

## **ENGINEERED FLOORING INSTALLATION AND CARE & MAINTENANCE GUIDELINES**

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### **OVERVIEW**

Congratulations on your new wide plank floors. Installing wide plank floors is a skill and should not be treated like standard strip flooring. READ THIS ENTIRE DOCUMENT THOROUGHLY BEFORE RECEIVING YOUR FLOORING and follow throughout the installation process. Failure to do so will void the warranty. INSPECTION

IT IS THE RESPONSIBILITY OF THE INSTALLER TO INSPECT THE PRODUCTS PRIOR TO INSTALLATION. If, BEFORE INSTALLATION, you discover any product that has obvious defects, does not match the order or if for any reason you are not satisfied with the material, please contact State of the Art Wood Floor Gallery immediately. DO NOT install the flooring. Quiet Leaf Flooring LLC accepts no responsibility for costs of products or labor when products with visible defects have been installed nonetheless.

### **Acclimation – Engineered Flooring**

DO NOT remove from packaging and acclimate like solid hardwood flooring. As wood is hygroscopic and responds to changes in temperature/humidity, proper acclimation is the most important step in ensuring a proper installation. Acclimation refers to the moisture content of the wood flooring and subfloor plus the conditions of the job site in terms of Temperature and Relative Humidity. Improper acclimation can cause a host of issues such as buckling, shrinking and/or cupping after installation. See further instructions below.

### **Subfloor Prep**

Subfloors must be level, clean and dry. Improper subfloor preparation can make the floor unstable and cause premature damage. See further instructions below.

### **NWFA Guidelines**

This installation guide is provided as a reference. In addition to these instructions, all flooring must be installed in accordance with NWFA (National Wood Flooring Association Guidelines). NWFA Guidelines provide additional information on jobsite requirements, acclimation, moisture testing, subfloor guidelines and specifications, installation instructions, safety guidelines, fastening schedule, wood terminology and a jobsite checklist.

### **Receiving**

Orders are shipped freight prepaid by Common Carrier or truckload Carrier. If your order arrives damaged due to shipping, note the damage on the freight bill before signing the bill of lading and contact your supplier immediately. Notify the Carrier of the damage and have them sign the bill of lading that identifies damage. Do not un-bundle your order and do not proceed with installation.

## STORAGE, ACCLIMATION & JOBSITE REQUIREMENTS

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### STORAGE & ACCLIMATION

Store materials in clean, dry area indoors on flat, level surface. Do not store materials directly on concrete or near outside wall. These floors need adequate acclimation for moisture equalization prior to installation. If possible, leave engineered wood flooring in their sealed packaging until time of actual installation. Do not remove from packaging and acclimate like solid hardwood flooring. If packaging was removed as a necessity to unload materials upon delivery, restack bundles onto the pallet in the installation area for storage/acclimation.

Store the flooring in the properly conditioned installation area for a minimum of **72 hours** before installation to allow flooring to adjust to room temperature. See jobsite requirements below for proper conditioning of installation area.

### JOBSITE REQUIREMENTS

Prior to installation, the installer must ensure that the jobsite and subfloor meet the requirements of these instructions and the recommendations of the NWFA. QUIETLEAF FLOORING accepts no responsibility for flooring failure resulting from unsatisfactory jobsite conditions and/or subfloor conditions.

All work involving water or moisture should be completed before installing hardwood flooring. For any new construction or remodeling project, hardwood flooring should be one of the last items installed.

HVAC systems must be operational and controlling site temperature and humidity. Area to receive flooring [and adhesive] must be properly conditioned at normal occupancy temperature (**60-70°F (15-21°C)**), and humidity levels (**35-55% humidity**), maintained for a minimum of **one week** prior to installation as well as during and continuously following installation. Do not install in areas subject to moisture, such as bathrooms or laundry rooms.

## Acclimation, Moisture Testing & Subfloor Prep

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### ACCLIMATION

Besides acclimating the wood flooring to the installation area as described in the previous section, Acclimation also refers to the moisture content of the wood flooring and the subfloor.

