How to Finish

WESTERN RED CEDAR

This guide is intended to provide a summary of the essential "best practices" for finishing, care and maintenance that will lead to a positive experience with your Western Red Cedar.

WESTERN RED CEDAR LUMBER ASSOCIATION

REAL CEDAR

WRCLA

1

INTRODUCTION

Western Red Cedar (WRC) is one of nature's most outstanding building materials.

Renowned for its performance and exceptional beauty; it brings warmth, character and longevity to homes and non residential projects around the world. Western Red Cedar's natural durability and physical properties make it ideal for exterior applications such as siding, trim, decking and for interior applications such as paneling.

Ultimately the choice to finish your Western Red Cedar project is yours. You can allow your Western Red Cedar to weather naturally or, with the application of a protective coating that will ensure maximum performance, you can retain the natural beauty of the wood or enhance its beauty by using coatings in a wide array of colors. This publication will address both options and provide you with the basic information needed to determine which option best suits you and your project needs.

NATURAL WEATHERING

Western Red Cedar performs satisfactorily as a decking and siding product if it is left unfinished to weather naturally.

You may choose this option due to:

1. A preference for the silvery grey look of naturally weathered Western Red Cedar;

2. A desire not to invest the time and effort required to maintain the finish on a cedar product;

3. Project inaccessibility, causing difficulty in maintaining the finish on a Western Red Cedar project, for example, siding on very tall buildings; or,

4. A concern about the environmental impact of applying a finish on your Western Red Cedar.

These are all valid considerations and the reality is that Western Red Cedar siding and decking can have a long service life without a finish coating in many environments—as long as good design, installation and maintenance practices are followed.

It is important to understand that the choice not to apply a finish to your cedar product has long-term implications. This choice requires advance consideration before you allow natural weathering to begin. As Western Red Cedar weathers, it will lose its natural color and become grey. In very dry climates, it weathers to a silvery grey color, but in most other climates, because of varying moisture and sun exposure conditions, the Western Red Cedar does not weather uniformly and is likely to develop a dark, blotchy, grey appearance.

Should you wish to restore weathered cedar to a state where it can be painted or stained however; significantly more effort will be required to prepare the surface of the wood for coating. If a truly uniform grey appearance is desired, then this effect can be achieved by the use of commercially prepared bleaching or weathering products. These are essentially water repellant finishes containing pigments and other additives which are most effective on textured cedar. To maintain this look, bleaching or weathering products may need to be re-applied periodically.

Although the natural weathering effect is usually only "skin deep" (less than 1–2mm), with the cedar largely unchanged beneath, extra care must be given to the design of the project, the installation of the cedar and routine maintenance. Without the protection provided by a coating against moisture intrusion, (especially end grain sealing), steps must be taken during the installation process to allow Western Red Cedar to readily dry following exposure to moisture, otherwise the risk of decay increases.

All cedar products used in exterior applications require a degree of maintenance to keep them looking their best. Even if the choice is made not to apply a finish to Western Red Cedar, contaminants such as dirt and mildew should be regularly removed to maintain its beautiful, natural appearance.

Life Cycle Assessment (LCA)[1] of Western Red Cedar siding and decking shows it has the most benign environmental impact of all the alternative product choices for those building applications. Coatings, especially the solvent borne finishes and the frequency of their application negatively impact the LCA of cedar siding and decking. This impact may influence a decision not to apply a finish. Fortunately, a new generation of more environmentally friendly, water borne, coatings are emerging and these products should be considered.

[1]Life Cycle Assessment (LCA) is used to assess the environmental performance of a product from cradle to grave.

FACTORS
AFFECTING FINISH RETENTION

A number of factors affect the performance of finishes including: Western Red Cedar's natural properties, manufacturing characteristics, and construction practices.

Natural Properties

The most important characteristics of Western Red Cedar are: its outstanding dimensional stability, fine texture, pattern of growth, and freedom from pitch and resin. These characteristics contribute to its exceptional ability to accept and retain many different types of finishes.

Dimensional stability is the resistance of wood to swelling and shrinkage when it gains or loses moisture. Light, low-density woods such as Western Red Cedar shrink less than higher density woods. Its excellent dimensional stability is an important factor responsible for the longer life of paints on Western Red Cedar in comparison to other woods.

Texture refers to the smoothness of the wood surface after sawing, planing or sanding and depends on the size of the wood's cells. Paint performs better on smooth, finer textured, wood species than on coarse textured species. Western Red Cedar has smaller wood cells and a finer texture than most other conifers or softwoods.

Pattern of growth refers to the alternating bands of light-colored, low density, springwood and dark-colored, higher density, summerwood. Together, these two bands constitute one year of tree growth. Paint performs better over the lower density spring wood which Western Red Cedar has a greater percentage of than most other conifer species.

Pitch or resin which can interfere with the bonding or penetration of a finish can be found in most softwoods but are absent in Western Red Cedar.

Manufacturing Characteristics

Surface Texture: Western Red Cedar products are available with a smooth (planed) or a textured (sawn or rough sanded) surface. As a rule, textured surfaces provide the best mechanical adhesion of the finish to the wood; for smooth-surfaced Western Red Cedar, a two coat paint system is preferred.

Moisture Content: Finishing wood that is wet (above 20% moisture content) may increase the risk of coating failure. It is best to finish Western Red Cedar when its moisture content has stabilized at the level that will prevail during the service life of the product. In North America this level is approximately 12% moisture content. The best product choice is Western Red Cedar that is kiln dried at the time of manufacture

Construction Practices

Construction practices have a significant influence on the performance of cedar and the finish over it. Care should be taken from the time the Western Red Cedar is delivered to the job site through to its installation and finishing. The moisture content of the wood (both prior to and during its service life), exposure to sunlight and surface contaminants (dirt) are important factors affecting the performance of each finish.

