

## Installation Guidelines 3-Dimensional Composite

NADURRA® imports high quality bamboo flooring. These installation guidelines pertain solely to the tongue and groove version of the *3-Dimensional Naturale Composite™* Collection and the *3-Dimensional Stained Composite™* Collection.

### 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 [nwfa.org](http://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 insure 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 of this with the homeowner.

**Installation Method:** Due to the extreme hardness of NADURRA® Composite™ bamboo flooring, which makes up the top and bottom layers of this engineered floor, one needs to be careful when installing using the nail down methods. Look for dimpling (raised bumps) on the surface of the plank. If you are unsure as to how to properly install the 3-Dimensional Collection bamboo flooring using a nailer we recommend using the full-spread glue-down or tongue and groove floating technique. NADURRA® is not responsible for installation or floor failures caused by nailing.

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### APPLICATION

The 3-Dimensional Composite™ Collection floors are designed for use above, on, and below grade. They can be nailed, glued down and floated in homes, condos, and light traffic commercial environments. They 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 it 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 completely opened or removed from packaging in the room where it will be installed to allow for moisture and temperature adjustment. Acclimatisation is relative to humidity, moisture and temperature and as every site has different conditions, acclimatisation is not related to a specific number of days. Only install the bamboo flooring once it has reached the optimum moisture content outlined below. Leave a couple of boxes unopened or only slightly opened in case you need to return boxes. Only resellable packages in near-perfect condition and untouched flooring will be accepted as returnable. Control the environment with an HVAC system that can consistently maintain the optimum Temperature and Relative Humidity ranges outlined below. 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: Due to the extreme density and resin with Composite Bamboo the acclimatisation process is longer than traditional hardwoods. In extreme dry climates the acclimatisation period may take a couple of weeks or longer. 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.**

Do not store the flooring directly on concrete or near outside walls. Concrete subfloors should be sealed or covered to retard vapour emissions.

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 as bamboo is a natural product that fluctuates in size and moisture content as its environment changes.

Always moisture test 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 bamboo flooring. Using the standard settings for different species will give inaccurate readings. 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.

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### TIPS:

- Run the interior climate controls for at least 6 days to stabilise 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 owner to decide whether a subfloor surface is acceptable. Take the appropriate actions to ensure that the subfloor is 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:

**Flatness Tolerance:** 3/16" over a 10' radius.

### 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 3/4" T&G CD Exposure 1 plywood for 12, 16" or greater OC floors, and 7/8" T&G CD Exposure 1 plywood for 24" OC floors. If using OSB, a minimum thickness of 3/4", PS 2-92 rated or PS 1-95 rated should be used. A sub-floor of 1-1/8" plywood over joists at 16" on center is recommended for an optimal installation. **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.

### 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.

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NADURRA recommends using the Calcium Chloride Test method (must not exceed 3lbs per 1000sqft in 24 hrs) and/or the In Situ Relative Humidity Probe method (must not exceed 75%). 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 to a minimum of 3/16" over a 10' radius. High spots should be ground down to flat.

Remember, a concrete slab on/below grade that measures dry today may become moist in the future due to rising groundwater or other factors. Installing a moisture barrier now may safeguard against floor failure in the future if the concrete becomes wet. NADURRA® is not responsible for site related moisture issues.

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.

### **RADIANT HEATING SYSTEMS**

NADURRA® 3-Dimensional Composite™ Collection bamboo floors are compatible with radiant floor heating, with the full spread glue down (recommended adhesive; ADU-7 or ADU-8 which both have moisture retarding properties) or nail installation method. The tongue and groove floating method is not warranted over 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 commercial environments and multi-unit residential/commercial 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. If installing in a basement lay a vapour barrier of 6mil poly (minimum) under the flooring 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.

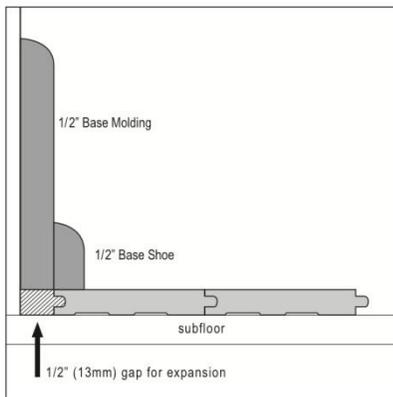
Planks should be laid out on the floor before installation to allow for visual selection. As with all plank floors, careful selection and placement of joints, colour and grain matched pieces will enhance the visual effect. When selecting planks to install, always have 3-4 boxes open at a time. Bamboo is a natural fibre and variations are to be expected. Correction of defect with the use of filler, wood putty or stain should be considered normal.

