Congratulations on choosing prefinished hardwood flooring for your home or office! When it comes to installing hardwood flooring, you have a number of different options. This guide will help you determine what is right for your floor to help ensure you have a successful installation.

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INSTALLATION OPTIONS

There are many options to consider when choosing the type of hardwood flooring and installation method for your home including:

- Subfloor Type
- Flooring Grade
- Flooring Construction
- Tongue and Groove Type
- Floor Installation Methods
- Ease of Installation
- Radiant Heat System Considerations

Use this quick reference table to help you determine the best flooring and installation method for your specific situation.

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*Check with your flooring manufacturer before installing over a radiant heat system.

† Below Grade installations may be acceptable for certain types of hardwood flooring if certain precautions are taken to protect the hardwood floor from moisture. ALWAYS check with your flooring manufacturer before installing Below Grade.
Subfloor Type

The subfloor is the structure upon which you will be installing your hardwood floor. It is important to choose the correct installation method for your subfloor.

Wood

Wood subfloors are plywood, plyboard, existing hardwood flooring or Oriental Strand Board (OSB). These types of subfloors could be above crawl spaces, on the second level of a home or placed over concrete. Installation methods for a wood subfloor include glue down, nail/staple down or floating for engineered and click lock flooring.

NOTE: Particleboard is not considered a wood floor. Hardwood flooring should not be installed over particleboard subfloors unless specifically approved by the flooring manufacturer.

Concrete

Concrete or cement subfloors can be found in homes with solid foundations or in apartments/condos. Installation methods for concrete subfloors includes glue down for both solid and engineered tongue and groove hardwood flooring or as a floating floor for engineered and click lock hardwood flooring. You can also install a moisture barrier on top of the concrete subfloor then either nail or glue plywood above the moisture barrier to use a nail/staple installation method.

TIP: While a 30 day old concrete slab may pass a moisture test, it is best to wait until the slab is 60-90 days old before testing and installing your flooring.

Radiant Heat

Always check with your retailer or manufacturer to ensure the type of hardwood you choose can be installed over a radiant heat system. Radiant heating affects the temperature, moisture and humidity of your hardwood flooring. Over time, these factors can cause problems if your flooring was not designed to be installed over a radiant heating system.

For more information on hardwood flooring and radiant heat systems, see the Radiant Heat System Considerations section on page 10.
Laying Over Existing Flooring

Always follow the flooring manufacturer’s recommendations when installing your new hardwood floor over an existing solid floor. In most cases, you can install hardwood:

- Using the glue down method over porcelain tile, ceramic tile or porous stone (like travertine or slate). Do not use the glue down method over high gloss stone (such as marble) because the surface is not porous enough to bond well with the flooring adhesive.
- Using the staple method over existing hardwood, bamboo or vinyl floors.

☑️ **TIP:** Existing sheet vinyl floors can act as an added moisture barrier between your subfloor and your hardwood floor. Peel and stick vinyl does not provide an adequate moisture barrier because of the potential for moisture to seep up between each square.

Additionally, be aware of asbestos if you are removing existing flooring. Some older flooring products contain asbestos which can contaminate your home or office if removed. If you find asbestos in your existing flooring, do not remove it. Follow all federal, state and local guidelines for containment.

**Flooring Grade**

There are three different flooring grades to consider when installing hardwood flooring:

- **Above Grade:** Flooring installed on a second floor of a home or above.
- **On Grade:** Flooring installed on the ground level of a home.
- **Below Grade:** Flooring installed below the ground level of a home (such as basements).

☐ **NOTE:** If the soil that surrounds the home is 3 or more inches above the floor on any level, that level is considered Below Grade.

Most hardwood flooring is approved for Above Grade or On Grade installations. Some retailers may say Below Grade installations are acceptable; however, **ALWAYS** check with the flooring manufacturer. The moisture and humidity levels in Below Grade environments greatly affect the stability of hardwood flooring.
Flooring Construction

Hardwood flooring is constructed in two different ways: solid hardwood and engineered hardwood. Choosing between the two is a personal preference as both types have:

- **Visual Appeal**: Both types of flooring preserve the hardwood’s natural characteristics including stains, surface textures and other wood-specific features. Solid flooring and some engineered flooring also comes in different widths which allows you to further customize the flooring to your home.

  ✔️ **TIP**: Narrow boards are considered more formal whereas wider boards produce a more comfortable, country look.

- **Resiliency**: Finished solid and engineered hardwood flooring is coated with a series of finish layers that resists scratches and dents. The most commonly used factory finish is an aluminum oxide wear layer hardened with a urethane topcoat.

No matter which type you go with, only a flooring professional (or a nosey neighbor) will know what you choose once your floor is installed.

Solid Hardwood Flooring

Solid hardwood flooring is made from solid planks of wood such as red oak, maple, cherry or ash. Planks are slice-cut from full logs so that the natural texture and wood grain are reflected on each board.

Many people prefer solid hardwood flooring over engineered hardwood flooring for a couple reasons:

- **Longevity**: Quality solid hardwood flooring is designed to last because it has a thick wear layer. Additionally, solid flooring can be sanded and re-finished multiple times which results in “new” looking floors.

- **Quality**: Some homeowners are of the opinion that solid flooring is a better quality floor than engineered flooring. However, with today’s advances in the flooring manufacturing process, differences in quality are negligible between good-quality engineered hardwood flooring and good-quality solid hardwood flooring.

- **Tradition**: Many homeowners choose solid hardwood flooring because it complements the tradition of the home.
Engineered Hardwood Flooring

Engineered hardwood flooring differs from solid hardwood because only the top layer (or wear layer) is made of hardwood. Engineered hardwood flooring is composed of between three and eleven layers of hardwood and other woods that are glued or laminated together, much like plywood. This cross-laminating process forms an extremely strong, durable floor. Engineered hardwood floors usually have a wear layer and one or more backing and core layers that provide dimensional stability. Engineered hardwood flooring cores can be made of HDF (like laminate flooring) or can be composed of strips of wood that run perpendicular to the top layer (which adds stability).

**TIP**: More layers usually results in additional stability.

Choosing engineered hardwood flooring has a couple of advantages over solid hardwood flooring:

- **Economical**: Engineered hardwood flooring is made up of several different types of hardwood and other woods. Since the top or wear layer is the only one that is seen, often times you can purchase an expensive looking floor for less than the cost of a solid hardwood floor.

- **Durable**: Inexpensive pine, spruce, birch, rubberwood, or HDF make up the sturdy core of engineered flooring.

- **More Installation Locations**: During the manufacturing process, the layers of engineered flooring alternate depending on the direction of the grain. This process helps to neutralize hardwood’s natural tendency to warp, contract, expand or cup. This means that engineered floors may be installed in rooms where solid flooring cannot, such as basements or areas with a higher moisture or humidity content. (Not all engineered flooring can be installed in basements or areas with higher moisture/humidity content. Always follow the manufacturer’s guidelines for installation.)

- **Environmentally Friendly**: Since engineered hardwood flooring only uses a fraction of the surface species as compared to solid, it is more environmentally friendly.
**Refinishing Engineered Flooring**

Today’s engineered hardwood floors are usually finished with Aluminum Oxide to help ensure the flooring is durable for longer periods of time so that refinishing is not needed as often if the floor is cared for properly. Typically, engineered hardwood flooring cannot be refinished as many times as solid hardwood since engineered hardwood is made up of layers of different materials and solid hardwood flooring is all the same material.

Be sure you know how thick the hardwood wear layer is for your engineered flooring as you do not want to sand past the hardwood into the other woods. If your floor has a thick hardwood layer or you have a solid hardwood floor you can still only sand the flooring to between 1/16” and 3/32” above the tongue and groove. If you sand any closer to the tongue and groove, you affect the way the flooring is put and held together.

However, if your hardwood floor (both solid hardwood and engineered hardwood) has lost its sheen or the hardwood is becoming discolored in certain areas (such as from water damage or other types of wear), you should consider refinishing the floor to prevent any further damage and to restore the “new” look of your floor.

**NOTE:** Not all engineered hardwood flooring can be refinished. Always follow the manufacturer’s guidelines for care and maintenance.
**Tongue and Groove Type**

Hardwood flooring is available in two different plank types: traditional tongue and groove and click lock tongue and groove.

**Traditional Tongue and Groove Hardwood**

Tongue and groove (T&G) hardwood is the traditional way hardwood flooring planks are milled for assembly. On each board, one side has a tongue and the other side has a groove. When placed together, the tongue of one plank fits into the groove of another providing a seamless floor.

Tongue and groove floors can be glued or nailed/stapled down. Engineered hardwood tongue and groove can sometimes be floated as long as the tongues and grooves are glued together during installation.

![NOTE: Always check with your flooring manufacturer to ensure their tongue and groove product can be installed as a floating floor.](image)

**Click Lock Hardwood Tongue and Groove**

Some engineered hardwood flooring is available with a click lock (also called glueless) system that enables the floor to be installed as a floating floor. A click lock installation is a good choice if you’re looking for any easy way to install a beautiful floor yourself. No glue, nails or staples are required!

For this type of installation, each plank is precisely manufactured so that it slides together and locks with another plank (a lot like a puzzle). Boards automatically align once clicked together. Click lock floors can be installed on top of most existing hard surface floors (as a floating floor) as long as the existing floor is level. Once installed, the floor is stable and will not move around or come apart.
Floor Installation Methods

There are a couple ways to install hardwood flooring. Always take your subfloor into consideration when choosing an installation method.