While it is not within the scope of this publication to describe in detail the many construction techniques necessary to maximize performance, the following brief checklist is helpful:

- Use stainless steel, hot-dipped galvanized or aluminum fasteners.
- Install flashing over all openings and above skirt and band boards.
- Provide adequate overhangs at eaves and gables.
- Install drip caps over windows and door frames.
- Allow at least 6 inches of clearance between the bottoms of siding and trim boards and the ground line.
- Allow at least 2 inches of clearance between the bottoms of the siding and trim boards and roofing materials.
- Install vapor barriers on the warm side of walls to minimize condensation within walls.
- Vent high humidity areas such as kitchens, laundries and bathrooms.
- Vent attics and crawlspaces.
- Keep cedar protected from the elements on the job site.
- Acclimatize Western Red Cedar to local humidity conditions before installing.
- Apply primer or stain to all six sides, including surfaces exposed after they are field-cut, before installing. Note that the end grain may require 2 coats to fully protect it.

Installing siding over a rain screen greatly decreases the chance that the backs of the siding will get wet and remain wet. This ensures that any water that penetrates the wall assembly will drain down and away from the walls. Rain screens also minimize moisture imbalances within the siding, thus reducing the potential for cupping and extractive bleeding. As a result, coating performance is markedly improved.

For more comprehensive information on installing Western Red Cedar siding, request a copy of the WRCLA publication: *How to Install Western Red Cedar Siding.*

EXTERIOR FINISHES FOR

WESTERN RED CEDAR SIDING & TRIM

If you choose to finish your Western Red Cedar siding or trim, it should **not** be left unfinished and exposed to direct sunlight and moisture for any significant period of time prior to stain or paint application. Weathered surfaces, even if only exposed to the elements for a few weeks, will compromise Western Red Cedar's ability to hold a paint or solid stain. The longer the period the Western Red Cedar is left to weather, the more rapidly the finish may fail.

Natural coloration of newly milled cedar can be retained by applying finishes that contain ultraviolet blockers. Finishes containing both an effective mildewcide and ultraviolet protection are recommended. Since these finishes contain a low percentage of solids, they tend to require higher maintenance. Penetrating oil-based stains or light-pigmented natural tones can also be applied to provide uniform color and wood protection.

Choice of Siding and Trim Finishes

The choice of an exterior wood finish for Western Red Cedar dvepends upon the desired appearance and the degree of protection required. Finished wood is a combination of two widely different materials and the properties of both must be considered to achieve the most durable wood-finish system. Note, however, that with all types of finishes, the manufacturer's recommendations should be followed. Western Red Cedar's excellent finishing characteristics cannot compensate for finishing products that are unsuitable, of inferior quality, or improperly applied. Exterior finishes perform best when the coating is applied to all surfaces (face, back, edges and ends).

In general, finishes for Western Red Cedar can be grouped into four categories: **(1)** opaque coatings, such as paints and solid-color stains; **(2)** semi-transparent stains; **(3)** natural finishes such as transparent stains; and **(4)** oils. Wood preservatives and fire-retardant coatings may also be classified as finishes in some respects but are not within the scope of this publication. The expected service lives of different exterior finishes for Western Red Cedar siding and trim are summarized below.

Figure 1: Suitability and Expected Service Life of Exterior Finishes on Western Red Cedar Siding and Trim[1]

Finish	On Planed Smooth WRC[2]		On Textured WRC	
	Suitability	Expected Life (yrs)	Suitability	Expected Life (yrs)
Paint[3]	High	Up to 10	High	Up to 12
Solid-color stain[3]	Moderate	3 to 5	High	4 to 6
Bleaching & Weathering Products	Moderate	3 to 5	High	5 to 6
Semi-transparent stain[4]	Moderate	1 to 3	High	2 to 4
Water-repellent preservative and oil[5]	High	1 to 2	High	1 to 2

You Get What You Pay For

Remember, when purchasing a finish for your Western Red Cedar project it is always best to use a top of the-line product from a supplier you know and trust.

[1]Data compiled from research observations. Expected lifetime predictions are for an average location in the continental United States. Expected life will vary in extreme climates or exposures such as desert, seashore, and deep woods or according to the building's orientation.

[2]Vertical grain cedar

[3]Expected life of two coats: one primer and one top coat. Applying a second top coat will increase the life of the coating.

[4]Follow manufacturer's recommendations for the number of coats.

[5]Development of mildew on surface indicates need for cleaning and possible refinishing.

OPAQUE FINISHES

Primers

Western Red Cedar contains water-soluble extractives that are responsible for its attractive color, exceptional stability and natural decay resistance. However, these extractives may discolor latex paints and solid-color stains unless a primer coat is used that is specifically formulated to help control extractive bleeding. These stain-blocking primers are available in alkyd-oil and water-based formulations. Alkyd-oil based primers usually offer the best shield against discoloration by water-soluble extractives. The label on the container should indicate that the coating is recommended for use as stain-blocking primer for Western Red Cedar.

Paint

Paint provides the most surface protection against weathering and wetting by water, while providing color and concealment of some of the wood's characteristics. Although paint can reduce wood's absorption of water, paint itself is not a preservative.

Paints of all types such as: water-based paints, acrylic (latex), acrylic enamel and solvent based paints (alkyd and oil-modified) are suitable for Western Red Cedar. However, test results show that good quality latex paint maintains its mechanical adhesion through dimensional changes of the wood during wet and dry moisture cycles. For this reason, finishes with high elasticity generally maintain adhesion better than brittle finishes during extended periods of exposure to outdoor weathering.