Stagger the end joints between rows at least 6" apart. For 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 or installation of material that the end user or installer for any reason (colour, grade, shading, etc) find unacceptable.

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Depending if you can maintain a constant year-round relative humidity and temperature or not (see acceptable ranges above), leave 1/2" to 5/8" expansion and 1/2" to 5/8" contraction gaps at all walls and vertical obstructions. Using a combination of base moulding with a shoe moulding in front can provide both an expansion and contraction space. The flooring must not hit the wall if it expands and should not show from under the shoe moulding if it contracts. Undercutting the drywall may be an option if the combination of base and shoe mouldings is not wanted. **NOTE:** bamboo expands and contracts along its length as well as its width so it is critical to leave movement 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/contraction 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/contraction joint every 32' or so. For geographical areas that experience high humidity, especially higher than the optimal range of 35-55%, the installer may need to place removable spaces between planks every few rows. For floating installations: 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; all door openings must have an expansion joint between rooms; ensure that the floor's ability to move freely is not restricted in any way.



### 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.

Use only NADURRA<sup>®</sup> approved, urethane-based, moisture-cured adhesives and 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 (upper moisture limitation: 6lbs and 80% RH). For increased moisture resistance, use NADURRA's ADU 7 – a zero-VOC, urethane-based, adhesive with moisture resistance (upper moisture limitation: 15 lbs and 85% RH). And for an the most moisture protection use NADURRA's ADU 8 – a zero-VOC, urethane-based adhesive, moisture barrier and sound barrier all in one (upper moisture limitations: none, dry to the touch). 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" to 5/8" expansion space and similar contraction space 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

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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 using a very clean cloth. An unclean cloth may just spread the adhesive around. The Bona™ finishes until worked in over time, may trap more adhesive than the standard urethane finishes. 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 INSTALLATIONS**

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.

#### **NAIL DOWN INSTALLATION**

Flooring should be installed square with the space and perpendicular to the joists. A ½" to ⅝" expansion space and similar contraction space should be left around the perimeter. Starter rows should be held firmly in place by wedging, face or blind nailing, or direct glue down. Whenever surface nailing the Composite bamboo it's advisable to predrill a pilot hole. This will allow better countersinking and minimize deflection and damage to the floor.

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 using a nailer and nails appropriate for the thickness of the flooring. The 3D Composite Flooring is available in varying thicknesses, so it is important to determine this before installation. NADURRA recommends using 18 gauge cleat nails, 1-½" to 1-¾" long, spaced every 6 to 8" and 3 to 4" from each end. **Note: 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 snugly in the nail pocket with each firing of the nailing gun.** The proper psi should be set according to each nailer manufacturer's recommendation. Test a few sacrificial planks on the job site to ensure the correct psi are achieved. Make sure that your nailer has the appropriate spacer plate to reduce down to the thickness of the flooring. Ensure your plate is sitting flush on the face of the floor. The selection and use of any nailer is at the sole discretion and responsibility of the owner/installer.

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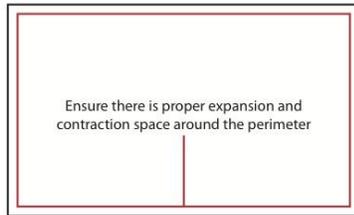
### NOTE:

- Excessive nailing pressure can cause splitting. Too little pressure can cause the nail head to not sit properly in the nail pocket and may cause dimpling (see below)
- Nailing too close to the ends of the boards can cause splitting.
- Due to the extreme hardness of NADURRA® Composite™ bamboo flooring, which makes up the top and bottom layers of this engineered floor one needs to be careful when installing using the nail down methods. Look for dimpling (raised bumps) on the surface of the plank. To check for dimpling look at a distance from a low angle across the surface of the floor towards a light source like a window. It is difficult to see the raised bumps from directly above. If you are unsure as to how to properly install the 3-Dimensional Collection bamboo flooring using a nailer we recommend using the full-spread glue-down or tongue and groove floating technique. NADURRA® is not responsible for replacing flooring installed with dimples or floor failures caused by nailing. If you see dimpling on your plank surface stop immediately. You can try adjusting the psi rating on your nail gun, the angle at which you are shooting the nail, the entry point of the nail/cleat into the tongue, the length or gauge of the nail, the soundness of your subfloor, your spacer plate, or the brand of gun you are using.
- 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.

