



Solid Flooring Installation Instructions

Auckland, Madeira, Mendoza, Moselle, Niagara, Velocity

Staple: All
Nail: All

Installer / Owner Responsibility

Kraus products should be installed by a qualified hardwood flooring mechanic. Many important decisions affecting the performance and appearance of the installed floor must be made on the installation site, and therefore are the responsibility of the installer and/or owner. These include, but are not limited to, complete evaluation of site conditions including moisture testing of the entire site and flooring, acclimation of flooring to proper site conditions, site preparation, flooring layout, milling, grade and color, proper installation methods, and clean up. DO NOT INSTALL any flooring if there is any question as to acceptability — INSTALLATION CONSTITUTES ACCEPTANCE. Additional technical information can be obtained from the National Wood Flooring Association at www.nwfa.org.

Site Conditions, Handling, and Storage

Kraus solid hardwood flooring may be installed above or on grade (outside soil level). Never install below grade (where soil is present along any perimeter wall and is more than 3" above the installed wood flooring level). Kraus floors must be installed after all other construction that may affect them is completed. Concrete, drywall, plumbing and any other "wet work" should be thoroughly cured. Keep flooring dry at all times. Provide good air circulation around pallets, bundles, or cartons. Do not stack flooring bundles or cartons more than three layers high, and maintain a flat stack. Record the flooring moisture content upon delivery and at the time of installation for future reference. Factory finished flooring is finished woodwork, and should be handled carefully to avoid damage to the finished face, edges, corners, etc.

Acclimation: Solid hardwood flooring must be acclimated to stable, permanent site conditions before installation. Hardwood flooring should be between 6 and 9% moisture content, and the subfloor and flooring should be within 4% of each other (2% on wider planks). In no case should the moisture content of either exceed 12%.

Permanent HVAC must be in operation before, during, and after installation. A temperature of 70 degrees F +/-10 degrees and a relative humidity between 35-55% is recommended. Heating units or un-insulated ductwork close to the flooring or subfloor may cause "hot spots" which must be eliminated prior to installation.

Radiant Heat: Kraus recommends only narrow widths (2-1/4, 3", and 3-1/4") of solid hardwood flooring may be installed over modern radiant heat systems. As installation and heating system conditions are very detailed, please consult NWFA and the manufacturer of the heating system for further details. Kraus cannot be responsible for improper use of radiant heat.

Site Moisture is the most important factor. Confirm proper drainage exists around the structure. In crawl spaces, exposed earth must be fully covered with minimum 6-mil polyethylene sheeting. Crawl space vents must be open at all times, and must equal at least 1.5% of the total square footage of the crawl space.

Basements must be dry and remain dry.

Subfloor Types and Conditions

General: The subfloor must be clean, dry, flat (within 3/16" in 10'), and structurally sound. Correct any joints or areas that are not flat. Securely fasten any loose boards or panels.

Wood: CDX plywood or OSB subfloor/underlayment grade is recommended. Minimum single layer subfloor thickness is 5/8" plywood on 16" o.c. joists or 23/32" OSB on 19.2" o.c. joists. The flooring must run perpendicular to the floor joists, or additional subfloor thickness is required (refer to NWFA for more details).

Concrete: Kraus solid hardwood flooring may be installed over concrete subfloors by first installing a wood subfloor or screed system (refer to NWFA for details).

Installation Preparation: Allow 3/4" expansion space between the wood flooring and any walls or other obstructions. Undercut door jams, casings, drywall, etc. A clearance of 1/16" above the floor is recommended so the floor fits underneath and allows proper expansion space. Over the subfloor, install a layer of #15 building felt, overlapped 4" at the seams after applying the felt chalk joist locations for reference when nailing.

Layout: The best appearance is usually achieved by installing parallel to the length of the room but always install perpendicular to the floor joists unless special subfloor conditions are met (see wood subfloors). While each job is unique, it is critical to establish a primary working line for the entire job usually through the longest continuous area to be installed) and reference all flooring layout from that line. Always rack out the flooring before installing to avoid clustered end joints and repeating patterns. Work simultaneously from several cartons to achieve good color distribution.