Solid-Color Stains

These are opaque finishes with fewer volume solids than paint. Like paints, solid-color stains protect Western Red Cedar against ultraviolet light degradation and moisture. They are available in a wide spectrum of hues which obscure the wood's true color but allow some of the cedar's natural characteristics and texture to remain. These finishes are non-penetrating and, like paints, form a film. A stain-blocking primer should be applied first, before applying the solid color stain. Solid color stains are available as latex or oil based formulations. Oil-based solid color stains should not be applied over latex primers

Solid-color stains have been developed that reveal the wood's grain. These are known as semi-solid stains and their effect on the appearance of wood lies between those of solid color and semi-transparent stains.

NATURAL FINISHES

Many users of Western Red Cedar prefer a finish that preserves the wood's natural color and appearance

To maintain the natural look of Western Red Cedar that is exposed outdoors, regular maintenance will be required. The following products provide varying degrees of protection against weathering while maintaining the cedar's natural beauty:

Transparent Stains

These stains do not alter the appearance of the cedar. They only slightly modify the color (tone) of the wood. Transparent stains are similar in composition to semi-transparent stains, but they contain fewer pigments. Transparent stains formulated with a fungicide that inhibits the growth of mildew and decay causing fungi will further increase the wood's durability. Waterborne and solvent borne formulations are available; however these unpigmented or lightly pigmented finishes provide limited protection against the sun's ultraviolet light and moisture related damage. As such, they require frequent refinishing. Transparent stains are, however, easily refinished with minimal surface preparation.

Semi-Transparent Stains

Solvent borne, oil-based, semi-transparent, penetrating stains penetrate the wood surface, are porous, and do not form a surface film like paints. These finishes are the best choice for Western Red Cedar, which is fully exposed to the weather, when a natural look is desired. Although these stains can be used on both smooth and textured Western Red Cedar, they will perform much better and last longer when applied to a textured surface. These stains contain pigments which provide color—including cedar tones—and greatly increase the durability of the finish by protecting the cedar surface, to some extent, from the damaging effects of the sun's ultraviolet rays. Service life on siding applications may vary from 3–6 years depending on the cedar surface texture, quantity of stain applied, and the intensity of the sunlight on the wood surface.

Latex semi-transparent stains are similar in appearance to the solvent borne stains; however their look is achieved by the formation of a thin film with little penetration. This film is often not thick enough to provide the same durability as solvent borne stains and tends to degrade by flaking from the wood's surface. Refinishing cedar that has been coated with a latex semi-transparent stain may require more substantial surface preparation. Currently, efforts are underway by many stain manufacturers to develop water-borne stains that penetrate cedar. However, to date, moderate success has been experienced in duplicating the properties of traditional oil-based, solvent borne, stains. As increasingly restrictive environmental standards reduce the availability of solvent borne stains, ongoing research suggests that penetrating, erodible latex semi-transparent stain finishes for cedar will be available in the near future.

Note: Transparent, non-flexible, film-forming finishes such as lacquer, shellac, urethane, and varnish are not recommended for exterior use on Western Red Cedar. Ultraviolet radiation can penetrate the transparent film and damage the wood. Regardless of the number of coats, the finish will eventually become brittle, develop cracks in the coating film and then fail.

FACTORY

FINISHING/PRIMING

For optimum performance, the WRCLA recommends that Western Red Cedar is pre-primed or pre-finished prior to job site delivery.

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Factory-priming, as the name implies, is performed in an industrial setting where a machine coating process applies a coating to all six sides of each board. The coated boards are then dried prior to shipment to the job sites.

Pre-primed siding and trim boards delivered to a job site should be kept dry and clean prior to installation. All field cuts should be re-sealed with a primer prior to the boards being installed. Top coating should be completed as quickly as possible as most primers are not intended to be exposed to natural weathering for more than 90 days.

Factory–finishing is similar to the above process, however, it allows for the additional application of one or two topcoats of acrylic latex paint, solid stains or natural stains in job lot quantities and in the colors selected by the builder/homeowner.

It is important not to overdrive nails during installation of factory finished siding, as this will damage the surrounding wood and coating. Overdriven nails must be remedied immediately by filling the depression with exterior grade wood putty or caulk specifically designed for this purpose. Touch-up any repairs or field cuts, taking care not to smear the top coat.

Properly done, factory priming/finishing provides:

- the application of a uniform coating at the recommended coverage of the primer/stain to all six surfaces of each piece (face, back, edges and ends)
- a controlled environment to permit proper curing of the finish
- the wood with a coating to protect it from exposure to sunlight (UV degradation) and surface contamination by mildew and dirt
- an elimination of lap marks, streaks and shrink lines after installation
- an ability to install products at any time of the year
- a product that often comes with a coating warranty

APPLICATION
TECHNIQUES FOR SIDING AND TRIM

The application of a finish on Western Red Cedar is as important for durability and optimal performance as is the finish-substrate combination chosen for the job.

Finishes can be brushed, rolled, sprayed or applied by dipping. The application technique, the quality and quantity of finish applied, the surface condition of the substrate, and the weather conditions at the time of application can substantially influence the life expectancy of the finish. The application guidelines suggested here should be followed in combination with the manufacturer's preparation and application recommendations for the product.

Finishes and cleaners are chemicals which may pose health hazards from contact, ingestion or by inhaling. So be sure to carefully read the all of the manufacturers' application instructions and warnings prior to purchasing the product.

Paints and Solid Color Stains

After proper surface preparation, follow these steps to achieve maximum service life.

