

Frequently Asked Questions

Wood and Coatings Applications

Joint Coatings and Forest Products Committee

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In the course of a given day, most paint stores and lumber suppliers are faced with many of the questions we have tried to address below. It is our intent with this article to update or confirm the answers to these questions with the most up-to-date findings from our collective knowledge to help correctly reply to the consumers' inquiries. As coatings technology advances, new products may appear that address some of the challenges mentioned below, but the advice is sound and provides a good basis for discussion regarding performance. Although some FAQ's can deal with coatings for masonry, vinyl, aluminum or other surfaces, the scope of our FAQ's will be limited to wood and exterior coatings for wood or wood composites.

Handling and application characteristics are not the same for all wood or coatings products. There are many wood species, wood-based products, and wood treatments, each having unique finishing requirements. Commercial finishes differ and may have unique qualities. Before starting any job, be sure to read and follow the manufacturer's label instructions for application, performance expectations, health/safety/environmental concerns and product warranty/guarantee.

To better facilitate the finding of the specific FAQ, they have been grouped into the following categories:

- Wood Surface
- Substrate & Coating Selection
- Finishes
- Surface Preparation
- Application
- Other

Wood Surface:

Should new wood be allowed to weather prior to painting?

No! Regardless of the wood type, weathering of wood for even short periods of time can ultimately compromise the service life of a paint system. Plywood has been shown to surface check if not coated shortly after installation. On new and unfinished woods, studies have shown that weathering of wood prior to painting (even for as little as one to two weeks) decreases paint adhesion, and affects the service life of the paint system. The paint fails prematurely by cracking and peeling. Best performance for all wood species can be achieved by using kiln dried lumber or by letting the lumber equilibrate to an equilibrium moisture content. The equilibrium moisture content is determined by the ambient relative humidity (RH). For most areas of the country, this will be about 12% moisture content. Kiln dried lumber is usually dried to less than 19%.

Should new wood be allowed to weather prior to staining?

Maybe! The answer varies depending on the type of stain, substrate, and anticipated weather conditions.

For solid-color, opaque, and heavy-bodied stains, paints, and water-based semi-transparent stains, NO!

If using solid-color stains or paints, they should be applied as soon as is practical. A primer coat should be applied to bare wood prior to painting, and should be applied prior to the solid-color stain as well. For reasons why wood substrates should not be allowed to weather, please refer to the question *“Should new wood be allowed to weather prior to painting?”* above.

New wood should not be allowed to weather prior to staining for several reasons.

- Wood sidings that are thinner than 1/2” are prone to developing objectionable cup if stain application is delayed.
- Objectionable surface checking can occur very rapidly in plywood if it is left unfinished while exposed to rain followed by intense sun exposure.

For oil-based penetrating semi-transparent stains, YES!

For penetrating semi-transparent stains, the surface may, within limits, be allowed to weather. Semi-transparent stains penetrate the wood surface, and weathering can increase the surface absorptivity. The increased surface absorptivity will increase the amount of stain that a given surface area can accept. The improved penetration and increased amount of stain will result in longer service life. Improved absorptivity can also be achieved by using saw-textured wood products. Surfaces that have weathered or are saw-textured can be finished using a two-coat, wet-on-wet application of the semi-transparent [see question *“What is a two-coat, wet-on-wet application?”* in the Application section]. There are however, some risks involved by delaying finish application. Good finish performance depends upon application to a clean dry surface; delaying stain application can sometimes result in a long wait until weather conditions are once again favorable for stain application. The best practice is to use saw-textured wood products without weathering the wood for more than 2-4 weeks (the time necessary for the wood to achieve an equilibrium moisture content). It is also beneficial to stain all surfaces of the siding prior to installing, particularly by dip-treatment. If saw-textured siding is used, the saw-textured side will absorb most of the finish. The amount absorbed is similar to the wet-on-wet application. A second coat should not be applied after installation because it cannot penetrate the first coat after the first coat dries.

The wood siding on my new home has been left unpainted for three months. Is there anything I can do to improve the coating performance now that it has weathered so long, or am I doomed to have early paint failure?

