

Installation Guidelines Solid Originals

NADURRA® imports high quality bamboo flooring. These installation guidelines pertain solely to the *Solid Originals* and the *Solid Stained Originals* in the Regular, *NEAR ZERO™* and *FSC®-certified* Collections.

ATTENTION! READ BEFORE INSTALLING

Please note that these guidelines are abbreviated. All information is provided as a courtesy to our clients and is meant to be understood as guidelines only. We recommend that only professional flooring installers are used to install NADURRA® bamboo flooring. The customer and/or installer are responsible for any and all decisions pertaining to how, where, and when to install NADURRA® bamboo floors. For more detailed information on the installation of bamboo flooring, please contact the National Wood Flooring Association (NWFA) at 1-800-848-8824 or on the web at www.nwfa.org. Before you begin installation, carefully read the instructions from start to finish. Carefully examine the flooring prior to installation for grade, color, finish, and quality. Ensure adequate lighting for proper inspection. If the flooring is not acceptable, contact your supplier immediately and arrange for replacement. NADURRA® is not responsible for floor failures due to inappropriate site conditions or installation methods.

Variations: Bamboo is a natural fibre and variations are to be expected. Carefully examine the flooring prior to installation for grade, colour, finish, and quality. Also check that the flooring received matches the order. NADURRA® is not responsible for providing extra cartons once an installer has begun opening and/or installing flooring from a shipped order. If the flooring is not acceptable or the quantity of boxes is incorrect, contact the seller immediately before opening any more of the cartons. Colour, shade, dimensions, and gloss variations may occur from the original samples or within a batch of flooring. Check the entire batch and each piece of bamboo flooring before installing. NADURRA® is not responsible for the installation of material with visible defects. Installation of any NADURRA® product serves as acceptance of that material.

Acclimation: As relative humidity varies in different parts of the country, acclimation of the flooring prior to installation is the most important precaution to take in order to ensure a successful installation. Proper acclimation is necessary to adapt the moisture content of the flooring to the conditions of your environment. Improper acclimation can cause the floor to buckle and/or the boards to shrink or cup after installation.

Keeping Records: The Installer is to keep a record of installation date, product code and batch (from Invoice or Packing Slip), site relative humidity, site temperature, and product and subfloor moisture content. The installer should keep a copy for themselves and leave a copy of this with the homeowner.

Installation Guidelines

Solid Originals

APPLICATION

The *Solid Originals* are designed for use in above, on, or below grade installations. They can be nailed, stapled, and glued down in homes, condos, and light traffic commercial environments. The Solid Originals are also acceptable over radiant floor heating.

HANDLING AND STORAGE

NADURRA[®] bamboo flooring has been kiln-dried to optimum moisture content for stability. Site installation conditions can have a major impact on the performance of your flooring.

ACCLIMATISATION

Do not ship or unload bamboo in the rain, snow, or other excessively humid conditions. Flooring should be stored in an enclosed building that is well ventilated and free of excess or low humidity. Bamboo should be stored in opened boxes in the room where it will be installed for at least 3 days before installation to allow for moisture and temperature adjustment. Open the boxes carefully and save a few boxes unopened as Nadurra only accepts unopened boxes, in perfect condition as returns. The temperature and humidity in the storage or acclimatisation room should be the same as the levels that will be sustained over the life of the floor. Permanent heat and humidity controls must be installed and operating during and after installation. **Note:** *In extreme dry climates the acclimatisation period should be longer (7 to 10 days).* **Remember:** *Continual dry heat or excessive moisture will change the moisture content from the manufactured moisture content, which may cause buckling or shrinking of the floor after it has been installed.*

It is important to note that gaps between boards and movement of the flooring will occur with seasonal fluctuations in relative humidity and temperature. This cannot be avoided and is a natural effect. Bamboo is a natural product that fluctuates in size and moisture content as its environment changes.

Always moisture test the bamboo flooring before installing. The Installer is to keep a record of installation date, product code and batch (from Invoice or Packing Slip), site relative humidity, site temperature, product and subfloor moisture content, and manufacturer of instruments used. The installer should keep a copy for themselves and leave a copy of this with the homeowner.