Glue Down Method

The glue down method is a simple, yet messy, way for non-professional installers to install tongue and groove hardwood flooring. With this method, you'll use a high-quality flooring adhesive (urethane adhesives are recommended) to attach each hardwood flooring plank to the subfloor. The glue down method can be used for concrete or wood subfloors. The glue down method can also be used when installing engineered hardwood flooring over a radiant heating system. Always check with both the adhesive and flooring manufacturers to ensure that you can use both products above a radiant heat system.

Nail/Staple Method

The nail or staple method is the method most used by professional installers when installing tongue and groove hardwood flooring over wood subfloors. Specialized nail or staple guns are required. This method can be used for concrete floors if plywood (¾ inch recommended) and a vapor barrier are secured to the concrete as a sleeper/screed system. The nail/staple method can also be used above a sleeper system for radiant heating.

Floating Method

Floating floors are used most often with engineered click lock hardwood flooring although engineered tongue and groove hardwood can be floated by gluing the tongues and grooves together. No special tools are required for this type of installation. Engineered hardwood click lock flooring can be installed over wood, concrete, existing hardwood or existing vinyl subfloors. Installing floating floors with solid tongue and groove hardwood is usually not recommended because of stability issues.

NOTE: If you are considering installing a floating floor using solid or engineered tongue and groove hardwood flooring, be sure to check the manufacturer’s warranty. Some warranty options may be voided if this type of installation method is used.
Ease of Installation

With the many different installation options available, it can be hard to determine what method and flooring type is the easiest or hardest to install. The following table lists the various installation methods from easiest to most complex.

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<td>Floating Floor</td>
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<tr>
<td>Complex</td>
<td>Solid or Engineered T&amp;G Hardwood</td>
<td>Nail/Staple Down</td>
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Radiant Heat System Considerations

Radiant heat systems heat homes from beneath the flooring. There are three main types of radiant heat systems:

- **Radiant air** where air heats the flooring. Because air is a poor conductor of heat, this method is not very cost effective for homes.
- **Electric radiant** where electric currents provide the heat. These types of systems usually come as mats that are laid beneath or embedded into the subfloor.
- **Hydronic radiant systems** (also called liquid systems) where heated water is pushed through tubing or piping laid in a concrete slab or below a subfloor.

Each of these systems can be installed by two different methods:

- **Wet** installation where the piping is installed directly in a concrete slab or in lightweight concrete above a wood subfloor.
- **Dry** installation where the piping is installed between two layers of plywood or attached directly below the subfloor. When installing between layers of plywood, aluminum diffusers are often used to distribute the heat evenly across the subfloor. When installing below a subfloor, reflective insulation may be used to direct heat upward into the floor.

Always check with your retailer or manufacturer to ensure the type of hardwood you choose can be installed over a radiant heat system. Radiant heating affects the temperature, moisture and humidity of the flooring. Over time, these factors can cause problems if your flooring was not designed to be installed over a radiant heating system.
Certain types of hardwood flooring are generally more suited for a radiant heat subfloor:

- Engineered hardwood flooring is a better choice since it is more dimensionally stable than solid hardwood flooring.
- Certain species of hardwood are more stable than others.

**TIP:** If purchasing engineered flooring for a radiant heat subfloor, make sure you know the different types of hardwood and woods that make up the engineered flooring.

- Narrow flooring planks are usually more dimensionally stable than wide flooring planks.

**NOTE:** Always follow the manufacturer’s guidelines when choosing and installing flooring for a radiant heat system.

Hardwood Flooring Installation Options for Hydronic Radiant Heat Systems

The installation method you choose for installing your hardwood floor over radiant heating systems varies depending on the type of flooring and radiant heat system you have. Some hardwood flooring can be glued directly to a concrete radiant slab, while others must have a sleeper system installed.

A sleeper, or screed, system is like a subfloor above your radiant heat system. Since radiant heating systems produce heat that accelerates the drying process of hardwood floors, some flooring needs this additional barrier in place to protect the floor.

Below are the different types of installations and considerations for hardwood floors above radiant heating systems.

**Glue Down Installations**

![Engineered flooring over a concrete radiant heat system.](image)
Nail/Staple Installations

Solid or engineered hardwood flooring nailed directly to a wood subfloor over joists or sleepers.

**NOTE:** This is the quickest way to heat a subfloor; however, this method tends to cause your hardwood floor to expand and contract more because the heat source is so close to the flooring.

Solid or engineered hardwood flooring nailed directly to a wood sleeper system.

Solid tongue and groove hardwood nailed directly to the sleeper.

Solid tongue and groove hardwood nailed to a single layer of ⅜” plywood.

Solid tongue and groove hardwood nailed to a double layer of ½” plywood.
Floating Installations

Engineered hardwood floated over a radiant heat slab.

NOTE: Always follow your flooring manufacturer’s instructions when choosing which installation method to use above your type of radiant heat system.

When installing a hardwood floor over a radiant heating system, all the same installation steps are required including moisture testing, acclimatizing your flooring and installing an underlayment. In addition to your flooring manufacturer’s instructions, you should also keep these things in mind:

- Some manufacturer’s recommend operating the heating system at normal living conditions for a minimum of 28 days before the installation. During this time, you would lay the hardwood flooring out as it would be installed on the floor and operate the heating system as normal over a 28 day period to acclimatize the flooring.
- Keep the heating system off for two days before and during the installation, unless otherwise directed by your flooring manufacturer. Many manufacturer’s recommend the floor be kept between 64° F and 68° F during the installation.
- Gradually increase the heat setting two days after the installation as directed by your flooring manufacturer.
- Keep the subfloor surface temperature below 85° F.
- Anticipate that your hardwood floor will shrink during the heating season due to moisture loss.
- Remember that solid hardwood flooring of 4 inches and wider is not recommended for use over sleeper systems.
- The overall temperature of the room must not vary more than 15° F during the year. The relative humidity should stay between 35% and 65% year round.
- Some manufacturers do not recommend using the glue down method for radiant heating. Always follow your flooring manufacturer’s instructions when choosing an installation method.
PLANNING YOUR INSTALLATION

Planning is a big part of any flooring installation project. The Advanced Estimator tool found at FindAnyFloor.com can help you plan your hardwood floor installation as well as estimate the amount of materials you'll need. When using the Advanced Estimator tool and this guide, you will:

- Consider Your Room Layout
- Design Your Floor Layout
- Factor in Waste
- Estimate Installation Time
- Install Safely

You should begin planning your installation before you receive or open one box of your new hardwood flooring to ensure you have enough materials on hand when installation day rolls around.

Measuring accurately, using sketches or drawings of your installation area and having the proper tools on hand will also make your installation go much smoother. Remember, the more up front planning you do, the fewer obstacles and surprises you'll probably run into during your installation.

**Consider Your Room Layout**

Rooms come in many different shapes and sizes. When evaluating your room, look at things such as: Is the room a square, a rectangle or an odd shape? How many fixed objects (such as “islands” in kitchens) will you be working around? Will you be installing flooring in narrow areas such as hallways or closets?

No matter what your room looks like, take the time to do detailed drawings and measurements. Highlight the areas that will take more time and planning. Thinking about how you'll layout those areas. If you're stumped, talk with a flooring professional. Measure each area carefully and write all your measurements on your drawing or in your notes. And don't forget to use the Advanced Estimator tool on FindAnyFloor.com to help you determine the best layout for your room.
Design Your Floor Layout

Flooring can be installed horizontally or diagonally across a room. Take all windows and doorways into consideration as light greatly affects how your flooring will look once installed.

Professional installers usually recommend laying hardwood flooring parallel to the light sources in the room (left image). For narrow rooms or hallways, hardwood flooring generally looks the best with boards situated along the length of the area (right image).

If possible, try to install the hardwood flooring so that it is perpendicular to the floor joists. This helps provide the floor with extra stability. However, if faced with a decision, most professionals will usually agree that laying flooring parallel to light sources is more important and aesthetically pleasing than the added stability.

Factor in Waste

Anytime you install flooring, there will be a certain amount of waste. Waste can be due to:

- Hardwood boards that have major defects.
- Odd shapes in the room that you must work around.
- Installation mistakes.
- Type of installation (straight vs. diagonal).

Non-professional installers should account for a waste factor of between 10%-15% for standard, horizontal installations. For diagonal or other complex installations, factor in 20% or more as these types of installations produce more waste because of the different types of cuts required. The Advanced Estimator tool on FindAnyFloor.com can help you determine how much hardwood flooring you need to complete your project.

Always factor waste into your original purchase. Since hardwood is a natural product, there may be color variations between each box. If you do not purchase enough hardwood to begin with, you may have to go back and purchase more during your installation. Or you may use all boards regardless of their condition. Either of these options could cause parts of your floor to look patchy.

And remember, **you should always end up with extra flooring at the end of your project.** Over the time you may need to replace boards that get damaged from use. Additionally, since vendors continually add and discontinue the types of flooring they offer, there is no guarantee that you will be able to get your exact hardwood flooring in the future.
Estimate Installation Time

There is no hard and fast rule for installing or completing your hardwood flooring project. Many factors affect installation time such as:

- **Room complexity**: Simple rooms usually take less time than rooms with complex floor plans.