Yes! There's something you can do. No! You are not doomed to have early paint failure. The wood must be scuff-sanded. As the bare wood is exposed to weathering, the moisture and ultraviolet rays start degrading the outer surface of the wood. This creates a layer similar to what we get when we get sunburned. That damaged layer will come off, and beneath will be a good layer. For your siding, if you just paint over the weathered wood, that top layer of wood will peel like that sunburned skin. You need to remove that weathered layer to get to the good wood that will give better adhesion and durability. This can be done by scuff-sanding the wood with 50-80 grit sandpaper. Many people try to remove the weathered surface by power-washing. [Be careful! Improper use of a power-washer often produces a damaged surface or one that doesn't absorb paint or stain very well.]

I am getting ready to repaint my wood siding. It has several spots where the paint has peeled. Do I have to worry about that wood being weathered also?

Yes! Unfinished wood that has been exposed to weathering for several weeks, whether previously painted or not, will be susceptible to peeling problems unless the surface is properly prepared. The exposed wood must be scuff-sanded. The surrounding paint should be sanded (feathered) to create a beveled transition between the painted and unpainted area. **(Warning! If the painted area near the peeled area is lead containing paint, this paint must not be sanded unless it is done by a certified lead paint removal specialist.)** Apply a quality primer to the bare wood before applying the topcoat. Paint peeling is also caused by water. Appropriate measures should be taken to insure that sources of water are remedied prior to repainting. This includes tracing the source of any prior problems (moisture buildup in the wood, ice dams, roof problems, improper venting of bathrooms, etc.). After the problem has been identified and corrected, proper surface preparation measures should eliminate the peeling problem in that area. If the wood has excessive moisture content (above 14%), allow the wood to dry before doing the surface preparation. (Don't leave home without your moisture meter!)

Do I need to put a finish on my deck?

Yes! Any of the woods used as decking (Redwood, Western Red Cedar, preservative-treated lumber, wood/plastic composites, etc.) will undergo objectionable weathering unless protected with a finish. Unprotected wood and wood-products will develop mildew and will weather within a year. Use of a deck finish will inhibit abrupt changes in surface moisture content of deck boards, thus inhibiting checking, splitting, and warping. Pigmented finishes like semi-transparent stains or clear penetrating finishes that incorporate an ultraviolet absorber will inhibit graying and surface erosion. A properly selected deck finish will also inhibit mildew growth. Always make sure that the products are specifically formulated for use on decks and follow the manufacturer's label recommendations.

I have pressure-treated lumber for my deck. I have heard that it should season for 6 to 12 months prior to finishing. Is this correct?

No! Pressure-treated lumber should be finished as soon as the wood is dry. Some pressure-treated lumber may still be wet when installed, however after about 1 week of sunny summer weather it will probably be dry enough to finish.

Concerns have recently been expressed about the possible leaching or weathering of arsenic and/or chromium from chromated copper arsenate (CCA) pressure-treated lumber, and the transfer of these metals from the treated wood to human skin. EPA has recommended that finishing of CCA-treated lumber will help decrease the amount of leaching and transfer of these metals.

I see there are finger-joined cedar boards available at my lumber store. What are the advantages and disadvantages of using this kind of lumber?

New finger-joined siding is Western Red Cedar "reassembled" to offer the performance of premium Western

Red Cedar siding. Finger-joined products, that have been graded, must conform to the ALSC recognized grade rule that would apply to the same ‘natural’ [non finger-joined] product. This lumber is typically marketed in long lengths. This makes for fewer field joints and faster application. Finger-joined Western Red Cedar siding is available in clear or knotty grade categories, in a wide variety of patterns and sizes. This type of lumber is more suited for opaque coatings and factory-finished coatings than for clears or semi-transparent stains.

I have heard that there are some staining problems with Western Red Cedar and Redwood. If there are problems, why should I invest in that type of wood?

