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While our Bamboo flooring manufacturers attempt to identify the contents of each carton as “light” or “dark”, there remains a range of colors within each category. The color determination is subjective and natural products are unpredictable in color consistency. To avoid color “blotches”, the installer should work out of 3 separate cartons, alternating planks from each carton to produce a floor with a pleasing collage of colors.

Installers are the last step in quality control and are required to inspect each plank prior to nailing or gluing it in place. The National Wood Flooring Association standard for off-quality product is 5%. Many of these off-quality planks can be used as starter pieces or fillers. We will exchange any planks in excess of 5%.

Excessive Moisture or lack of moisture is the primary factor of wood flooring failures. Although bamboo flooring is somewhat more resistant to problems caused by moisture than solid wood flooring. The standard "solid bamboo", it is not an engineered floor but rather an assembled floor and you should use the same installation guidelines as you would for a solid wood floor. Greenwood stocks several type engineered products (a bamboo wear surface laminated to a plywood base). Engineered wood of any species or bamboo is inherently more stable than a solid version of the same species. However, these are limits to how any floor covering specie will perform with excessive moisture or absence of moisture.

Installation Instructions Bamboo Flooring

Inspect material carefully before installation. Any material installed with obvious defects will not be warranted

- All Bamboo Tongue & Groove Plank should be installed as follows:
- **General conditions:** In area to be installed, temperature and humidity shall be brought to normal occupancy levels for a minimum of 72 hours before installation and maintained at those levels after installation. Some areas may require more time for proper acclimation. Be sure the job is closed in, with all outside windows and doors in place. Excessive moisture caused by the slab or plaster drying out should be dissipated before the flooring is placed at the job-site. Flooring should be removed from the box and allowed to acclimatize on site at least 72 hours before installation. **Be sure to use your moisture meter to check moisture levels in both the sub-floor and the bamboo flooring before installation. IF THERE IS A THREE- PERCENT (3%) OR MORE DIFFERENCE BETWEEN THE TWO, DO NOT INSTALL THE FLOORING UNTIL THE DIFFERENCE IS LESS THAN THREE PERCENT.**
- **Applications:** May be nailed or glued down over wood sub-floors or glued directly to concrete sub-floors on, above, or below grade. May be floated within certain dimensional limitations (not to exceed 16’ in width without an expansion gap).
- **Sub-floor:** Surfaces shall be clean, dry, smooth (maximum 1/8” variance over 8 lineal feet) and free of dirt, wax, oil, paint, curing agents and other contaminants that would interfere with adhesive bond. Old resilient floors can be covered provided above conditions apply. Wood sub-floors shall be sanded level prior to new installation. Concrete sub-floors shall have all cracks and holes filled with a cementitious patching material (ArDEX or equal). Concrete sub-floors shall be tested for moisture and not exceed three (3) pounds per 1,000 square feet using the calcium chloride test.
- **Nail Down:** Use a two-layer, 15-pound felt, overlapped, under the bamboo for protection against moisture migration. Planks shall be started square with the room and parallel to its longest dimension by positioning with a chalk line, leaving a minimum 1/4” expansion space from base plate or wall. Ensure starter rows are firmly in place by wedging, face nailing or using adhesive. Once initial rows are secure, second and further courses shall be blind nailed directly above tongue at a 45-50 degree angle to the face. Fasteners shall be spaced at 10-12 inch intervals with a minimum of 2 fasteners per piece and a fastener within 3 inches of each plank end. Our installation customers have used the Model 200 T&G from Powernail and the Primatech R610 engineered flooring nailer. In addition, there are adaptors for other models that can be used. NOTE: Particleboard does not provide adequate holding of the nails and is therefore not considered an acceptable sub-floor material.
- **Glue Down:** Use a wood flooring adhesive like "Bostik's Best". Follow the adhesive manufacturer’s guidelines for safe use, storage and handling. **Wear gloves and long sleeves.** Spread with a notched trowel as recommended by the adhesive manufacturer. Planks shall be started square with the room and parallel to its longest dimension by positioning with a chalk line, leaving a minimum 1/4” expansion space from base plate or wall. Ensure starter rows are firmly in place by wedging or face nailing. Once initial rows are secure, use adhesive in a *Wet-Lay* method of installation as follows: Apply

