

# Trestlewood II Features/Issues

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You would be hard-pressed to find a more unique and exciting reclaimed wood product line than Trestlewood II flooring, timbers, accessories and poles. Many of Trestlewood II's unique features are attributable to the salt and other minerals it gained from its nearly 100 years of service as railroad trestle piling in the Great Salt Lake. These features translate into a great product. They also create various practical issues which need to be considered when using Trestlewood II products. Following is an alphabetized summary of some of the things we and our partners have learned, primarily through experience, about Trestlewood II features and issues.

## Color

Colors found in Trestlewood II include yellows, oranges, reds, browns, greens, grays/blacks and purples. The coloring of individual boards and timbers varies widely, from normal Douglas Fir coloring to color combinations unique to Trestlewood II.

Textures and finishes impact final Trestlewood II floor and accessory coloring. Surfacing and finishes influence final timber coloring. Color variations are more noticeable in planed timbers than in band-sawn or circle-sawn timbers. Similarly, color variations are not as noticeable in band-sawn millwork stock as in finished floors and other finished millwork products.

Final Trestlewood II product coloring, then, is determined by the interaction of several factors. The result is that each Trestlewood II application, whether it be a floor, a timber package or a set of cabinets, has its own distinctive, unique coloring.

## Durability / Decay Resistance

“In the end, I think our tests would permit one to conclude that the Trestlewood is slightly more durable than normal Douglas-fir, particularly in the sapwood. This durability is temporal and the materials still must be protected with a conventional preservative in soil exposures where decay is likely to occur. One potential benefit of a more durable material, however, would be a diminished risk of internal decay once the product has been placed in service. This would be particularly useful for larger products such as bridge timbers, railroad ties or poles, where there is a large amount of untreated wood surrounded by a shell of treatment.”

– Jeffrey J. Morrell, Oregon State University, 26 Oct 1994

## Electrical Conductivity

Salt is a metal and is, therefore, a conductor of electricity. It is probably not advisable to use Trestlewood II as power poles or in other applications involving high electrical voltages.

## **Finishes**

The most important note to make here is: **Do not use water based finishes.** Solvent based finishes seem to work well with flooring and other fully kiln-dried Trestlewood II products. Glossy polyurethanes with high solid contents have worked especially well (gloss finishes can be sanded lightly at the end of the finish work to give them the desired texture - semi-gloss, flat, etc.) Check the labels on polyurethanes to make sure that they are not water-borne products.

We tend to favor penetrating oil finishes on Trestlewood II timbers and other non-kiln-dried Trestlewood II products. Penetrating oil finishes allow the wood to breathe, thereby facilitating efficient air drying. The use of penetrating oil finishes also helps avoid a potential issue with shell type finishes – the trapping of salt beneath the shell finish (which can increase the difficulty of refinishing or touching up the coated timbers or other products.)

## **Fire Retardance**

Schuller International performed an ASTM E-84 Flame Spread test on a Trestlewood II piling sample in January, 1995. The resulting index value was 16.

The lower its index value, the more fire retardant a material is. The Forest Product Laboratory's Wood Engineering Handbook (1990) indicates that in the building codes, flame spread requirements are specified as Class I or A (< 25), Class II or B (26-75) and Class III or C (76-200). Normal Douglas Fir has a flame spread index of 70-100. Only a few wood species have flame spread index values less than 75. Fire retardant treatments are generally necessary to meet Class I (and often to meet Class II).

Note that Trestlewood II piling and Trestlewood II products cut from piling have varying salt/mineral contents (depending on such factors as how much time they were submerged in the waters of the Great Salt Lake) and, therefore, possibly have varying fire retardant characteristics. It would be our guess that timbers cut from the butt ends of Trestlewood II piling (which spent less time underwater) would have lower salt/mineral contents and, hence, possibly lower fire retardant characteristics than timbers cut from the middles or tip ends of Trestlewood II poles.

## **Glues**

Not all glues are created equal when it comes to working with Trestlewood II. Glues which have generally worked well with Trestlewood II include National Casing's Quick C brown glue and yellow glues such as Titebond. Polyurethane glues have produced mixed results.

In general, Trestlewood II requires the use of more glue than most wood. One of our partners who uses Titebond to laminate doors reports that it is important to move quickly – the Trestlewood II seems to accelerate the rate at which the glue dries.