Upon delivery, check wood flooring moisture content with a moisture meter to establish a baseline for required acclimation. Check the moisture content of multiple boards. A good representative sample is typically 40 boards for every 1,000 square feet of flooring. Acclimate to moisture content % appropriate for your area -- see NWFA Guidelines - Appendix D for a map of the USA and recommended MC% by state.

### MOISTURE TESTING

#### For Wood Subfloors:

Perform tests so that each test area does not exceed 200 square feet (18.6 sq. m), and perform no fewer than two tests in each installation area and with test areas evenly spaced in installation areas – minimum 20 testing locations per 1,000 square feet for wood subfloors.

**Wood Subfloors must have a moisture content under 12% and within 2% of the moisture content of the flooring material.** If you record excessively high readings in one or more areas, do not proceed with installation until the origin of the moisture is identified and moisture problems are remedied. Pay special attention to exterior and plumbing walls. See NWFA guidelines - Chapter 3 - for acceptable vapor retarders over a wood subfloor. Do not use an impermeable vapor retarder material with a perm rating of .7 or less as it may trap moisture on or in the wood subfloor.

#### **For Concrete Subfloors:**

Test concrete floors for moisture vapor emission using a Calcium Chloride Test per ASTM F 1869 or Calcium Carbide (CM) Test per ASTM (modified) D 4944-04. Before moisture testing begins, a concrete slab must be fully cured for at least 30 days. It is recommended that you first perform an electrical impedance and electrical resistance test with a moisture meter specifically designed for concrete (such as Tramex). These tests are not for the purpose of accepting or rejecting the subfloor, but rather are useful survey tools to select locations for further Calcium Chloride or CM testing.

**\*\* NOTE: A "DRY" SLAB, AS DEFINED BY THESE TESTS CAN BE WET AT OTHER TIMES OF THE YEAR. THIS TEST DOES NOT GUARANTEE A DRY SLAB.** QUIETLEAF FLOORING is not responsible for site related moisture issues.

#### **Calcium Chloride Test (ASTM F 1869)/Calcium Carbide (CM) Test (ASTM (modified) D 4944-04)**

Follow all NWFA testing guidelines and test manufacturer's guidelines. Perform a minimum of 3 tests per 1,000 square feet and one additional test for each 1,000 square feet thereafter. For concrete slabs reading less than 3 lbs per 1,000 square feet ( $15 \text{ g/m}^2$ ) in 24 hours using the Calcium Chloride Test OR less than 2.5% using the CM Test) we recommend using BONA Quantum Adhesive. Visit US.Bona.com for product information including the latest Technical Data Sheet, MSDS, and application instructions. For concrete slabs reading over 3 lbs and up to 7 lbs using the Calcium Chloride Test OR over 2.5% and up to 4% using the CM Test OR if there is any concern about the slab remaining "dry" year-round, a direct glue-down application (**Bona Quantum Adhesive**) is recommended **only in combination with a vapor barrier (Bona R540 Primer) with a perm rating of 0.15 or less.** A concrete slab with a reading over 7 lbs using the Calcium Chloride Test OR over 4% using the CM Test is not acceptable for wood flooring installation. Keep detailed documentation of test results and all test location(s).

If directly gluing to concrete, use recommended Bona adhesive ONLY and follow all of Bona's instructions.

#### **On-Grade or Below-Grade Installations**

Due to the concern of moisture, for **on-grade or below-grade installation**, we recommend installing a vapor barrier and a plywood sub-floor over the concrete. If slab conditions are not adequate for a direct glue down application, building in a subfloor is common. An impermeable vapor barrier with a perm rating of .15 or less, such as a 6 mil polyethylene film or **Bona R 540**, is required over the concrete slab prior to building the subfloor. Gluing/Screwing down a plywood deck prior to installing the wood floor is one option. Plywood and adhesives **MUST** be rated for this application. A floated subfloor is another option. Additionally, installing sleepers then a nailed down plywood deck is another approach to the creating a subfloor condition where wood flooring can be nailed down, or glued and nailed to the deck. See NWFA Guidelines, Chapter 6 for additional information on installing a subfloor over concrete.