- **Experience level**: If this is your first time installing a hardwood floor, it may take you longer than a non-professional who has already done one or more installations.

- **Installation method**: Installation times vary depending on the type of flooring (solid hardwood flooring vs. engineered hardwood flooring, tongue and groove vs. click lock) and the installation method (glue vs. nail/staple vs. floating).

- **Amount of planning**: The more planning you do, the less time your project will take. Planning helps you identify your problem areas so that you can identify what to do before you get to them.

- **Assistance available**: If you are the only one working on the project, it may take longer than if you have help. However, too much help can also hamper your progress.

Rarely do home improvement projects go smoothly. Even professionals have bad days or run into unexpected problems. Remember:

- **You’re going to make mistakes**. That’s part of what you factored in for waste. Remember, even professionals make mistakes and miscalculations. Correct it and move on.

- **It’s going to take longer than you expect**. Plan your installation with adequate time to run over schedule. Try not to begin your hardwood installation on a tight schedule (such with holidays around the corner or a major dinner party the following weekend). Take your time and don’t rush.
Install Safely

Safety should be taken into account for any flooring project. When installing your hardwood flooring, use the following guidelines to ensure a safe working environment.

- Read and follow all the flooring manufacturer’s guidelines when installing your hardwood flooring.
- Wear the proper clothing and work boots or tennis shoes.
- Wear OSHA approved safety goggles and hearing protection.
- Wear other personal protective equipment such as knee pads, shin guards, gloves and/or respirators when necessary.
- Do not work under the influence of drugs, alcohol or other medications which can impair your decision making ability.
- Keep your work area clear from clutter and debris. These things are not only tripping hazards but can scratch and damage your new hardwood floor.
- Make sure the room has proper ventilation and lighting throughout the whole installation.
- Make sure the electrical power to the area can support all electric tools you’re using.
- Have a first aid kit readily accessible.
- Use all tools and machinery as intended by the manufacturer with safety guards in place.

✔ TIP: Some professional installers also use mallet ties. A mallet tie is a piece of string or shoe lace where one end is tied to the handle of the mallet and the other is tied to your wrist. If you lose your grip on the mallet, the mallet tie helps ensure the tool doesn’t go flying through the air (possibly breaking a window, injuring someone on the jobsite or landing on and damaging your new hardwood floor).
PREPARING FOR INSTALLATION

While installing your hardwood flooring should be one of the last steps in your building, remodel or re-decorating process, there are a number of things you must do to prepare your subfloor and hardwood flooring before you get started:

- Performing a Moisture Test
- Getting Your Flooring Delivered
- Acclimatizing Your Flooring
- Moisture Testing your Hardwood Flooring
- Inspecting Your Subfloor
- Undercutting Door Casings
- Removing Molding and Doors

Performing a Moisture Test

Moisture testing is an extremely important part of the installation process. If the flooring or the subfloor is too moist, you can run into installation problems as well as expansion/contraction issues in the years to come.

Moisture testing should be performed BEFORE your hardwood flooring is delivered. You may have to reduce the subfloor moisture content before you install your flooring if your subfloor is too moist. Additionally, your hardwood may acclimatize to the wrong conditions if the moisture content of your subfloor exceeds the recommended amounts.

You should also take moisture readings the day before and the day of your installation. Excessive moisture under a hardwood floor can be costly to repair and correct in the years to come.

Types of Moisture Meters

There two main types of moisture meters:

- **Probe**: When pushed into the plank parallel with the grain, this device measures the electrical resistance across opposite sets of pins. Some meters come with insulated pins that when pushed into the plank will measure the moisture content at the varying depths of the board. This can help you to know if the moisture is concentrated in any one area of the flooring.
• **Pinless:** This device sends a signal through the hardwood flooring up to 1 inch or more (similar to an ultrasound). The device is moved across the surface of the subfloor or flooring to measure for pockets of moisture. Pinless meters generally have a deeper depth than probe meters. If measuring moisture in an installed floor, this type of device may register moisture in the flooring as well as the subfloor.

For any moisture meter you choose, be sure that it has a moisture content range of between 6% and 30%. Additionally, always follow the meter manufacturer's recommendations for calibration and reading.

Moisture meters are used mainly for wood subfloors and flooring. Depending on the manufacturer’s recommendations, some models may be used to measure moisture in concrete slabs. However, even if the meter registers an acceptable range for concrete, still perform a simple polyethylene moisture test (see Testing Concrete Subfloors for Moisture on page 20). Additional testing for concrete slabs could save you a lot of time and money if on the rare occasion a meter registers an incorrect moisture reading.

**Testing Wood Subfloors for Moisture**

When performing moisture tests on wood subfloors, use a calibrated moisture meter approved by the manufacturer for testing wood subfloors. Moisture ranges depend on the width of the flooring you are installing.

- For flooring up to 3” wide, readings between the wood subfloor and the hardwood flooring should have no more than a 4% difference.
- For flooring more than 3” wide, readings between the wood subfloor and the hardwood flooring should have no more than a 2% difference.

**Example:** You’re installing 3” wide flooring over a wood subfloor. If your subfloor has a 10% moisture reading, the flooring should have a 7%-13% moisture reading. Hardwood flooring that is 6% or 14% is borderline acceptable. Moisture readings below 6% or above 14% could pose major installation problems and long-term headaches.

Additionally, you should take into account the area in which you live and any special circumstances your area encounters. More humid areas of the country have different moisture content allowances than drier climates. Also, living near an ocean, lake or golf course can cause higher humidity rates. For more information, go to FindAnyFloor.com to view a climate map of the US and the typical moisture content allowances for various areas.

When testing a wood floor for moisture, take multiple readings in the area where the floor will be installed. Sometimes one area of the floor will be within range while another area will not. Also,
pay attention to readings along exterior walls or near plumbing fixtures. Since these areas have the most potential for seepage, accurate readings are essential.

If your moisture readings are above the recommended 4% for flooring less than 3" wide or 2% for flooring over 3" wide, DO NOT install the hardwood floor. You must find the cause of the moisture and fix it before beginning the installation. Excessive moisture in wood subfloors may be caused by a plumbing leak or may be the result of the area under the wood subfloor being too moist.

✔️ **TIP:** Improper irrigation (such as sprinklers and gutters around the house) is one of the biggest causes for excessive moisture under a subfloor. Be sure all sprinklers and gutters have proper run off routes so water and excessive moisture does not collect below the home.

**Considerations for Wood Subfloors over Crawl Spaces**

If your home has wood floors over crawl spaces, pier and beam construction or is a manufactured home, you may have to take additional steps to control moisture below the wood subfloor. Check with your flooring manufacturer to see if any of the following conditions must be met:

- Opening all vents to ensure proper air circulation below the wood subfloor.
- Laying a 6-8 mil polyethylene moisture barrier or other waterproof underlayment on the ground beneath the wood subfloor.

✔️ **TIP:** When laying a moisture barrier on the ground, overlap seams and secure with waterproof tape (such as duct tape).

⚠️ **NOTE:** In areas with high rainfall (like the Pacific Northwest), some homeowners also install crawl space fans to help ensure their crawl spaces are kept dry and mold free.

**Testing Concrete Subfloors for Moisture**

Moisture testing for concrete subfloors is a little more complicated than for wood subfloors. There are three different types of tests you can perform.
Polyethylene Moisture Test
The Polyethylene Moisture test is an easy way to perform a moisture test on a slab that is at least 30 days old. Duct tape several 12 inch by 12 inch pieces of polyethylene in various places onto the concrete slab for 24-48 hours. A clear garbage bag or clear plastic sheeting works well. When taping, be sure the squares are taped all the way around so no air can escape. If after 24 to 48 hours any condensation forms on the plastic or if the concrete darkens, you must perform a Calcium Chloride and pH Alkalinity test. These results indicate that your subfloor may contain too much moisture to safely install your hardwood flooring. If neither of these things happens, the concrete subfloor is ready for your hardwood flooring.

NOTE: Even if you have a successful polyethylene test, you should consider a Calcium Chloride test to ensure it is safe to install your new hardwood floor.

Calcium Chloride and pH Alkalinity Test
Calcium Chloride and pH Alkalinity tests are far more accurate than the polyethylene test. Supplies can be purchased online or at stores that specializes in concrete tools and/or flooring. These tests measure the moisture emissions and the alkalinity of the concrete slab. Perform each test according to the manufacturer’s instructions. Acceptable readings for each are:

- Calcium Chloride = 3 lbs per 24 hours per 1,000 square feet of moisture emissions or 1.5 lbs per 24 hours per 1,000 square feet for radiant heat floors
- pH Alkalinity = 6 to 9 on a pH scale of 1-14

If either of these tests exceeds these recommended results, you should seal your concrete subfloor with an appropriate sealer which can be purchased at your local flooring retailer or any home improvement store. Once the sealer has cured, you should re-test to ensure moisture levels are within acceptable limits. If after sealing your concrete you are still having moisture issues, talk to a flooring professional for additional guidelines and testing procedures.

NOTE: Not all hardwood flooring can be installed directly over a concrete subfloor. Some require a plywood and polyfilm vapor barrier be attached to the slab. Always follow the manufacturer’s recommendations when installing over a concrete subfloor. If you are using a sealer, make sure that product will not interfere with the adhesive if you are using the glue down method. Remember: Hardwood should NEVER be installed directly over concrete without some sort of moisture barrier in place!
Getting Your Flooring Delivered

Once your subfloor passes all moisture testing, it's time to get your flooring delivered. Flooring should be at the installation site between 2 and 7 days before you begin your installation depending on your manufacturer's recommendations. Once delivered, your flooring needs time to acclimatize to your home's environment.

