

## Technical Bulletin – Kiln Dried Verses Air Dried Decking

### Kiln Dried Verses Air Dried Decking

Kiln Drying is the method in which most wood species are stabilized by removing the free moisture in the lumber by accelerating the lumber drying process to what would be the natural ambient equilibrium moisture level of the woods service environment. As an example lumber used for flooring and indoor furnishings is typically kiln dried to a moisture content between 6% and 8% as equilibrium is typically controlled through heat and air conditioning to this range. Lumber for outdoor use is typically kiln dried to a moisture content between 12% and 14% as the natural ambient equilibrium levels in outdoor climates fall somewhere within this range. This is why virtually all wood decking species require kiln drying to create dimensional stability; with one exception...Ipe. Ipe or *Tabebuia* spp – Lapacho group is unique as a wood species, in that it is incredibly stable as it acclimates to ambient equilibrium which is why Ipe is sold as both Air Dried and Kiln Dried Decking. Ipe is very difficult to Kiln Dry which is why lumber 2 inches and thicker is only available Air Dried.

Air Dried decking is packaged for export with drying sticks between layers which may or may not leave sticker marks and dirt stain on the decking. These sticker marks are normal in air dried decking and can be removed by light sanding, or by weathering over time. Kiln Dried decking is dense packed and plastic wrapped for export and as such will not be subject to sticker marks or dirt stains.



Air Dried Ipe Packaged On Stickers



Sticker Stain



Kiln Dried Ipe Dense Pack and Plastic

Wrap

### So if Ipe is so stable why should I buy Kiln Dried Ipe Decking?

Some mills saw their own logs and process their own decking. This means that their Air Dried decking is in fact what we call green and has a moisture content typically between 30% and 40% when run to decking profile.

Some mills are finishing mills who buy their sawn molding blanks from a saw mill, which means their decking will be run from partially air dried lumber that could have a moisture content between 25% and 35%.

Iron Woods mills provide the option of Kiln drying the rough sawn decking blanks to 12-14 percent or pre-stabilizing the decking blank to equilibrium before molding.

As an example all three mills have run 1x6 deck board to net .75" inches in thickness and 5.5" in width.

The Kiln Dried decking has the advantage of being pre-stabilized at the top end of the equilibrium moisture content for outdoor applications. It will roughly maintain its starting thickness and width before during and after installation or experience minor shrinkage in a climate with an extremely low equilibrium.

The Air Dried decking will typically reach equilibrium after installation, the partially air dried decking shrinking less than the green decking. By experience this shrinkage runs between 1/8 and 3/8 inches in width. This is typically not a problem when face fastening Ipe but can become problematic when using hidden fastening systems. This becomes even more problematic in extremely dry climates where equilibrium may be in the 10% range. 40% to 10% is significant particularly when installed using hidden fasteners as decking may shrink beyond the clips ability to hold the decking or when installed in very sunny and hot climates as moisture may be drawn rapidly from the face of the board causing it to cup. In Air Dried Decking it's all about thickness to width ratio. Example a 5/4x6 Air Dried board is less likely to cup than a 1x6 Air Dried Board. However kiln drying reduces the potential of cupping by equalizing the moisture inside the board before it is milled to it's final dimension.



Kiln Dried 1x6 Ipe Decking at 14% Equilibrium



Air Dried 1x6 Ipe Decking at 14% Equilibrium

Again, Ipe is dimensionally very stable green to dry so warp, twist, and bow are not significantly impacted by selecting Air Dried vs Kiln Dried Ipe decking. Width consistency and reduced potential for cupping are the benefits to kiln dried decking. It is important to note that Kiln Dried decking can shrink when the equilibrium on site is below 12%. It will however shrink much less than Air Dried. Kiln Dried decking which is dried below the equilibrium of the installation site will equally be subject to expansion at the time of installation unless the wood has been allowed to acclimate.