Redwood and Western Red Cedar are two species that are known for their good surface stability, and therefore can typically hold paint for a long time. Redwood and Western Red Cedar heartwood are also known to be more decay-resistant than most other wood species. This makes the selection of these species more desirable than other species. For more in-depth discussion of Western Red Cedar, please refer to: <http://www.wrcla.org/finishingcedar/extractivebleeding/overview.asp>

Stains on Western Red Cedar and Redwood generally occur either from extractives bleeding or from using inappropriate fasteners.

From the standpoint of paint or stain discoloration, by far the most important type of extractives are those that are water-soluble. The stain is sometimes called tannin stain, referring to the tannic acid present in wood, especially Western Red Cedar and Redwood. Discoloration of paints or stains may occur when extractives are dissolved by water and are deposited on the painted surface. They may remain on the surface as a gray to reddish-brown stain after the water evaporates. This is termed extractive bleeding. This problem is easily remedied by use of a high-quality stain-blocking exterior primer, proper installation, and by reducing the exposure the siding has to water.

The tannins in Redwood and Western Red Cedar react with iron to produce a blue-black iron tannate. This compound makes ugly stains in the wood adjacent to the fasteners if iron comes in contact with the wood. The only way to assure this doesn't happen is to use stainless steel fasteners. Electroplate galvanized fasteners will fail within weeks and the performance of other types of galvanized fasteners is not satisfactory in many areas. Both the California Redwood Association and the Western Red Cedar Association recommend stainless steel fasteners on their products.

If improper fasteners are used, the remedy is extremely costly. The siding will usually have to be replaced. Treatment with oxalic acid will neutralize the stain temporarily, but additional iron will react with the wood to produce more stain. Removing the fasteners is almost impossible without damaging the wood.

Substrate & Coating Choice:

What types of finish should I use on my wood siding?

You have a wide range of choices, ranging from clear penetrating finishes to paints. The choice is really up to you. [For a more in depth look at what the choices are, please refer to “*What is the difference between paint and stain?*” under the **finishes** section] Redwood and Western Red Cedar contain water-soluble staining extractives, which are activated by moisture (water). If a light-colored paint or a light-colored solid-color stain is desired, use of a stain blocking primer is imperative. These primers are available in alkyd and water-based formulations and the paint label should indicate that they are stain-blocking primers.

How can I keep my wood looking natural?

There is no easy way to maintain the natural look of wood used outdoors. Constant maintenance is necessary. Clear film-forming finishes such as varnish last only one or two years and fail by peeling, which requires

extensive preparation prior to refinishing. The newer varnishes containing transparent trans-oxides and ultraviolet (UV) absorbers perform better than traditional varnishes, but they still may require excessive maintenance if used in areas having a lot of sun. Toned finishes give a natural look while providing some UV protection. All of these finishes give some protection against moisture. Clear and tinted penetrating finishes have about the same service life as the film-forming, but are easier to maintain because they do not tend to fail by peeling.

How can I give my wood a weathered gray look?

In order to achieve a weathered gray look, other than by natural aging, there are stains available that will mimic natural aging. They are usually sold under the name “weathering stain.” These stains include a gray pigment to give the weathered look and may have a water repellent and mildewcide.

Is it OK to use a clear finish on wood decks and siding?

Maybe! Clear, film-building finishes, such as varnishes, should be avoided since premature peeling can occur [even with 2, 3, or 4 coats] as the UV radiation degrades the wood/coating interface. Subsequent maintenance becomes a nightmare. However, clear penetrating finishes are acceptable for use on these surfaces. They should contain a water-repellent, wood preservative, and an UV absorber.

Can I use a varnish on my deck?

No! Varnishes form a film that will eventually crack and peel. There is also concern that due to the film-forming nature they can become very slippery when wet. The usual recommendation for a deck is to avoid any film-forming coating [varnish, paint, solid-color stain] and use a penetrating stain or sealer that will protect the wood.

Can I paint my deck?

No! Maybe! The typical answer to this question is no. Deck stains typically are low solids finishes that penetrate the wood and help prevent water from penetrating the wood, while allowing moisture to escape. Their failure mechanism is by erosion, or wearing away. They may have to be recoated more often, but preparing the deck is very easy.