CONDITION REQUIREMENTS:

| | |
|---------------------------------|---|
| Temperature Range: | 60-80°F 16- 26°C |
| Relative Humidity Range: | 35-55% (no greater than 15% difference between high and low). Humidity levels outside this range will void this warranty and may result in movement in the flooring, cupping, buckling, cracking, splitting, surface checking, warping, separation of the slats or strands and separation from the subfloor. |
| Moisture Content: | Flooring with moisture content greater than 2% outside the optimum moisture content of 6-9% should not be installed. |

TIPS:

- Run the interior climate controls for at least 6 days to stabilize the moisture conditions prior to storage and installation.
- All plaster, painting, and plumbing work should be completed prior to installation.
- Separate the boxes into small piles to optimise acclimatisation.

SUBFLOOR PREPARATION

A moisture barrier such as 6 mil polyethylene film should be placed in crawl spaces. It is the responsibility of the installer and the owner to decide whether a subfloor surface is acceptable. Take the appropriate actions to ensure that the subfloor is

Installation Guidelines

Solid Originals

clean, flat, dry, sound, and free of abrupt highs and lows. High spots should be ground down and low spots equal to or greater than 3/16" over 10' should be filled in with a proper levelling compound that is non-compressible. The subfloor must

be free of dirt, wax, oil, paint, curing agents, and other foreign material that would interfere with installation. Wood subfloors must have no flex. Fix any squeaks or movement in the sub-flooring surfaces prior to installation. **Warning:** The lack of moisture protection before installation can significantly reduce flooring performance.

CONDITION REQUIREMENTS:

FlatnessTolerance: 3/16" over a 10' radius.

WOOD SUBFLOORS

NADURRA[®] bamboo flooring performs best when installed on a wooden, exterior grade plywood subfloor. Use a UU-B-790a, Grade B, Type 1, Style 1a permeable vapor retarder or equivalent with a perm rating between .7 and 1. A layer of 15 lb felt paper or asphalt laminated Kraft paper meeting ASTM D4869 standards over the subfloor provides both a moisture and dust retarder. Use a 5/8" (16mm) T&G CD Exposure 1 plywood for 12" and 16" on center floors (OC), 3/4" T&G CD Exposure 1 plywood for 16" to 19" OC floors, and 7/8" T&G CD Exposure 1 plywood for 24" OC floors. A sub-floor of 1-1/8" plywood over joists at 16" on center is recommended for an optimal installation. If using OSB, do not use any board thinner than 3/4".

Note: Hardboard, particleboard, and chipboard are not recommended as subfloor material because they are prone to moisture damage and/ or lack of rigidity. Moisture Content of the subfloor must not exceed ± 2% difference between it and the flooring. When securing plywood to concrete use at least 9 nails (shots) per 4' x 8' plywood sheet. In areas with higher humidity, more nailing may be required. A 1/8" spacing should be left between each sheet of plywood at the ends and 1/4" at the edges.

TIPS:

- Adequately securing the subfloor is important; good nailing or screwing prevents creeping caused by shrinkage of lumber as well as irritating floor squeaks.
- Avoid using latex-containing levelling compounds.

CONCRETE SUBFLOORS

Use an appropriate liquid or trowel-applied moisture barrier membrane/adhesive system. Impermeable moisture barrier/vapor retarder systems with a perm rating less than or equal to .13 are suggested. Depending on the level of moisture protection needed, at which grade you are installing and the moisture content of your concrete slab, NADURRA offers different adhesives which serve as moisture resistant membranes as well. See the "Full-Spread Glue Down Installation" section below for more details.

Concrete or levelling compound must be cured a minimum of 60 days. Prior to installation the concrete must be tested for moisture according to the NWFA's guidelines. Test the concrete in more than one place for consistent readings. **NADURRA**[®] recommends using the Calcium Chloride Test Method and the flooring must not exceed 3 lbs per 1000 sq.ft in 24 hours. If the moisture content is higher than recommended, do not install the flooring. Appropriate measures must be taken to dry the floor. Concrete should be checked for flatness prior to installation and any low spots or voids should be filled. High spots should be ground down to flat.

Remember, a concrete slab on or below grade that measures dry today may become moist in the future due to rising groundwater. Installing a moisture barrier now may be viewed as an insurance policy against concrete becoming wet in the future. This will lead to subsequent floor failure. **NADURRA**[®] is not responsible for site related moisture issues.

