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SOLID WOOD FLOORING 5/16" (8 MM) STRIP INSTALLATION INSTRUCTIONS

FOR STAPLE-DOWN AND GLUE-DOWN METHODS

RECOMMENDED ADHESIVES: Bruce® Equalizer™ Pro moisture cured urethane adhesive, Bruce Proconnect Plus or Bruce Summit™ All In One Adhesive

RECOMMENDED ADHESIVE REMOVER: Low Odor mineral spirits

RECOMMENDED MOISTURE RETARDANT: 6 mil poly retardant barrier (staple down applications); Bruce Summit Select™ All In One Adhesive (glue down applications)

RECOMMENDED CLEANER: Bruce® Hardwood & Laminate Floor Cleaner

THANK YOU FOR CHOOSING AHF PRODUCTS FLOORING. If properly installed and cared for your new flooring will be easy to maintain and will look great for years to come. If you have questions or comments, please visit us at www.ahfproducts.com or 1 866-243-2726.

These directions are based on industry standards and best practices. Failure to follow these installation instructions may result in damage to the flooring and void the floor's warranty.

- For complete warranty information call 1-866-243-2726 or go to www.ahfproducts.com.
- For technical or installation questions, or to request a Safety Data Sheet, please call 1-866-243-2726 or visit www.hardwoodexpert.com our technical website.
- For general questions or comments, please visit us at www.ahfproducts.com or call 1-866-243-2726.

I. GENERAL INFORMATION

Owner/Installer Responsibility

Beautiful hardwood floors are a product of nature and therefore, not perfect. Our hardwood floors are manufactured in accordance with accepted industry standards. For optimum performing hardwood flooring, carefully read and follow these installation instructions.

- These hardwood floors were manufactured in accordance with accepted industry standards, which permit grading deficiencies not to exceed 5%. These grading deficiencies may be of a manufacturing or natural type. When flooring is ordered, 5% must be added to the actual square footage needed for cutting and grading allowance (10% for diagonal installations).
- The owner/installer has final inspection responsibility as to grade, manufacture and factory finish. Inspection of all flooring should be done prior to installation. The flooring should also be carefully examined for color, finish and quality before installing it.
- The installer must use reasonable selectivity and not use or cut off pieces with deficiencies, whatever the cause. Should an individual piece be doubtful as to grade, manufacture or factory finish, the installer should not use that piece. If material is not acceptable, do not install it and contact the seller immediately.
- Prior to installation of any hardwood flooring product, the owner/installer must determine that the job-site environment and the sub-surfaces involved meet or exceed all applicable standards. Recommendations of the construction and materials industries, as well as local codes, should be followed. These instructions recommend that the construction and subfloor be clean, dry, stiff, structurally sound and flat. The manufacturer declines any responsibility for job failure resulting from, or associated with, subfloor and substrates or job-site environmental deficiencies.
- Use of stain, filler or putty stick for touch-up and appropriate products for correcting subfloor voids is accepted as part of normal installation procedures.

II. PREPARATION

STORAGE AND HANDLING

NOTE: MINOR SQUEAKING OF MECHANICALLY FASTENED FLOORS IS NOT ABNORMAL DUE TO STRUCTURAL MOVEMENT CAUSED BY CHANGES IN ENVIRONMENTAL CONDITIONS. FOLLOWING THESE INSTRUCTIONS CAN MINIMIZE THESE FACTORS, BUT OFFER NO GUARANTEE THAT THE FLOOR WILL NOT SQUEAK.

- Solid hardwood flooring should be stored in the environment in which it is expected to perform. Deliver the materials to an environmentally controlled site. The wood subflooring materials must not exceed 12% moisture content. Using a reliable wood moisture meter, measure and document the moisture content of both the subfloor and the hardwood flooring, to determine proper moisture content. The difference between the moisture content of the wood subfloor and the wood flooring must not exceed 3% (2% for plank). Check the moisture content of multiple boards. A good representation is to check 40 boards for every 1,000 sq. ft.
- Acclimate the hardwood flooring on or off the job, as necessary, to meet these moisture content requirements. Store in a dry place, being sure to provide at least a four-inch air space under cartons that are stored upon "on-grade" concrete floors. Flooring should not be delivered until the building has been enclosed, with windows and doors in place, and until cement work, plastering and all other "wet" work is completed and dry. Concrete should be at least 60 days old.