On the other hand, most paints, varnishes and solid-color stains form a film. This forms a barrier to keep water from penetrating the wood, but also keeps in moisture, which can lead to blistering and, in severe cases, wood rot. Film-forming finishes usually have a failure mechanism of cracking and peeling. Most people do not want to periodically deal with a deck that is peeling.

Within the past few years, there has been some new technology that has been developed by several paint manufacturers, which will allow specific solid-color stains or paints to be used on decks. These coatings have been specifically formulated and tested for this use. Be sure to read the labels for proper surface preparation, application tips, and warranty information prior to application.

How do I keep my deck looking new?

It's really not very difficult! Decks should be finished as soon as possible after installation (conditions permitting). Clean annually using a mild solution of deck cleaner or dilute solution of household bleach, detergent, and water and a sponge mop or soft bristle brush. Reapply a clear or a transparent coating every 12-24 months. Reapply a semi-transparent stain every 18-24 months. Reapply a solid-color stain every 24-36 months. Make sure that the product chosen for the deck is specifically formulated for use on decks. These are estimates, which may differ for many reasons, including specific product performance, quality of application, weathering exposure, climate, deck usage [traffic], etc. Reapplication of these finishes should be according to

specific recommendations of the finish manufacturer.

Can I use the same primer for all types of wood and wood-based surfaces?

Yes! Solvent-based or water-based, stain-blocking exterior primers can generally be used on almost any wood or wood-based surface. Oil-based, solvent-based primers will generally have better tannin stain-blocking properties than water-borne primers over Redwood and Western Red Cedar. Water-based, exterior primers are generally preferred for use on Pine, Douglas-fir or plywood, since they are more flexible than solvent-based primers and are better able to withstand the dimensional changes of those wood substrates. With new technology on the market, check with your local paint professional to make sure your primer selection is appropriate for your application.

Do I need a primer when using a solid-color stain? If so, what type?

Maybe! It depends if the surface is already stained or if it is unfinished, bare wood. If the wood has not been previously finished, using an oil-based stain would not require use of a primer. However, a second coat of solid-color stain will probably be necessary to achieve sufficient film thickness. If the wood has not been previously finished and you wish to use a solid-color latex stain, a primer should be used first over Western Red Cedar or Redwood to help block the extractive stains in the wood. For these finishes to perform properly, they need to have a sufficient film thickness. This can only be obtained with at least 2 coats of finish. If a primer is not used, then two coats of the solid-color stain must be applied.

Do I need to prime new hardboard siding that is factory pre-primed?

Maybe! There are two issues that must be considered with hardboard siding. These are: 1) end cuts, and 2) adequate topcoat thickness.

Hardboard siding manufacturers usually require that all end cuts be field-primed. End-cuts often abut window or door casings, and thus cannot be top-coated, unless they are sealed prior to installation. Since there are no topcoat layers to offer additional resistance to water absorption, the primer is the sole barrier to water movement on the end-cut surfaces. Failure of the coating system at this point results in expansion of the edge as moisture penetrates the hardboard. Check with your hardboard supplier or manufacturer for the most up-to-date recommendations on edge-sealing practices and coating recommendations.

Priming of factory-primed surfaces is not usually necessary. However, one coat of topcoat may not give sufficient coating thickness. A two-coat system may be required to get sufficient thickness. One of these could be the primer particularly if the factory primer is degraded or damaged. If the primer is in good condition, two topcoats of acrylic latex paint are recommended. Either a primer-topcoat or topcoat-topcoat system over a factory-primed surface should give excellent service life (in excess of 10 years). Penetrating finishes such as oil-based semi-transparent stains cannot be used on hardboard.

Finishes:

What is the difference between paint, stain, and water-repellent preservative?

Chemically they are very similar in nature, the big difference is in the recommended uses, viscosity, percent solids and hiding power. But there are two classes of stains: solid-color and semi-transparent, and these types of stain are quite different in properties and in the way they can be used.

