

# INSTALLATION INSTRUCTIONS

3/8"   7/16"   1/2"   9/16"   5/8"  
10mm   11.1mm   12.7mm   14.2mm   15.8mm

## Engineered Flooring Staple Down Installation

### STAPLE/NAIL DOWN INSTRUCTIONS

#### ATTENTION

Inspect **ALL** materials carefully **BEFORE** installation. Warranties **DO NOT** cover materials with visible defects once they are installed. It is recommended that all engineered products acclimate for 2 days.

It is the responsibility of the installer/owner to determine if the job site subfloor and job site conditions are environmentally and structurally acceptable for wood floor installation. Flooring manufacturer declines any responsibility for wood floor failure resulting from or connected with subfloor, subsurface, job site damage or deficiencies after hardwood flooring has been installed.

### STAPLE/NAIL DOWN INSTALLATION

#### Tools:

- 3/8" & 7/16" Staple Down using 1 1/4" to 1 1/2" long staples or 20 gauge cleats depending on the flooring product
- 1/2" & 5/8" Staple Down using 1 1/2" long staples or either 15 gauge or 18 gauge cleats depending on the flooring product

#### SUBFLOOR:

- **5/8" minimum thickness, preferred 3/4" or thicker plywood** installed with long edges at a right angle to the 16" on center floor joists and staggered so that the end joints in adjacent panels break over different joists. Nail at each bearing with 6d threaded or 8d common nails spaced 10" on center along intermediate joists.
- **1" x 4" to 6" wide, square edge, kiln dried coniferous lumber**, laid diagonally over 16" on center wooden joists. The ends of all boards are to be cut parallel to the center of the joists for solid bearing. Face nail each board solidly at every bearing on the joists with two nails (7d threaded or 8d common).
- **23/32" minimum O.S.B. on 19.2-inch minimum** center floor joists with system properly nailed or minimum 7/8" subfloor with 24" on center floor joists or trusses.
- Baseboards should be installed so that their lower edge is slightly above the level of the finished floor, but not nailed into the finished floor.
- Basement and crawl spaces must be dry and ventilated when plank or strip flooring is to be installed over them. In crawl spaces a vapor barrier should be provided. Black vapor barrier must be provided below subfloor on the ground. (6 mil. black)
- Subfloor should be flat or made to be flat to 3/16" in a 8' ft. radius.
- Particle board of any thickness is **NOT ALLOWED!**
- Adequate and proper nailing as well as soundness of the subfloor should be ascertained. Foreign material shall be removed from the subfloor surface and swept clean.
- The clean subfloor shall be covered wall to wall with one of the following: 15lb. asphalt saturated felt, moisture mat or Aquabar® B (no rosin paper). Butt the edges when positioning one or the above mentioned moisture retarder. Double the felt around heat ducts that may be in the floor.

Wood type subfloors should also be checked for moisture using a reliable moisture meter. Wood or plywood subfloors should not exceed 14% moisture content, the moisture content difference between hardwood flooring and subfloor should not exceed 4%. Check with your local distributor for your geographical variances.

#### General Staple/Nail Down Installation Instruction:

- Time at which to install hardwood flooring: Lay only after sheetrock and tile work are thoroughly dried and all but the final woodwork and trim have been completed. The building interior should have been dried and seasoned and a comfortable working temperature (at least 60° F) and a relative humidity of 35 – 55% should exist during installation.
- **DO NOT open until ready to install.**

**Preparation of subfloor:** Subfloor irregularities and undulation may cause any wood flooring installation to develop hollow spots between the flooring and subfloor and/or lead to noise, i.e. squeaking, popping or crackling. These hollow spots are NOT the result of any wood floor manufacturing defect and are NOT covered by the flooring manufacturer warranty.

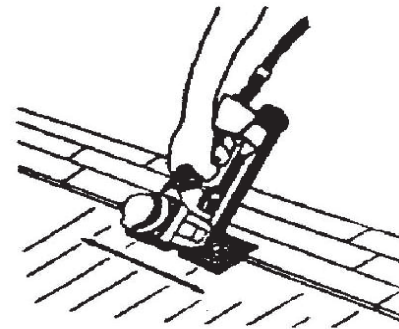
- Adequate and proper stapling as well as soundness of the subfloor should be ascertained. Foreign material shall be removed from the subfloor surface and swept clean.
- The clean subfloor surface shall be covered, wall to wall, with 15 lb. asphalt saturated felt, Aquabar® B, or moisture mat (no rosin paper). Butt the edges of this felt when positioning it.
- Laying direction for plank flooring: Flooring should be laid at right angles to the floor joists and, if possible, in the direction of the longest dimension of the room.