1. Apply a good quality stain-blocking primer at the spread rates recommended by the manufacturer as soon as possible after surface preparation and when the moisture content of the wood is below 20%. The primer coat is very important because it forms a base for all succeeding paint coats and should be used whether the top coat is oil-based or latex-based. It is best to prime before installing siding because it permits application to the face, back, edges and ends. Priming the back or wall side of the siding is often referred to as "back priming". This practice helps to prevent cupping and enhances the paint's service life.

2. Apply the top coat over the primer. Brushing is considered to be the most effective way to apply the coating. If two top coats are to be applied, allow the first to cure for the period recommended by the manufacturer before applying the second coat. In cold or damp weather, allow extra drying time between coats. Oil based paints should not be applied over latex primers

Solid Color Stains

These may be applied to Western Red Cedar by brush, roller, or pad. Brush application is usually the best. These stains perform similarly and are applied like paint. One coat of solid-color stain is only marginally adequate on new wood. A prime coat with a top coat will always provide better protection to the wood as well as promoting a longer service. Optimal performance can be obtained if the wood is primed, then given two coats of stain. Top coats of acrylic latex solid-color stains are generally superior to all others, especially when two coats are applied over a primer.

Unlike paint, a solid-color stain may leave lap marks. To prevent lap marks, follow the procedures suggested for semi-transparent penetrating stains.

Semi-Transparent Stains

You have the option to apply semi-transparent stains by brush, spray, pad, or roller. Brushing will usually give the best penetration and performance. Spray or roller application followed by back-brushing is also an acceptable method of application. Oil-based stains are generally thin and runny, so application can be messy. Lap marks can be prevented by staining continuous lengths. This method prevents the front edge of the stained area from drying before a logical stopping place is reached. Working in the shade is desirable because the drying rate is slower. Stain that has been applied by spray, without back-brushing, is prone to show blotchy patterns as it weathers.

FINISHING
ON SITE

The surface condition of the wood on which the finish is applied can substantially affect the performance and life expectancy of the finish.

New (not weathered) Western Red Cedar

New cedar siding and trim should be protected from the weather before, during and after construction. It is seldom necessary to carry out extensive surface preparation providing the wood has not weathered for more than two weeks and is clean and dry. The moisture content should always be checked as a precaution. The moisture content cannot be above 20% and if the wood has been contaminated by dirt, oil or other foreign substances, the contaminants must be removed. Dirt should be washed from the surface (see section on cleaning and discoloration).

For smooth-planed, flat-grained cedar, some surface preparation may be desirable. On flat-grained wood, the surface should be scuff-sanded with 50-60 grit sandpaper. This procedure will greatly increase the coatings performance but will not detract from a smooth appearance. Surface preparation is not necessary for clean textured cedar.

Weathered Western Red Cedar

Cedar siding and trim that has been exposed to the elements for longer than 2 weeks may have a degraded surface that is unsuitable for painting. Preparing the surface by sanding, brushing (with a non-ferrous bristle brush), and washing before applying the finish is recommended.

Two coats of penetrating oil-based stain on textured Western Red Cedar will provide a longer service life than one coat, but only if the wood will accept the second coat. Stir the stain thoroughly during application to prevent settling and color change. Avoid mixing different brands or batches of stain.

Latex semi-transparent stains do not penetrate the wood surface, but they are easy to apply and less likely to form lap marks. These stains are film-forming and may not be as durable as oil-based stains.

EXTERIOR FINISHES FOR

WESTERN RED CEDAR DECKS

Finish Decks for Optimal Performance

Although Western Red Cedar is a naturally durable wood ideal for decks, its performance is enhanced when protected by an appropriate finish. Decks are subjected to the most challenging exposure conditions. The combination of a horizontal surface, the abrasive effects of foot traffic, pounding rain and full exposure to sun make deck finishing more demanding than other finishing applications such as siding. It is important to ensure that the finish you apply to your Western Red Cedar decking boards has been specifically formulated for this end use.

Unseasoned decking should be air dried (not exposed to direct sunlight) and finished on all sides prior to installation.

Choice of Deck Finishes

A full range of both penetrating and film-forming finishes are available for cedar decks. Since they do not form a film, the penetrating finishes provide better overall performance and are the easiest to maintain and refinish.

Penetrating finishes do not flake, crack, or peel. These treatments help repel water and if formulated with a mildewcide, slow down the growth of micro-organisms like mildew. The penetrating finishes are often used as a natural finish for cedar decks. There are three types of penetrating finishes: water repellents, water-repellent preservatives, and solvent-borne semi-transparent stains. The best of these finishes are solvent-borne semi-transparent ones.

Transparent Stains and Water Repellents

These are essentially colorless, penetrating finishes that are commonly used for cedar decks. These natural finishes enhance the appearance and service-life of cedar decks. The water-repellent preservatives are preferable to the water-repellents because they contain a mildewcide and often other fungicides that help inhibit surface mildew growth. Many of these water-repellants contain ultraviolet light blockers or absorbers that help protect the Western Red Cedar from damaging sunlight. To date, the best of them are solvent-borne but new products containing water soluble oils are becoming more readily available. The water repellent preservative finishes are very effective in stopping the absorption of liquid water thus reducing swelling and shrinking of the wood. Water-repellents should be used only on newly manufactured bare cedar, on restored bare cedar, or on cedar previously treated with the same type of product. When used as a natural finish, the service life of a water repellent is only one to two years depending on the wood and exposure conditions.