JOB-SITE CONDITIONS

- The building should be enclosed, with all outside doors and windows in place. All concrete, masonry, framing members, drywall, paint and other "wet" work should be thoroughly dry. The wall coverings should be in place and the painting completed, except for the final coat on the base molding. When possible, delay installation of base molding until flooring installation is complete. Basements and crawl spaces must be dry and well ventilated.
- Exterior grading should be complete with surface drainage, offering a minimum drop of 3" in 10' (7.6 cm in 3.05 m), to direct flow of water away from the structure. All gutters and downspouts should be in place.
- Solid flooring may be installed on- or above- grade level. Do not install in full bathrooms.
- Crawl spaces must be a minimum of 18" (46 cm) from the ground to the underside of the joists. A ground cover of 6-20 mil black polyethylene film is highly recommended as a vapor barrier with joints lapped 6" (15 cm) and sealed with moisture resistant tape. The crawl space should have perimeter venting equal to a minimum of 1.5% of the crawl space square footage. These vents should be properly located to foster cross ventilation (Figure 1). Where necessary, local regulations prevail.
- Subfloor must be checked for moisture content using the appropriate testing method.
- The installation site should have a consistent room temperature of 60-80° F (16-27° C) and humidity of 30-50% for 14 days prior to and during installation and until occupied.

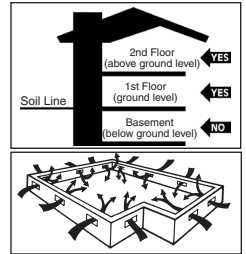


Figure 1

SUBFLOOR CONDITIONS

- CLEAN - Subfloor must be free of wax, paint, oil, sealers, adhesives and other debris.
 - LEVEL/FLAT - Subfloor must be within 3/16" in 10' (5 mm in 3 m) and/or 1/8" in 6' (3 mm in 2 m). Sand high areas or joints. If the floor is to be glued down, fill low areas with a latex additive cementitious leveling compound of 3,000-PSI minimum compressive strength Underlayment & Embossing Leveler with Underlayment Additive. Follow the instructions of the leveling compound manufacturer but make certain the leveling compounds are completely DRY before beginning installation. When mechanically fastening the floor down, flatten low spots with a maximum of 6 layers of 15# builders felt, plywood or shims (not leveling compounds). Leveling materials must provide a structurally sound subfloor that does not affect the holding power of the fastener.
 - DRY - Check and document moisture content of the subfloor using the appropriate moisture test. Concrete subfloors must be a minimum of 30 days old before testing begins. Moisture content of wood subfloor must not exceed 12% on a wood moisture meter, or read more than a 3% difference than moisture level of product being installed.
 - STRUCTURALLY SOUND - Nail or screw any areas that are loose or squeak. Wood panels should exhibit an adequate fastening pattern, glued/screwed or nailed as system requires, using an acceptable nailing pattern. Typical: 6" (15 cm) along bearing edges and 12" (31 cm) along intermediate supports. Flatten edge swell as necessary. Replace any water-damaged, swollen or delaminated subflooring or underlayments.
- NOTE:** Subfloors with excessive vertical movement should be avoided. Optimum performance of hardwood floor covering products occurs when there is little horizontal or vertical movement of the subfloor. If the subfloor has excessive vertical movement (deflection) before installation of the flooring, it is likely it will do so after installation of the flooring is complete.

SUBFLOORS WITH RADIANT HEAT

DO NOT INSTALL THIS PRODUCT OVER SUBFLOORS WITH RADIANT HEAT.

TOOLS & ACCESSORIES NEEDED

For All Installation Methods

- Broom • Hand saw • Table saw, jig saw, or circular saw • Eye Protection • NIOSH-designated dust mask
- Tape measure • Hammer • Chalk line & chalk • Moisture meter (wood, concrete or both)
- Recommended hardwood flooring cleaner

Add For Staple Down Installations

NOTE: It is extremely important to use the proper adapters as well as staples or cleats. Improper fasteners, machines and air pressure can cause severe damage. The manufacturer of this flooring product is not responsible for damage caused by use of improper tools or misuse.

- Pneumatic brad-nailer with 1" brads • Drill with 1/16" drill bit • 4-6d nails • Nail set
- 5/16" "blind" Fastening machine • Stanley-Bostitch, PowerNail, Senco • 18 gauge staples or cleats
- Other machines designed or adapted SPECIFICALLY to 5/16" solid flooring • Polyethylene tape
- 1" (minimum) glue coated staples

NOTE: The flooring manufacturer does not recommend nor endorse any specific brand or type of mechanical fastener.

ATTENTION INSTALLERS

CAUTION: WOOD DUST

SAWING, SANDING AND MACHINING WOOD PRODUCTS CAN PRODUCE WOOD DUST. AIRBORNE WOOD DUST CAN CAUSE RESPIRATORY, EYE AND SKIN IRRITATION. THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) HAS CLASSIFIED WOOD DUST AS A NASAL CARCINOGEN IN HUMANS.

Precautionary Measures: If power tools are used, they should be equipped with a dust collector. If high dust levels are encountered, use an appropriate NIOSH-designated dust mask. Avoid dust contact with eye and skin.