**Note:** Normally, expansion space around the room should be the same distance as the thickness of the hardwood flooring.

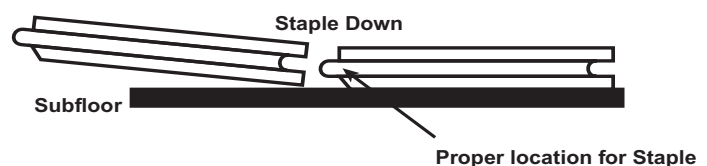
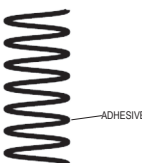
- The floor should be installed from several cartons at the same time to ensure color and shade mix.
- End joints should never be closer than 4" to 6" from each other.
- Staple or Nail Engineered Plank Hardwood Flooring: The first and last row of flooring should be face nailed and filled, as well as staples placed at Tongue. Staple each board along the tongue every 4 to 6 inches apart and within 2 inches of each end joint. This should be done to the entire floor.

#### Notes:

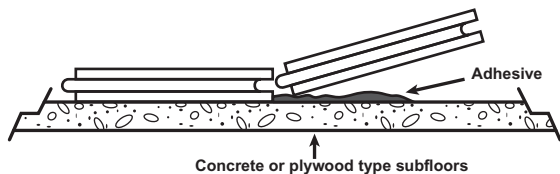
- To avoid movement in hardwood floor relative humidity should be maintained year round at 35-55%
- The use of flooring putty to cover small cracks or face nail holes should be considered normal in hardwood flooring installation.



**When installing wider plank wood floors (5" and wider)** flooring movement due to seasonal changes may be reduced by utilizing both glue **and** the mechanical fasteners (nails/staples) specified. Do **NOT** use a moisture inhibitor with this application since glue assisted applications must have direct contact with the wood subfloor. Utilize a premium grade urethane construction glue (such as Liquid Nails® or Locktite® Urethane Wood to Wood Glue ) and apply glue in a serpentine fashion to the subfloor.



**RADIANT HEAT (OAK ONLY) - See next page.**



#### **RADIANT HEAT (OAK ONLY) - See below.**

##### **Concrete or Plywood: Radiant Heat (Oak ONLY)**

- Radiant Heat Subfloors on or above grade.
- The maximum temperature of subfloor under normal use should not exceed 80°F (Check with heat system manufacturer.)
- For correct water temperature inside heating pipes, check with manufacturer's suggested guidelines.
- Heating pipes must be covered with 1 ¼" of concrete or minimum of 1/8" below bottom side of plywood subfloor.
- Before installation of hardwood flooring, heat system must be operated at normal living temperature for a minimum of 14 days. One to two days before the flooring is laid, switch off heating unit. (At time of installation, subfloor should be 64°F to 68°F)
- Room temperature should not vary more than 15°F season to season. Flooring manufacturer approved systems must not exceed 8 watts per square foot heating.

#### **IMPORTANT HEALTH NOTICE FOR MINNESOTA RESIDENTS:**

SOME OF THE BUILDING MATERIALS USED IN THIS HOME (OR THESE BUILDING MATERIALS) EMIT FORMALDEHYDE. EYE, NOSE, AND THROAT IRRITATION, HEADACHE, NAUSEA AND A VARIETY OF ASTHMA-LIKE SYMPTOMS, INCLUDING SHORTNESS OF BREATH, HAVE BEEN REPORTED AS A RESULT OF FORMALDEHYDE EXPOSURE. ELDERLY PERSONS AND YOUNG CHILDREN, AS WELL AS ANY-ONE WITH A HISTORY OF ASTHMA, ALLERGIES, OR LUNG PROBLEMS, MAY BE AT GREATER RISK. RESEARCH IS CONTINUING ON THE POSSIBLE LONG-TERM EFFECTS OF EXPOSURE TO FORMALDEHYDE.

REDUCED VENTILATION MAY ALLOW FORMALDEHYDE AND OTHER CONTAMINANTS TO ACCUMULATE IN THE INDOOR AIR. HIGH INDOOR TEMPERATURES AND HUMIDITY RAISE FORMALDEHYDE LEVELS. WHEN A HOME IS TO BE LOCATED IN AREAS SUBJECT TO EXTREME SUMMER TEMPERATURES, AN AIR-CONDITIONING SYSTEM CAN BE USED TO CONTROL INDOOR TEMPERATURE LEVELS. OTHER MEANS OF CONTROLLED MECHANICAL VENTILATION CAN BE USED TO REDUCE LEVELS OF FORMALDEHYDE AND OTHER INDOOR AIR CONTAMINANTS.