Semi-Transparent Stains

Semi-transparent stains have pigments which provide color and greatly increase the durability of the finish. The pigments help block sunlight and protect the cedar surface, thus increasing service-life. The better products contain water repellents and mildewcides or fungicides. The solvent-borne, semi-transparent stains penetrate into the cedar without forming a film and do not blister or peel even if excessive moisture enters the cedar. However, latex semi-transparent stains can sometimes build up a film, especially on recoating, which can lead to peeling. Latex formulas containing water soluble oils are becoming more readily available.

It is possible to switch to a semi-transparent stain when the deck needs to be refinished. Even if the deck has been coated with a clear or transparent stain for many years, an oil-based semi-transparent stain can be applied, provided the wood surface is cleaned.

Note: Film-forming finishes are normally not recommended for use on Western Red Cedar decks because they can fail by cracking, flaking and peeling and can be very difficult to refinish and maintain. Your lowest maintenance option for Western Red Cedar decks is to apply nothing allowing the wood to weather naturally. Then you only need to keep the deck clean and free from mold & mildew.

APPLICATION
TECHNIQUES FOR DECKS

The first finish applied to cedar decks is the most important one. If the first finish is not done properly, it can be difficult to correct problems that develop later.

The finish should be applied as soon as the cedar surface is dry. The deck should be cleaned, but power washing should never be used to clean cedar decks because this process can damage the wood surface fibers and make it difficult for the finish to bond. Factory finishing is the best option and is available in most markets.

Semi-Transparent Stains

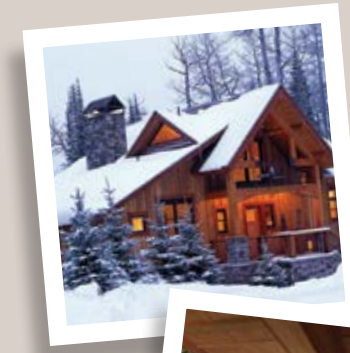
Semi-transparent stains are best applied to decking by brush because the stain is worked into the wood surface promoting the achievement of even finish penetration into the wood. Apply the stain liberally by brushing in the direction of the wood's grain. Apply finishes to the full length of only two or three boards at a time to avoid lap marks. Try to avoid overlapping areas that contain dry stain with fresh stain, which can also create lap-marks. Working in the shade can help reduce lapping because the drying rate of the stain is slower. Water-based stains are less likely to form lap marks than solvent-based stains because they are slower drying, but they form a thicker film on the surface than solvent-based stains and may not be as durable. Do not apply more stain than the cedar will absorb because the excess stain will appear as a shiny area on the surface. Apply the stain liberally to the end grain of deck boards, nail holes and any cracks in the boards. For maximum protection, deck boards should be stained on all sides.

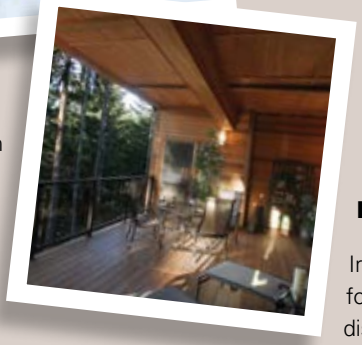
Application of Transparent Stains and Water-Repellent Preservatives

The method of applying transparent stains to wood is similar to that described for semi-transparent stains. Water-repellents, however, are more forgiving and can be applied by brush, pad, or roller followed by thorough back-brushing. Repeated brush treatment of Western Red Cedar until the wood will no longer absorb any more water-repellent (known as the point of refusal) will enhance the durability of the finish. The more water-repellent finish absorbed by the wood, the longer the service life. Liberal amounts of water-repellant should be applied to the end grain of deck boards. Other areas subject to moisture penetration such as nail or screw holes and cracks also need to be will treated.

CARE & MAINTENANCE

The surfaces of finished Western Red Cedar decks, siding and trim boards exposed outdoors inevitably become dirty and can also be discolored by mildew, algae and moss. These natural elements slowly erode the finishes and as a result, all finishes applied to cedar require regular cleaning and maintenance to perform best. The degree of maintenance depends on local climatic conditions, the type of finish and end use (deck or siding).





Discoloration of finishes on Western Red Cedar

Western Red Cedar enjoys a well-deserved reputation as a wood that takes and holds a range of finishes for extended periods. Nevertheless, the usual lifespan of a finish will be shortened by degradation and discoloration. The causes of discoloration often require remedial treatment.

Dirt

Dirt is the most benign cause of discoloration. A periodic cleaning with a mild, non-phosphate detergent solution will usually restore the surface finish.

Mildew

Mildew is a common form of discoloration of paints and stains caused by staining fungi. Re-staining does not solve a mildew problem. When it is time to refinish, clean off the mildew with a mild bleach solution (oxygen bleach is preferred) or commercial mildew-remover. After the wood has been thoroughly rinsed and allowed to dry, refinish with a coating that contains an effective mildewcide.

Tip: A simple test for the presence of mildew on the coating can be made by applying a drop or two of a fresh solution of liquid household bleach (containing 5 percent sodium hypochlorite) to the stained area. The dark color of mildew will usually bleach out in 15 to 30 seconds. Discoloration that does not bleach is due to other factors and requires further investigation.

Extractive Bleeding

Discoloration due to extractive bleeding is usually caused by moisture. To stop stains caused by extractive bleeding, the moisture source must be eliminated. Mild staining is often washed away by rain over a period of weeks. In sheltered areas of a building where the stain persists, it may become darker with age and more difficult to remove. If washing with a mild detergent solution does not work, applying a mild oxalic acid solution has been proven to be effective in removing water, tannin or iron stains. Commercial cleaners are also available. If the stain remains, prime the area with an alkyd primer and top coat with a latex coating.

