

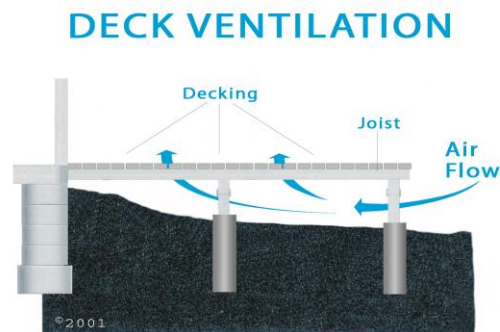
Technical Bulletin-Deck Ventilation

The importance of ventilation and air flow under and around wood decking in improving product stability and performance has been well understood. You never want trapped moisture behind building materials.

Air Dried decking is typically delivered with a moisture content between 18% and 25% and is more prone to shrinkage and cupping immediately after installation if equalization has not been fully achieved prior to installation. Air Dried decking may shrink up to 1/8" on 4" face and 1/4" on 6" face depending on the moisture content at time of installation, climate and site conditions.

Cupping occurs when the underside side of a board is exposed to consistently high levels of moisture that cannot dry quickly and the face of the board is exposed to rapid drying conditions like direct sun exposure. These risks are reduced by creating an environment where good air flow from multiple directions is created under a deck.

The elevation of the deck or distance below stringers is not relevant. If good air flow is not created, wood decking may experience cupping.



The deck / stairs to the left illustrates some problematic conditions.

- 1) The deck is completely skirted = Zero Air Flow
- 2) While the contractor installed lighting he did not install air vents.
- 3) The deck surrounds a hot tub which will add to the underdeck moisture levels in addition to weather.
- 4) The bottom stringers and fascia are installed flush to the pavers preventing drainage and further eliminating air flow.

Had each level of the deck framing and skirting been raised 1/2" to 3/4" from the ground and each level and or adequate vents been installed on all exposed faces, the potential for cupping would have been reduced.

Iron Woods™ Kiln Dried Decking is pre – stabilized to a moisture content typically between 12 and 14% which minimizes shrinkage or expansion reducing the risk for wood movement in service.

The stress that high moisture under a deck combined with the impact of sun and heat to the surface of a deck causes stress that can result in increased checking, cup and twist. This being said there are applications that simply cannot avoid the reduction of ventilation by design. Decks at grade or on roofs are not that uncommon, so how do we reduce problems in these applications.

First off it is important to understand that dimensional stability is directly related to decking thickness and width ratios. Instability increases as the board widens related to its thickness. As an example a 1x4 is more stable than a 1x6 and 5/4x4 is much more stable than 5/4x6.



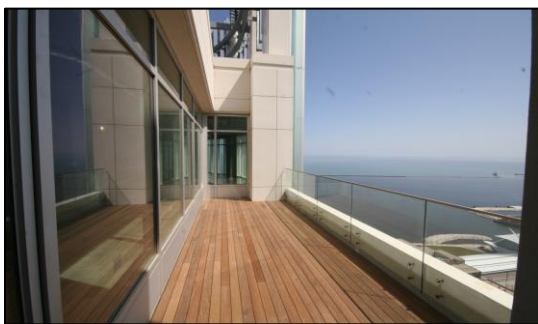
So what's going on with the deck on the left?

This deck was installed in a concrete pan with decking installed on pressure treated joists using adhesive and hidden fasteners. The concrete pan is holding water which is keeping the decking between the joists wet which is also driving the tannins (nature's wood preservative) in the decking to the surface causing staining, while the adhesive film is creating a barrier at the joist connections that is keeping the decking over the joists dry where it is weathering normally.

Uneven coloration is likely only the start of the problem on this deck. Movement of the deck boards is likely to come at some point in the future as the moisture cannot be removed from under the deck and ventilation cannot be established.