Acclimatizing Your Flooring

Most hardwood flooring needs an environment that is between 60° and 80° F with a relatively humidity of between 35% and 65%. Prior to installation, you must make sure the hardwood is acclimatized to your home’s average living environment. You should always store and acclimatize your hardwood in the room in which it will be installed.

Additionally, follow these guidelines when acclimatizing your new hardwood floor:

- The home or building must be fully enclosed. This is especially important when installing in newly built homes.

  □ NOTE: If installing on a concrete subfloor, the concrete must be at least 30 days old.

- Using either an air conditioner or furnace, keep the environment where the floor will be installed at a normal “living” level for at least five days. If the room is more moist, dry, hot or cold than normal, your floor may acclimatize incorrectly which could lead to expansion or contraction problems later on.

- Read and follow all the manufacturer’s guidelines for acclimatizing your new hardwood flooring. Not doing so may void the flooring manufacturer’s warranty.

- If recommended by the manufacturer, break the flooring into small piles in the center of the room where it will be installed. Place 1” sticks between each layer of flooring to help with air flow. Or simply open the ends of the package to allow air to flow more freely.

  ✔ TIP: If using 1” sticks to aid with air flow, place sticks carefully so you do not scratch the finish of your new hardwood.

  □ NOTE: Always follow the manufacturer’s guidelines for acclimatizing your flooring. Some flooring does NOT need to be removed from the packaging to acclimatize.

- If opening the package is not recommended by the manufacturer, stack cartons with spacers according to the manufacturer’s instructions.
• Always store hardwood flooring away from outside walls, windows, doors and air vents.
• NEVER store your new flooring in a garage, even if the garage is climate controlled. Even when climate controlled, garages have different moisture conditions than your installation area.
• Make sure your hardwood flooring is out of direct sunlight at all times.

**TIP:** Direct sunlight can cause your hardwood flooring to acclimatize incorrectly, warp and darken. If you’re using sticks to separate your hardwood flooring and the flooring is stored in direct sunlight, the hardwood may darken except where the sticks are placed leaving stripes. While many times these stripes may fade, play it safe and store your hardwood flooring away from of direct sunlight.

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**Moisture Testing your Hardwood Flooring**

Most manufacturers recommend moisture testing your hardwood flooring after it arrives and is acclimatized. Using either a probe or pinless meter, take moisture reading in several places. You should always test both edges of the hardwood flooring as well as the middle. Test various hardwood flooring planks in each box to ensure all of your flooring is within the manufacturer’s recommended limits.

**Inspecting Your Subfloor**

While your hardwood floor is acclimatizing, you should inspect and prepare your subfloor. Your subfloor should be:

• Dry and have passed all moisture testing requirements.
• Free from all debris and swept clean.
• Smooth and level. If the floor is not level, take the necessary steps to level the floor.
• Free from contaminants (such as oil, wax, grease and paint) which might interfere with the installation method.
• Structurally sound. Fix or replace any damaged areas. Nail or screw down any areas that are loose or where you feel movement.

Additionally, always make sure to follow all the manufacturer’s specific instructions for preparing your subfloor. Improperly prepared subfloors may void the flooring manufacturer’s warranty.
Leveling Your Subfloor

A level, or flat, subfloor is one that is free from peaks and valleys no matter how small. These imperfections can be caused by a number of things from the concrete slab not being perfectly flat or drywall splatters on the floor that were not scraped up. Whatever the cause, it’s your job to fix or remove the imperfections so the floor is completely flat.

Before you begin finding your imperfections, make sure the floor is scraped and swept clean of all drywall mud, paint splatters and any other debris.

Finding the Imperfections

The first step to leveling your subfloor is finding all the imperfections. Many manufacturers recommend that your subfloor not have a variance of more than 3/16” over a 10’ section of subfloor. An easy way to find imperfections in your subfloor for both concrete and wood subfloors is using an 8-10’ piece of straight lumber. While a perfectly straight piece of lumber may be hard to find, take the time to look. Unlevel subfloors can cause your new hardwood floor to squeak or have soft, squishy spots.

Start at one end of the room and lay the straightest side of the lumber down on the subfloor. From ground level look to see if there are any gaps between the lumber and the subfloor. Mark those with a pencil.

Next touch each end of the lumber. Does it rock or tip to one side? If there is any movement, find the high spot and mark it with a pencil. Make your way across the room with the lumber observing and marking the imperfections in the subfloor.

Leveling Low Spots in Concrete Subfloors

If you found dips in your concrete subfloor, use a self-leveling compound or floor patch to fix them. Self-leveling compounds are like quick-set concrete. DO NOT use regular cement products as they do not set and cure fast enough. Only use self-leveling compounds that indicate they have quick drying times and are made specifically for leveling subfloors underneath hardwood floors. These can be purchased at many flooring or home improvement stores.

⚠️ IMPORTANT: When using self-leveling compound, you must wait an additional 24-48 hours before installing your floor so you can perform the proper moisture tests on the newly leveled areas.
1. Prepare the self-leveling compound in a bucket following the manufacturer’s instructions. Mix the compound outside or in an area where it won’t matter if some splashes out of the bucket. Always follow the manufacturer’s instructions when mixing the compound. Some recommend adding the water after the compound is added while others recommend adding water before.

   ![NOTE: Because these products set so quickly, do not prepare the compound until you are ready to begin using it on your floor.]

   ![TIP: Mix only small batches of compound at a time so it does not dry before it is all used up.]

2. Mix the compound using a paddle-type drill attachment. These can be purchased at most home improvement stores. You want the mixture to be similar in consistency to a milkshake.

3. Place your straight piece of lumber at the edge of the place you will be leveling. Pour some of the leveling compound on the spot to be leveled. Use a trowel to fill in all the low areas. After you’ve spread the compound, quickly move the lumber across the area you just leveled to ensure it is flat. If it is not, add more compound. If the area is too high, quickly scrape away compound.

   ![TIP: This part of the process works best with two people – one person working with the compound and one person working with the straight lumber.]

4. Work quickly across the floor filling in all the low spots with compound and ensuring they are flat with the lumber.

   If you run out of compound, clean up the bucket and tools then mix another small batch.

5. Once all the low spots are filled, take your lumber and re-assess all newly leveled areas. If you find low areas, mix another batch of compound and add more to the top of the dried compound.

6. After the compound is completely dry and set, perform a polyethylene, Calcium Chloride and/or pH Alkalinity test on each newly leveled area. Follow all the same guidelines for this moisture test as you did when moisture testing the whole slab.
Leveling High Spots in Concrete Subfloors

Use a grinder or sander (which can be rented from an equipment rental store) to level high spots in concrete subfloors. When sanding high spots on the subfloor, wear a respirator so you do not inhale the concrete dust. You can also control dust by wetting the slab before you begin grinding. If you are working on an addition to a home, make sure everything is sealed tightly with plastic sheeting and taped completely shut. Cover and tape all AC intake vents so that concrete particles are not distributed throughout your home via the ventilation system.

**TIP:** Concrete dust will get everywhere (including closed cupboards or drawers) because the particles are so fine. Be sure to tape up everything tightly!

Place a box fan in a window so that the air from inside the home is pulled outward to help disperse the concrete dust.

Leveling a Wood Subfloor

Before you begin leveling, walk the subfloor and screw down any loose or squeaky places with coarse-headed screws. You should also consider screwing down high-traffic areas to help reinforce the floor and prevent squeaking down the road. Once everything is screwed down tightly, you’re ready to begin leveling the subfloor.

Leveling a wood subfloor can prove to be more challenging than concrete, especially if the wood subfloor is not flat because of high spots over joists (also called crowned joists). If the high spot over a crowned joist is relatively low, you may be able to sand down the subfloor above the joist enough to make it flat. If the crowned joist is high and there are very low areas between joists, you have a couple options.

Some professionals recommend using roofing shingles to help taper the areas between crowned joists. Layer shingles on top of each other in the low areas so they taper up to the crowned joist until the area is level and flat. If you are using a nail down installation, you can choose not to nail the shingles down as the nails/cleats you use for the flooring should penetrate the flooring as well as the shingles and subfloor. If you are using a floating installation, you should nail the shingles to the floor before you begin your installation. Do not use shingles to level a wood subfloor if you are using the glue down method.

**NOTE:** Make sure to check with your flooring manufacturer before using this method to ensure it will not void the warranty.
Other professionals recommend using a self-leveling compound to fix uneven wood subfloors. All the preparation, application and moisture testing steps are the same as for concrete subfloors.

If your floor has excess sagging, check below the subfloor. You may be able to correct some of the sagging by adding wood supports between the joists. You could then fix any further sagging with either shingles or self-leveling compound.

**Undercutting Door Casings**

Undercutting door casings is a relatively easy and elegant way to install your hardwood flooring around doors just like the pros do. You should undercut all door casings that will require the hardwood to be installed in or around them before beginning your installation. This ensures you do not have wood chips or saw dust in your installation area.

To undercut door casings, you’ll need a scrap piece of flooring, a pencil and your saw (a handsaw or special saw for cutting door jambs). Always use the finest blade possible so that the saw does not split or mar the trim. NEVER use a saws-all or skill saw as these saws may be difficult to control for these types of cuts.