Iron Stains

Iron stains may appear in two forms: the reddish brown discoloration caused by iron or other sources of corrosive metals in direct contact with Western Red Cedar. To prevent these stains, use only hot-dipped galvanized, aluminum or stainless steel fasteners when installing cedar. To clean areas affected by iron stains, use a commercial cleaner. In situations where the stain has penetrated the wood surface, light sanding or brushing may be required.

Water Stains

These often occur in combination with extractive bleeding and mildew growth. These stains can be difficult to remove. Scrubbing the wood with a dilute oxalic acid solution is sometimes effective.

Caution: Handle oxalic acid solution with care as it can be harmful—carefully follow the instructions.

Chalking

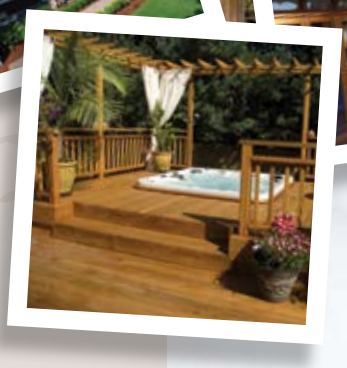
Chalking, the release of pigment and degraded resin particles, results from weathering of the paint's surface. It is a degradation of the paint film, not the cedar. Chalking is a common cause of fading in tinted or colored paints.

Peeling, Blistering or Flaking

Paint failure such as peeling, blistering or flaking is often associated with moisture build-up behind the paint and poor adhesion of the paint film to the underlying wood. This problem is exacerbated if paint is applied to weathered wood.

Regular Maintenance Extends the Life of Both Finish and Decking

A deck that dries after wetting will last longer than one that stays damp. Ongoing maintenance practices for cedar decks include: allowing proper water drainage; keeping the surface free of dirt, leaves, tree needles and other debris; moving planters, benches and other deck accessories from time to time to permit the deck beneath them to dry thoroughly and ensuring that the ventilation under the deck is not inhibited.



RESTORING
WESTERN RED CEDAR

SIDING AND TRIM

Good surface preparation practices are essential to achieve a durable, long-lasting exterior finish. Most premature exterior coating failures are attributable to inadequate surface preparation resulting in:

- poor finish coat adhesion
- surface discoloration
- lack of finish coat uniformity (sheen, color and surface hiding)
- lack of corrosion resistance

The first step in surface preparation is to inspect the surface and make any necessary repairs. The surface must then be cleaned to be free of all dirt, mildew and loose material (discussed below).

Paint and Solid Color Stains

Exterior Western Red Cedar surfaces only need to be refinished when the old coating has worn thin and no longer affords the wood protection. In refinishing painted or solid-color stained siding and trim, removal of the old coating may be required. This is necessary if, for example, the old finish is severely cracked or is peeling. These finishes can be removed by a variety of procedures, all of which can be difficult, time-consuming and expensive processes. Some of these procedures can damage the wood. For example, power washing should never be used for removing coatings from Western Red Cedar because this process can severely damage the wood surface fibers and make it difficult for the next finish to adhere properly.

Refinishing Opaque Finishes

Western Red Cedar that has been finished with paints or solid-color stains is best refinished with the same type of finish originally applied. These finishes are sometimes used interchangeably but old latex coatings should always be refinished with latex coatings and never with oil-based coatings. Old oil-based finishes can be refinished with latex finishes only when the old oil-based finish has been properly cleaned and a primer coat applied first. Remember, that proper surface preparation and cleaning before refinishing are essential for optimal performance of the new finish coat or coats.

To refinish the old surface, first scrape away all loose, cracked or peeling finish. Sand the bare wood and any remaining finish to "feather" the edges smooth with the bare wood. Mildew must be killed and removed before Western Red Cedar is refinished, or the mildew will grow through the new paint coat or solid-color stain. Removal can be done with a commercial mildew remover or with dilute solutions of liquid household (oxygen based) bleach followed by thorough rinsing with clean water. After these preparations, scrub the surface with a stiff bristle (not wire) brush and water, and rinse with clean water. Allow the washed surface to dry before recoating and apply primer paint to areas of bare wood. After the primer has dried, apply one or two topcoats of paint or solid-color stain. Two topcoats are always better over bare wood that has been primed.

Refinishing Clears, Semi-Transparent Stains and Bleaching Oils

Oil finishes and water-repellent preservatives can be renewed by a simple cleaning of the old surface with a stiff bristle (non-metallic) brush and water followed by an application of a new coat of finish. In some cases, a mild scrubbing with a detergent followed by rinsing with water is appropriate. In more drastic cases, mildew cleaners must be used. The second coat of water-repellent preservative will last longer than the first because more can be applied as it penetrates into small surface checks which open as the wood weathers. The rougher the surface, the more finish can be applied, and the longer the service life.

Semi-transparent, oil-based, penetrating stains are relatively easy to re-apply. Excessive scraping and sanding are not usually required. Simply use a stiff bristle (non-metallic) brush to remove all surface dirt, dust, and loose wood fibers. Following proper cleaning to kill mildew contamination, apply a new coat of stain. The second coat of penetrating stain often lasts longer than the first coat because more can be applied as it penetrates into small surface checks. Note that steel wool and wire brushes should never be used to clean Western Red Cedar. Metal deposits can react with chemicals naturally occurring in the cedar to yield dark blue-black stains on the surface. Bleaching and weathering products are refinished the same way as the semi-transparent oil-based penetrating stains.

Semi-transparent latex stains act more like very thin paints and may require more extensive surface preparation (scraping, sanding, etc.) before being re-applied. Care should be taken not to build-up the film thickness by recoating too frequently. Manufacturer's instructions should be followed carefully.