Poor Ventilation Solutions

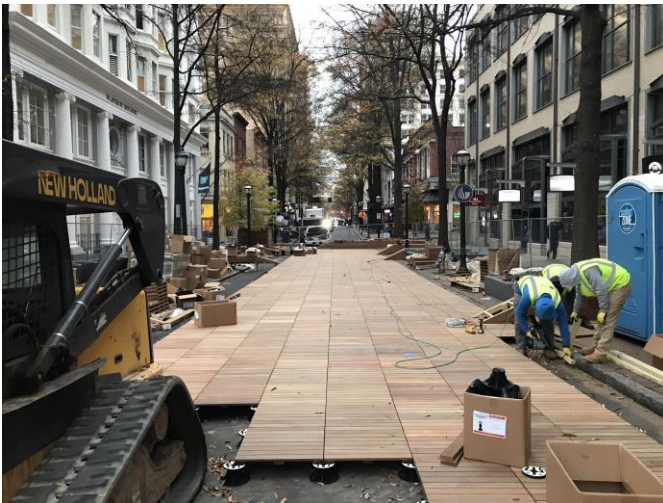
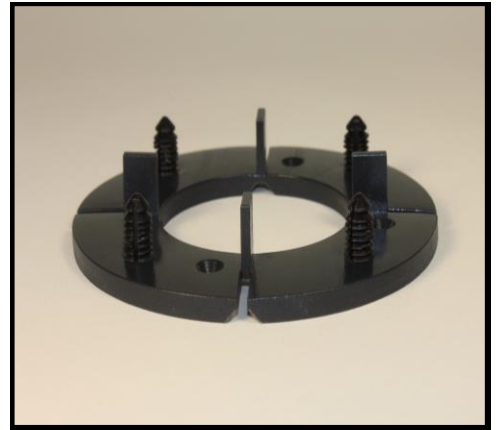
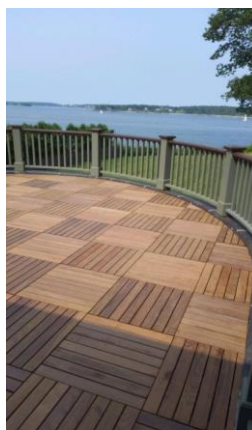
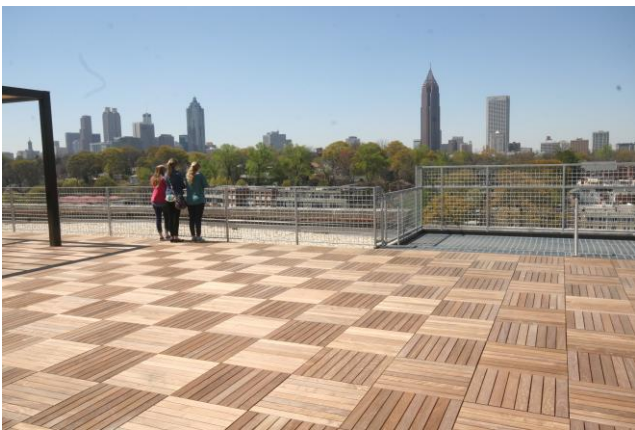
By experience we know that a 5/4x4 deck board or deck board of similar dimension ratio, air dried or kiln dried, provides the most stable performance in poorly ventilated residential or commercial decks regardless of the fastening method.



You may also wish to consider products such as Iron Woods™ Roof Deck Tiles and Pedestal Systems or Decking and Pedestal Systems which are specifically designed for poorly ventilated applications. Deck Tiles are constructed of wood slats that have a stable thickness to width ratio roughly equal to that of 5/4x4 decking. The use of shorter length components provides a highly cost effective and unique deck construction option as well.

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Iron Woods™ Commercial Grade Heavy Duty 24" x 24", 24"x48", and 24x72" Deck Tile system allows for drainage and can be applied directly to any flat surface using our Elevations EPDM, Star T or Self Leveling Screw Jack pedestals. If you want to build a deck literally at grade, a cost effective solution is to pour a concrete slab and apply these tiles directly on top.



The above images show poorly ventilated applications...commercial and residential roof decks the application of Iron Woods Deck Tiles on Screw Jack Pedestals between the curbs of a city street to create an Urban Boardwalk.

Iron Woods™ Deck Tiles are a great option for conventionally constructed decks as well. Simply double your stringers 24" on center and fasten down at the corners with 4 Pro Plugs™ per tile. Iron Woods™ deck tiles provide a unique appearance while at the same time significantly lowering overall construction costs. Deck tiles can be installed to create a wide range of designs and patterns.