1. Use the scrap piece of hardwood flooring to bring your saw up to the right height of the door casing. Make sure to account for your underlayment in the total height. Use a pencil to mark or draw a line at the top of the plank/underlayment. This is how much you’ll be cutting off the bottom of the door casing so that the flooring will fit underneath it.

2. Use the saw to cut the door casing along the line you drew. Keep your scrap piece of wood in place to ensure you make a straight cut.

Now when you reach a door casing, you can cut and place a plank under the casing and flush with the wall.

✔️ **TIP:** Be sure to leave some expansion/contraction room between the cut plank and the wall under the door casing. And always take your underlayment into consideration before making your cut.

**Removing Molding and Doors**

Remove all molding and baseboards in your installation area. If you want to on reuse the molding or baseboards remove carefully. Small nicks can be filled, sanded and painted over; however, pieces that are broken or have major damage will probably need to be replaced. Remove all doors as set aside.
UNDERSTANDING THE INSTALLATION BASICS

Flooring is one of the most used and viewed surfaces in your home. Especially if this is your first hardwood flooring installation, you should understand some of the fundamentals about installing and enjoying your new hardwood floor:

- Allow for Expansion and Contraction
- Always Use an Underlayment
- The First and Last Rows are the Foundation of a Great Floor
- Stagger Joints for a Natural Look
- Inspect All Planks before Installation
- More Tips for a Successful Installation

Allow for Expansion and Contraction

All natural hardwood floors experience some contraction and expansion because of the moisture content of the wood, environmental relative humidity and seasonal temperature and moisture fluctuations. These changes will happen even if you maintain consistent temperature levels with heating and air conditioning.

**Example:** One 3 inch wide flooring board may expand or contract 1/16” depending on the relative humidity fluctuations in the installation area. In extreme conditions, a floor installed over a ten foot wide or greater area may expand or contract up to 2½ inches.

The protective coatings on both engineered and solid hardwood floors do help slow this process somewhat, but they cannot eliminate it altogether. Engineered hardwood floors are almost always less susceptible to expansion and contraction compared to solid hardwood flooring. If you live in an area where this is a concern, consider installing an engineered hardwood flooring product. When installing hardwood floors, you must take this expansion and contraction into account and leave enough room around the perimeter of your floor. Don’t worry; you will not see this expansion/contraction space as is covered by moldings such as baseboards, base-shoe or quarter-round.

Most homeowners can leave a standard ½ inch around the perimeter of the room to allow for expansion and contraction. If you are flooring a large room, you may want to take the time to calculate the expansion rate more precisely. Talk to a flooring professional for more information on how you can specifically calculate your floor’s expansion rate for your area and climate.
If you do not leave an expansion perimeter, your floor will still go through the natural process of expanding and contracting. However, instead of expanding into the perimeter, the hardwood floor may begin to buckle or cup which will damage the boards and create an uneven floor.

**TIP:** Play it safe! Always leave an adequate expansion and contraction perimeter.

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**Always Use an Underlayment**

Underlayments are important for any hardwood floor. Underlayments help to protect the bottom of the hardwood from moisture as well as provide sound barriers and cushioning which improves the flooring’s durability. There are a number of hardwood underlayments on the market today. Always follow your flooring manufacturer’s recommendations when choosing and installing an underlayment.

**NOTE:** The “softness” of an underlayment is not the same for hardwood as it is for carpet. In most cases, doubling up foam for extra “softness or cushioning” is NOT recommended. The extra cushioning can create too much movement between the flooring joints which can cause board separation, floor squeaking or damage to the flooring.

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**Cork**

Cork is one of the most popular underlayments when it comes to sound control, moisture control and cushioning. Cork may be required in some buildings (such as condos or other high-rise residences) to help control sound between levels. Other homeowners choose cork because it is an excellent shock absorber and sound barrier. Since cork is a natural material, it controls moisture well since it is porous and “breathes.” Additionally, cork is an all-natural, renewable material.

A cork underlayment can be used for wood or concrete subfloors. Cork can be glued to the subfloor for glue down or nail/staple installations or not adhered to the floor for floating floor installations. Most manufacturers recommend that a sealer, plastic sheeting or other moisture underlayment be used in conjunction with cork for added moisture protection. Always follow your flooring manufacturer’s recommendations during installation. Cork underlayments come in a variety of thicknesses with the typical being ¼” and ½”.
Standard Foam

Standard foam underlayments provide minimal sound barriers and basic shock absorption between the subfloor and your hardwood floor. Standard foam does not provide a moisture barrier unless it has plastic sheeting adhered to one side of it. Most flooring professionals consider foam to be an entry-level underlayment. With that said, many homeowners choose foam because it is considerably cheaper than cork.

Foam underlayments can be used over both wood and concrete subfloors (although, concrete subfloors may require additional moisture barriers). Foam can be taped (using double-sided tape) for nail/staple installation. Foam can be laid down and not adhered to the subfloor for floating floor installations. Many manufacturers and professional installers do NOT recommend using foam for glue down installations. Instead, consider cork or an underlayment made specifically for glue down installations.

Foam underlayments also come in a variety of types and densities. Most manufacturers have their own brands of foam underlayments; however, almost all products provide the same basic benefits. Always check with your flooring manufacturer before purchasing your foam underlayment. Some manufacturers require that certain brands of foam be used so as not to void the warranty. Some professionals also use foam without a moisture barrier as an anti-slip underlayment which can make hardwood flooring easier to install.

Combination Foam/Film

Combination foam/film has all the same benefits of standard foam with the added feature of having a built-in moisture barrier. Combination foam/film can be used exactly the same way as standard foam.

Upgraded Foam Underlayments

Upgraded foam underlayments are a good compromise between cork and standard foam or combination foam/film. Upgraded foam is thicker and provides a better sound barrier since it’s made from high-density foam; however, it is still not as good as cork.

Upgraded foam can be used in the same areas as standard foam and combination foam. Some upgraded foam products come with built-in moisture barriers while others do not. Always check with your retailer before you purchase to ensure you get the correct type for your installation area.

Newer foam underlayments also have the unique ability to close around small holes for added moisture protection. For example, during a nail/staple down installation, a staple may perforate the underlayment. In most cases, this creates an area for moisture to seep into your hardwood floor. New foam products actually seal around the nail to protect your hardwood flooring from any future moisture.
Asphalt-Saturated and Asphalt-Laminated Felt Paper

Asphalt-Saturated and Asphalt-Laminated felt paper are used to help control moisture between the subfloor and your hardwood floor. These types of asphalt papers are cleaner and easier to work with than traditional asphalt roofing felt since the asphalt does not rub off. Traditional asphalt paper (roofing felt) or red rosin should NEVER be used according to the National Wood Flooring Association (NWFA). These types of papers do not provide adequate moisture protection for your hardwood floor.

If you choose asphalt paper, you should only use one that meets NWFA’s criteria:

- Asphalt-Laminated Paper: UU-B-790a, Grade B, Type 1, Style 1a
- Asphalt-Saturated Paper: #15 or #30 asphalt-saturated paper that meets ASTM Standard D-4869 or II0B-790, Grade D

Also remember that asphalt-saturated and asphalt-laminated papers are not acceptable for all climate conditions, hardwood flooring or installation methods. If you are using the glue down method, the asphalt may not be compatible with certain brands of adhesives. You should always check with your flooring manufacturer to ensure these types of underlayments can be used under your flooring for your climate area.

NOTE: Asphalt-Saturated and Asphalt-Laminated felt papers do not provide any padding or sound barrier.

Plastic Underlayment

Plastic underlayments are generally considered to be 6mm polyethylene/plastic sheeting. Many homeowners lay plastic sheeting between their subfloor and their underlayment (such as cork or foam) as an additional moisture barrier.

Plastic can be used for wood or concrete subfloors that will use a staple/nail down installation or for floating floors.

NOTE: Plastic does not provide any padding or sound barrier.
Kraft Paper or Roofing Felt

While Kraft paper, or roofing felt, is most often used for roofing houses, it can be used to help prevent moisture from seeping up from the subfloor. If using Kraft paper, always use an additional moisture barrier as Kraft paper will not completely protect your hardwood flooring from moisture. Most of the time, professional installers use Kraft paper as anti-slip paper for an easier installation.

Kraft paper can be used above wood subfloors in conjunction with another type of moisture barrier for glue or staple/nail down installations or for floating floors.

NOTE: Roofing felt does not provide any padding or sound barrier.

The First and Last Rows are the Foundation of a Great Floor

Before you lay your first hardwood plank, think about the first and last row of flooring. The first row is important because it provides a sturdy foundation for the floor. If there are problems with the starter row (such as it not being straight or not having the proper spacing from the wall), the rest of the floor may have the same problems.

The starter row should be parallel to the longest side of the room and should align with the incoming light from windows or doors. Many installers work from the left to right, but always do what is most comfortable for you. When complete, your hardwood floor should be square with the room. This is important for aesthetics and long-term stability.

The last row is important because it completes the floor and holds everything against the starter row. Additionally, the hardwood plank for the last row must often be cut widthwise to fit in the remaining space. Depending on the layout of the floor, a thin plank on one side of the room may look odd if the rest of the room has full size boards.
In order to avoid this issue, you can calculate the number of hardwood planks you’ll need to complete the whole floor.

