

PROTECTING EXTERIOR WOOD

What Manufacturers Won't Tell You

By Bob Flexner

Protecting exterior wood is probably more misunderstood than any other aspect of painting and finishing. You probably know from experience what works and what does not, but often your clients are more influenced by something they've seen on TV or been told by a neighbor than by reality. When asked by a customer to complete a job in a way you know won't last, your challenge is to explain why another way is better. To do this, you need facts to back you up or at least some common experiences to which your client may relate. Following are some explanations that may help you in dealing with customers.

The Problem

Wood will last indefinitely if it is kept dry and out of sunlight. But when exposed to water or bright light, wood loses its color, splits, warps and often rots. Evidence of this fact should be obvious to even the most stubborn customer. The best way to protect wood exposed to sun and rain is to apply a paint or finish that blocks sunlight and moisture and that itself holds up to these destructive elements. Point to 100- and 200-year-old frame houses as proof. If paint on such structures has been maintained, the wood underneath will be like new.

Effects of Sun

Light is the principal enemy of paints and finishes. Ultra-violet (UV) rays, especially from sunlight, break down paint. Your clients witness this on cars and buildings that have been exposed to the sun for many years; the paint has dulled and begun to chalk. If the paint system is not too far-gone, it may be possible to rub off the dullness with abrasives and expose paint that looks shiny and new. Though it's unlikely anyone would do this on a house, it's often done on cars. Many car polishes, in fact, are composed largely of fine abrasives whose purpose is to remove the chalking.

UV rays also break down clear finishes. But most clear finishes on wood peel before dulling or chalking. Peeling occurs when UV rays penetrate the film and destroy the lignin that glues the cellulose cells of wood fiber together. The surface cells separate, and the finish that is bonded to these cells peels. Exterior doors, trim or furniture finished with a clear coating may well exhibit such peeling.

The best sun-blocking agent, and thus the best UV protector for coatings applied outdoors, is pigment (contained in paints and stains). Pigment blocks UV rays, so the wood underneath doesn't deteriorate. The problem with pigment is that it also hides the wood, and your customers may want the wood to show. Customers may ask about the UV absorbers they've seen in advertising. These are sun-

blocking agents similar to those included in suntan lotions. They convert VU light energy to heat energy that dissipates. UV absorbers don't hide the wood, and they are fairly effective at preventing wood deterioration under a finish.

However, they have downsides and are expensive. Also, a significant amount of absorbers must be included in the finish to be effective. It isn't enough to add just a few drops to a vat so it can be claimed, as many manufacturers do, that the product contains UV absorbers. One to 3 percent by weight must be added, and this increases the cost of the finish significantly.

The only finishes that contain enough UV absorbers to do any good are marine varnishes. Marine varnishes cost more than \$50 a gallon and are difficult to find. (But if you really want them, go to a marina.) These varnishes are always very glossy, relatively soft (in order to be flexible), and eight or nine coats must be applied to reach maximum UV resistance. In addition, because the UV absorbers in these finishes don't prevent the finish itself from deteriorating, surface deterioration must be sanded off and several additional coats applied whenever the surface begins to dull. This might be as often as once a year if the finish is exposed to bright sunlight.

Use the experience of wooden-boat owners to confirm all of this. Because of the high maintenance required, owners are typically willing to pay whatever necessary to get the best possible finish. Marine varnishes are thus the best that can be made, and they still require all those coats and all that maintenance to be effective for 10 years or more.

All this information may cause clients to think twice before asking you to apply a clear wood finish. But if they insist, be sure they understand that you cannot be held responsible for early problems.

Effects of Moisture

Moisture also causes coatings to peel. But, in order to do so, the moisture must get between the paint or finish and the wood. Paints resist moisture penetration well, but most clear finishes do not. Water repellents contain a low-surface tension, waxy substance (companies use different types) that causes water to bead, but they aren't very effective at stopping water penetration.