Fastening: Use caution to avoid edge and face damage during installation. Special footer plates are available for flooring tools to protect factory finished flooring faces and edges. Use backer boards of 1/2" plywood ripped to an appropriate width to establish straight lines. Backer boards should be secured to the subfloor and carefully aligned with starter lines. Use flooring fasteners (cleat or staple) minimum 1-1/2" (avoid conflict with concrete



under subfloors and radiant heat systems). Air pressure should be regulated so the fastener seats fully in the groove, but does not split the tongue or wood below it. Nailing schedule is standard NOFMA, for strip 8-10", 1-3" from end joints, for plank 8". Face nail only as required with 7d or 8d finish nails or cleats, 1/2" from the groove, pre-drilling the nail holes to prevent splitting. Nailing schedule is the same as with blind fasteners (above). Face nails should be countersunk and covered by molding or properly filled.

Adhesive/Fastener Installation:

On wider width planks (4" and wider), combining adhesives and fasteners is an option to minimize flooring movement after installation. #15 felt paper should be omitted when using adhesives. Use a quality urethane hardwood flooring adhesive. Follow all practices recommended by the adhesive manufacturer including adhesive temperature, room temperature and humidity, proper ventilation, spread rate, open time, safety procedures and equipment, clean up and cure time. Avoid allowing urethane adhesive residue to dry on the face of the flooring. Special cleaners are available (from the adhesive manufacturer) to clean off any residue.

Aggressive solvents may attack the finish, so test any cleaner for finish compatibility before using it on installed flooring.

Finishing Touches

Fill any nail holes or small cracks with the proper filler. Clean the floor thoroughly and remove all scraps and debris. Leave care and maintenance information for the consumer.

Note: Applying additional finish over the factory finish may cause problems and does not improve durability or seal the joints. Any finish materials used that are not recommended by Kraus Premium Hardwoods will void your warranty. If you have questions about proper installation, contact Kraus or the National Wood Flooring Association (www.nwfa.org).

NO WARRANTIES APPLY TO ANY PRODUCTS NOT SPECIFICALLY ADDRESSED IN KRAUS' WRITTEN WARRANTY DOCUMENT.

SOLID HARDWOOD FLOORS

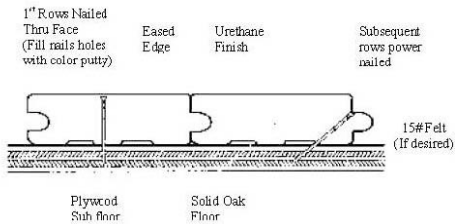
Staple & Nail Down Installation Install Above and On-Grade Only

ATTENTION: INSTALLER-OWNER READ ALL INSTRUCTIONS CAREFULLY BEFORE STARTING

The patterns and color variations created in a living tree are, like all of nature, never repeated. Remember that your newly installed floor will vary from samples or pictures shown. One should not expect uniformity from hardwood. Expect instead a beautiful and natural variation.

This product is manufactured in accordance with industry standards which permit a defect tolerance not to exceed 5%. The defects may be of any type, whether manufactured or natural.

- Prior to installation, the installer must determine that job site conditions meet or exceed standards set forth by the industry as necessary for a proper installation. Kraus Floors will decline responsibility for situations associated with improper installation or job site conditions.
- The installer and owner should work together as final inspector of grade, manufacture, and factory finish. Pieces you consider imperfect should be used in hidden areas or closets, should be cut off, or held out of the floor. Any doubtful piece should not be used. Please note the Kraus Floors warranty does not cover labor for defects visible prior to installation.



The use of putty, stain or filler for the enhancement of the floor should be accepted as normal.

WOOD DUST

Sawing, sanding or machining wood products can produce wood dust, which can cause a flammable or explosive hazard. Wood dust may cause lung, upper respiratory tract, and eye and skin irritation. Some wood species may cause dermatitis and/or allergic respiratory effects. The International Agency for Research on Cancer (IARC) has classified wood dust as a nasal carcinogen in humans. The National Toxicology Program (NTP) has also classified wood dust as a known human carcinogen.

- Avoid dust contact with ignition source.
- Sweep or vacuum dust for recovery or disposal.
- Avoid prolonged or repeated breathing wood dust in air. Approved respirators may be needed depending upon dust conditions.
- Avoid dust contact with eyes and skin. Wear gloves and safety glasses when handling and machining the product.
- FIRST AID: If inhaled, remove to fresh air. If irritation persists, contact a physician.

JOBSITE CONDITIONS

Kraus | Premium Hardwood is designed to perform in an environmentally controlled structure. 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 at “normal living conditions”.

The manufacturer declines any responsibility for wood failure resulting from or connected with subfloor, subsurface, job site damage or deficiencies after hardwood flooring has been installed. All substrates must be clean, dry, structurally sound and flat.

