PERMA-CHINK® SYSTEMS, INC.

Technical Tip

The Dynamics of Weathering

Many people are under the impression that the winter months are hard on their logs and finishes. To some extent that's true in cold climates where the exterior log surfaces may be covered with ice and snow for several months but even then the most damaging effects of weather on wood and coatings occur during the hot summer months. One component of sunlight is ultraviolet light, commonly referred to as UV. UV light is responsible for most damage to exposed wood because it changes or destroys the wood's lignin, a component of wood that hardens and strengthens the cell walls. In more scientific terms this process is called photo-oxidation.

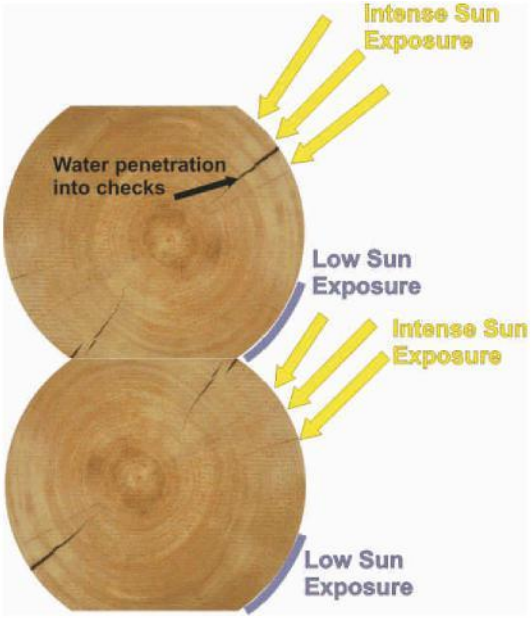
LIFELINE™ finish systems help retard this photo-oxidation process through three distinct mechanisms; reflection, absorption and chemical reaction. Our Advance topcoats help reflect the sun's rays thus reducing the amount of UV light hitting the color coats and the underlying wood. Glossy surfaces are better reflectors than dull surfaces which is why our Advance Gloss provides a bit more protection than Advance Satin. However, an accumulation of dirt on the finish will significantly reduce the reflective properties of the topcoat, one reason why a home should be routinely cleaned with Log Wash. Advance topcoats also help protect the color coats and wood from the abrading effects of wind, rain, ice and snow.

The colorants contained in the color coats are responsible for absorbing UV light. The more colorant a finish contains the less UV light will get through to the wood itself. Opaque finishes like paint and solid body stains pretty well block all of UV light from hitting the wood. That's why when they peel off the freshly exposed wood may still look bright. On the other hand the objective of transparent stains like LIFELINE is to allow the character of the wood to show through the finish. In order to accomplish this transparency, the pigment loading is significantly less than that contained in opaque finishes. So although some of the UV is blocked by the colorants, enough of it gets through to eventually photo-oxidize the wood. Since darker colors typically contain more colorant than lighter ones, they tend to last longer. However some of our light colors like Butternut and Wheat also contain a high colorant loading which extends their life but they do give up some degree of transparency in return.

High quality finishes like LIFELINE also contain components known as UV inhibitors that chemically protect both the finish itself and the underlying wood from the effects of sun exposure. The limitation of these constituents is that they are sacrificial. In other words over time they get used up. The more sunlight that hits them the quicker they lose their effectiveness. In shaded areas of a home these UV inhibitors may continue to work for many, many years but in those highly exposed areas of a home like the south and west facing walls, they may only last a few years. That's why occasional maintenance on a home is so important.

Round Logs

The profile of the logs has a significant impact on the weathering characteristics of a wall. The effect of sunlight and the weather on round logs is altogether different than on squared logs or flat, vertical siding. The top third of a round log is subjected to much more intense weathering than the bottom third. In cold weather climates snow and ice can accumulate on the upper third while the bottom third remains somewhat protected. Upward facing checks that have formed in the top section of the log will funnel rainwater directly into the interior of the log where it can soak into the surrounding wood. But most damaging of all is the angle of the top third of a round log towards the sun.



The top third of round logs catches many times more UV light than the bottom third. Besides exposing the wood to more UV exposure, the UV inhibitors in the upper third may become used up whereas in the lower third they may still be active. Over time this can result in a noticeable difference in color and signs of weathering between the upper and lower sections of the logs. Providing some maintenance to the upper sections of round logs without creating lap marks or color differences can be accomplished but it may be a bit of a challenge. The key is to do the maintenance before the wood becomes gray due to photo-oxidation.

Squared Logs

Squared logs and vertical flat siding are easier to maintain since the sun hits the logs at the same angle, and the UV light is evenly distributed over the entire surface. In addition, the flat vertical surfaces cannot accumulate snow and ice and even upward facing checks are not as prone to rainwater entering the logs. Although squared logs are subject to the same weathering parameters as round logs, and since the weathering is mostly uniform over the entire exposed surface, maintenance is easier to accomplish without worrying about lap marks and color differentiation.

Log Siding

Round log siding probably presents the greatest challenge to forestalling the effects of weathering. Typically used in high exposure locations such as dormers and gable ends, in addition to suffering the same weathering characteristics as round logs, log siding has some features which makes it even more difficult to protect from the effects of the weather. Siding is often manufactured from lower quality wood than logs, frequently using green wood. This makes it more susceptible to twisting, warping and cracking. Since siding does not have the high thermal mass of full logs, during the summer months their temperature can range from 80º F to 160º F or higher during the course of one day. This puts a lot of mechanical stress on both the siding and its finish system resulting in small fissures forming on the surface. Rainwater can then enter these fissures and get behind the finish.

Fissuring of Log Siding

Round log siding is typically milled quite smooth. The extreme smoothness presents a challenge applying the proper thickness of pigmented film necessary for adequate protection of the underlying wood. Smooth log siding should be coarse sanded or pressure washed using Wood ReNew before the application of the pigmented stain. Prelude Clear Primer should never be used on log siding unless it is unusually porous or has been media blasted.

Protecting Your Home

There are two basic ways to combat the effects of weathering. The most effective method is to keep log walls and siding in the shade by extending roof overhangs or constructing roofed porches around the home. The next best way is to apply a high quality finish system like LIFELINE™ and Advance Topcoat. But the overall performance of even the best finish system is dependent upon proper surface preparation and application technique. Avoiding the use of chlorine bleach and back-brushing all coats of finish to assure adequate film thickness is crucial for long term protection of the wood.

Routine maintenance also plays a role in extending the life of your finish system. Our Advance Topcoats help reflect sunlight thus decreasing the amount of UV light that hits the surface of the wood. If the surface is dirty it diminishes the reflective properties of the topcoat so giving your home a good washing a couple times a year not only keeps your home looking attractive but helps retain the color of the stain and protects the underlying wood from UV damage.