The best water-resistant, clear finishes are varnishes that are made very flexible so they keep up with extreme wood movement. These varnishes are usually called "spar" or "marine" varnish, and the best are made with phenolic resin and tung oil. They don't crack as quickly as those made with polyurethane resin. As long as the wood isn't exposed to sunlight, a common spar varnish ought to hold up well. But if water can find a way behind the finish, it will peel very quickly.

A common example of peeling caused by water occurs on exterior paneled doors. Rainwater gets between the panels and the frame because the panels shrink and expand significantly, so you can't successfully caulk the cracks. The water then works its way under the finish and causes it to peel. This can happen just as easily and quickly on painted doors. If a paneled door is exposed to the rain, you should recommend a storm door to protect it. People see peeling problems all the time, but they often think you have some better application method or secret coating that will hold up. Don't get caught promising more than technology can supply.

Exterior Siding

The best way to protect wood outdoors is to paint it. I am not aware of any dispute about this. Paint repels water and blocks UV rays very effectively. There are two large categories of paint to choose from: oil-based and water-based. Because oil-based paints wear better than paint, they are best for objects that are used, like chairs and picnic tables. Oil-based primers are also best when you're painting wood that has been exposed to the weather for a month or more. As mentioned, the sun breaks down the surface cells of the wood, making it difficult for paint to get a good hold. Since oil-based primers penetrate deeper, they are better able to get through the deteriorated wood and bond to good wood underneath. If the wood is freshly milled or sanded, acrylic latex primers perform well. Latex paint is the best choice for wood siding because it allows moisture vapor to pass through better than oil paint does. What your clients might think of as a deficiency is actually a benefit because moisture that is generated inside buildings from cooking, showers, etc., must be able to escape when the building is closed up and the heating or air conditioning is turned on. The moisture works its way through the walls, through the insulation and through the wood siding. If it can't get through the paint layer, the moisture will build up behind it and cause it to peel. A primer coat of oil-based paint is not thick enough to stop the penetration. No clear finish performs as well as paint, but the best are spar and marine varnished if the wood is not exposed to sunlight.

Decks

Decks present a special case because paints and clear finishes are so difficult to repair when they peel. Peeling usually occurs much more rapidly on a deck than on siding, because the sun strikes it more directly, and there are many more places where water can get in and work its way behind the coating. Most people who have applied paint or clear finish to a deck have regretted it, and it should not be difficult for your client to find someone who will confirm this.

Unfortunately, none of the alternatives are good ones. The best is probably to cut yourself out of a job and recommend that your clients use redwood or cedar heartwood cut on the radius (quartersawn) and not apply any coating. These

woods will turn gray in time, but they won't rot for decades and as long as the boards are quartersawn they will be very stable and resistant to splitting.

Because of their far lower cost, pressure-treated pine, hemlock and fir are the most widely used woods for decks. Pressure treating makes these woods very resistant to rot and not to splitting or warping. An entire industry has sprung up to supply water repellents that are claimed to retard this deterioration, but, unfortunately, none work very well. The reason is they don't block UV rays. It is the sun that does the most damage to pressure-treated decks, not rain.

Your clients may not want to color the wood, but the best way to protect a deck made of pressure-treated wood is with a stain. Stains contain enough pigment to partially block UV rays and enough finish (which glues the pigment to the wood) to partially block water penetration. But they don't build, so they don't peel. Solvent-base stains build less than water base.

Many deck stains contain water-repellents to make water bead, and your clients will probably feel better about your work if they see this beading, but it is the finish in the stain that provides the most resistance to water penetration. The deck should be recoated whenever the stain begins to wear through.

Non-pressure-treated pine or fir won't hold up long no matter what you do to it. Preservatives applied to the surface offer very temporary protection. No matter what you do, water will find a way to get into the wood and will eventually rot it out. You could be faced with a situation where a non-rot-resistant wood deck has already been installed and you are now asked to apply something to preserve it. Do the best you can, but be sure to explain that it is the poor choice of wood, not your work that will be responsible for any rot that occurs.



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