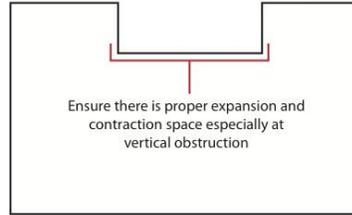
### TONGUE AND GROOVE FLOATING INSTALLATION

Depending if you can maintain a constant year-round relative humidity and temperature or not (see acceptable ranges above), leave ½” to 5/8” expansion and ½” to 5/8” contraction gaps at all walls and vertical obstructions, as outlined above at the beginning of this section. For floors larger than 16’ in any one direction, leave an additional expansion space of 1/8” on the edges for each 48” of installed flooring. 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. All door openings or transitions into new areas must have an expansion joint between rooms/spaces. Ensure that the floor’s ability to move freely is not restricted in any way. Heavy objects such as counters, kitchen islands and large appliances should be in place prior the flooring installation. If the floating floor is compressed against the subfloor with excessive weight, this could inhibit the floor’s ability to move in response to humidity or temperature changes and may result in cupping or gapping.

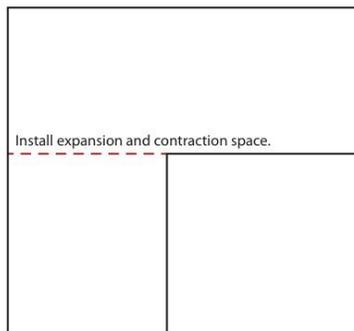
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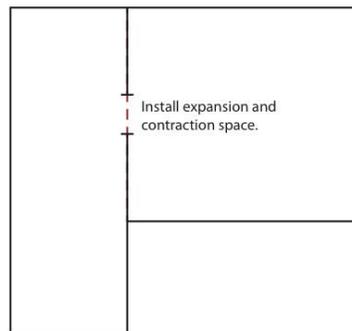
Rectangle or Square Room



Rectangle or Square Room with obstruction (fireplace, chimney, etc.)



T, L, F, or U Shaped Room



Two Adjoining Rooms Or Adjoining Hallway And Room

Use an approved PVA-2 (poly vinyl acetate) tongue and groove floating floor edge glue, such as Franklin Titebond II or equivalent. Roll out a NADURRA™ approved high density underlayment (e.g. NADURRA's Sound Down Floating Underlayment - 1/16" thick) material on to the sub-floor. Make sure that the underlayment is butted edge to edge, joining the lengths at the edges with tape. If installing in a basement or over concrete, lay a vapour barrier of 6mil poly (minimum) under the underlayment. If installing over plywood on or above grade, install a vapour retarding membrane under the flooring.

Ideally, the flooring should be installed parallel to the longest dimension of the room. In a square room, the long joints should (preferably), follow the path of the incoming light. Walls are often not straight; therefore, it is very important to square the first row. Use wedges/shims between the flooring strips and the wall to achieve the desired 1/2" to 5/8" expansion and contraction gaps. Before laying the first plank apply glue to the upper and lower edge of the groove of the small end of the plank. Lay the first piece of flooring with the grooved edge towards the wall. Before placing the next plank in that row apply the glue to its small end groove. Then place the tongue end of the second plank into the groove of the first plank and gently tap it into place. Continue until the end of the row. Clean any glue on the finished side of the flooring before the glue dries to prevent permanent damage to the flooring. Always follow the adhesive manufacturer's instructions as to how to remove unwanted adhesive. You may use 3M blue tape, if required, to hold pieces together until a glue bond has fully developed. You may need flooring straps to keep the edges together.

Allow the glue to set on the first row to minimize subsequent movement when adding rows. Begin the second row using the cut off from the end of the first row as a starter plank for this row. This assures randomly staggered end joints. Apply adhesive to the end and side grooves and engage the planks. Use the same technique as above for the second and all subsequent rows. Never strike the planks directly. Always press an approved tapping block against the tongue of the flooring to avoid damage. Tap lightly. Use tape or straps to secure each row to the previous row. Ensure the tape is meant for prefinished flooring or it may damage the surface of the flooring

If necessary, cut planks lengthwise as required to fit planks for the final row. Remove all spacing wedges. Install moulding as required to hide expansion gaps. Remove all tape and or straps. Adhesive must be allowed to dry completely as per manufacturer's instructions before placing furniture or allowing foot traffic. Never install cabinets or walls on top of a NADURRA floating floor.

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### 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.