1. Measure the room width.

2. Subtract the spacing width for expansion/contraction.

3. Divide the width of the room by the width of the hardwood plank.

   \[
   \text{Total Planks} = \frac{\text{Total room width} - \text{Expansion width}}{\text{Plank width}}
   \]

If your Total Planks is a whole number, you will not have to cut any hardwood planks for your first and last row. If your Total Planks is not a whole number, divide the remainder by 2 to determine the width for your first and last rows.

**Example:**

- **Total room width**: 132” (11’)
- **Minus expansion width**: 1” (1/2” on either side of the room)
- **Divided by plank width**: 3”

\[
\text{Total planks needed} = \frac{132” - 1”}{3”} = 43.66
\]

You need 43 full hardwood planks and one hardwood plank that is 2” wide. Since you have two rows that should be equal length, your first and last row planks would each be 1” wide. Thus you end up needing 43 full width planks and two 1” wide planks.

Remember, this is **NOT** the total amount of flooring you need. This is just the number of boards you’ll need for that section of your room. Always purchase 10-15% more flooring than you need to account for waste, mistakes and damaged boards.

**TIP:** Having the first and last row the exact same width is a personal preference. Most professionals agree that this only needs to be done if these two rows will be **VERY** different, such as the first row being 3” wide while the last row is 1” or less.
First and Last Row Exceptions
Rooms come in a variety of different sizes, shapes and degrees of straightness. If you are working along a wall that is not perfectly straight, it may be necessary to cut your hardwood plank to match the wall (also called scribe fitting). You can also use this method to work in odd shaped areas of the room. Always remember, the goal is to lay a straight, square floor even if the walls are not straight and square.

**TIP:** Inner walls tend to be straighter than outside walls.

The first and last row can also be tricky if your type of flooring has a minimum width for installation. Some hardwood flooring cannot be cut to small widths to accommodate equal first and last rows. In these cases, use your best judgment for installation. Or talk to a flooring professional. They may have simple, yet easy solutions for your specific situation.

**Stagger Joints for a Natural Look**
Staggering joints provides a more natural, stable and professional looking hardwood floor. Try to stagger end-joints in adjacent rows to be at least three times the width of the plank. Avoid H-joints unless absolutely necessary.

When installing your hardwood flooring, make sure that the length of each flooring plank is no shorter than 2 to 3 times the width of the plank. Following this width/length ratio helps ensure you do not use short flooring planks (which will cause your floor to look brick-like).

Also when you get to the end of a row, use the remainder of the plank to start the next row if it meets the manufacturer’s minimum length requirements (usually between 8-10 inches long). This also helps keep all joints staggered correctly from row to row.

**TIP:** Some professional’s layout the whole floor before beginning the installation. This helps them see the floor as it will look before it’s installed so they can make any adjustments to the joints and layout. If using this method, try not to walk or place tools on the hardwood to prevent breakage and surface damage.
Inspect All Planks before Installation

Like in nature, hardwood flooring varies greatly with regard to color and patterns. Each box of flooring may be slightly different. During your installation, always use planks from at least three different boxes at a time. Some installers recommend opening all packages and mixing up the hardwood flooring so that planks from each box are used throughout the entire floor.

NOTE: If you use this method, take care not to scratch any boards as you mix them up. Always follow your flooring manufacturer’s recommendations for storing your hardwood. Never store flooring by standing on end or by resting on either side.

Before you install each piece of hardwood, visually inspect the plank. Do not install any hardwood that has obvious defects. Remove or trim and use for starting rows.

More Tips for a Successful Installation

Keep these tips in mind as you install your new hardwood flooring:

- **Cutting Planks**: Always saw into the face or the top of the hardwood plank. Cutting into the finished side helps protect the surface from chips. Additionally, use a carbide tipped blade to ensure you make smooth cuts. If you use a miter saw, make sure the saw is up to speed before cutting your hardwood.

  TIP: Use blue painters tape to tape the area to be cut. This type of tape allows you to mark where you need to cut without writing directly on the flooring. Painters masking tape also helps protect the hardwood’s finish from splintering or fracturing during the cutting process. Before you begin cutting the actual lengths of flooring, experiment your cutting technique on pieces of scrap flooring to ensure you are cutting in a way that does not damage the hardwood.

- **Tapping Planks**: Always use a tapping block to move planks into position. Do not hit your hardwood flooring directly as it may fracture or damage the hardwood. A piece of trim or an extra, clean piece of flooring make good tapping blocks.

- **Ending Rows**: You may have to cut planks to fit at the end of each row. Use the remainder of that plank to begin the next row if it meets the minimum required length and allows for proper staggering.

- **Keeping the Installation Area Clean**: Sweep and vacuum to keep your installation area clean. Saw dust and wood chips produced during cutting can damage your floor’s finish or create an uneven subfloor.
- **Storing Tools during Installation:** Do not store your tools directly on your newly installed hardwood floor as they may scratch or damage the surface. Instead, place your tools on a piece of plywood, cardboard or clean cotton drop cloth. Never slide your tools across your bare hardwood floor.

- **Work from Left to Right:** Most installers and manufacturer’s recommend working from left to right as you install your flooring. Be sure to always work from the subfloor and NOT your newly installed hardwood floor during your installation.

- **Use Waste Planks:** You can use discolored or slightly damaged planks in areas such as closets or pantries where the color variations might not be noticed as much.
GLUE DOWN INSTALLATION

The glue down method is the simplest, yet messiest, way for a novice to install solid tongue and groove hardwood flooring over a concrete or wood subfloor. The glue down installation method is used most often for solid hardwood floors as opposed to engineered hardwood floors. Engineered floors can be glued down if you prefer that method over a floating floor. Always check with your flooring manufacturer to ensure the installation method you choose does not void your warranty.

Tools and Materials

While specialized tools (such as nail guns or staplers) are not needed, you will need the following:

- 4’ or 6’ level
- Adhesive remover (as recommended by your flooring manufacturer or a flooring professional)

**Tip:** If your adhesive manufacturer does not have any adhesive remover recommendations, you can use a clean rag with small amounts of mineral spirits. Use sparingly as too much mineral spirits can damage the hardwood’s finish. Always ensure you have proper ventilation when working with mineral spirits.

- Blue painters tape (to hold planks together without marring the finish)

**Tip:** Always test the tape on a piece of scrap flooring before using during your installation to ensure it does not damage the surface of your hardwood.

- Broom
- Carpenter’s square
- Chalk line
- Crow, pull bar and/or power bar
- Electric and/or hand saw and jig saw with a carbide tipped blade
- Flooring adhesive (as recommended by your flooring manufacturer or a flooring professional)
- Hammer
- Heavy items such as stacks of books, extra buckets of glue, etc (used to weigh down areas of the floor that do not sit level with the rest of the floor)
Notch Trowel: 3/16” square notch for planks less than 5”
1/4” square notch for 5” planks or wider

**NOTE:** Always follow the manufacturer’s instructions for the specific adhesive you choose to ensure you use the proper trowel for that product.

- Ratchet straps to hold flooring together while the adhesive dries (instead of painters tape; although painters tape is recommended for non-professional installers)
- Safety goggles and mask
- Soft rubber mallet
- Spacers for the expansion gaps around the perimeter of your floor (refer to your manufacturer’s guidelines for the proper width for your flooring)
- Tape measure
- Tapping block or clean piece of scrap wood
- Utility knife
- Utility towels (damp and dry)
- Any other tools recommended by the flooring manufacturer

**Types of Adhesives**

There are a number of quality adhesives on the market. When purchasing an adhesive, be sure to consider your flooring manufacturer’s recommendations. Always make sure the adhesive you choose is specifically designed for glued down hardwood flooring. In most cases, the adhesive will be a urethane-based product. **DO NOT use an adhesive that has water as an ingredient.** Some adhesives are designed to be applied to the tongue and groove while others are troweled on the subfloor. Always follow your flooring manufacturer’s instructions when choosing and applying an adhesive.

**TIP:** If you are NOT gluing the hardwood to the subfloor, you are installing a floating floor.

Currently, a couple good choices on the market are:

- Franklin 811 Plus
- Bostik’s Best or BST
When working with a floor adhesive, follow the flooring and adhesive manufacturer’s guidelines. Some flooring can be set into wet glue (wet set), which allows you to spread the glue in sections then lay down the flooring. Other adhesives have quicker drying times, so you must spread as you go. Additional recommendations may include things such as subfloor moisture rates, spread rates, trowel sizes and flash times.

**Installing the Underlayment**

Installing the underlayment is the first step in your flooring process. Acceptable underlayments for glue down installations include:

- Cork
- Underlayments made specifically for glue down installations
- Sealers

1. Lay out the underlayment above the subfloor. Follow the manufacturer’s instructions for attaching the underlayment to the sub floor. If the underlayment is not secured to your subfloor, ensure you are using the correct underlayment for a glue down installation method.

2. Trim all edges at the wall level using a utility knife.

**Installing the First Row**

Now that you’ve got your underlayment in place, you can begin installing your first row of hardwood flooring.

1. Starting on the longest wall, measure out from the wall in at least two places to allow for your expansion/contraction space. Mark each spot. Snap a chalk line across the marks to form a straight line.

