

Installation Guidelines Solid Composite™

NADURRA® imports high quality bamboo flooring. These installation guidelines cover all **solid** versions of the Nadurra Composite™ Flooring including: *Solid Composite™*, *Stained Composite™*, *TRAFFIC Composite™*, *Commercial Composite™*, *Formaldehyde-Free* and *FSC®-certified* versions.

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 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 amount of boxes is incorrect, contact the seller immediately before opening any more of the cartons. Colour, shade, dimension 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, product and subfloor moisture content and manufacturer of instruments used. The installer should keep a copy for themselves and leave a copy with the homeowner.

Installation Method: Due to the extreme hardness of NADURRA® Composite™ bamboo flooring, one needs to take time and carefully check one's work periodically as the installation progresses when using the nail down method. Look for dimpling (raised bumps) on the surface of the plank. Using an experienced wood flooring installer certified by the National Wood Flooring Association (NWFA) is the best way to ensure a satisfactory installation. NADURRA® is not responsible for installation or floor failures caused by improper installation technique.

Installation Guidelines

Solid Composite™

APPLICATION

Our *Composite™* planks are twice as dense as red oak, making them perfect for toughening up high traffic homes, medium traffic retail stores and salons or other commercial applications. The *Solid Composite* collection is designed for use with above, on, or below grade installations. Note that this floor may not be acceptable for bathroom installations due to the excessive moisture associated with such environments.

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 humidity. To allow for temperature and moisture adjustment *Composite™* bamboo should be stored in the actual rooms where it will be installed for a minimum of 5 days. **Due to the extreme density and resin content, acclimation will progress more slowly with Composite Bamboo than with traditional hardwoods. It may take longer than 5 days for this product to acclimate. In very dry or very humid climates, proper acclimation may take several weeks.** Do not store the boxes of flooring directly on concrete. Open the boxes, remove any plastic wrapping and spread the flooring out to let it breathe.

The temperature and humidity in the storage or acclimatisation room should be the same or close to the occupancy levels. Permanent heat and humidity controls must be installed and operating during and after installation. Failure to acclimate properly may result in shrinkage/gapping or cupping/buckling. **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 in the floor may come and go seasonally due to temperature and relative humidity changes. The amount of movement depends upon a combination of the effects of temperature, relative humidity, and the moisture content of the flooring and subflooring (wood moves as moisture content rises and falls).

Always test the moisture content of the bamboo flooring before installing. It is suggested to use a pinless meter when moisture testing *Composite* bamboo. Pin type meters can give misleading readings because of the product's resin content interfering with electrical conductivity. Use the moisture meter manufacturer's recommended settings for strand-woven bamboo flooring. If they do not have recommended settings for strand woven bamboo you may try the setting for Ipe, however the manufacturer's suggestion always trumps this suggestion. 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.
- Arrange to deliver your flooring after the plastering and painting are completed and dried.
- Separate the boxes into small piles to optimise acclimatisation.

Installation Guidelines

Solid Composite™

SUBFLOOR PREPARATION

A moisture barrier such as 6 mil polyethylene film should be placed in crawl spaces. The general contractor/owner must take the appropriate actions to ensure that the subfloor is flat, clean, 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. As well the floor must be free of dirt, wax, oil, paint, curing agents and other foreign material that would interfere with installation. **Warning:** *The lack of moisture protection before installation can significantly reduce flooring performance.* Wood subfloors must have no flex. Fix any squeaks or movement in the sub-flooring surfaces prior to installation.

CONDITION REQUIREMENTS:

Flatness Tolerance: 3/16" over 10'

WOOD SUBFLOORS

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, a minimum thickness of 3/4", PS 2-92 rated or PS 1-95 rated should be used. **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 $\pm 2\%$ 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.

CONDITION REQUIREMENTS:

Minimum: 3/4" Douglas Fir Plywood CSA O121-1978M - Grading Good One Side

Moisture Content: Must not exceed $\pm 2\%$ difference between the subfloor and the flooring

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 a minimum of 20 places for every 1000 sq.ft for and then use the average reading. All concrete should be tested for moisture prior to installation using the Calcium Chloride test method, a non-invasive moisture meter, or a pin/probe meter. When using a Calcium Chloride Test, the result must not exceed 3 lbs per 1000 sq.ft in a 24 hour period. If the moisture content is higher than recommended, appropriate measures must be taken to prevent problems. For floors exceeding the maximum moisture content, a vapour barrier should be used to mitigate moisture seepage.