We are interested in your feedback about glues that have and have not worked for you.

## **Grading – (See Also: “Strength”)**

Trestlewood II timbers can be graded (WWPA or WCLB) upon request. We highly recommend that any Trestlewood II timbers that are to be used in a structural application be graded. Graded timbers, like all other Trestlewood products, are subject to Trestlewood’s Product Liability and Return Policy.

## **Kiln Drying – See “Moisture”**

## **Leaching, Salt – See “Salt Leaching”**

## **Metal Corrosiveness**

The salt and other minerals in Trestlewood II make the corrosion of metal fasteners (and other metal in the vicinity of Trestlewood II) a potential issue. We recommend the use of high-grade stainless steel fasteners in lieu of regular steel fasteners, especially if your application involves the likely mixing of Trestlewood II, moisture and oxygen. Galvanized steel fasteners should not be considered as offering a high degree of protection against corrosion, especially given that certain galvanizing agents can react with the salt in Trestlewood II. If your objective is to minimize corrosion, high grade stainless steel is probably your best bet. The wooden pegs commonly used in timber frame applications provide a potentially attractive non-metal fastener option.

It is not uncommon for a Trestlewood II user to not be bothered by the aesthetics of rusty metal fasteners (or even to desire/welcome the character added by rusted fasteners or other rusty metal.) Where this is the case, the task becomes that of using beefy enough metal fasteners and other metal products to safeguard the structural integrity of whatever is being built even with the metal corrosion that will happen. Metal fastener and other metal decisions, like all other project decisions, are the responsibility of you and your design team.

If you are planning to further process Trestlewood II, you should be aware of the corrosive effect that Trestlewood II can have on machinery and saw blades. The negative impact on your machinery can be minimized through a regular, thorough cleaning routine. Nothing you do will change the fact that you will go through saw blades more quickly when processing Trestlewood II than when processing most other types of wood.

## **Moisture**

All Trestlewood II flooring products are produced from stock kiln dried to 8% moisture content or below (the moisture content of kiln-dried Trestlewood II stock and the flooring produced therefrom does not stay at this level, but typically increases, given wood’s tendency to reabsorb moisture to the point that it is in equilibrium with its environment.) Some Trestlewood II accessory products are also kiln-dried.

There is no such thing as a “dry” Trestlewood II timber, although some Trestlewood II timbers are wetter than others. Air drying is the primary mechanism by which Trestlewood II timbers lose moisture. An individual timber’s moisture content depends largely on the amount of air dry time the timber has had since being cut (and when it has had this air dry time – summer air dry time is generally much more effective than winter air dry time, for example.) Custom-cut Trestlewood II timbers are likely to be fresh-sawn and, hence, relatively wet.

Trestlewood II timbers can be kiln dried for 12 days. The focus of timber kiln drying is to remove surface moisture and excess moisture from the outer 1” or so of the timber so that it can be surfaced and finished as desired. Timbers that are kiln dried for 12 days still have significant amounts of moisture in them – they are by no means a fully kiln-dried product.

Trestlewood II absorbs moisture more readily than typical Douglas Fir. It should be handled, stored and transported carefully to minimize any unnecessary reabsorption of moisture.

Moisture is a big issue with all wood floors and accessories. It is an especially big issue with Trestlewood II. It is crucial that the flooring/accessory installer climatize and install Trestlewood II in a manner that is consistent with (1) National Wood Flooring Association procedures and (2) the special characteristics of Trestlewood II.

The environment in which Trestlewood II is being installed is also important. Humid environments pose special challenges. Oregon State University has done some testing for us which suggests that Trestlewood II moisture reabsorption is not a special concern at 22 degrees Celsius (71.6 degrees Fahrenheit) and 70% relative humidity, but is a major concern at 32 degrees Celsius (89.6 degrees Fahrenheit) and 90% relative humidity. We strongly recommend that Trestlewood II flooring and accessories not be installed in environments which cannot be kept at or below 22 degrees Celsius and 70% relative humidity. Trestlewood II timbers and other non-kiln-dried Trestlewood II products should only be used in humid environments after you have carefully considered Trestlewood II characteristics and the implications of those characteristics for your application.