HUMIDITY

“Normal living conditions” are defined as having the relative humidity (air) being monitored and maintained at 35% to 55%, and the moisture content of the flooring at 6% to 9%, with a tolerance of +/-1%. The proper use of a humidifier/de-humidifier is recommended. Wood that is too dry may “crack” or “check”. Wood that is too damp will increase in width, causing “cupping” or “crowning”. A moisture content that is too high may also lead to mildew in extreme conditions. These situations are job site related and not considered a manufacturing defect.

IMPORTANT: On wider width flooring, Installer-Owner must ensure that moisture levels meet and remain consistent with all manufacturers’ recommendations to avoid cupping/crowning as shown above.



SUBFLOOR PREPARATION AND RECOMMENDATIONS FOR ALL INSTALLATIONS

Concrete Subfloors

New concrete slabs require a minimum of 60 days drying time before covering them with a wood floor. (Must be fully cured)

Lightweight Concrete

Lightweight concrete that has a dry density of 100 pounds or less per cubic foot is not suitable for solid wood floors. Many products have been developed as self-leveling toppings or floor underlayments. These include cellular concrete, resin-reinforced cement underlayments, and gypsum-based materials. Although some of these products may have the necessary qualifications of underlayment for wood flooring installations, others do not.

To test for lightweight concrete, scrape a coin or key across the surface of the subfloor. If the surface powders easily or has a dry density of 100 pounds or less per cubic foot, do not install this Engineered Wood floor.

Concrete subfloors must be dry, smooth (level within 3/16" in a 10 foot radius – 1/8" in 6') and free of structural defects. Hand scrape or sand with a 20-grit #3-1/2 open face paper to remove loose, flaky concrete. Grinding high spots in concrete is recommended over using filling compounds. However if a filling/leveling compound is used, it must be of a Portland base compound (min. 3,000 p.s.i.) with a high compressive strength. Concrete must be free of paint, oil, existing adhesives, wax, grease, dirt, seals, and curing compounds. These may be removed chemically or mechanically, but do not use solvent-based strippers under any circumstances. The use of residual solvents can prohibit the satisfactory bond of flooring adhesives. It is important to ensure a proper bond between the adhesive and the concrete, and planks or strips. Kraus | Premium Hardwood may be installed on grade & above grade only.

To ensure a long lasting bond, make sure that the perimeter of the foundation has adequate drainage and vapor barrier.

Wood Subfloors

Wood subfloors need to be well nailed or secured with screws. Nails should be ring shanks and screws need to be counter sunk. The wood subfloor needs to be structurally sound (meaning subfloors without loose boards, vinyl or tile). The moisture should be between 6%-9% prior to installation. If the sub-floor is single layer, less than 3/4" thick, add a single cross layer for strength and stability (minimum 3/4" thick). This is to reduce the possibility of squeaking. Wood sub-floors must be free of paint, oil, existing adhesives, wax, grease, dirt and urethane, varnish etc. Underlayment grade OSB (performance rated) is also a suitable subfloor. Particleboard is not an acceptable subfloor for staple or nail down installation, but can be used as a subfloor in glue down installations. When installing over existing wood flooring, install at right angles to the existing floor.

Subfloor Moisture Check

The recommended wood flooring adhesive may be used for above, on, and below grade applications and on all common substrates. On and below grade applications are susceptible to moisture and should be tested for moisture prior to installation in several locations within the installation area. Acceptable conditions for above, on, and below grade applications are:

- Less than 3lbs. /1000 sq. ft. /24 hrs. on a calcium chloride test.
- No greater than a reading of 5 on a Tramex Concrete Moisture Encounter (moisture meter).
- Wood Substrates must have a moisture reading of less than 14% when using a moisture meter.

To correct any subfloor problems concerning moisture, either wait until the subfloor dries to meet specifications or use an appropriate moisture barrier. For more information concerning moisture conditions, contact Kraus technical service department.

Subfloors other than Wood or Concrete

Note: Perimeter glued resilient vinyl and rubber tiles are unacceptable underlayments and must be removed.

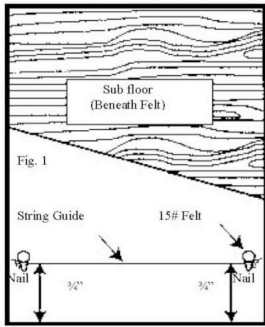
Terrazzo, tile and any other hard surfaces that are dry, structurally sound and level, as described above, are suitable as a subfloor for this hardwood flooring installation. As above, the surface must be sound, tight and free of paint, oil, existing adhesives, wax, grease and dirt.

