TECHNICAL BULLETIN

Wood Product Samples

This technical bulletin was written to help the reader understand how environmental conditions can affect wood samples beyond appearance, grade, and quality issues.

It is the nature of wood products to adjust their moisture content to the equilibrium relative moisture of the surrounding environment. Wood products do this by releasing and/or absorbing moisture as their surrounding area changes in temperature and humidity. When wood takes on moisture, it expands; when it loses moisture, it shrinks. It is also not abnormal for wood to develop surface checks or cracks as the wood acclimates or equalizes to the project site conditions. These checks and cracks do not affect the strength or durability of the wood; it is simply a natural reaction to the drying process.

Wood dries by the movement of free water through fiber cavities, fiber walls, and the movement of water vapor through the wood. Because wood is not homogeneous, it shrinks more along the growth rings (radial) than across the rings (tangential). Tangential dimensional change is often nearly twice that of radial movement for most wood species, and longitudinal (length) dimensional change is almost always negligible. These shrinkage variations may cause wood movement or checking. Wood movement will cease as the moisture content of wood approaches equilibrium with its environment. Checking will often remedy itself with the checks closing once the timber's core has reached equilibrium. While this is typical, it cannot be guaranteed. Any individual piece of wood will display unique shrinkage or swelling patterns in these three planes of the lumber. The larger the wood dimension, the longer this process takes.

To minimize shrinkage, warping, checking, and splitting in the finished product, lumber must be acclimated to the middle of the range of expected in-use moisture content before installation. This can be done through the process of either:

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Air-Drying (natural process/slow): Air-dry moisture content for wood products is generally between 18% and 35%.

All air-dried Tropical Forest Products wood products will have a moisture content between 18% and 25%.

or

Kiln-Drying (artificial process/accelerated): Kiln-dry moisture content for Tropical Forest Products Decking and Cladding is generally between 12% and 14%.

For much of the United States, thoroughly air-dried lumber's exterior moisture content equilibrium is 12% to 15%. For the seasonal EMC levels in your region, consult the US Forest Labs website, www.fpl.fs.fed.us. Search for the "Equilibrium Moisture Content of Wood in Outdoor Locations" document.

Indoor environments pose a unique challenge to wood as equilibrium drops to 6% to 8%. As naturally durable wood products are typically produced for exterior applications, naturally durable wood samples subjected to indoor environments may react inconsistently and be subject to movement and checking, which would not occur in an exterior application environment. Such movement is not indicative of long-term performance for which the product's superior performance is intended and well documented.

Color and Grain Variation

Color and grain variation are typical of materials created by nature and are recognized as part of the beauty that sets natural products apart from manufactured ones. This is particularly true where wood products are concerned, though some species have more or less color variation than others. When looking at wood samples, this should always be considered (see color/grain variation technical bulletins).

Some color consistency can be achieved by either staining wood or allowing the wood to weather or grey out.

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