The salt in Trestlewood II makes moisture meter readings unreliable. Trestlewood II moisture content can be determined using an oven dry test.

## **Odor**

Wet Trestlewood II timbers, lumber and poles often have a Great Salt Lake and/or “musty” smell to them. This odor is especially strong as wet Trestlewood II materials are being cut or otherwise processed. It tends to become less and less of an issue as the materials are allowed to air dry and are kept dry. We do not believe this to be an issue with Trestlewood II flooring and other kiln-dried Trestlewood II products (other than when they are being processed in some way or have moisture reintroduced into them), but we invite those of you with sensitive senses of smell to check it out for yourselves.

Our experience suggests that a Trestlewood II odor is most likely to be noticeable in situations involving moisture or high humidity; limited ventilation / air circulation; and/or uncoated/unsealed Trestlewood II products. We believe that the most important step in minimizing Trestlewood II

odor issues is to control moisture by facilitating the efficient air drying of non-kiln-dried Trestlewood II products and minimizing any reintroduction of moisture. Using penetrating oil finishes on non-kiln-dried Trestlewood II products can help facilitate efficient air drying by allowing the wood to breathe.

## **Plants – See “Vegetation”**

### **Salt Leaching**

As moisture is drawn out of Trestlewood II timbers, it brings salt with it. Salt leaching tends to be the most concentrated at knots and timber ends, but can happen anywhere. Kiln drying Trestlewood II timbers for 12 days (and keeping them dry) minimizes, but does not eliminate, salt leaching. Approaches to salt leaching range from sanding and refinishing impacted areas to doing nothing (and letting the salt serve as one of the most visible evidences of the history and reclaimed nature of Trestlewood II timbers.) Salt is more visible on planed timbers than on band-sawn or circle-sawn timbers.

Salt leaching has not been an issue with kiln-dried flooring and accessory products that are used in non-humid environments and are kept dry. Reintroducing moisture to Trestlewood II products makes salt leaching a potential issue even with fully dried products.

### **Stability**

Our experience has been that Trestlewood II is a very stable product. Like all wood, undried Trestlewood II will experience some shrinkage and develop seasoning checks as it dries. The drying process also often widens any “prior use checking” associated with Trestlewood II’s life of service as railroad trestle piling. Such checking tends to be more pronounced with timbers (usually larger than standard dimension) cut from the large diameter (butt) end of the piling. Trestlewood II does not, in general, twist or warp as much as one would expect green lumber to do.

### **Strength**

“The long exposure to the saline waters of the Great Salt Lake has not reduced the strength and stiffness of the Trestlewood piling. The design properties of these piling, or of lumber cut from these piling, may be considered equal to common Douglas fir piling and lumber from freshly cut logs.”

– Robert J. Hoyle, Jr., P.E./S.E., 1/15/95

Their favorable overall strength characteristics notwithstanding, Trestlewood II timbers are a reclaimed wood product. Individual Trestlewood II timbers can have characteristics that can compromise their structural integrity. In a high percentage of cases, such characteristics can be visually identified and addressed. In rare cases, timber defects can be difficult to detect.

Timber breakage risks can be greatly reduced (albeit not eliminated) through such steps as (1) having any timbers that are to be used in structural applications graded and (2) carefully considering the sizes of timbers to be used (it is wise, for example, to avoid long, skinny pieces.)

Checking, holes (where metal has been removed) and wane tend to be more pronounced in Trestlewood II timbers wider and/or thicker than 10" than in standard size Trestlewood II timbers (up to 10" x 10".)

You should assume a high moisture content when consulting design value tables.

### **Vegetation**

Salt tends to kill vegetation. You should be careful about using *Trestlewood II* in landscaping applications which bring it into direct contact with desirable plants. On the other hand, you might consider trying to get some weed control benefits from it!

### **Weight**

Trestlewood II products typically weigh between 4 (kiln-dried) to 5 (undried) pounds per board foot.

*The above summary is provided for informational purposes only. We have tried to provide an accurate summary of our current working knowledge of Trestlewood II. We, however, make no guarantees about the accuracy of this information. Our Trestlewood II product research is ongoing. We welcome any feedback from you about your experiences with Trestlewood II products.*

**Trestlewood II products, like all Trestlewood products, are subject to Trestlewood's Product Liability and Return Policy.**