Remember, a concrete slab on/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.

Installation Guidelines

Solid Composite™

Ceramic Tile, resilient tile and sheet vinyl must be well-bonded to subfloor, in good condition, clean and flat. Do not sand existing vinyl floors, as they may contain asbestos.

CONDITION REQUIREMENTS:

Recommended Levelling Compound: Cementitious type

Moisture Content: ≤ 3 LB / 1000 ft. / 24 hours

RADIANT HEATING SYSTEMS

NADURRA® Solid Composite™ Collection 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 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. **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. 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. Work from several open boxes of flooring and “dry lay” the floor before permanently laying the floor. This will allow you to select the varying grains & colors and to arrange them in a harmonious pattern. It also allows you the opportunity to select out very dark/light pieces for use in hidden areas in order to create a more uniform floor. Should an individual plank be questionable as to appearance or dimension the installer should not use this piece. 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. **NOTE:** bamboo expands and contracts along its length as well as its width so it is critical to leave expansion spaces around the entire perimeter of the room. 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. Ensure 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). Do not apply tape to a floor that has been wiped with a solvent and never leave the tape on a finished floor surface longer than an hour. 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.

TIPS:

- When selecting planks to install, always have 3-4 boxes open at a time to select from.
- *Note: The subfloor must be within 2% moisture content of the bamboo flooring before installing.*

Installation Guidelines Solid Composite™

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 ½" 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.

NOTE: If you have purchased a product with a Bona™ finish, be especially diligent to clean any adhesive immediately with mineral spirits or adhesive remover. The Bona™ finishes until worked in over time, may trap more adhesive than the standard urethane finishes.

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 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.

Installation Guidelines Solid Composite™

NAIL DOWN INSTALLATION

IMPORTANT: Due to the extreme hardness of solid Composite bamboo, particular care must be taken by the installer to ensure that the appropriate nailer, proper cleat nails, and the correct PSI settings are used to create a successful installation without damaging the floor. This includes damage to the surface or tongue of the plank. Choice of appropriate power nailer and selection of proper PSI settings are the sole responsibility of the home owner/installer. The correct air pressure needed to install this flooring will vary with subfloor type, but generally ranges between 55 and 95 psi. Note that Composite bamboo flooring may vary in density along the length of a plank, so the installer must be sensitive to this and watch that the tongues are not splitting (too much pressure) and that the cleat head is sitting snug in the nail pocket with each firing of the nailing gun (ensuring proper fitting of the next plank). Test a few sacrificial planks to make sure that nailing will not cause dimpling (localized raised edges) in the finished floor immediately above the nail. (Note: Be sure to look at the face of the installed flooring at a low angle from a distance to see if dimpling is occurring as it is hard to see when directly above the floor.) If dimpling does occur, stop and adjust the nailer shoe, angle/place of nail entry, psi, or nail gun in order to avoid it. NADURRA® is not responsible for dimpling or damage incurred to the floor as a result of improper installation technique.

Apply a layer of 15 lb felt paper or asphalt laminated Kraft paper performing to ASTM D4869 standards over the subfloor to provide both a moisture and dust retarder. Use an air nailer compatible with the thickness of the flooring planks. NOTE: the Solid Composite flooring is available in varying thicknesses. It is important to know what thickness of flooring is being installed and use the appropriate nailer, spacer plate or adjustment on the nailer to match the flooring. Bamboo planks are secured to the plywood subfloor using 1 1/4" to 1 1/2" - 18 gauge coated nails (**NOTE:** cleats larger than 18 gauge (i.e. 15 gauge) may damage this flooring and void the warranty). Nails should be blind nailed directly above the tongue at a 45-50 degree angle to the face of each plank.

Nails shall be placed no closer than 6" from the ends of each plank and then spaced at 8" to 10" intervals or as required to prevent tongue splitting/damage. To start a new area against a wall, either top/face nail or glue down the first several rows until a pneumatic tool can be used. A 1/2" expansion gap should be left at all vertical obstructions.

TIPS:

- Stagger the end joints between rows at least 6" apart and avoid 'H' patterns.
- Excessive nailing pressure can cause splitting in bamboo.
- Always tap against the tongue. Tapping against the groove may damage the plank.
- For concrete applications, make sure to choose a nail length that does not penetrate through the subfloor; fasteners which are too long will "blow out" the bottom side of the subfloor.

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 any 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 buildups.

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.