First Aid Measures in Case of Irritation: In case of irritation, flush eyes or skin with water for at least 15 minutes.

If you have any technical or installation questions, or to request a Safety Data Sheet, please call 1 866 243 2726 or visit our technical website at www.hardwoodexpert.ahfproducts.com.

IMPORTANT HEALTH NOTICE FOR MINNESOTA RESIDENTS ONLY:

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 ANYONE 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 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: EXISTING IN-PLACE RESILIENT FLOOR COVERING AND ASPHALTIC ADHESIVES. DO NOT SAND, DRY SWEEP, DRY SCRAPE, DRILL, SAW, BEADBLAST, OR MECHANICALLY CHIP OR PULVERIZE EXISTING RESILIENT FLOORING, BACKING, LINING FELT, ASPHALTIC "CUTBACK" ADHESIVE, OR OTHER ADHESIVE.

These existing in-place products may contain asbestos fibers and/or crystalline silica.

Avoid creating dust. Inhalation of such dust is a cancer and respiratory tract hazard.

Smoking by individuals exposed to asbestos fibers greatly increases the risk of serious bodily harm.

Unless positively certain that the existing in-place product is a non-asbestos-containing material, you must presume it contains asbestos. Regulations may require that the material be tested to determine asbestos content and may govern removal and disposal of material.

See current edition of the Resilient Floor Covering Institute (RFCI) publication Recommended Work Practices for Removal of Resilient Floor Coverings for instructions on removing all resilient floor covering structures or contact your retailer.

AHF floor coverings and adhesives do NOT contain asbestos.

Add For Glue-Down Installations

- Recommended adhesive
- Recommended adhesive cleaner
- 1/4" x 1/2" x 3/16" (6 mm x 13 mm x 8 mm) V-Notch trowel (Figure 2) or other adhesive manufacturer's trowel
- 3M Scotch-Blue™ 2080 tape

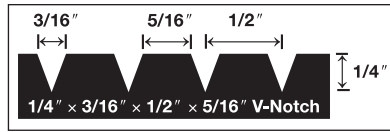


Figure 2

III. SUBFLOOR/UNDERLAYMENT REQUIREMENTS

All Installation Methods

- 3/4" (19 mm) CDX grade plywood (Preferred) • 3/4" (23/32") OSB, Waferboard or Chipboard
- MINIMUM: 5/8" CDX grade plywood • Existing solid hardwood flooring (Staple-Down Only)
- Vinyl, resilient tile, cork flooring • 3/4" particleboard (minimum 40-lb. density)

Glue-Down Installations Only

- Concrete slabs • Acoustic concrete • Ceramic, terrazzo, slate and marble • Metal • Cork
- Minimum 3/8" approved underlayment installed over existing solid hardwood flooring

Concrete

(Glue Down Installation Only)

5/16" solid hardwood flooring can be glued directly to on-grade concrete with a minimum compressive strength of 3000 PSI. Do not install over a concrete sealer or painted concrete. If present, remove by grinding or sanding. Do not install over slick, heavily troweled or burnished concrete. Roughen the surface as necessary by sanding or grinding. Use an appropriate NIOSH-designated dust mask.

Concrete Moisture Tests

NOTE: Test several areas, especially near exterior walls and walls containing plumbing. All concrete subfloors should be tested, and results documented, for moisture content. Visual checks may not be reliable. Acceptable test methods for subfloor moisture content include:

- **Tramex Concrete Moisture Encounter Meter** (Figure 3): Moisture readings should not exceed 4.5 on the upper scale. (Figure 3 shows an unacceptable reading of over 4.5) Concrete Moisture Meters give qualitative reading results-not quantitative ones. These results are a quick way to determine if further testing is required.

NOTE: The following tests are required in commercial applications. Either or both tests are acceptable.

- **Calcium Chloride Test (ASTM F 1869):** The maximum moisture transfer must not exceed 3 lbs./1000 ft.² in 24 hrs. With this test.
- **RH Levels in Concrete Using In-situ Probes (ASTM F 2170)** should not exceed 75%.

"DRY" CONCRETE, AS DEFINED BY THESE TESTS CAN BE WET AT OTHER TIMES OF THE YEAR. THESE TESTS DO NOT GUARANTEE A DRY SLAB.



Figure 3

Moisture Retardant System

If excessive moisture is present or anticipated, use a Moisture Retardant System, Bruce Summit Select All In One adhesive or inexpensive sheet vinyl to reduce vapor intrusion.

NOTE: When using a moisture retardant system or sheet vinyl as a moisture retardant, **USE ONLY** Bruce® Equalizer urethane adhesive.