RADIANT HEATING SYSTEMS

NADURRA[®] Solid Originals bamboo floors are compatible with radiant floor heating. Floors are warranted over hydronic in-floor heating only. Electric in-floor heating due to its tendency to produce dry heat is not warranted. As well, flooring installed in multi-unit projects where the water temperature is not controlled separately in each unit, is not warranted. The floors are only warranted over radiant in-floor heating under these conditions: with the purchase of the extended radiant floor heat

Installation Guidelines

Solid Originals

warranty (please contact your seller for details), and by following the full NADURRA™ Installation Guidelines, the NADURRA™ Radiant Floor Heating Guidelines, and the NADURRA™ Care and Maintenance procedures.

INSTALLATION

PREPARATION

NADURRA® bamboo flooring can be installed using the same methods used by flooring professionals when installing tongue and groove hardwood flooring products. Please refer to the Hardwood Flooring Manual produced by the NWFA before installation. For the best performance of the Originals, NADURRA® recommends the nail down installation method over plywood subfloors. If installing in a basement, lay a vapour barrier of 6 mil polyethylene film (minimum) under the subfloor and in the crawl space. If installing on or above grade, install a vapour retarding membrane under the flooring.

NADURRA® bamboo is supplied in fixed lengths and packaged in cardboard boxes. Like wood, bamboo has natural appearance variations requiring some over stock allowance for on-site pre-selection, organising and cutting. NADURRA® suggests over-ordering by 5-10% extra. Flooring may become damaged over time and NADURRA® suggests keeping some flooring from the same batch with which to make replacements.

Planks should be laid out on the floor before installation to allow for visual selection. As with all plank floors, careful selection and placement of joints, colour, and grain matched pieces will enhance the visual effect. When selecting planks to install, always have 3-4 boxes open at a time. Bamboo is a natural fibre and variations are to be expected. For the best visual effect do not install boards varying greatly in color next to one another. Carefully examine the flooring prior to installation for grade, colour, finish, and quality. If the flooring is not acceptable, contact the seller immediately before opening all of the cartons. **NADURRA®** is not responsible for the installation of material with visible defects.

Correction of defect with the use of filler, wood putty or stain should be considered normal.

A ½" expansion gap should be left at all walls and vertical obstructions. For spaces wider than 20' (boards running the length of room), installers may need to build in additional spacing at the edge of room. For spaces larger than 40' wide an expansion joint in the middle of the room should be created, such as that provided by a T-Mould (or other flat moulding) or spacers. Place the expansion joint every 32' or so. Any rooms that are not square (such as a T, L, F, or U shaped room) must have non-parallel areas separated by an expansion joint. It is critical that the floor's ability to move freely is not restricted in any way.

Flooring should be one of the last items installed in a project. In order to protect the floors while other trades are finishing their work prior to final cleanup and turnover to the owner, use rosin paper and only use 3M® 2080 Blue Tape to hold the rosin paper to the floor (other blue tapes may damage the finish). Clean the floor thoroughly before laying the rosin paper to ensure that no debris is trapped underneath. DO NOT USE plastic film or other non-breathing coverings as this can cause the floor to become damaged from humidity build-ups.

NAIL DOWN INSTALLATION

Flooring should be installed square with the space and perpendicular to the joists. The starter row should be held firmly in place by wedging, face or blind nailing, or direct glue down. Once starter rows are secure, additional rows should be blind nailed directly above the tongue at a 45-50 degree angle to the face of each plank. Bamboo planks are secured to the plywood subfloor using 1 ½" to 2" 15.5 gauge cleats, 1 ½" to 2" 15.5 gauge coated staples (1/2" crown), or equivalent, spaced every 6-8" and 3-4" from each end (always test nailer/stapler to ensure that it is not damaging/splitting the flooring or not seating properly, before proceeding with installation). Make sure that your nailer has the appropriate spacer plate to reduce down to a 5/8" thick product. The selection and use of any nailer is at the sole discretion and responsibility of the owner/installer. A ½" expansion gap should be left at all walls and vertical obstructions.

NOTE: Excessive nailing pressure and nailing too close to the ends of the boards can cause splitting.

Installation Guidelines

Solid Original

TIPS:

- Stagger the end joints between rows at least 6" apart.
- Always tap against the tongue. Tapping against the groove may damage the plank.
- For concrete applications, make sure to choose a staple/nail length that does not penetrate through the subfloor; fasteners which are too long will "blow out" the bottom side of the subfloor (especially on Oriented Strand Board subfloors).

FULL-SPREAD GLUE DOWN INSTALLATION

Glue down installations should only be performed by professional wood flooring installers.