Paints tend to be high in solids (the material left on the surface after the solvent evaporates), hiding power and viscosity. Paint films can range in appearance from flats through gloss. Paints form a film, and will typically give longer coating life than a stain. A general rule of thumb is that between the original application and

refinishing time, one coat of paint on a smooth surface, vertical exposed to the weather, will last twice as long as one coat of a solid-color stain, and three times as long as semi-transparent stain. Paints degrade by slow erosion of the paint from the surface, however if the surface has not been properly prepared they tend to prematurely crack and peel.

Solid-color stains are similar to paint in hiding, but are lower in solids and typically lower in viscosity. These stains are usually flat, and do not form as thick a film as paints. Solid-color stains are used on textured wood sidings to highlight the textured surface. They do not permit the grain pattern of the wood to show. Like paints, solid-color stains degrade by surface erosion, but will fail prematurely by cracking and peeling if the film thickness is not sufficient or if the surface preparation was not done properly.

Semi-transparent stains have less hiding and solids content than solid-color stains. They highlight both the wood grain and texture. They do not form a film on the surface, but tend to penetrate the surface because of their low solids content. These systems almost always degrade by erosion, making surface preparation for reapplication of stain fairly easy. If the finish has too high a solids content or if it is applied too thickly, it may form a film and fail prematurely by flaking.

Clear or toned penetrating finishes, such as water repellent preservatives (WRPs) are natural finishes that usually provide some degree of resistance to water and fungi, but they last only 6-12 months, depending on weathering conditions.

Transparent non-flexible film-forming finishes [such as lacquers and varnishes] are typically not recommended for exterior use. The UV radiation can penetrate the film and degrade the wood thus causing loss of adhesion, and over time the film will also turn brittle, creating cracks and eventually peeling. They require extensive scraping and sanding prior to reapplication of a new finish.

Can latex paint be applied over oil-based paint and vice versa?

Generally, latex can be put over oil-based coatings. One must make sure that any dirt, chalk and mildew are completely cleaned away before applying the coat, or poor adhesion and durability will result.

The concern for putting solvent-based coatings over a latex coating is that solvent-based/oil-based coatings tend to become brittle with time. A latex coating will continue to stay flexible. So, putting a solvent-based/oil-based coating over a latex coating can lead to an eventual cracking and peeling of the more brittle oil-based top-coat.

What lasts longer, a flat or satin paint?

In general, satin finishes tend to have slightly more mildew resistance, dirt resistance, flexibility, and hold the color better than flat finishes. However, there are many factors that go into paint durability, and situations can occur where a flat paint can out-perform a satin. Satin exterior finishes are some of the fastest growing coatings on the market today. However, flat exterior finishes are very desirable in that they can help hide imperfections in the siding.

Can I use a latex semi-transparent stain, or is it better to use a penetrating, oil-based, semi-transparent stain?

The oil-based semi-transparent will perform better. Oil-based stains will naturally penetrate the wood, and are inherently more resistant to water penetration. Most formulations are designed to enhance these inherent properties. In addition, the oil-based stains are more versatile in that they can be applied to bleeding and non-bleeding woods. Latex semi-transparent stains achieve the "semi-transparent" by forming a thin film on the surface. This thin film usually fails within 2-3 years by flaking. Oil-based stains that are formulated by forming emulsions in water or with co-solvents to give a "water-based" finish may penetrate similar to a traditional oil-based stain or they may form a film like a latex semi-transparent stain. It depends on the way that the stain was formulated. Waterborne stains are easier to clean up, and some have been shown to perform well in exterior

exposures.

I coated my siding with a solid-color stain. Now I would like a more natural look. What can I do to get this look?

Not much! Aside from choosing another solid-color stain that is more in line with “wood tones”, the only way to really achieve a more natural wood look would be to remove the solid-color stain to bare wood [power washing, sanding, or chemical stripping] and apply a clear or semi-transparent protective coating. Even after removing the old finish, you may not get good results from a penetrating finish such as a WRP or semi-transparent stain because the residual paint in the wood will keep the natural finish from absorbing properly. Please consult local experts to insure your safety if you do decide to remove the current coating, as there can be hazards in this process. Finishes applied prior to 1980 may contain lead.

Why should I pay more for a quality finish?