**NOTE: Installing a plywood subfloor over the concrete is our recommendation for installation over concrete on- or below-grade. However, if you choose to perform a direct glue-down installations on-grade or below-grade, a vapor barrier (such as Bona R 540) with a perm rating below .15 is always required.**

Do not use a concrete sealer nor install over one. The concrete must be high compressive strength (3,000 psi or greater). All concrete sub-floors should be tested for moisture content. Visual checks are not reliable.

See NWFA Installation Guidelines, Chapter 3 for additional information on moisture testing.

## **SUBFLOOR PREPARATION**

### **ACCEPTABLE SUBFLOOR TYPES:**

- 3/4" or thicker exterior plywood, 5/8" minimum thickness, installed with the long edge forming a right angle to the floor joists.
- 3/4" minimum O.S.B. on 19.2" center floor joists system properly nailed.
- Concrete Slab - minimum 3,000 psi (glue-down only)

**NOTE: Direct glue-down of QUIETLEAF engineered wood flooring over a Gypcrete subfloor is not recommended due to the possibility of shearing/cracking of the Gypcrete caused by the adhesive pulling on the subfloor as the wood naturally expands/contracts with changes to temperature & humidity.** If working with a Gypcrete subfloor, we recommend building a plywood deck prior to installing the wood floor. Plywood **MUST** be rated for this application. Additionally, installing sleepers then a nailed down plywood deck is another approach to the creating a subfloor condition where wood flooring can be nailed down, or glued and nailed to the deck. Consult NWFA for recommendations on constructing a subfloor over Gypcrete.

**QUIETLEAF is not responsible for any flooring failure caused by subfloor conditions.**

### **All sub-floors must be:**

- **Structurally Sound**
- **Dry** and remain dry year-round.
- **Clean:** swept (or vacuumed with industrial vacuum if using glue-down method) thoroughly and free of all debris. If using glue-down installation, subfloor must also be free of wax, grease, paint, sealers and old adhesives which can be removed with sanding. A simple way to test for the presence of sealers on concrete is to pour a small amount of water on the concrete slab - the concrete should be porous and the water should seep into the concrete. If the water is beading, this would indicate the presence of a sealer which needs to be sanded prior to beginning the installation.
- **Level:** flat to within 3/16" in 10 feet or 1/8" in 6 foot radius.

Grind and fill sub-floor using methods and materials appropriate to the sub-floor construction to eliminate humps and depressions exceeding 1/8 (3 mm) inch in 6 feet (1830 mm) radius or 3/16 inch in 10 feet. If necessary, level down any irregularities using #20 grit paper and fill any uneven spots with cementitious leveling compound - we recommend Cement based Self Leveling Compound (see next

page for additional information). Remove all paint, wax, oil, plaster, sheetrock mud, protruding fasteners and previous or existing glues and adhesives. Grind concrete with #3 1/2 grit sandpaper if needed then sweep or vacuum thoroughly. Clean surfaces thoroughly prior to installation.

**Wood sub-floor must be:**

- Flat, clean, dry, structurally sound, well secured, free of squeaks, free of protruding fasteners and with a moisture content under 12% and within 2% of the moisture content of the flooring material.
- Nailed down or screwed down every 6" along the joist to avoid squeaking.
- Leave a 1/8" gap around perimeter to allow for expansion.
- Leveled by sanding down high spots and filling in low spots with a Portland based leveling patch as necessary. For installations using mechanical fasteners of 1 •••" and longer, the subfloor should be flat to within •••" in 10 feet or 3/16" in 6 foot radius. For glue-down installations and installations using mechanical fasteners of less than 1 •••", the subfloor should be flat to within 3/16" in 10 feet or 1/8" in 6 foot radius.

**Concrete sub-floor must be:**

- Fully cured for at least 30 days
- Installed properly with minimum 6-mil polyfilm between concrete and ground.
- Dry all year round. Do not install over concrete if you are not sure it will remain dry.
- Tested for moisture by using Calcium Chloride Test or CM Test (see moisture testing above)
- High Compression Strength - Minimum 3,000 psi (20 MPa)

**INSTALLATION**

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QUIETLEAF Engineered Wood Flooring can be installed above-grade on-grade, or below grade. It may be glued down over a plywood or concrete sub-floor. Knot holes or other defects can be filled with a clear two part epoxy, wood filler, or clear adhesive. Note: this may take extra time when working with reclaimed wood. All cracks, open knot holes and large nail holes are normal with reclaimed wood and will require filling.