IF YOU HAVE ANY QUESTIONS REGARDING THE HEALTH EFFECTS OF FORMALDEHYDE, CONSULT YOUR DOCTOR OR LOCAL HEALTH DEPARTMENT.

**WARNING:** Drilling, sawing, sanding or machining wood products can expose you to wood dust, a substance known to the State of California to cause cancer. Avoid inhaling wood dust or use a dust mask or other safeguards for personal protection. For more information go to [www.P65Warnings.ca.gov/wood](http://www.P65Warnings.ca.gov/wood)

COMPLIES WITH EPA TSCA Title VI and CARB ATCM PHASE 2 COMPLIANT for FORMALDEHYDE

# INSTALLATION INSTRUCTIONS

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10mm	11.1mm	12.7mm	14.2mm	15.8mm

## Engineered Flooring Glue Down Installation

### GLUE DOWN INSTRUCTIONS

#### ATTENTION

Inspect **ALL** materials carefully **BEFORE** installation. Warranties **DO NOT** cover materials with visible defects once they are installed. It is recommended that all engineered products acclimate for 2 days.

#### Concrete or Plywood: Radiant Heat (Oak ONLY)

- Radiant Heat Subfloors on or above grade.
- The maximum temperature of subfloor under normal use should not exceed 80°F (Check with heat system manufacturer.)
- For correct water temperature inside heating pipes, check with manufacturer's suggested guidelines.
- Heating pipes must be covered with 1 1/4" of concrete or minimum of 1/8" below bottom side of plywood subfloor.
- Before installation of hardwood flooring, heat system must be operated at normal living temperature for a minimum of 14 days. One to two days before the flooring is laid, switch off heating unit. (At time of installation, subfloor should be 64°F to 68°F)
- Room temperature should not vary more than 15°F season to season. Flooring manufacturer approved systems must not exceed 8 watts per square foot heating.

#### FOR UNFINISHED PRODUCTS

- Do not start sanding product until adhesive has cured.

#### FLOATING INSTALLATION

- 3/8", 1/2", 9/16 or 5/8 product **3" width or wider** can be floated in some, not all, installations. If necessary call your supplier for details.

It is the responsibility of the installer/owner to determine if the job site Subfloor and job site conditions are environmentally and structurally acceptable for wood floor installation. Flooring manufacturer declines any responsibility for wood floor failure resulting from or connected with subfloor, subsurface, job site damage or deficiencies after hardwood flooring has been installed.

#### GLUE DOWN INSTALLATION

**ADHESIVE:** Using an appropriate, quality urethane adhesive is recommended.

**TOOLS:** The required tools for installation of these products include a hammer, hand power saw, chalk line, wood floor adhesive and recommended trowel.

**Recommended Trowel:** General 1/2" thick wood floor should use 3/16" wide 5/32" deep v-notch trowel to yield approximately 45 to 50 sq. ft. per gallon or 1/4" x 1/4" x 3/16" square notch. 5/16" thick wood flooring should use 3/16" x 1/4" x 1/2" contour v-notch to yield 60 sq. ft. per gallon. **Follow adhesive manufacturer's guidelines.**

#### General Installation Instruction:

Time at which to install hardwood flooring: Lay only after sheetrock and tile work are thoroughly dried and all but the final woodwork and trim have been completed. The building interior should have been dried and seasoned and comfortable working temperature (at least 60°F) should exist during installation.

#### Preparation of subfloor:

Subfloor irregularities and undulation may cause any wood flooring installation to develop hollow spots between the flooring and subfloor and/or lead to noise, i.e. squeaking, popping or crackling. These hollow spots are NOT the result of any wood floor manufacturing defect and are NOT covered by the flooring manufacturer warranty.

As part of your subfloor preparation remove any existing base, shoe mold or doorway thresholds. These items can be replaced after installation, but should be replaced in such a way as to allow at least 1/4" room for expansion around the perimeter of the room. All door casings should be notched out or undercut to allow for 1/4" room expansion and to avoid difficult scribe cuts. This is easily done by placing a piece of the engineered product on the subfloor as a height guide for your handsaw or jamb saw.

**Note:** Normal expansion space around the room should be the same distance as the thickness of the hardwood flooring.

#### Thoroughly clean subfloor:

Remove paint, wax, oil, plaster, "sheetrock mud" and other foreign materials, as well as obvious surface irregularities. #3-1/2 grit open coat paper may need to be used to grind a concrete subfloor. This will loosen any dirt, loose concrete or contaminants. Sweep or vacuum thoroughly. All previous or existing glues or adhesives must be removed before installing new hardwood floor. Concrete subfloors must be clean, flat, sound and sufficient compression strength (3000 lbs. P.S.I.) being sure that the surface is NOT slick.

