

Paint Or Stain?

While the use of paint or stain on a job is often a matter only of customer preference, contractors should understand the specific application processes of both so as to advise their clients. In addition, certain conditions exclude certain products. APC asked wood coatings expert Paul Tillman to discuss the properties of wood and their impact on paint and stain. Tillman is Technical Specialist with Cabot in Newburyport, Mass.

APC: Do certain applications lend themselves more toward paint or stain (e.g., new wood, old wood, south-facing wood, hot/cold climates, wet/dry climates, specific wood types or cuts, etc.)?

Tillman: Quality products, whether paints or stains, are the key to protecting wood siding from the ravages of the environment. The choice is really up to the homeowner, or the contractor who is assisting the homeowner. My first recommendation for new wood might be a semi-transparent stain, especially for rough siding, commonly referred to as rustics. The wood will be protected, although to a lesser extent than by a paint of solid color stain. The semi-transparent stains allow the wood grain and texture to show, so what better way is there to show off a home that has rustic sidings?

On the other hand, because of VOC issues, semi-transparent stains are now formulated with much higher solids, especially for states like California, or manufacturers are turning to waterborne products. As a result, the oil-based products can be less user-friendly when it's time to reapply the product as part of a maintenance program. There may come a point when a solid color stain or paint may become necessary because the semi-transparent stain may not penetrate. Semi-transparent stains are not film forming, and they may fade prematurely as a film.

NEW WOOD: We recommend all types of coatings or stains for new wood siding. The choice is up to the homeowner and contractor.

OLD WOOD: Old wood may bring to mind many hard, brittle coatings applied over many years. Surface preparation plays a bigger role here than the actual product choice. I am not minimizing the use of a quality product, but the product will only be as good as the surface preparation. Case in point: older coatings, especially alkyd or oil-based, become brittle and hard with age due to a continuation of the curing/oxidizing reaction. Chances are that the coatings have lost a great deal of their bond to the wood even though they appear to be solidly bonded. Unless a great deal of labor is expended through scraping or stripping, a new paint or solid-color stain (especially quality acrylic latex products) may pull the old coatings from the siding.

South-Facing Wood: Of course, such siding takes the brunt of the climate and weather elements. To get the maximum protection for the wood from ultraviolet radiation, wind-driven rain, high wind shear, salt spray, etc., one coat of a quality primer and two coats of quality paint or solid-color stain will protect the southern-exposed wood for many years. The more pigment you put between the sun and the wood, the better protection for the wood.

Again, the key is a quality product. For example, a contractor can apply a high-solids paint at \$10-\$12 a gallon and not get half the longevity that can be obtained from a slightly lower solids, \$20-a-gallon, 100 percent acrylic, solid-color stain. You may save money on the product, but you must paint twice as often. Try selling that to your customer.

Hot/Cold Climates: The northern United States and Canada without a doubt have the worst set of conditions for paints and stains on wood siding. Summer temperatures may reach as high as 105 degrees, and winter temperatures can be as low as -30 or -40 degrees. With temperature swings like that, it's important to have a product that will expand and contract with the wood substrate. Paints and solid-color stains with 100 percent acrylic resins are best able to provide the desired flexibility to withstand the expansion or contraction of the siding.

Wet/Dry Climates: Again, the best products for these conditions are 100 percent acrylic resin latex stains or paints, which are very flexible, mildew- and fungus-resistant, non-yellowing, chalk-resistant, UV-resistant and can withstand high wind shear conditions. So whether you're on the top of a dry 9,000-foot peak with high UV and wind shear, or in the warm, humid, tropical climate of the Gulf States, 100 percent acrylic paints and stains protect the substrates.

With few exceptions, wood species play a lesser role in paint or stain performance. Western red cedar and pine, for example, both hold stain well because of the inherent chemical nature of the stain or paint product. However, woodcuts are a different story.

Flat-Grained Wood: Smooth, flat-grained lumber, which is cut tangentially to the growth ring structure of the tree, does not hold paint or solid-color stain well. This cut is less stable and is best used as rustic siding, rough side out. Knots present a different problem.

Edge-Grained Wood: Smooth, edge-grained wood, sometimes called quartersawn, holds stain and paint very well. This wood is very stable in comparison to flat-grained wood. Smooth western red cedar at one point in the past may have been sold with a condition referred to as mill glaze. It was reported that mill glaze interfered with good adhesion, but Cabot never experienced this with our Problem-Solver Oil Primer as a first coat.

Heartwood versus Sapwood: The heartwood of the tree, the darker center of the tree, is more resistant to attack by fungus, bacteria and certain critters. However, this section produces more tannin (extractive) bleeding and may affect the color or aesthetics of the coating. Tannin-retarding primers are available to counteract tannin bleed. The sapwood of the tree is not as durable as the heartwood and will require better protection during its lifetime.