![NOTE: Always follow your flooring manufacturer’s recommendations for the expansion/contraction spacing.](image-url)
2. Lay out the first row of hardwood flooring end to end with the groove toward the wall but DO NOT glue yet. Remember that not all walls are straight and square. Use a chalk line, level and blocks or wedges to help you get this first row completely straight. Cut planks where needed to ensure the floor is straight even if the walls are not.

If your first and last rows are less than a full plank width, cut all your first row planks to the correct width before laying out to evaluate the fit. (For more information, see The First and Last Rows are the Foundation of a Great Floor on page 32.)

3. Once you are satisfied with the fit of the first row, take apart and stack in the order they will be re-installed (the last board to be installed should be on the bottom of the stack).

4. Re-install the first row, applying the adhesive to the floor using a trowel. Squeeze the T&G together so they fit tightly. Immediately wipe away any adhesive that seeps up from the joint.

⚠️ CAUTION: Too much adhesive will interfere with the way the boards are manufactured, keeping them from fitting tightly together.

If your subfloor is wood, you can use small finishing nails to hold the first row in place, if necessary.

✔️ TIP: Once installation is complete, you can fill the nail holes with wood filler that matches the color/blend of your new floor.

5. Continue working your way across the floor installing the first row and placing spacers between the wall and the floor. Take time to measure with a tape measure and/or level every foot or so to ensure your expansion/contraction spacing is adequate and equal throughout the whole length of the first row.

Remember: Take more time with this first row as it is the foundation for the rest of the floor. Don’t forget to randomize hardwood planks across this first row to vary color differences.
6. When you get to the last hardwood plank in the first row, measure the size plank you need, factoring in adequate expansion/contraction space. Glue down the last piece in starter row. If necessary, use a pinch bar to help you maneuver the last plank of the first row into place between the wall. Place a spacer between the wall and the last plank that was installed. If the remainder of the hardwood plank you cut is 8" or longer, use it to start the next row.

✔️ **TIP:** Professionals recommend that any cut plank you use be 2 to 3 times the width of the flooring.

7. Use a tape measure and level to re-measure your starter row and expansion spacing. If you’re satisfied with the fit, let the first row set for 2-4 hours. If you’re not satisfied with the fit, remove and re-install the planks where necessary then let the floor set.

✔️ **TIP:** Even if you use finishing nails to help secure the first row, it is a good idea to let the first row set completely before installing the rest of the floor. If the first row is not set and stable, the pressure the rest of the floor puts on the first row could slowly push it out of alignment. If the first row becomes crooked, the rest of the floor will also be crooked.
Installing the Rest of the Floor

Once your starter row is done, the rest of your hardwood floor will begin taking shape.

1. Use a short or partial plank to begin of your second row. This ensures the plank joints are staggered. (Always stagger joints 6” or more for maximum stability and a more professional look.)

   Trowel a layer of adhesive. Lay the new hardwood plank on the floor and fit the long T&G edge and the short (end joint) T&G edge together. Gently tap the boards together using a tapping block to ensure a tight fit. Tape with blue painters tape or strap together, if necessary.

   ✔ TIP: Follow the manufacturer’s recommendations for troweling out adhesive. If you spread out too much glue, it could dry before you get to install that part of the floor. This will waste adhesive and could cause your subfloor to become uneven.

2. Continue working across the floor from left to right, spreading adhesive and fitting the hardwood together along each row.

   Remember to:
   o Use hardwood from multiple packages to vary colors throughout your floor.
   o Install spacers along all walls at the recommended intervals.
   o Stagger joints so the floor has a random pattern.
   o Stop to measure to ensure the floor is going down straight and level.
   o Gently tap boards together using a tapping block. Do not hammer the planks directly. Always tap the tongue and not the groove. Do not hammer the face of a plank (even with a rubber mallet) as it may damage the finish.
   o Do not trowel more adhesive than you need.
   o Immediately wipe away any excessive adhesive.
   o If the adhesive dries on the floor before you install the hardwood flooring, scrape up then reapply to ensure the subfloor stays level.
   o Weight down areas of concern as you move across the floor (such as areas where the flooring is not firmly in contact with the subfloor).
Installing the Last Row

Your floor is almost complete and ready for the last row.

1. Measure in at least two places the space you have left between the wall and the edge of the new floor. Mark each spot. Subtract your expansion/contraction space. This measurement should be close to the width of your first row (if you cut the first row to be approximately the same width as your last row).

   Snap a chalk line across the marks to form a straight line.

2. Roughly layout the hardwood to identify how many boards you will need to complete the last row. Cut all boards to the correct width.

3. Lay out the last row of hardwood flooring end to end with the tongue toward the wall but DO NOT glue yet. Remember that not all walls are straight and square. Like with your first row, cut planks where needed to ensure the floor is straight even if the walls are not.

4. Once you are satisfied with the fit of the last row, take apart and stack in the order they will be re-installed (the last board to be installed should be on the bottom of the stack).

5. Re-install the last row, applying adhesive where necessary. Use a pull bar to squeeze planks together so they fit tightly. Immediately wipe away any adhesive that seeps from the joint. Place spacers between the wall and the last row of flooring.

   If your subfloor is wood, you can use small finishing nails to hold the last row in place, if necessary. You may be able to use blue painters tape as an alternative to nailing; however, painters tape may not work in all situations.

6. Continue working your way across the floor installing the last row. Take time to measure with a tape measure and/or level every foot or so to ensure your expansion/contraction spacing is adequate and equal throughout the whole length of the last row.

   Like with the first row, take more time with the last row as it is holds the rest of the floor against the first row.

7. Once all planks are installed, use a tape measure and level to re-measure your last row and expansion spacing. If you’re satisfied with the fit, your floor is almost complete!

   If you’re not satisfied with the fit, remove and re-install the planks where necessary.
**Rolling the Floor**

Some adhesive manufacturers recommend rolling the newly installed hardwood floor with a 100 lb to 150 lb roller. Rolling the floor while it is still tacky helps to ensure there is full contact between the new floor and the adhesive as well as levels out any adhesive pockets under the hardwood.

Follow the adhesive and flooring manufacturer’s guidelines for rolling floors. Some recommend rolling at set intervals during the installation while others may leave rolling for the end.

For many non-professional installers, rolling the floor is not practical. Instead, some professional installers place weights on the newly installed hardwood floor as they are working their way across the room. Weighting the floor, like rolling, helps the adhesive form a bond with the flooring and the subfloor. Weights can be buckets of glue, bags of sand or unused boxes of flooring. ALWAYS place these items on cardboard or plastic to protect your new hardwood floor from denting and scratching.

**Letting the Floor Set**

Most adhesives take between 8 and 24 hours to fully set. During this setting time, no one should walk, move or place anything upon the newly installed hardwood floor. All spacers must be left in place during the setting time. Removing spacers could cause the floor to expand and set improperly.
NAIL/STAPLE DOWN INSTALLATION

The nail or staple down method is the installation method most professionals use to install solid tongue and groove hardwood flooring over a wood subfloor. The nail/staple down method can also be used above a sleeper system for radiant heating.

The nail/staple down installation method is used most often for solid hardwood floors as opposed to engineered hardwood floors; however, this method can be used for engineered non-click lock hardwood flooring systems if approved or recommended by the flooring manufacturer. If using the nail/staple method above a radiant heating system, make sure your fasteners will not puncture the heating elements under the subfloor.

Tools and Materials

You will need the following tools and materials:

- 4’ or 6’ level
- A punch to drive a nail/staple in completely
- Broom
- Carpenter’s square
- Chalk line
- Crow bar, pull bar and/or power bar
- Electric and/or hand saw and jig saw with a carbide tipped blade
- Electric drill (for pre-drilling holes)
- Hammer
- Nail or staple gun
- Nails or staples
- Pliers (such as needle-nose) to remove a nail/staple that did not go in completely
- Safety goggles and mask
- Soft rubber mallet and/or white tipped mallet
- Spacers (refer to your manufacturer’s guidelines for the proper width for your flooring)
- Tape measure
- Tapping block or clean piece of scrap wood
- Utility knife
- Wire cutters to cut the head of a nail/staple that is partially exposed
- Any other tools recommended by the flooring manufacturer
**Fasteners Types and Fastening Machines**

There are a variety of nail guns, staple guns and supplies on the market for installing hardwood floors. The following are a few options to consider.

**NOTE:** Be sure to follow your flooring manufacturer’s recommendations when choosing a nail or staple as different floors and planks widths require different supplies.

**Fastener Types**

There are two types of fasteners recommended for nail/staple down installations: cleats (a specific type of flooring nail) and staples. Always follow the flooring and fastening device manufacturer’s recommendations when choosing a type of fastener for your floor as cleat/staple length varies. Most manufacturers recommend using staples over cleats when using the nail/staple down method for hardwood flooring.

**Types of Fastening Devices**

There are two types of fastening machines on the market: manual and pneumatic. Manual fastening devices rely on springs to provide enough force to push the nail or staple into the flooring. Pneumatic fasteners use air pressure supplied by an air compressor to set the nail or staple into the flooring. Pneumatics’ are much easier to use and recommended for the novice installer.

When working with manual fastening devices, make sure you’ve selected the proper plate size for the width and style of the flooring you are installing. Nail plates are designed to position the staple at the angle needed to install the hardwood while not touching (and scratching) the flooring. Plates are usually designed based on the height of the flooring (3/4”, ½”, etc.). Using the wrong plate size can cause major damage to the hardwood because the staple will not go in at the correct angle or the plate will scratch the wear layer during installation.

