

Consequences of Using Chlorine Bleach

For many years the product of choice for cleaning bare wood surfaces was a solution of chlorine bleach and water, perhaps with some detergent or TSP (trisodium phosphate) added to help clean the wood. When correctly applied and well rinsed, bleach solutions can work fairly well most of the time. However, household bleach does not come with a set of directions for using it on wood and even within the log home industry there is no agreement as to how to properly use bleach. Consequently, homeowners as well as professional applicators end up misusing chlorine bleach solutions which can result in several problems with both the appearance and performance of the finish system. But even when used correctly chlorine bleach solutions can create discolorations that may not show up for weeks or months after a finish is applied.

Adhesion

Chlorine bleach destroys lignin, a component of wood that hardens and strengthens the cell walls. Once the surface cellular structure loses its integrity, film forming finishes like LIFELINE™ have no sound wood to bond to and can peel off. The picture at right is a typical example of what can happen when a high concentration of chlorine bleach is applied to a home. Before a new finish can be applied the damaged wood fibers must be mechanically removed by sanding, media blasting or aggressive pressure washing. If the bleach solution dried on the wood, sodium hypochlorite crystals will form in the top layer of wood. These crystals are extremely difficult to dissolve and rinse away. If a water-based finish is applied over the bleach crystals, it would be the same as trying to apply the finish on top of unrinsed bleached wood and problems with finish adhesion will likely reoccur.



Discolorations

The use of bleach can cause several types of discolorations on both bare and finished wood. If the wood is bare any discolorations that may appear can usually be corrected either chemically or by physically removing the discolored wood. However if the discolorations show up after the finish has been applied, the only way to eliminate them is to first remove the finish.

Streaks and Runs



These types of discolorations usually appear within a few days. They are the result of either applying the bleach starting at the top of the wall and allowing it to run down or not adequately rinsing the bleach solution from the wall. As with all types of discolorations under the finish the only way to get rid of them is to remove the finish and start over again.

Iron Tannate Stains

These types of discolorations may appear days, weeks or even months after a finish is applied. They are the result of bleach bringing tannins to the surface of the wood where they can then react with minute metal particles remaining on the surface from the sawing, planing or milling process. As you can see from the picture, it was not so much the use of a bleach solution that created this problem as it was inadequate rinsing of some of the areas of the wall. The finish must be removed in order to treat these iron tannate discolorations with Oxcon, an oxalic acid solution.



Brown Stains, Black Marks, Etc.



All wood contains a multitude of chemical components. Some of them may be present in the sapwood, others in just the heartwood and still others throughout the entire tree. They can vary from species to species and even within the same species they can vary from log to log depending on the nutrients that may have been in the surrounding soil while the tree was growing. If the chemistry of the wood is not disrupted, these components usually stay in their natural state but when subjected to highly alkaline chemicals (i.e. chlorine bleach) they can become quite dark. This process may take several months to occur but once the wood has discolored there is nothing that can be done without first removing the finish. Even then it may not be possible to completely remove these types of discolorations if they go deep into the wood.

The best product that we've found for treating these discolorations once the finish is removed is a two (2) cups per gallon solution of Log Wash. Although it may not completely eliminate the discolorations it may lighten them enough, so that the use of a darker colored stain will hide them.