For glue down applications over concrete bamboo flooring must be installed over a moisture barrier or vapour retarder.

Use only NADURRA[®] approved, urethane-based, moisture-cured adhesives and/or moisture barrier system specifically recommended by the adhesive manufacturer for use with bamboo flooring. Depending on the level of moisture protection needed, where you are installing and the moisture content of your concrete slab, NADURRA offers different adhesives. For above grade and on grade installations where minimal moisture resistance is needed, NADURRA ADU 6 – a zero-VOC, urethane-based adhesive - will be acceptable. For increased moisture resistance use NADURRA's ADU 7 – a zero-VOC, urethane-based, adhesive with moisture resistance. And for an unlimited moisture protection use NADURRA's ADU 8 – a zero-VOC, urethane-based adhesive, moisture barrier and sound barrier all in one. Using another manufacturer's adhesive may result in failure and void warranty. Follow the curing time, spread rate, trowel size, and installation guidelines as recommended by your adhesive manufacturer. Instructions can be found on the side of the pails or online. The selection and use of any adhesive / moisture control system is at the sole discretion and responsibility of the owner/installer.

The sub-floor must be extremely flat (see adhesive manufacturer's specifications), be square with the space, and run perpendicular to the joists. Starter rows should be held firmly in place using wedges. A 1/2" expansion space or isolation barrier should be left around the perimeter. Once the starter rows are secure, apply the adhesive per the manufacturers' installation instructions. Using a floor jack during installation will help ensure a tight fit between planks, as well as speed up the installation. Blue masking tape can also be used as long as it is being effective at holding the planks together. Apply the tape perpendicularly to the seam of adjoining rows to prevent the rows from spreading apart while drying. Always check your working lines to be sure the floor is still aligned. When installing new boards, avoid pushing them into place across the subfloor, as this may unevenly redistribute the adhesive. Instead, hold the new board above the subfloor at an angle, engage the tongue and groove joint, then press the board directly down onto the subfloor. Ensure no glue is forced into tongue & groove joints during installation as this may affect the fit of the joint. Use 3M[®] Blue Tape to hold any planks which might have a side bow and need to be held straight & tight until the adhesive sets up.

NOTE: Always remove any adhesive from the surface of the flooring (smudges, fingerprints, etc.) with a dry and clean cloth before it dries. Use the adhesive manufacturer's adhesive removing product or mineral spirits. Clean up as you go – do not wait until the installation is complete. Cured adhesives are very difficult to remove and may permanently damage flooring.

Immediately roll finished installation with a 100lbs roller to ensure solid contact between the flooring and glue. Carefully walking each section of flooring foot-by-foot may also achieve the same result. Wait 24 hours before moving furniture or appliances onto floor.

DOUBLE GLUE DOWN APPLICATIONS

If gluing down over underlayment or sound barrier use a double glue down method. This type of installation requires the use of the NADURRA[®] approved adhesives for adhering both the underlayment to the subfloor and for installing the flooring to the underlayment.

Always remove any adhesive from the surface of the flooring (e.g. smudges, fingerprints, etc.) before it dries. Clean up as you go – do not wait until the installation is complete. Cured adhesives are very difficult to remove and may

Installation Guidelines Solid Original

permanently damage flooring. Always follow the adhesive manufacturer's installation instructions. The selection and use of any adhesive / moisture control system is at the sole discretion and responsibility of the owner/installer.

AFTER INSTALLATION

Flooring should be one of the last items installed in a project. In order to protect the floors while other trades are finishing their work prior to final cleanup and turnover to the owner, use rosin paper and only use 3M® 2080 Blue Tape to hold the rosin paper to the floor (other blue tapes may damage the finish). **Note: Do not allow the tape to remain on the floor longer than one hour. And do not apply tape to flooring that has been wiped with a solvent at any stage of the installation process.** Clean the floor thoroughly before laying the rosin paper to ensure that no debris is trapped underneath. Buff the floor with lamb's wool pads in order to remove an loose splinters, residues or footprints. **DO NOT USE** plastic film or other non-breathing coverings as this can cause the floor to become damaged from humidity build-ups.

Remove expansion spacers and install accessories and baseboard or quarter round to cover expansion spaces.

Place walk off mats at all entrances to help collect dirt and debris that could damage or dull the flooring finishes. Install felt protectors underneath all furniture.