Weathered Western Red Cedar

Uncoated, weathered Western Red Cedar siding or trim can often be restored to its original color by applying commercial products called cleaners, brighteners or restorers. Although intended primarily for restoring horizontal wood surfaces such as decks, these products generally work almost as well on vertical surfaces. Some products are formulated with thickening agents to help the liquid cling better to vertical surfaces. For more information see *'Restoring Deck Finishes'*.

RESTORING
WESTERN RED CEDAR DECKS

It is a good practice, to clean your deck once a year, in the spring, to remove dirt, mildew and other forms of discoloration.

Yearly cleaning will ensure that the deck looks nice as well as prolonging the life of the protective coating. Scrubbing your deck with warm soapy water will remove dirt, but diluted household (oxygen based) bleach will be required to remove mildew. Most coating companies also manufacture deck cleaning products to complement the deck finishes they manufacture. These products called cleaners, brighteners or restorers remove different forms of discoloration without stripping the finish from the Western Red Cedar. Most of these cleaners can remove dirt and discoloration caused by mildew and algae from the surface of cedar, but they vary in their ability to remove iron and tannin stains and weathered (grey) wood from the surface of the deck. Some of these deck cleaners may actually remove wood from the weathered cedar surface and therefore you should take care when using them.

Power washers can damage cedar deck surfaces and this type of cleaning is NOT recommended for cedar decks of any other cedar application.

Note: Information on the best cleaners and strippers to use on cedar can be found in the WRCLA web site (see *www.realcedar.com)*

Deck surfaces should be refinished when the Western Red Cedar starts to lose its color. The new finish needs to penetrate into the wood. Finishing too soon leads to inadequate absorption; finishing too late means the coating may have been applied to weathered wood, which reduces the performance of finishes. The first step in refinishing a Western Red Cedar deck is to clean it (as above). After the deck surface has been cleaned and rinsed thoroughly it should be allowed to dry. The moisture content of the wood should be below 20%. Refinishing the deck with semi-transparent stain or transparent stains and water-repellents is relatively easy as the finish can simply be reapplied using a brush, pad or roller. The stain will easily penetrate some areas of the deck surface which have become more porous after weathering. In other areas, there may be a tendency for the finish to sit on the surface of the wood.

Try to prevent this occurrence by removing the excess finish with a brush. If you apply too much stain when refinishing your deck, the stain will form a film on the surface and will behave like a paint requiring more extensive maintenance (stripping of the finish) in the future.

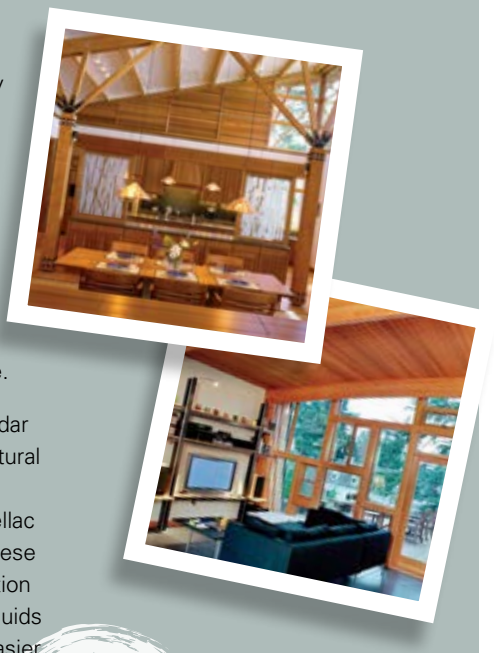
It is difficult to maintain the original natural look of Western Red Cedar exposed to the weather over a prolonged period of time. The more natural and transparent the finish, the more difficult it will be to retain the original color of the wood. Eventually you may decide to completely strip the weathered finish from the surface of your deck and start from scratch. In this situation, you can use a heavy duty cleaner/stripper that will remove the stain from the wood as well as discolored and weathered fibers. However, you should be aware that it is quite difficult to completely restore the cedar to its original appearance. Commercially available stain-strippers will remove oil-based stains and acrylic stains from finished Western Red Cedar. Most are supplied as ready-to-use liquids. After use, residual cleaner or stripper should be thoroughly rinsed from the wood surface and the wood should be allowed to before any other finish is applied.

INTERIOR FINISHES FOR

WESTERN RED CEDAR

Interior Applications Require Less Protection

Western Red Cedar used indoors for paneling, posts, beams and joinery requires less protection than exterior siding, trim and decks and consequently different types of finishes are used. The exception to this general rule is when the Western Red Cedar may be subjected to high moisture levels, for example in bathrooms. In such situations, finishes should be exterior grade, and have good resistance to moisture. Always ensure that the coating is recommended for interior use.



Most people selecting Western Red Cedar for use indoors will want to retain its natural appearance. This is best achieved using transparent finishes such as waxes, shellac and other clear film forming finishes. These "interior" finishes provide some protection to the cedar from minor abrasion and liquids (less so with wax) and make cleaning easier.

Western Red Cedar used indoors can also be coated with a variety of finishes. For example: bleach, oils, semi-transparent and solid body stains and opaque finishes can be used to change the wood's appearance to complement a decorative theme. Some of these finishes are mentioned below, but this section will focus mainly on finishes that enhance the natural appearance of cedar and have a minimal effect on indoor air quality.

Surface Preparation and Conditioning Before Finishing

To achieve the best results, the wood should be preconditioned in the area of the building in which it will be used, prior to installation. This will enable the cedar to achieve

equilibrium moisture content with its surroundings. Western Red Cedar, depending on its texture, may require a light sanding with fine-grit sandpaper to remove any minor surface characteristics. It is good practice to experiment with the proposed finish on a small sample of wood identical to the product to be finished. This will ensure that the coating will achieve the desired "look" you want. Once the decision has been made about the type of finish, the same brand name product should be used throughout to avoid incompatible formulations and color variations.