**PLEASE NOTE:** It is the duty of the installer to judge the suitability of any piece for placement in an obvious area of the room. If you feel a piece is not suitable, either do not install it or install it in an inconspicuous place.

**PREPARING FOR INSTALLATION**

**Be sure to follow proper subfloor prep and moisture testing as outlined in the previous section.** Undercut or notch-out door casings to fit flooring underneath by placing a piece of flooring on the sub-floor as a height guide for sawing. Remove door thresholds and base moldings and replace after flooring installation. Always leave at least 1/2" expansion space between flooring and all walls and vertical objects. Use wood or plastic spacers during installation to maintain this 1/2" expansion space.

Use a hammer and tapping block and tap against the tongue to pull planks together. Never tap against the groove of the plank. When near a wall, use a crow or pull bar to close end joints. Be careful not to damage flooring edge. All of State of the Art Wood Floor Gallery's Engineered Wood Flooring is milled to very exacting standards, so pieces that do not go together easily usually have debris in the groove, the

tongue and/or groove has been damaged, or the board is a little bowed and you just need to flatten it out, rather than forcing the pieces together.

### **Starting Installation**

For aesthetic purposes, wood flooring is often laid to the longest wall. However, the building owner/architect/design, upon the advice of the professional installer should make the final decision as to which direction the planks will run. Flooring should be laid at right angles to the floor joists and, if possible, in the direction of the longest dimension of the room. Most professional installers will begin installation next to an outside wall, which is usually the straightest wall, as a reference point in establishing a straight working line. A good way to establish a working line is to measure an equal distance from the wall at both ends and snap a chalk line. Measure distance from the wall at the width of the plank plus another 1/2" for expansion space for establishing your working line. It is advisable to "dry lay" a few rows before permanently laying the floor to confirm your directional layout decision and working line. This will also allow you the opportunity to select the varying colors and grains to create an aesthetically pleasing pattern. Adjustments of the working line may be necessary if the outside wall or other working line reference is out of square. This can be done by scribe cutting the first row of planks to match the wall, thereby creating a straight working line.

Stagger end joints of boards row to row a minimum of 8-10" for 3" to 5" planks, and 10" for planks wider than 5".

### **Glue-Down Installation**

You can contact QUIETLEAF FLOORING OR BONA US, Use of another manufacturer's adhesive may result in failure and void warranty.

Follow Bona's instructions for minimum temperature and open time before beginning installation of flooring. Use the trowel recommended by Bona, since tooth size is important for the best adherence to the sub-floor. A P5 (3/16"x3/16"x3/16") trowel can be used for BONA Quantum if being used as an adhesive only. Periodically check trowel for wear any worn down trowel must be replaced before continuing application.

Always allow for adequate cross ventilation when working with flooring adhesive. Follow adhesive instructions regarding proper set time before affixing wood floor planks. **If using BONA R 540 Primer, as noted in the BONA instructions, BONA recommends allowing NO MORE THAN 36 hours between priming and beginning installation with adhesive otherwise, the primer epoxy will set and the adhesive will not be able to adhere to the primer.** With a trowel at a 45-degree angle, spread as much adhesive as can be covered by flooring in one hour.

Start at the outside wall. Once adhesive has set per instructions, lay the first of the flooring with the groove facing the wall. Continue laying the flooring until adhesive is covered with flooring. Remember to always check the alignment with the working line, being careful not to move the installed floor on the wet adhesive. Wood flooring should be immediately placed on wet adhesive - do not wait for set. Use a tapping block to fit the planks together. When the first section is complete, continue by repeating the process section by section until installation is complete. **Immediately remove** any adhesive that gets on the flooring's face by using a good quality adhesive remover. When required, use weights to hold the flooring planks on the perimeter until adhesive is cured.