WARNING! Do not sand existing resilient tile, sheet flooring, backing, or felt linings. These products may contain asbestos fibers that are not readily identifiable. Inhalation of Asbestos dust can cause Asbestosis or other serious bodily harm. Check with local, state and federal laws for handling hazardous material before attempting the removal of these floors.

Radiant Heated Subfloors

Before installing over a radiant heated floor turn off heat and wait until the floor has reached room temperature (70°F-75°F). After installing the floor, gradually return the heat to the previous setting.

Note: When radiant heat is installed in concrete, mortar beds, or gypsum cement, it is very important to operate the heating system until these are completely dry before you install your wood flooring on top.



(This can take several weeks. Be patient.)

Operate the heating system until the humidity in the structure stabilizes to the average level expected for the area in which the wood floor will be installed.

Then allow wood to acclimate to this humidity level before installation. This will minimize dimensional changes due to moisture. For more information on Radiant Heated Subfloors go to www.NOFMA.org

Caution: The subfloor surface must never exceed 85° F. in temperature.

PREPARATION

Remove all moldings and wall-base and undercut all door casings with a hand or power jam saw using a scrap piece of flooring as a guide.

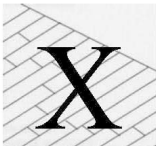
“Racking the Floor”

Whether you choose to install the floor with glue, nails, or staples start by using random length planks from the carton by cutting four to five planks in random lengths, differing by at least 6". As you continue working across the floor, be sure to maintain the 6" minimum between end joints on all adjacent rows. (See Figures 1A & 1B). Never waste material; use the left over pieces from the fill cuts to start the next row or to complete a row.

Figure 1A



Figure 2A



Note: When installing a pre-finished wood floor be sure to blend the wood from several cartons to ensure a good grain and shading mixture throughout the installation.

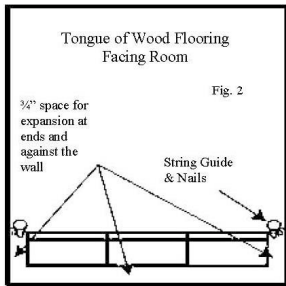
Installing 6 mil Polyethylene

Install the polyethylene parallel to the direction of the flooring and allow a 3" over run at the perimeter. Make sure each run of polyethylene overlaps the previous run by 6" or more. Do not overlap the felt if it is used.

Layout the job

Measure out from the ends of your starting wall, 2 3/4" when installing 2 1/4" strip flooring, 3 1/2" when installing 3" planks 5 1/2" when installing 5" planks and mark both ends. Where possible, lay the flooring at 90° angles to the floor joists. Make a chalk line along the starting wall using the marks you made (See Figure 7).

PLEASE NOTE: While this set of instructions is for installation of solid 3/4" flooring, there may be some regional differences used by your installer that may be correct, yet vary slightly from these instructions. i.e. use of felt.



1. STORING AND HANDLING

- Material should be on the job at least 72 hours before being installed. Open the cartons, but do not remove the product from the cartons. Make sure the heating/cooling is set within the normal temperature range. The flooring is acclimated and ready for installation when it has reached a moisture level consistent with the job site and normal living conditions.
- On wider width flooring, Installer-Owner must ensure that moisture levels meet and remain consistent with all manufacturers' recommendations to avoid cupping/crowning as shown above.

2. GENERAL INSPECTION

- All work involving water, such as pouring basement concrete floors, drywall and plaster work, plumbing, etc. should be completed well in advance to floor delivery.
- We recommend 3 types of sub floor—plywood, solid wood planks (1 x 6 inch or larger), or sleepers (2 x 4 inch). Each sub floor has separate installation instructions below.
- PLYWOOD/OSB Plywood should be 3/4 inch (preferred) or 5/8 inch (minimum) thickness. If plywood is being laid on joists, place it at right angles to the joists and be certain to leave at least a 1/8" to 1/4" gap between each sheet to allow for expansion. OSB must be 3/4" and Performance Rated. As with plywood, leave a 1/8" to 1/4" gap between each sheet to allow for expansion. With plywood and OSB, follow the manufacturer's directions regarding the 1/8" to 1/4" gap on sides and ends.
- SOLID WOOD SUBFLOOR Solid planks should be nailed diagonally across the joists with a 1/4 inch gap between the boards.

CONCRETE

- There are several methods of installing strip flooring on concrete. One method is to use 5/8" or 3/4" plywood. It is recommended that a vapor barrier be used prior to installation of the floor; preferably, a 46 mil Polyethylene film with enough excess to be placed under the baseboards. Fasten the plywood to the concrete using appropriate fasteners. Another way of laying the plywood on concrete is to cut the plywood in 4 x 4 foot squares and lay it in mastic. A moisture barrier should also be used with this method.