Choice of Interior Finishes

The rich beauty of Western Red Cedar's natural color can be enhanced or modified by applying any of a number of commercial finishes. If left in its natural state, some darkening of the wood can be expected as it ages and the color variation will become less pronounced. Application of transparent finishes will also darken Western Red Cedar to some degree but they form a protective coating that is easier to maintain.

Bleached finishes result in a sun bleached driftwood look. It can be achieved with commercially available bleaching agents. After bleaching, the Western Red Cedar can be left in its natural state or given a coat of clear sealer.

Clear wax is a finish option for smooth surfaced cedar. Few finishes bring out its inner luster so well. There are also unpigmented liquid waxes on the market which incorporate a penetrating vehicle.

Clear finishes or water-based acrylic, polyurethane or acrylic/polyurethanes are an excellent option for finishing Western Red Cedar. These finishes can be brushed on to produce a non-yellowing coating that does not mask the natural appearance of cedar. They contain very low levels of solvents and other compounds that can reduce indoor air quality. They are available in flat (matte), satin (semi¬gloss) and gloss finishes from a number of manufacturers. When choosing a brand it is important to specify a non-yellowing formula unless an amber tint to the Western Red Cedar is preferred. High-gloss polyurethanes provide the most durable finish but the highly-reflective surface may be objectionable to some. These products are not suitable for exterior use.

Oils such as Danish oil, tung oil and boiled linseed oil are widely available and easily applied to smooth or textured Western Red Cedar; however, they tend to darken the wood unevenly and should be tested on a sample before final application.

Clear lacquer can be used for smooth surfaces. It is an unobtrusive finish which helps to retain much of Western Red Cedar's natural beauty. It is not recommended, however, for kitchens and bathrooms or areas which require more than a light dusting for regular household cleaning.

Due to their fast drying characteristics, some lacquers are best applied with an air-less sprayer rather than brush. For best results, two or more coats are recommended, and sanded with the grain between applications. For optimum surface durability, the first coat may be of high gloss lacquer followed by one or two coats of matte or satin lacquer.

Clear varnish is recommended only for smooth surfaces. It will inevitably add a richer, darker tone to cedar. Two coats applied by brush are acceptable for most areas but additional coats should be added for kitchen and bathroom use. The surface will be slightly brittle and may show scratches but these can be touched up with a tinted wax. Varnish-finished surfaces can be cleaned with soapy water, or wiped with thinners.

Varnish stains are varnishes to which color pigment has been added. Although difficult to apply, they are available in a broad choice of tones and tints.

Paint is an unlikely choice as an interior finishing medium because it will hide the intrinsic beauty of Western Red Cedar. However, if it is desired to accent a feature wall or door for example, any of the following paints may be used:

- **Latex or oil-based paints** should be used over a stain-blocking primer recommended by the manufacturer. A more common interior use for latex or oil-based paints is as a tinting medium. Only a few pieces should be painted at a time and then allowed to sit for a few seconds before wiping with a clean cloth. By controlling the amount of paint used and the time that elapses before wiping, a wide variety of effects can be achieved while still allowing the grain to show through.
- **Enamels** used over cedar require both a primer and an enamel undercoat. Check the manufacturer's directions before application
- **Glazing and antiquing** is an innovative finishing technique that employs transparent or translucent glazes—sometimes several layers of super-imposed glazes—over a base of alkyd or oil-based paint. Although this technique is more commonly used on woods of lesser quality and character, it is perfectly acceptable for use on Western Red Cedar.

Stains

All three types of stain—transparent, semi-transparent, and opaque—may be used indoors (if approved by the manufacturer) to provide decorative color accent. Since there is less need for protection, lightly pigmented products usually provide the required tone without hiding the natural grain of the wood. One brushed coat is normally sufficient.

As with exterior stain, all dirt and dust must be removed before application. The stain should be stirred often to ensure color consistency, and a wet edge maintained at all times to avoid lap marks.

When choosing a stain, remember that it is much easier to darken an area by adding extra coats than to lighten a color.

- **Oil-based stains**, heavy-bodied and semi-transparent oil-based stains approved for interior use by the manufacturer, are suitable for Western Red Cedar. They are particularly attractive when applied sparingly to textured surfaces. On smooth surfaces, wiping techniques offer varying degrees of transparency. Ensure that the coating manufacturer approves the indoor use of the product.
- **Penetrating wood stains** are for use on smooth surfaces only and have an oil base. A wide choice of basic colors is available and these can be blended to achieve intermediate shades. The usual technique is to apply a single coat by brush and to wipe off the excess with a cloth after two or three minutes. To achieve a uniform result, it is best to apply stain to a small area at a time and then wipe before proceeding.

WESTERN RED CEDAR LUMBER ASSOCIATION

The Western Red Cedar Lumber Association (WRCLA) is an organization of Western Red Cedar producers, distributors and retailers throughout North America. Founded in 1954, the association is known worldwide as "the voice of the cedar industry." Its mem bers account for more than 65 percent of the world's production of cedar and have an annual volume of nearly 1 billion board feet.

The association offers extensive resources to assist with the selection, specification and application of a wide range of Western Red Cedar products. Online, print and in-person AIA certified education courses are available at no cost.

The WRCLA's Architect Advisors are product specialists and available by calling 1 866 778 9096 or visiting the website **www.realcedar.com.**

When selecting Western Red Cedar, assure yourself of quality by specifying products from WRCLA members who are listed on our website.

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