Sections not flat due to waviness, trowel marks, etc. are to be flattened by grinding or the use of leveling compound. Especially along the walls, the subfloor flatness must be checked and if necessary improved. Flatten to 3/16" in 10' radius. In addition to cement subfloors, these wood flooring products can be installed over dry, flat subfloors such as plywood. No Particle board.

Time at which to install hardwood flooring: Lay only after sheetrock and tile work are thoroughly dried and all but the final woodwork and trim have been completed. The building interior should have been dried and seasoned and a comfortable working temperature (at least 60° F) and a relative humidity of 35 – 55% should exist during installation. If subfloor is concrete, check for dryness see below. If moisture is present, do not lay. All concrete subfloors on or below grade need to be tested.

#### Concrete subfloor Moisture Testing (minimum 3000 PSI):

Electrical Impedance Test and Electrical Resistance Test (Concrete Moisture Meters) Follow Moisture Meter MFG Guidelines. If Meter shows possibility of excess moisture further testing is required. Calcium Chloride Test. See below.

Relative Humidity Test (Standard test method for determining relative humidity on concrete floor slabs using Situ Probes. If test shows over 75% vapor retarder must be used or wait for further curing.

Calcium Chloride Test ASTM F-1869 Readings over 3 lbs and up to 7 lbs vapor retarder needed.

See NWFA installation guidelines chapter 3 Moisture Testing for full information of testing.

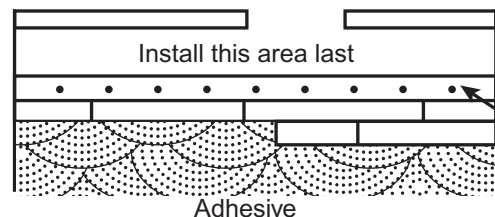
Check floor in several locations. Consult with your local flooring distributor for graphical variances.

**Note:** Normal expansion space around the room should be the same distance as the thickness of the hardwood flooring.

- The use of flooring putty to cover small cracks or face nail holes should be considered normal in hardwood flooring installation.

New wood type subfloors should also be checked for moisture using a moisture meter. In general, wood or plywood subfloors should not exceed 14% moisture content and no more than 4% MC difference between wood flooring and subfloor. Check with your local distributor for your geographical variances. If the plywood is used as an overlay over the existing subfloor, the thickness of the overlay material must be such as to yield a total 3/4" subfloor thickness.

**Suggested Layout Working Line:** EXAMPLE: For 3" Material, snap a chalk line 30 1/4" from the wall on the door side of the room. The small area will be your working space and the last to be installed. Temporarily nail straight board on chalk line.



Nail straight board on chalk line  
remove board later

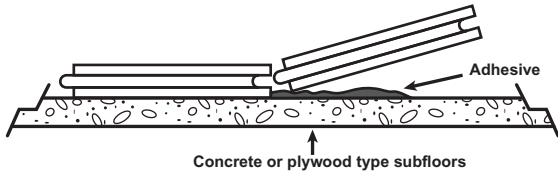
**Caution:** Proper humidity must be controlled between 35 – 55% for successful performance before, during and after installation.

#### Installing the floor:

- The floor should be installed from several cartons at the same time to ensure color and shade mix.
- End joints should never be closer than 4 inches from each other.
- Install tongue into groove.
- Tongue and groove should be engaged by hand.
- Lift a plank periodically to check adhesive transfer.
- Remove nailed board and install remainder of flooring.
- Install base and mould after floor installation.
- Clean adhesive off surface of wood with cleaner and soft cloth. (see adhesive manufacturer's recommendations)

#### For Unfinished Products

- Do not start sanding product until adhesive has cured.



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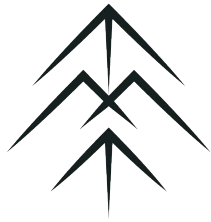
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**MULLICAN<sup>®</sup>**  
— **HARDWOOD FLOORING** —

## **ENGINEERED ONLY**

### **FLOATING INSTALLATION**

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In addition to the normal staple or glue installation, the engineered products can also be used with the floating installation method in residential settings.

Please refer to instruction sheets (enclosed in each box of flooring) for instructions on sub-floor conditions, such as flatness and moisture.

Underlay for floating shall be closed cell foam, with a maximum 1/8<sup>th</sup> thick with moisture barrier.

Tongue and groove should be glued together using a tite bond type white water proof glue or equal.

Expansion space should be equal to the thickness of the flooring, i.e. 3/8", 1/2", etc., at all walls plus any vertical obstructions.

**Do not install cabinets or walls on top of a floating floor.**

Radiant heat systems use **Oak Species only**.