- **Bruce Summit Select All In One adhesive:** Apply the adhesive using the Summit clip on trowel attachment that is included in every pail. Flooring can be installed immediately after applying the adhesive.
- **Sheet vinyl:** An inexpensive sheet vinyl or "slip-sheet" (felt-backed with vinyl wear layer) may be installed. Use a premium grade, alkali resistant adhesive and a full spread application system to properly bond the vinyl to the subfloor. Follow the sheet vinyl manufacturer's instructions for installation procedures. A bond test may be required as an adhesion test. Install several small areas (3' x 3') (1 m x 1 m) and allow the vinyl to set for 72 hours. Remove the vinyl. If the backing remains attached to the concrete, the subfloor should be acceptable for sheet vinyl installation. Install the sheet vinyl and allow the adhesive to cure for 24 hours prior to beginning your hardwood installation with a 5lb. Calcium Chloride moisture limit. Degloss as necessary with abrasive pads to create an adequate adhesive bond. Always check for adequate adhesive bond.

Acoustic Concrete

(Glue Down Installation Only)

Acoustic concrete normally contains large quantities of gypsum that may inhibit the adhesive's capability to properly bond. Acoustic concrete must be primed with the concrete manufacturer's recommended primer/surface hardener. Test the concrete by scraping the surface with a nail or other sharp object. If the concrete powders or crumbles, it is not sound and suitable for direct application of hardwood flooring and may require the use of a floating subfloor system. Always check for adequate adhesive bond. The concrete must have a minimum compressive strength of 2000 PSI.

Ceramic, Terrazzo, Slate & Marble

(Glue Down Installation Only)

All grout joints and broken corners that exceed 3/16" (5 mm) must be filled with a cementitious leveling compound Patch, Underlayment & Embossing Leveler with Underlayment Additive. The surface should be cleaned and abraded to create a good bonding surface for the adhesive. Loose tiles must be re-adhered to the subfloor or filled as above. Remove all sealers and surface treatments. Always check for adequate adhesive bond.

Acoustic Cork Underlayment

(Glue Down Installation Only)

The flooring can be glued or floated directly over full-spread, permanently bonded acoustic cork. The cork should have a density of no less than 11.4 lb./cubic foot. The cork, in general, should be pure cork combined with a polyurethane or resin binder. Install cork in accordance with cork manufacturer's recommendations. Always check for adequate adhesive bond.

Wood Subfloors and Underlayment

(All Installation Methods)

General: The wood subflooring materials must not exceed 12% moisture content. Using a reliable wood moisture meter, measure moisture content of both the subfloor and the hardwood flooring to determine proper moisture content. The difference between the moisture content of the wood subfloor and the hardwood flooring must not exceed 3%. When installing parallel to the floor joists it may be necessary to stiffen the subfloor system by installing an additional minimum of 3/8" (9.5 mm) approved underlayment. Applicable standards and recommendations of the construction and materials industries must be met or exceeded.

NOTE: As flooring manufacturers, we are unable to evaluate each engineered system. Spacing and spans, as well as their engineering methods, are the responsibility of the builder, engineer, architect or consumer who is better able to evaluate the expected result based on site-related conditions and performance. The general information provided below describes common, non-engineered joist/subfloor systems. Engineered flooring systems may allow for wider joist spacing and thinner subflooring materials.

Wood Structural Panel Subfloors and Underlayment

(All Installation Methods)

Structural panels/underlayment must be installed sealed side down. When used as a subfloor, allow 1/8" (3 mm) expansion space between each panel. If spacing is inadequate cut in with circular saw. Do not cut in expansion space on tongue and groove panels.

- **Plywood:** Should be minimum CDX grade (exposure 1) and meet US Voluntary Product Standard PS1-95 performance standard or Canadian performance standard CAN/CSA 0325-0-92. The preferred thickness is 3/4" (19 mm) as a subfloor [minimum 5/8" (16 mm)]. When using an underlayment panel a minimum 3/8" (9.5 mm) thickness is recommended.
- **Oriented Strand Board (OSB):** Conforming to US Voluntary Product Standard PS2-92 or Canadian performance standard CAN/CSA 0325-0-92 construction sheathing. Check the underside of the panel for codes. When used

as a subfloor, the panels must be tongue and groove, and installed sealed side down. Minimum thickness to be 23/32" (18 mm) thick when used as a subfloor or 3/8" (9.5 mm) as an underlayment. Some board manufacturers' recommendations vary.

- **Waferboard and Chipboard:** Conforming to US Voluntary Product Standard PS2 or Canadian performance standard CAN/CSA 0325-0-92. Must be 3/4" (19 mm) thick when used as a subfloor, and 3/8" (9.5 mm) thick when used as an underlayment.
- **Particleboard:** Must be a minimum 40-lb. density, stamped underlayment grade and be 3/4" (19 mm) thick.

