hickson Corporation

Figure 2. *For large surfaces, use a low-pressure garden sprayer, followed by brushing, to apply sealer.*

initial drying and eliminates cracking, splitting, warping, and cupping. Recently, the major suppliers of treating chemicals have developed water-repellent products that are applied under pressure along with the preservative chemicals. Treated lumber with these water repellents will be available this year in most parts of the country, sold under the names of Wolman "Extra" (Hickson Corp., Perimeter 400 Center, 1100 Johnson Ferry Rd., Suite 680, N.E., Atlanta, GA 30342; 404/843-2227) and CSI's "UltraWood" (One Woodlawn Green, Suite 250, Charlotte, NC 28217; 704/522-0825). Factory-applied waterproofing treatments penetrate the wood to a much greater degree than a surface application. These new products should be a real timesaver, because contractors won't have to pretreat the wood with a sealer before painting or staining.

Their costs are appealing too. The additional cost of a thousand board feet of 2x6 treated with this process will be about $50 to $60. You'd spend that on the four gallons of sealer needed for just a single coat. And this wouldn't include labor or the recommended second coat.

CSI has been testing the performance of various stains and paints to make sure they perform well with its pre-sealed Ultrawood. The tests show that you can stain or paint over them with nearly the same results as over regular CCA-treated wood. Oil-based paints and stains work best with this product. The company found some streaking when using water-based stains, and they rated performance with a latex exterior paint merely "good" instead of excellent.

Stains

Like sealers, oil-based stains penetrate the wood. They have varying levels of pigment, but still allow the grain and texture of the wood to show through. Stains are relatively permeable to moisture and are not as effective as sealers in protecting the wood. For better protection, you can apply an undercoat of sealer followed by a penetrating stain.

Stains can be applied to treated lumber so long as the surface is dry. I recommend a waiting period of a couple of weeks on new projects, depending on exposure and weather. If it's cool and damp, I wait longer. In hot dry weather, I wait less.

There are two reasons for the wait. The first is that I want the wood fairly dry—at least 1/8 inch deep—to get maximum penetration. The second is that slightly weathered wood absorbs stain better than unweathered wood. A finish consisting of a coat of sealer, followed in a couple of weeks by two coats of stain, with the second coat being applied before the first is completely dry, will give you a finish that will last six to eight years. The lighter the stain and the more limited the exposure, the longer the life. Darker stains won't last quite as long because they absorb more solar radiation.

Application. Again, a low-pressure sprayer followed by brushing works very well. Keep the stain well mixed by giving the sprayer a gentle shake now and again. With darker stains, the higher solids content could plug the sprayer, but I've never had a problem with this.

When you're applying semi-transparent stains, watch out for lap marks. These are caused where you overlap a "dry edge" with wet stain. A sprayer lets you work faster, and it's easier to maintain a "wet edge."

Where to use. Semi-transparent stains are not ideal for horizontal surfaces like decks, since they are not very resilient to abrasive wear (see "Pros and Cons"). If you use a dark stain, wear patterns develop quickly. Stick to lighter shades if you're staining a deck.

Beyond this slight limitation, semi-transparent stains are an excellent way to protect treated lumber. Their ease of application, good service life, and the fact that they never peel make them my favorite.

Paint

Oil or latex paints and latex stain form a film on the surface of the wood. (Latex stain performs like paint because it does not penetrate the wood like an oil-based stain.) Whether latex or oil, paint offers the greatest protection against weathering because of its high pigment content. However, paint performance can be a problem for two reasons:

First, the wood's high moisture content can cause paint to peel. Moisture gets trapped behind the paint film, especially during the initial drying period. Even though paints and latex stains are supposed to be "breathable" (with

What Ages Wood?

During treatment, wood is pressure impregnated with a solution that is roughly 98.5% water and 1.5% chemicals. This raises the moisture content of a typical piece of untreated kiln-dried #2 southern yellow pine from 19% to 75%-100% saturation. By the time the wood gets to a retail lumberyard, the moisture content has usually dropped to the 50% range, unless the treated wood has been kiln dried after treatment (KDAT) or allowed to air dry.

According to the American Wood Preservers Association, less than 10% of the treated lumber sold last year was dried after treatment. That means most of us are using undried wood that is going to be giving up its excess moisture until it comes into equilibrium with the surrounding environment. During hot dry spells, moisture content can drop to 5% or 10%, and during damp, humid weather, it can rise to 30% or 40%. This fluctuation changes the wood's dimensions by as much as 5% and causes checks and splits.

The more serious problem of warping or cupping happens when the different sides of a wet piece of treated wood dry at different rates. For example, when the top bakes in the sun while the bottom faces damp soil.

Sunlight

The sun's ultraviolet rays break down the cellular structure of the exposed wood cells and the infrared rays speed up the drying process. These problems are accentuated when we are dealing with treated lumber because treated lumber is generally used outdoors where it has maximum exposure to sunlight.

The breakdown of the wood's exposed surface layer, for some people, is not a concern. They like the soft, silvery, weathered look it brings, and some surface coatings are even designed to speed up weathering. Other people don't like the look of a naturally weathered deck or fence, and with these customers, you'll want to use paints or stains to keep the wood new looking.

—D.B.