One more point about wood types – Most stains and paints bond well to the various wood species sold as exterior siding. One exception to this rule is incense cedar. The oil (solvent extractable resins) in the heartwood and knots of incense cedar interfere with the drying mechanism of oil-based products, especially those that contain linseed oil. It was recently reported to Cabot that the south coast cypress species has been known to retard the drying time of oil-based stains, but as of this writing, we do not have sufficient data to confirm that. For incense cedar, we recommend 100 percent acrylic solid-color stains.

Paint and Stain Life Spans

APC: As for life spans, is it safe to say that a two-coat paint system will last up to 7-10 years? What about for stains – 3-5 years?

Tillman: Again, good surface preparation is very important – a sound, clean surface. Two-coat acrylic paint systems may last 15 years or more. Two-coat solid-color acrylic stains may last 12-15 years. Of course, I'm referring to high-quality, \$18-\$25/gallon, 100 percent acrylic resin products. Quality two-coat oil-based systems may last seven to eight years depending on the resin system and other ingredients, while quality, two-coat, alkyd/oil-based solid-color stains may last five to six years. We would expect normal weathering effects with oil-based products, and the worst weathering would take place on the southern exposure. With routine cleaning and maintenance, there's no reason why these products can't endure.

Color Choice

APC: To what degree does color choice affect a paint system's life span?

Tillman: Dark colors absorb more infrared or heat energy. Light colors reflect more energy away from the coating and substrate. Heat absorption causes thin beveled siding or shingles to expand. Older, brittle coatings applied to these substrates will crack when their expansion capability or elongation rate is exceeded. Subsequent cracks in the coating will allow moisture to infiltrate the wood. Additional moisture-related problems will result. So, light-colored, 100 percent acrylic resin-based paints and stains will fair much better than dark colored.

Substrate-Specific Choices

APC: Which conditions require the use of paint? For example, if the substrate is previously finished with paint, now chipping, should the contractor opt for paint over stain? Does stain require a more thoroughly prepared substrate than does paint?

Tillman: A substrate finished with a paint that is chipping is assumed to be an older, hard, oil-based coating or a latex coating not necessarily recommended for exterior siding. Older, hard coatings cannot expand and contract well with the substrate so they crack and chip. After a through surface preparation – removing all of the chipped paint and feathering the areas with sandpaper – spot prime with an application of oil-based primer. In a situation as you describe, most "experts" would recommend the contractor re-coat with an oil-based paint or solid-color stain. Ideally, all of the chipping, older coatings should be removed. If the budget of the homeowner is such that a through removal of all of the paint is prohibitive due to labor costs, then the best one can hope for is a "bandage" approach. The homeowner can expect chipping and peeling at some point in the future in areas not restored or re-coated. I try to stay away from recommending the application of an acrylic paint or solid-color stain. They have been known to "pull off" additional weakly bonded coatings.

In those cases where excessive moisture in the wood could escape through cracks in the older coating, and a new coat of oil paint is applied, the paint has the potential to impede the transmission of the moisture. The moisture may cause blistering and peeling of the weakly bonded coating.

Stains do not require more thoroughly prepared substrates than paints. Solid-color stains require as much or the same type of preparation as paints – a sound, clean substrate. Semi-transparent stains require a porous substrate for proper penetration.

One Over Other

APC: What about staining over paint and painting over stain – what are the limits?

Tillman: Yes, as long as we are talking apples and apples. Solid-color latex stains can be applied over latex paints. Latex paints can be applied over latex stains. It is highly recommended to avoid applying oil-based stains and paints over latex stains and paints. However, it is generally acceptable to apply latex stains and paints over oil-based products, but once the contractor does this, he must stay with latex. The contractor should avoid applying latex products over chalky surfaces.

If the alkyd-based or latex paint is a semi-gloss or gloss finish, it is recommended to de-gloss the paint before applying a flat latex stain.

Customer Beware

APC: In general, what should contractors be aware of and relate to customers when deciding between paint and stain?

Tillman: The contractor should inform the customer that a quality paint or stain performs best. Provide the customer enough information about the products that are available to allow the homeowner to make the final decision. The wood species, the siding style and the design of the home will dictate the type of product to be applied. Both solid-color stains and paints have their place in the coatings market. Solid-color stains tend to allow more texture to be revealed than do paints. The contractor should be knowledgeable about the type of substrate to be coated.

The contractor should also be aware that the product mix in the marketplace is changing due to EPA regulations. If nothing changes, September 1999 is the deadline for architectural and industrial maintenance (AIM) coatings to be VOC compliant. The new compliant oil-based paints and solid-color oil stains may take a little getting used to by contractors who are new to them.



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