Solid Wood Subfloors

(All Installation Methods)

- Minimum 3/4" (19mm) thick with a maximum width of 6" (15 cm) installed at a 45° angle to the floor joists.
- Group 1 dense softwood (Pine, Larch, Douglas Fir, etc.); No. 2 common, kiln dried with all board ends bearing on joists.
- For glue-down applications add 3/8" (9.5 mm) approved underlayment.

Existing Hardwood Flooring

(All Installation Methods)

- Existing engineered flooring must be well bonded/fastened. When gluing over existing hardwood flooring of any thickness, the finishing materials must be abraded or removed to foster an adequate adhesive bond. When flooring is to be mechanically fastened, the existing engineered hardwood flooring must be a minimum of 3/8" (9.5 mm) thick installed over approved wood/wood composite underlayment that has been properly fastened. When installing over engineered flooring that is glued to concrete, the minimum thickness of that flooring must be 1/2" (13 mm) to allow for the length of the fastener.
- Existing solid hardwood flooring that exceeds 6" (15 cm) in width must be covered with 3/8" (9.5 mm) approved underlayment and fastened as required. Do not install over solid flooring attached directly to the concrete.

Subfloor Systems Bonded to Concrete

Concrete must be of high compressive strength, 3000 PSI or better. Install a suitable moisture retardant followed by a plywood subfloor with a minimum thickness of 3/4" (19 mm). Allow 1/2" (13 mm) expansion space around all vertical objects and 1/8" between all flooring panels. In general, smaller panels [less than 4' x 8' (1.2 x 2.4 m)] oriented at 45 degrees (preferred) offer better results. The panel must be properly attached to the subfloor using a minimum of one fastener per square foot and more if necessary. Use pneumatic or powder actuated fasteners. Do not hand nail the subfloor with concrete nails. Install a moisture retardant barrier with joints lapped 6" (15 cm) and begin installation of flooring using 1-1/2" (4 cm) fasteners.

Floating Subfloor

Install a suitable moisture retardant followed by a plywood subfloor with a minimum thickness of 3/8" (9.5 mm) [1/2" (13 mm) preferred]. Allow 1/2" (13 mm) expansion space around all vertical objects and 1/8" (3 mm) between all flooring panels. Install a second layer of plywood of the same thickness at a right angle to the previous panels, offsetting the joints 2" (61 cm). Staple the two layers of plywood together with staples that will not penetrate the first layer of the subfloor. The staples should have a crown width of 3/8" (9.5 mm) or more. Install a moisture retardant barrier with joints lapped 6" (15 cm) and begin installation of the flooring.

Vinyl, Resilient Tile, Cork Flooring and Linoleum

(All Installation Methods, see notes below)

(Glue-Down Installations)

- Make sure the floor covering materials are well bonded to the subfloor/underlayment with full spread adhesive, and are no more than two layers thick, not to exceed 3/16" (5 mm).
- With approved wood/wood composite subfloors, if vinyl or tiles are loose, broken, or in poor condition, install a 3/8" (9.5 mm) approved underlayment directly over the flooring materials.
- Clean the flooring materials as necessary to create a good adhesive bond. If a maintenance material is present on the floor covering or a gloss is present, de-gloss with a flooring pad and a commercially available stripper, then rinse completely. Allow ample drying time. (**NOTE:** Do not sand any resilient products for they may contain asbestos fibers, which may be harmful.)
- Cork floors must have all sealers and surface treatments removed before installation begins. Always check for adequate adhesive bond.
- (**Mechanically Fastened/Stapled Installation**)
- Do not install over floors that exceed one layer, as the thickness of the flooring materials will prevent an adequate mechanical bond.
- Make certain that the subflooring materials meet minimum requirements.
- Some tile products may be too brittle for staple penetration. Always test an area for breakage before proceeding.

IV. INSTALLING THE FLOOR

General Installation Tips

NOTE: When installing UNFINISHED solid hardwood flooring, allow a minimum of 72 hours adhesive curing time before applying seals, stains and finishes to unfinished flooring. Test the moisture content of the hardwood in accordance with the stain/finish manufacturer's recommendations.

- Floor should be installed from several cartons at the same time to ensure good color and shade mixture.
- Be attentive to staggering the ends of the boards at least 6" (15 cm), when possible, in adjacent rows (Figure 4). This will help ensure a more favorable overall appearance of the floor.
- Installation parallel to the longest wall is recommended for best visual effects, however, the floor should be installed perpendicular to the floor joists unless the subfloor has been reinforced to include subfloor stiffness. Find the appropriate subfloor from the "Subfloor Type" section in these instructions.
- The unique milling process creates built-in expansion naturally. This special tongue and groove configuration is designed to leave small expansion gaps in the floor during installation. Avoid using tapping blocks, machines or systems that eliminate this built-in expansion.
- Large spans in areas of high humidity may require the addition of internal or field expansion. This can be accomplished by using spacers, such as small washers, every 10-20 rows inserted above the tongue and removed after several adjoining rows have been stapled or glued.
- When possible, preselect and set aside boards that blend best with all horizontally mounted moldings used to assure a uniform final appearance. Install these boards adjoining the moldings.