Pros and Cons

Coating	Pros	Cons
Water Repellent Sealants	1. Easiest to apply and reapply 2. Least expensive short-term 3. Gives the most natural look 4. Offers good protection from moisture damage 5. Widest range of effective application situations	1. Recommended yearly reapplication 2. Most expensive long-term if only finish used 3. Offers least protection from sunlight damage
Semi-Transparent Penetrating Stains	1. Easy to apply and reapply 2. Least expensive long-term 3. Easiest "colored" finish to apply 4. Does not chip, flake, or peel	1. Not available in as many colors as conventional paints 2. Dark colors can fade quickly 3. Not resistant to wear on horizontal surfaces
Paints	1. Offers most protection from sunlight damage 2. Offers good protection from moisture damage 3. Can match most conventional colors of vinyl and aluminum siding 4. Can match color of an already painted house 5. Longest useful lifespan if properly applied 6. Least likely to fade	1. Most time consuming to apply and reapply 2. Peels, flakes, and chips 3. Most expensive short-term 4. Most difficult to apply properly

Sealer Sources

Plain Water Repellent Sealers

Thompson's Water Seal
E.A. Thompson Company, Inc.
P.O. Box 99037
San Francisco, CA 94109
415/685-7555

Aquatrol
The Flood Company
1213 Barlow Road
P.O. Box 399
Hudson, OH 44236
216/650-4070

Wolman RainCoat Water Repellent
Kop-Coat, Inc.
K-1824 Koppers Building
436 7th Avenue
Pittsburgh, PA 15219
412/227-2427

Water Repellent Sealers with Preservatives and Ultraviolet Light Inhibitors

TWP (Total Wood Preservative)
AMTECO, Inc.
815 Cass Avenue
St. Louis, MO 63106
314/436-4811

Clearwood Finish - UV
The Flood Company
1213 Barlow Road
P.O. Box 399
Hudson, OH 44236
216/650-4070

Weatherscreen Semi-Transparent or Weatherscreen Solid Oil
The Olympic HomeCare Products Company
2233 112th Avenue, N.E.
Bellevue, WA 98004

Water Repellent Sealers with Preservatives

Clearwood Finish
The Flood Company
1213 Barlow Road
P.O. Box 399
Hudson, OH 44236
216/650-4070

Wolman Clear Wood Preservative with Water Repellent
Kop-Coat, Inc.
K-1824 Koppers Building
436 7th Avenue
Pittsburgh, PA 15219
412/227-2427

Clearwood Preservative
The Olympic HomeCare Products Company
2233 112th Avenue, N.E.
Bellevue, WA 98004
800/426-6306

Woodlife & Woodlife II
Roberts Consolidated Industries
600 N. Baldwin Park Boulevard
City of Industry, CA 91749

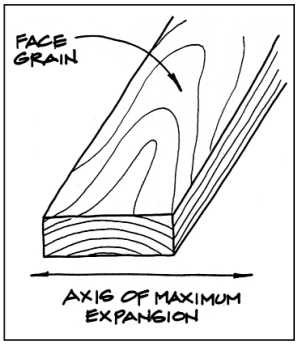
Seal Treat-II
W.M. Barr Company
Memphis, TN 38101
901/775-0100

latex paint the most breathable and oil and alkyd paint the least), the paint just can't release or "breathe" the moisture fast enough. This breaks the bond between the paint and the surface, causing the paint to peel or flake off.

Ideally you should wait for the wood to dry out completely, but if you do, direct sunlight will degrade the wood, creating an unstable surface for paint. The paint-to-wood bond breaks down and the paint peels. You can get around these problems by sealing the wet treated wood and then waiting for the surface to dry out just enough for painting. This is typically two to three weeks, depending on weather conditions.

A quicker technique is to use kiln-dried treated lumber, which you can prime and paint immediately. If kiln-dried treated lumber is not available in your area, you can let the wood air dry. However, this is time-consuming, and isn't really feasible for large jobs.

If you keep some stock pieces of treated lumber on hand, drying in a sheltered area, you'll have dry lumber for those small remodeling projects. I always have a couple of pieces of treated 1x6, 2x4, or 2x6 salted away that I'll use for any trim I find that started to rot away from the ground up. Immediately after dry treated wood is installed, it can be sealed, primed, and painted.



Keith Ginnodo

Figure 3. *Construction lumber has a higher proportion of exposed face grain than you find in siding or trim. This makes construction lumber dimensionally unstable and a poor substrate for paint.*

If you have a large job and cannot find regular kiln-dried treated lumber, see if wood foundation lumber (stamped FDN) is available. All FDN lumber is kiln-dried after treatment. Kiln-dried treated wood will run you 10% to 20% more than undried treated wood.

Even with dry lumber, you may have problems with paint adhesion because of the high proportion of flat grain on the wide face of the lumber (see Figure 3.) The problem is not unique to treated lumber. All construction lumber is flat sawn, making the surface vulnerable to cracks and splits which let in moisture.

Application. A brush, roller, or conventional sprayer is the way to go here. Low-pressure sprayers cannot handle the high amount of solids and pigments.

For maximum durability, start with kiln-dried lumber with as much vertical grain as possible. Use a sealer followed by a compatible primer after the sealer cures. Use two coats of top-quality acrylic-latex house paint for the finish. This will give you an extremely durable finish which may outlast the same finish on untreated wood.

Where to use. Painted surfaces work best when the wood is not exposed to foot traffic. A fence, deck railing, arbor, or woodshed can be protected with paint.

Recent research shows that chromium in the CCA chemicals may enhance the bonding of paints to the wood's surface and prolong the paint's effective life.

A project built from CCA-treated lumber is going to last a long time. But how it looks while its there depends on how well it is protected from moisture and sunlight. ■

David Bowyer has worked as a remodeling contractor and as a rep for Great Northern Forest Products, Inc., a manufacturer of treated-wood products.