There is no substitute for a top-line finish. Bargain finishes are **not** a bargain. They usually contain less solids and lower quality pigments and resins. In addition, your time and labor has value, as well as if you hired a contractor to do your painting. Do not short-change yourself to save a few dollars, or you will find yourself applying finish more often and battling a potential maintenance headache.

Surface Preparation:

How long should I wait before I finish my siding or decking?

Only long enough to assure the moisture content is below 20%. Try to limit exterior exposure to less than a week of moderate, dry weather. For reasons why, see remarks above, under **Wood Surface**.

Should I finish the back of the siding before I install it?

Yes! Fluctuations in moisture content of the wood are the key to expansion and contraction of wood or wood-composite panels. During rain, water often gets behind siding and can easily be absorbed by the wood. This causes rapid dimensional changes in the wood. By back priming or using a paintable water-repellant or a primer on all six sides of each panel will help decrease water absorption from rain, making the wood panel more stable, and making the finish more durable.

What are the ideal temperature and conditions for finishing?

When temperatures are in the 70° F's [21°C] and humidity is moderate, this is the ideal time to finish. For many areas this is the late spring or early fall. Typical conditions to avoid are temperatures below 50°F [10°C] and above 90°F [32°C], or when the dew point is less than 5°F [3°C] below the actual temperature. Avoid finishing late in the afternoon or early evening, as lowering temperatures and possibility of dew condensation could ruin the day's work. Also, avoid finishing in direct sunlight, as this may lead to heat blisters or improper coalescence of latex finishes.

I have seen contractors spraying down the siding of a home before painting. Is this something that should be done?

Yes! However, if applying an oil-based finish, allow the surface to dry. When painting in the summertime [or when it is hot], the sun has a tendency to heat up the siding of homes above 90°F [32°C]. Spraying down the siding with water not only helps remove any loose dirt that may have been deposited recently, it will help cool down the siding as the cool water evaporates.

Key point on this method is the use of a latex finish. A latex finish can be applied to a slightly damp surface. However, use of a solvent-borne coating or stain after spraying down the siding with water can lead to blistering and adhesion problems. Solvent-borne coatings must be applied only to dry surfaces.

How can I tell if there is mildew on my siding?

Mildew is a type of fungus that is present in the environment. Mildew needs oxygen, a food source, moisture, and a temperature between 40 and 90°F [5 and 32°C] to grow. There are over 2000 different species of mildew, ranging from black, red, and green in color. Mildew has been seen to grow on many substrates, including tile, glass, automobile finishes, aluminum and vinyl siding. Wood always has mildew spores present on the surface when it is delivered to the construction site. If the conditions are right (a little moisture), the spores germinate and the mildew grows. When repainting, careful inspection needs to be done to make sure the surface is clear of mildew. Chances are, there will be mildew present on the surface you intend to paint.

The best way to tell if there is mildew on your siding is to put a few drops of bleach on the discolored area of concern. If the discoloration clears up without any scrubbing on your part, the spot is mildew. If the bleach shows no effect, then it is probably dirt or another contaminant.

In some climates with high humidity, algae growth is also possible, sometimes showing up as green growth. Removal is similar to mildew, but may require the use of a stiff scrub brush to remove it. The key to prevention of both mildew and algae is a periodic cleaning of your home, and reduction of possible sources of moisture.

Why can't I just paint over the mildew on my siding?

If mildew is present when you repaint, you help the mildew in two ways. First, you have provided food and moisture to help the spores grow. Second, you have provided a protective coating to prevent bleach solutions from reaching the source of the mildew. The mildew often grows on dirt on the siding. This mildew/dirt combination interferes with proper adhesion of the paint. In a case like that, one can anticipate a persistent bloom of mildew spores through the coating and premature paint peeling. Once the new paint is applied over the mildew, the only ways to eliminate the mildew problem are 1) to completely strip the new coating, use a mildew cleaner on the mildew, and repaint, or 2) reside the building. Always use the coating producer's recommendations for safe and proper use of these cleaners.

How do I get rid of mildew on my siding?