General Information for Staple-Down Installations

Improper pressure settings and failure to use proper adapters can cause severe damage to the flooring. The correct fastening machine and air pressure setting will properly set the staple in the nail pocket (Figure 5). Low air pressures may fail to properly set the staple and damage the adjoining boards. Air pressures set too high may cause damage to the tongue, preventing installation of adjoining boards and cause blisters on the face of the flooring. Make certain the compressor has a regulator in-line with the air hose for proper adjustment. Set pressure at 70 PSI to begin with and adjust until proper staple setting occurs. Use a stapler designed for the thickness of the product being installed such as the Stanley Bostitch SX150BHF or others listed. Any water damaged, swollen or delaminated subflooring materials will not hold staples and must be repaired or replaced.

STEP 1: Doorway and Wall Preparation

(All Installations)

- Undercut door casings and jambs. Remove any existing base, shoe mold or doorway thresholds. These items can be replaced after installation. All door casings and jambs should be undercut to avoid difficult scribe cuts (Figure 7).

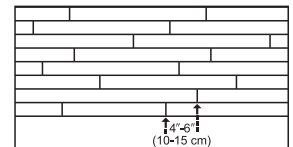


Figure 4
Preferred Alignment

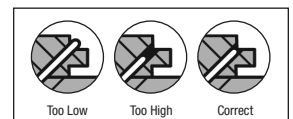


Figure 5

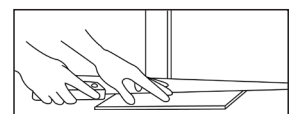


Figure 6

STEP 2: Establish a Starting Point

(All Installations)

- Installation parallel to the longest wall is recommended for best visual effects, however, the floor should be installed perpendicular to the flooring joists unless subfloor has been reinforced to reduce subfloor sagging.
- When possible, always begin the layout or installation from the straightest wall, generally an outside wall.
- In at least two places at least 18" (46 cm) from the corner, measure out equal distance from the starting wall (Figure 7) and snap a chalk line. The measurement must be the sum of the width of the flooring plus an additional 7/8" (22 mm) to allow for 3/4" (19 mm) expansion space and the width of the tongue. Continue to Step 3 Glue-Down Installations.

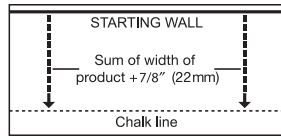


Figure 7

STEP 3: Installing the Moisture Retardant Barrier

(Staple-Down Installations)

CAUTION: The moisture retardant barrier may be slippery and unstable when walked on prior to the installation of the flooring. Use extreme care during installation.

- Roll out the materials in the same direction the flooring will be installed, allowing the moisture retardant barrier to extend 3"-4" (8-10 cm) up the walls.
- Position the moisture retardant barrier so the chalk lines can be seen through this material.
- Staple or tape at the corners to hold the moisture retardant barrier in position.
- Overlap the moisture retardant barrier 6" (15 cm) at all joints and poly tape the seams together. The first piece of moisture retardant barrier will be secured when the first row of flooring is installed.

STEP 4: Installing First and Second Rows

(Staple-Down Installations)

- Use the longest, straightest boards available for the first two rows.
- Align the tongue of the first row on the chalk line. The groove should be facing the starting wall.
- Use a pneumatic brad nailer to face-nail the groove side 1/2" (13 mm) from the edge of the wall at 6" (15 cm) intervals and 1"-2" (2.5-5 cm) from each end then face-nail at a 45° angle-down through the nailing "pocket" on top of the tongue (Figure 8). OR pre-drill the nail holes 1/2" (13 mm) from the back (groove) edge, 1"-2" (2.5-5 cm) from each end, and at 6" (15 cm) intervals. Pre-drill at the same intervals at a 45° angle down through the nailing "pocket" on top of the tongue (Figure 8). Face-nail the groove side where pre-drilled.
- When complete, blind-nail at a 45° angle through the tongue of the first row. Fasten using 4 or 6d nails. Countersink nails to ensure flush engagement of the groove. Avoid bruising the hardwood by using a nail set to countersink the nails. Continue blind-nailing using this method with following rows until the stapler can be used.
- End-joints of adjacent rows should be staggered a minimum of 6" (15 cm) to ensure a more favorable overall appearance.