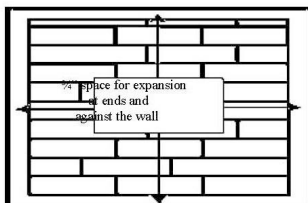
Another alternative would be to use "sleepers." This method uses treated, kiln-dried 2 x 4's laid flat in asphalt mastic every 12 inches at right angles to the direction of the finished floor. Overlap or stagger the sleepers by at least 4 inches and make sure each one is securely imbedded in mastic. A polyethylene vapor barrier is then laid over the sleepers. Be certain that you do not puncture or bunch up the polyethylene, or it will not create an effective vapor barrier. Nail the flooring through the plastic into the sleepers.

- Sub floors should be level within 1/4" in each 10'. High areas should be sanded flat. Low areas should be filled with latex leveling compound.

3. PRE-INSTALLATION PREPARATION TOOLS NEEDED SUPPLIES NEEDED

Tape Measure 10D Nails

Chalk line or String Saw Small Drill Bit (smaller than Hammer nails) Pry Bar Nail Set Drill 15# felt paper-equal to Footage of floor Dust Mask Color Matching Wood Putty Broom Power Cleats for power Mechanical Nailer/Stapler Mallet 2" Barbed Flooring Cleat or Safety Glasses 2" (15 gauges) staples with 1/2" crown



- Have trim moldings on the job and use flooring pieces next to them that will assure a good match.
- Remove existing base, shoe mold or thresholds. These pieces will be reinstalled after installation to cover the 3/4" "expansion gap" left at the edge of the room.
- Sub floors should be cleaned prior to floor installation.
- Make sure the sub floor is dry to 12% or less moisture content, and will stay that way.
- Undercut doors and casings using a handsaw laying flat on a scrap piece of flooring. This will eliminate difficult scribe cuts.
- Sweep the area to remove all dust and debris.



4. INSTALLATION

STEP 1 - LAYOUT

Measure and mark "3 1/4" (see fig 1) from the wall at two spots near each end of the room. Drive a nail at each spot. Stretch string and tie each end of string around nail so the nails become post. Use the string as your flooring guide.

- This dimension should be 4 1/4" when installing 3 1/4" wide flooring.

STEP 2 -INSTALL FIRST ROW

Using the string as a straight edge lay the first row of flooring in place with the tongue facing the center of the room. Leaving a 3/4" (See Figure 2) gap at the wall, pre-drill and face nail 10D (type) nails the entire length of the room 6 to 8" apart. Leave 3/4" (See Figure 2) expansion at each end. Set nails (fill holes with wood putty), then remove the string and guide nails.

STEP 3 -INSTALL REMAINING ROWS

Continue installation (using a mechanical nailer/stapler) with several rows at a time, fastening each board with at least two fasteners, 8-10" apart and 2 - 2 1/2" from the ends, making sure to nail to each floor joist. Helpful Hint: Use flooring lengths that offset (or stagger) the ends 6" or so for a more professional look. Carefully cut the last row to leave a 3/4" expansion space. (See Figure 3).

- Replace trim moldings.
- Make sure power cleats are approved for use in OSB if plywood is not used as a substrate.
- Do not mix lot numbers without checking for color match.
- Lay out several cartons to make sure of quality and grading and "rack" or stagger them in random lengths.
- Leave 3/4" at the edges for expansion. Cover the space with trim molding. (See Figure 3)
- Pre-drill, nail with 10D nails, then use wood putty to fill the holes
- Some rows that are hand nailed may be drilled at an angle through the top of tongue to hide the nail head.
- Lay flooring perpendicular to the direction of floor joists
- Occasionally, a piece may be slightly bowed. Nail one end first, then use a pry bar to push the other end in place, nailing as you go.
- The last few rows may need to be face nailed because the mechanical nailer/stapler can no longer be used safely. Simply repeat the procedure used on the first few rows.
- Using shorter pieces at undercut door jams will help when fitting flooring into place.

5. COMPLETING THE JOB

- Countersink and fill all nail holes.
- Clean the floor with a recommended hardwood floor cleaner.
- Reinstall all moldings and transition pieces, nailing into the wall or sub floor and not the flooring.
- Use felt tips on the bottom of all furniture.

Congratulations! You've just finished a beautiful room!!!