Mildew growth may be removed by using any commercial mildew cleaner. A solution of 1 quart household bleach and 3 quarts of warm water may also be used. If a small amount of detergent is added, be sure that it **DOES NOT CONTAIN AMMONIA!** Scrub the surface gently using a sponge mop or soft bristle brush. After 15 to 20 minutes, a thorough water rinse to remove any remaining bleach solution is essential to making sure the finish color, adhesion and performance is not compromised.

Other commercial cleaners, such as those containing sodium percarbonate can be used. When added to water it is effective in removing mildew stains from painted surfaces or weathered wood. Once treated and properly cleaned, the wood may show some of its natural original color.

Protective eyewear and gloves are, at a minimum, a must! Also, never use concentrated bleach on wood to clean or rid an area of mold and mildew. There are many commercial premixed cleaners for removing mildew. As always, please read and follow the label instructions when using these cleaners to safely obtain the desired results.

Why should I do extra work in brushing or rolling two coats when I can get the same dry-film thickness with one thick coat from an airless spray system?

No! There are two reasons for brushing or rolling two coats. The first is that either a brush or roller application will assure better penetration and bonding to the substrate. The second reason is that studies have shown two coats of finish will perform better than one coat when applied at equal film thickness. Some problems that may be encountered by spraying just one coat are lower gloss, blisters, mud-cracking, or sagging of the finish.

Why do I have to spend so much time cleaning and preparing before finishing?

If it has been some time since the surface was last finished, several things have happened during the natural weathering process. Dirt has accumulated on the surface, the finish has degraded and chalked to some degree, mildew growth may have started, etc. These surface contaminants must be removed in order to insure a durable finish performance.

Stains and paints are much like Band-Aids... you can cover up those contaminants, but the Band-Aid won't stick long.., and neither will your finish adhere or last if applied to an improperly or poorly prepared surface. The contaminants must be removed! It is said that **75-95%** of the effort to obtain long service life of a coating is in the preparation. Quality surface preparation, quality finish, quality tools, and quality application are the four keys to long service life of paints and finishes.

Application:

Is it OK to spray the finish?

Yes, but follow up with back brushing. Architectural paints and stains are primarily designed to be applied by brush, roller, and airless spray. As a general rule for airless spray application, thin (low viscosity) finishes require smaller tip sizes (0.009"-0.011") for the spray gun. Conversely, thick (high viscosity) materials require larger tip sizes (0.013"-0.019"). Back-brushing or back-rolling is recommended to properly "seat" the paint into the substrate to enhance adhesion properties.

Would application of two coats of solid-color stain on my siding improve the durability and long-term performance?

Yes. To prevent premature failure of the finish because of cracking and flaking, sufficient film thickness is imperative. Just as with paint, two coats provide a thicker film, which will give more protection to the wood substrate. It will also hide the substrate better, as there is more coating covering the wood.

Two coats of a solid-color stain may begin to look more as though a flat paint was applied. Aesthetically, there will be less texture of the wood showing through, but the coating system performance will be much more durable than that of a single coat of solid-color stain.

Would application of two coats of semi-transparent stain on my deck or siding improve the durability and long-term performance?

Maybe! Application of two coats of semi-transparent penetrating stains requires a special application method. The proper way is to apply the semi-transparent stain in a two-coat wet-on-wet method [see the question "[What is meant by a two-coat wet-on-wet application of stain?](#)" below], making sure that any puddling of the stain is wiped up before the system cures. If you wait for the first coat to cure before applying the second coat, the second coat will not be able to penetrate, puddling on the surface. If puddling of the stain is allowed to remain, some stains will form hard amber sections that will peel and give a poor overall appearance, while other stains may just remain gummy or sticky. Since not all stains are formulated for use on decks, make sure the product you are planning to use is specifically recommended for use on decks.

As a safety issue, if finishes are formulated with linseed oil or other drying oils, the finishes give off heat as they dry. Rags, paper towels, and other clean-up materials can spontaneously ignite if not disposed of properly. Make sure to read the label and follow the handling recommendations in order to avoid spontaneous combustion of these materials.

What is meant by a two-coat, wet-on-wet application of stain?