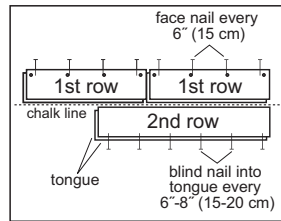


Figure 8

STEP 5: Installing the Floor

(Staple-Down Installations)

- Using the appropriate staple gun, set the compressor as previously recommended.
- Fasten a sacrificial board to the floor. Check for surface damage, air pressure setting, tongue damage, etc. before proceeding. Make all adjustments and corrections before installation begins. Once proper adjustments have been made, remove and destroy the board.
- Install the floor from several cartons at the same time to ensure good color and shade mixture.
- End-joints of adjacent rows should be staggered 6" (15 cm) when possible to ensure a more favorable overall appearance.
- Begin installation with several rows at a time, fastening each board 3"-4" (8-10 cm) apart and 1"-2" (2.5-5 cm) from the ends (to avoid splitting) with a minimum of three fasteners per board. Tighten boards as necessary to reduce gaps before fastening. (See General Installation Tips.)
- Install the remainder of the floor working from several cartons.
- The last 1-2 rows will need to be face-nailed where clearance does not permit blind nailing with a stapler or brad nailer. Brad-nail or pre-drill and face-nail on the tongue side following the nailing pattern used for the first row.
- Rip final row to fit and face-nail. If the final row is less than 1" (2.5 cm) in width, it should first be edge-grooved to the previous UNINSTALLED row and the two joined units should be face-nailed as one.

General Information for Glue-Down Installations

- Working time will vary depending on the job-site conditions. Open times and curing times of all adhesives vary dependent upon subfloor porosity, air movement, humidity and room temperature. Urethane adhesive has a shortened working time in high humidity environments.
 - Hold the trowel at a minimum 45 degree angle (Figure 9) firmly against the subfloor to obtain a 50-60 ft.² (4-5.5 m²) per gallon spread rate. The trowel will leave ridges of adhesive and very little adhesive between the ridges. This will allow you to still see the chalk lines between the ridges and provide the recommended spread rate.
 - Avoid installing from the surface of the flooring. If necessary, distribute weight using a kneeler board.
 - Clean the adhesive from the surface of the floor frequently. Do not use blue tape before the adhesive is removed. Use a clean towel, changing frequently to prevent hazing.
- NOTE: DO NOT INSTALL FLOORING USING RUBBER MALLETS. STRIKING THE SURFACE WITH A RUBBER Mallet MAY "BURN" THE FINISH CAUSING IRREPARABLE DAMAGE.**

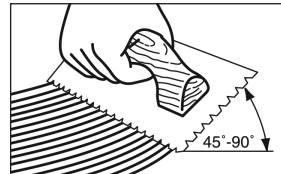


Figure 9

STEP 3: Spread the Adhesive

(Glue-Down Installations)

- Spread sufficient amounts of recommended adhesive with the recommended trowel (Figure 2) in an area that can be covered in 30-60 minutes (see adhesive information).
- If necessary, nail a sacrificial row with 1" (2.5 cm) nails on the dry side of your chalk line to help hold the first row in place.

NOTE: Avoid installing on the surface of the flooring. If necessary, distribute weight using a kneeler board.

STEP 4: Installing the Floor

(Glue-Down Installations)

(Figure 10a-10d)

- Use the longest, straightest boards available for the first two rows. The first row of the hardwood flooring should be installed with the edge of the groove lined up on the chalk line. The tongue should be facing the starting wall. The first row must be aligned and seated in the adhesive as all additional rows will be pushed back to this original row. Remove the tongue to allow for expansion space, if necessary, on the row adjoining the wall.

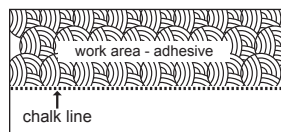


Figure 10a

- When installing pieces, engage the end-joint first, as close to the side (long) tongue and groove as possible, then slide together tightly to engage the side (long) joint tongue and groove. To avoid adhesive bleed-through and memory pull-back, avoid sliding pieces through the adhesive as much as possible when placing them in position.
- During the installation, occasionally remove a piece of flooring from the subfloor and inspect the back for proper adhesive transfer. Adequate adhesive transfer is necessary to ensure sufficient holding strength. If the adhesive skins over and fails to transfer, remove and spread new adhesive to achieve proper bonding.
- For additional application instructions, follow the recommendations on the adhesive container. When not in use, keep the adhesive container tightly closed to prevent thickening. Thickening will cause difficulty in spreading the adhesive. Proper ventilation within the room must be provided.