## POST-INSTALLATION

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Immediately following installation, clean and remove all dirt and debris on floor by dry mopping. Cover and protect completed flooring from further construction traffic with heavy Kraft-paper or other suitable coverings with a vapor permeance (perm rating) of 1 perm or more (tested in accordance with ASTM E-96) to avoid trapping moisture/vapor on or within the floor. However, be aware that covering a glue-down application may not allow some adhesives to properly cure. Follow Bona's recommendations. Do not use non-breathable sheet or film that could cause condensation to form. Any coverings should be taped, using a low-adhesion tape, to base or shoe moldings. Do not tape to finished flooring. When taping paper or sheets together, tape them to each other, not to the floor. Maintain covering throughout remainder of construction period. Do not allow any foot traffic or heavy furniture placement for at least 24 hours. Approximately 2 days after installation is complete, gradually (over a period of 1 week) raise the temperature of the heating system to its desired operating level.

**Surface Temperature of flooring should never exceed 81 degrees F/27 degrees C. Exceeding this temperature will void any warranty.**

### **Protection, Maintenance and Care:**

Wood is subject to fading when exposed to direct sunlight. Whenever possible, use drapes or other systems to protect your floor from excessive light. Wood expands/contracts in response to fluctuations in temperature/humidity. Maintaining the recommended temperature (60-70°F (15-21°C)) and relative humidity (35-55%) will minimize the visible effects of normal expansion/contraction. *In very dry climates, a humidifier may be necessary.* Wood is photosensitive & will change color as they are or are exposed to UV light. This natural occurring phenomenon is NOT considered a material defect and is excluded from coverage under the provisions of QUIETLEAF FLOORING .

While specific-finish types may require different maintenance, some guidelines apply to the care of all wood floors.

- Sweep or vacuum regularly to keep your floor free of dust and eliminate abrasives that can scratch the finish. Beater bars and dirty wheels on your vacuum can mar your floor.
- Quickly wipe up any spills from the floor to protect wood from excess liquids.
- Use mats outside and inside entrances so sand and other rough particles cannot build up on the floor. Avoid mats with rubber or other dense backings that will block airflow beneath rugs or might retain abrasives and humidity.
- Use mats near sinks, dishwasher and workstations to protect your floor from cooking tools, water, soaps, oils, and other kitchen mishaps.
- Stick felt pads under all furniture or chair legs so they can easily slide and to avoid scratches. Always keep such pads clean. Check often for signs of wear, in which case replace promptly.
- Large soft polyurethane or rubber casters are much better than narrow hard plastic casters.
- Protect your floor when moving heavy furniture. One idea: Turn a mat over and then place a piece of plywood on it. Put furniture on this so it can slide smoothly over your floor. Make sure the mat's surface is clean and free of sand, rocks, or other abrasive objects.
- Pointed objects such as spiked heels or sport shoes, can easily damage the finish of your floor especially if worn or damaged.
- Water and sand are the worst enemies of hardwood floors. Next are spiked heeled shoes. This is true for all floor surfaces, even concrete flooring.

- Keep the relative humidity level between 35-55% for your health as well as for your wood floors and wood furnishings. Wood is a natural material that absorbs and releases moisture depending on the relative humidity. With high humidity, wood absorbs the excess humidity and expands, which can cause buckling in the flooring. Keep the humidity level down by using a dehumidifier or dehumidifying air conditioning system or with a heating system and good ventilation. During dry periods (periods of low relative humidity), wood releases moisture and will contract and shrink which can cause gaps between strips and even cupping.
- If the relative humidity is low, use a humidifier to reduce shrinking of the wood. The multilayer construction of State of the Art Wood Floor Gallery's engineered flooring is not as prone to movement as traditional solid wood flooring, but it is still subject to the physical laws of nature and can shrink or expand in very dry or extremely humid environments.
- Pet claws should be trimmed regularly to avoid scratching floors.
- Your floor should be protected from sunlight and intense artificial lighting to reduce discoloration. Wood naturally changes color over time and with exposure to light. This is a natural phenomenon with all wood surfaces. Different kinds of wood will change color to varying degrees. This is not a defect. You can minimize this color change by moving around furniture and carpets and reducing strong light sources. These changes in wood color result from the natural process of the wood aging. It is not due to the yellowing of the finish.