The two-coat, wet-on-wet application is specific to semi-transparent penetrating stains. In this method, the first coat of stain is applied to a few boards. Then, while the first application of stain is still wet, a second coat is applied over the top. This makes sure that the first coat has not sealed the board from accepting the second coat, and allows for more stain to be applied, enhancing the performance and durability of that application of stain. If one were to wait until the first coat of stain cured before the second coat was applied, the second coat would not be able to penetrate, resulting in film-formation and poor appearance. This two-coat wet-on-wet can only be used on weathered or saw-textured surfaces. Smooth wood will not absorb two coats.

Other:

I keep hearing the acronym VOC. What is a VOC and why should I care?

VOC stands for Volatile Organic Compound. VOC's are generally the volatile components in a paint, stain, or wood preservative. Paint thinners, gasoline fumes, cleaning solvents, degreasers, fingernail polish remover, etc. fall into the VOC category. As part of the Clean Air Act of 1990, the EPA was mandated to put national programs in place to improve air quality by lowering emissions of VOC's into the atmosphere. On September 11, 1998, the EPA issued the final rule for the National Volatile Organic Compounds for Architectural and Industrial Maintenance (AIM) Coatings. Provisions of the rule dictate VOC maximum content of architectural coatings that include paints, stains, and wood preservatives. The coatings industry has responded by formulating and producing finishes with lower VOC content to replace older paints that contained higher levels of solvent (VOC).

I just heard about CCA pressure-treated lumber being phased out because of concerns about health. Do I have to worry about the treehouse I built for my children?

Studies have shown that applying a coating system to the wood and keeping it well maintained decreases the amount of arsenic and chromium on the wood/painted wood surface. Semi-transparent stains decrease the amount of chromium and arsenic that could leach out of the wood or rub off of the surface to below detectable limits of the analytical instrumentation measuring these metals.

If you have new pressure-treated wood and you are not sure what type of treatment it has, checking the tag on the end of the boards will give you the grade and preservative type.

I own an older home that I am planning to redecorate. Are there any hidden hazards I need to worry about?

If your home was built prior to 1972, you may want to contact your local health department before you begin any major remodeling in your home. Why 1972? That was the year that the use of lead in residential paints was outlawed, as was the use of asbestos fibers in drywall and fiberboard. If your project will require you to remove paint [by scraping, sanding, etc.], drywall or fiberboard from the walls or siding, first check with your local health department for testing, or contact the *Environmental Protection Agency's National Lead Information Center (NLIC)*, 1-800-424-LEAD for lead information and your State Health Department contacts.

This is by no means a complete question and answer guide, but does contain many of the most frequently asked

questions and misconceptions. Again, there are even exceptions to some of the answers listed above. It cannot be stressed enough to read and follow all of the manufacturers' directions prior to [not after] using the product.

For further reference, the reader is encouraged to visit the following web sites. These sites contain more general knowledge that is in tune with our current knowledge at the Joint Coatings and Forest Products Committee.

Recommended Websites:

1. www.apawood.org: Engineered Wood/American Plywood Association.
2. www.pbmdf.com: Composite panel/American Hardboard Association.
3. www.preservedwood.com: American Wood Preservers Institute.
4. www.wrcla.org: Western Red Cedar Lumber Association.
5. www.wwpa.org: Western Wood Products Association
6. www.woodinfo.org: Wood Products Council
7. www.calredwood.org: California Redwood Association.
8. www.cedarbureau.org: Cedar Shake and Shingle Bureau.
9. www.fpl.fs.fed.us: US Forest Products Laboratory.
10. www.nahbr.org: National Association of Home Builders Research
11. www.pdra.org: Paint and Decorating Retailers Association.
12. www.paint.org: National Paint and Coatings Association
13. www.coatingstech.org: Federation of Societies for Coatings Technology
14. www.paintquality.com: Paint Quality Institute

This technical article is one in a series to deal with the basics of painting and finishing exterior wood and wood-based surfaces on houses and commercial buildings, written by the Joint Coatings and Forest Products Committee. The committee is made up of about 20 technical representatives of the Federation of Coatings Technology, National Forest Products Association, and USDA Forest Products Laboratory, and has written this series of articles.