NOTE: Clean adhesive from the surface of the floor frequently, using the recommended adhesive cleaner. Urethane adhesives become extremely difficult to remove when cured. Do not use 3M Scotch-Blue™ 2080 Tape before adhesive is removed from the surface. Use clean towels, changed frequently, to prevent haze and adhesive residue.

- Check for a tight fit between all edges and ends of each plank. End-joints of adjacent rows should be staggered 6" (15 cm) when possible to ensure a more favorable overall appearance (Figure 4).
- It may be necessary to align the product with a cut-off piece of scrap as shown (Figure 11 – Keep scrap angle low to avoid edge damage).
- To eliminate minor shifting or gapping of product during installation, use 3M Scotch-Blue™ 2080 Tape to hold the planks together. After installation is complete, remove all the 3M Scotch-Blue™ 2080 Tape from the surface of the newly installed flooring. Do not let the tape remain on the flooring longer than 24 hours. Avoid the use of masking or duct tape, which leaves an adhesive residue and may damage the finish.
- If necessary, use weights to flatten boards with bows, until adhesive cures, in order to prevent hollow spots. Boards that cannot be flattened should be cut in length to reduce the bow or should not be used.
- Be sure not to spread adhesive too far ahead of your work area. (Figure 10d)
- Complete the installation using this same technique for the remainder of the floor.
- Avoid heavy foot traffic on the floor for at least 24 hours. Lift the furniture or fixtures back into place after 24 hours.

STEP 6: Complete the Installation

(All Installations)

- Remove all tape and clean the floor with the recommended hardwood flooring cleaner.
- Install or re-install any transition pieces, reducer strips, T-moldings, thresholds, bases and/or quarter round moldings that may be needed. These products are available pre-finished to blend with your flooring (see below). Nail moldings into the wall, not the floor.
- Inspect the floor, filling all minor gaps with the appropriate blended filler.
- If the floor is to be covered, use a breathable material such as cardboard. Do not cover with plastic.
- Leave warranty and floor care information with the owner. Advise them of the product name and code number of the flooring they purchased.
- To prevent surface damage, avoid rolling heavy furniture and appliances on the floor. Use plywood, hardboard or appliance lifts if necessary. Use protective casters/caster cups or felt pads on the legs of furniture to prevent damage to the flooring.

V. TRANSITION AND WALL MOLDINGS



Reducer Strip Threshold Stair Nosing Quarter Round T-Molding

- Reducer Strip:** A teardrop shaped molding used around fireplaces, doorways, as a room divider, or as a transition between hardwood flooring and adjacent thinner floor coverings. Fasten down with adhesive, small nails or double-faced tape.
- Threshold:** A molding undercut for use against sliding door tracks, fireplaces, carpet, ceramic tile, or existing thresholds to allow for expansion space and to provide a smooth transition in height difference. Fasten to subfloor with adhesive and/or nails through the heel. Pre-drill nail holes to prevent splitting.
- Stair Nosing:** A molding undercut for use as a stair landings trim, elevated floor perimeters, and stair steps. Fasten down firmly with adhesive and nails or screws. Pre-drill nail holes to prevent splitting.
- Quarter Round:** A molding used to cover expansion space next to baseboards, case goods, and stair steps. Pre-drill and nail to the vertical surface, not into the floor.
- Combination Base and Shoe:** A molding used when a base is desired. Used to cover expansion space between the floor and the wall. Pre-drill and nail into the wall, not the floor.
- T-Molding:** A molding used as a transition piece from one rigid flooring to another of similar height or to gain expansion spaces. Fasten at the heel in the center of the molding. Additional rigid support may need to be added to the heel of the molding dependent upon the thickness of the goods covered. Do not use this molding as a transition to carpet.

INSTALLERS - ADVISE YOUR CUSTOMER OF THE FOLLOWING

Seasons: Heating and Non-heating

Recognizing that hardwood floor dimensions will be slightly affected by varying levels of humidity within your building, care should be taken to control humidity levels within the 30-50% range. To protect your investment and to assure that your floors provide lasting satisfaction, we have provided our recommendations below.

- Heating Season (Dry):** A humidifier is recommended to prevent excessive shrinkage in hardwood floors due to low humidity levels. Wood stoves and electric heat tend to create very dry conditions.
- Non-Heating Season (Humid, Wet):** Proper humidity levels can be maintained by use of an air conditioner, dehumidifier, or by turning on your heating system periodically during the summer months. Avoid excessive exposure to water from tracking during periods of inclement weather. Do not obstruct in any way the expansion joint around the perimeter of your floor.
- Damage caused by failing to maintain the proper humidity levels is not manufacturing related and will void the floor's warranty.**

NOTE: Final inspection by the end-user should occur from a standing position.

FLOOR REPAIR

Minor damage can be repaired with a Bruce touch-up kit or filler. Major damage will require board replacement, which can be done by a professional floor installer.

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