adhesive to substrate with suitable trowel. Immediately place flooring onto "wet" adhesive. Spread no more adhesives than can be worked with in a forty-minute period (100 to 200 sq. ft.). Clean any adhesive that comes in contact with the face of the plank immediately. Use straps if necessary to remove any bowing or "banana" that is common in many types of plank flooring. This will ensure proper alignment of the rows and eliminate gaps along the length of the planks. Use blue painters tape to keep the planks from creeping apart from one another by placing the tape perpendicular to the length of the planks, crossing over multiple planks. Remove the tape once the adhesive has set. Use weights if necessary to remove any bowing of the planks.

- It is incumbent upon the installer to protect the floor from possible damage by other trades by using heavy kraft paper or equivalent.
- **Moisture: While bamboo flooring is much more stable than most woods, it is still subject to damage when in direct contact with a constantly wet slab. The bamboo shall be isolated from this type of slab by use of a moisture barrier, plywood on slab, or a sleeper sub-floor. Urethane adhesive will usually fail when vapor pressure exceeds 3 pounds per 1000 sq. ft. in 24 hours as measured by the calcium chloride test. Bamboo flooring cannot be glued down under those conditions.**

LOW-HUMIDITY CONDITIONS

In extremely dry climates, care should be taken to avoid shrinkage by allowing flooring to acclimatize under actual use conditions. Remove the planks from the box and expose to local conditions for a minimum of five (5) days. The bamboo flooring's moisture content (MC) is reduced to 8-10% through kiln drying at the manufacturing plant. However, the flooring may pick up moisture during the ocean voyage or while being warehoused. It is therefore necessary to test the flooring, as well as the slab/sub-floor, with a moisture meter to make certain that the MC of the two are within 3 percent of each other.

Excessive Moisture: In the event of excessive slab moisture either now or expected in the future, there are several options available to assure a sound floor.

1. Plywood on Slab **-DO NOT USE THIS METHOD IF YOU ARE GOING OVER RADIANT HEATING PIPES.**
 - a) Cover the slab with a vapor barrier. Do this by either priming the slab or applying cold, cutback asphalt mastic with a notched trowel (50 sq. ft. per gallon). Allow mastic to set for two hours. Unroll 15-pound asphalt felt or building paper, lapping the edges 4" and butting the ends. Apply a second coating of mastic over the asphalt or paper and roll out a second layer of asphalt or paper in the same direction as the first, staggering the overlaps to achieve an even thickness.

OR

Cover the entire slab with a 4 to 6 mil polyethylene film, overlapping the edges 4" to 6" and allowing enough film to extend under the baseboards at all sides. Under severe conditions, the film should be laid into mastic, which has been fine-troweled (100 sq. ft. per gallon). Always walk the film flat and puncture bubbles to release trapped air.

- b) Install ¾" x 4' x 8' exterior grade plywood panels diagonally across the direction of the finished floor after the vapor barrier is in place. Leave a ¾" space at the wall line and ¼" to ½" between the plywood sheets. Fasten the plywood to the slab by using power-actuated fasteners starting with the middle of the plywood and then the edges, using 9 or more fasteners per panel. The bamboo planks may now be nailed or glued to the plywood, leaving a 1/4" expansion space from base plate or wall.
2. Sleepers

Sweep the slab clean and apply an asphalt primer, allowing it to dry. Install flat, dry, preservative treated, random length 2" x 4" sleepers (18" to 48" in length) on their flat faces into rivers of hot (poured) or cold (cut-back) asphalt mastic, in rows 12" on center at a right angle to the direction of the finished flooring. Stagger the end joints, overlapping the ends of the spacers by 4" with a ¼" space in between. Loosely lay a 4 or 6 mil polyethylene vapor barrier over the sleepers, overlapping the edges on top of the sleepers. Avoid bunching or puncturing the film. Nail the flooring through the film.

Radiant Heating Pipes: Please contact GreenWood Products for detailed information.