Both types of devices come as either top nailer or an angled nailer (also called blind nailing). Top nailers are set flush to the top of a board and push the staple through the hardwood to the subfloor. Top nailers are usually only used to secure the first and last row of hardwood since the staple hole is visible and must be filled or covered by molding. Top nailing can also be accomplished with a standard hammer and nails.

Angled nailers have a different type of head that sits flush with the hardwood at an angle. This allows the staple to be placed precisely in the tongue of the hardwood flooring. Angle nailers are used for the rest of the floor because they do not damage the top of the hardwood while securely fastening it to the subfloor.
When working with pneumatic fastening devices, always choose the correct adapters and pressure settings (usually between 70-80 PSI). Always test the pressure and staple type on a scrap piece of hardwood flooring BEFORE you start your installation. The proper pressure may vary depending on the fastener, the nailing device and the brand flooring being used.

If selected correctly, the device will set the staple properly in the nail pocket (the space between the tongue and the main part of the plank). Too little or too much pressure may improperly set the staple in the nail pocket which could cause too much space between planks.

For both manual and pneumatic fastening devices, always place the stapler/nailer flat against the hardwood to prevent damage. The device should engage at the top of the plank at the appropriate angle over the tongue. Additionally, the plate should be covered with felt or plastic to prevent damage to your flooring.

✔️ **TIP:** Following these guidelines can help reduce the likelihood that your finished hardwood floor will squeak. Squeaking can be caused by improper installation techniques, but is also a product of changing environmental conditions. Most squeaking is the result of improperly installed subfloors.

If you need to remove a side nailed staple from a hardwood plank, pull it out from the tongue at the front of the board with the pressure from the device directed at the subfloor. Do not pull the staple straight up from the tongue or you will damage the surface of your hardwood flooring. In some instances, you can use a hammer and a punch to knock the staple though the flooring or push it out the other way so that it will not affect the fit between the tongue and groove of the next hardwood flooring board.
Installing the Underlayment

Installing the underlayment is the first step in your flooring process. Acceptable underlayments for nail/staple down installations include:

- Cork
- Standard Foam
- Combination Foam/Film
- Upgraded Foam
- Sealers

1. Lay out the underlayment above the subfloor. Follow the manufacturer's instructions for attaching the underlayment to the floor.

2. Trim all edges at the wall level using a utility knife.

Installing the First Row

Now that you’ve got your underlayment in place, you can begin installing the first row of hardwood flooring. If you are installing your flooring on a plywood subfloor over a concrete subfloor, make sure to choose the proper staple length. If the staple is too long, it will penetrate through the plywood subfloor into the concrete. The staple will then transfer sound from your hardwood floor through the subfloor to the concrete.

Fasten along the tongue of each piece of flooring at the appropriate intervals:

- 3-4” for staples
- 4-6” for cleats
- Within 1-2” of end joints

If you live in an area with high humidity, consider fastening more often than these guidelines. However, do not fasten too closely together or the tongues and boards may begin to split.

Always make sure the nails or staples are set properly into the hardwood before beginning any new rows. This ensures the tongues and grooves fit tightly together and also helps prevent the hardwood from splitting because of uneven pressure.
1. Starting on the longest wall, measure out from the wall in at least two places to allow for your expansion/contraction space. Mark each spot. Snap a chalk line across the marks to form a straight line.

   ![NOTE: Always follow your flooring manufacturer’s recommendations for expansion/contraction spacing.]

   ![TIP: The longest wall should be perpendicular to the floor joists for maximum stability.]

2. Lay out the first row of flooring end to end with the groove toward the wall but DO NOT fasten yet. When arranging, make sure the tongue is facing out as you will be fastening the tongue to the subfloor. NEVER nail or staple through the groove!

   Remember that not all walls are straight and square. Use a chalk line, level and blocks or wedges to help you get this first row completely straight. Cut planks where needed to ensure the floor is straight even if the walls are not.

   If your first and last rows are less than a full plank width, cut all your first row planks to the correct width before laying out to evaluate the fit. (For more information, see The First and Last Rows are the Foundation of a Great Floor on page 32.)

3. Once you are satisfied with the fit of the first row, take apart and stack in the order they will be re-installed (the last board to be installed should be on the bottom of the stack).

4. Re-install the first row, top-nailing to hold the hardwood in place. Once installation is complete, fill the nail holes with wood filler that matches the color/blend of your new floor.

   ![TIP: Top nailing should only be used around the perimeter of a floor. This method provides a very sturdy frame for the flooring, but mars the top of the plank. Top nailing only along the perimeter of the floor keeps the aesthetic flaws to a minimum while not compromising the stability of the new hardwood floor.]
5. Continue working your way across the floor installing the first row and placing spacers along the walls. Take time to measure with a tape measure and/or level every foot or so to ensure your expansion/contraction spacing is adequate and equal throughout the whole length of the first row.

Remember: Take more time with this first row as it is the foundation for the rest of the floor. Don’t forget to randomize boards across this first row for a natural looking hardwood floor.

6. When you get to the last plank in the first row, measure the size plank you need, factoring in adequate expansion/contraction space. Top nail the last piece in the starter row. Place a spacer between the wall and the last plank that was installed.

If the remainder of the hardwood board you cut is 8” or longer, use it to start the next row.

✔ **TIP:** Professionals recommend that any cut plank you use be 2 to 3 times the width of the flooring.

7. Use a tape measure and level to re-measure your starter row and expansion spacing. If you’re satisfied with the fit, you’re ready to continue installing your hardwood floor.

If you’re not satisfied with the fit, remove and re-install the planks where necessary.

**Installing the Rest of the Floor**

Once your starter row is done, the rest of your hardwood floor will begin taking shape.

1. Use a short or partial hardwood plank to begin your second row. (Always stagger joints 6” or more for maximum stability and a more professional look.)

   Gently tap the boards together using a tapping block to ensure a tight fit. Blind nail the hardwood to the floor with an angled nailer/stapler.
2. Continue working across the floor from left to right, fitting the hardwood planks together and blind nailing along each row.

Remember to:

- Face the tongues out on all rows so that you can easily fasten to the subfloor. NEVER nail or staple through the groove.
- Fasten appropriately:
  - 3-4” for staples
  - 4-6” for cleats
  - Within 1-2” of end joints
- Use hardwood boards from multiple packages to vary colors throughout your floor.
- Install spacers along all walls at the recommended intervals.
- Stagger joints so the floor has a random pattern.
- Stop and measure to ensure the floor is going down straight and level.
- Gently tap boards together using a tapping block. Do not hammer the planks directly. Always tap the tongue and not the groove. Do not hammer the face of a plank (even with a rubber mallet) as it may damage the finish.

**Installing the Last Few Rows**

Your floor is almost complete. You’ll install the last few rows of your hardwood a little differently since your nailer may not fit between your flooring and the wall.

1. When you get approximately 5 to 6 rows from the wall, begin using a white tipped mallet (which will not leave a mark on the wall) to move the hardwood into place.

2. When you get approximately 3 rows from the wall, your nailer may not fit between the wall and the floor. Continue laying your hardwood and use a power bar to wedge each piece into place. With your white tipped mallet, strike to ensure the wood is flat and the tongues and grooves are tight. You will not nail these two or three rows together so you must ensure the flooring is fit tightly together.

3. When you get to the last row, measure in at least two places the space you have left between the wall and the edge of the new floor. Mark each spot. Subtract your expansion/contraction space. This measurement should be close to the width of your first row (if you cut the first row to be approximately the same width as your last row).

   Snap a chalk line across the marks to form a straight line.
4. Roughly layout the hardwood to identify how many boards you will need to complete the last row. Cut all boards to the correct width.

5. Lay out the last row of hardwood flooring end to end with the tongue toward the wall but DO NOT nail yet. Remember that not all walls are straight and square. Like with your first row, cut planks where needed to ensure the floor is straight even if the walls are not.

6. Once you are satisfied with the fit of the last row, take apart and stack in the order they will be re-installed (the last board to be installed should be on the bottom of the stack).

7. Re-install the last row by top nailing (like what you did for the first row). Place a spacer between the wall and the last row of flooring. Use a power bar and white tipped mallet to place and fit the flooring tightly together.

   **NOTE:** When you nail the last row, the nails will be holding the last several rows in place. Be sure all these rows are fit together tightly. Consider adding a few extra nails on the last row to ensure a tight, long-lasting fit.

8. Continue working your way across the floor installing the last row. Take time to measure with a tape measure and/or level every foot or so to ensure your expansion/contraction spacing is adequate and equal throughout the whole length of the last row.

   Like with the first row, take more time with the last row as it holds the rest of the floor against the first row.

9. Once all hardwood planks are installed, use a tape measure and level to re-measure your last row and expansion spacing. If you’re satisfied with the fit, your floor is complete!

   If you’re not satisfied with the fit, remove and re-install the planks where necessary.

**Letting the Floor Set**

Unlike with the glue down method, a nail/staple down installation does not need any time to set. Once the last row is installed, you can begin using your new hardwood floor.
FLOATING INSTALLATION FOR CLICK LOCK FLOORING

Click lock engineered hardwood flooring is installed using a floating floor installation method above a wood or concrete subfloor.

Tools and Materials

You will need the following tools and materials:

- 4’ or 6’ level
- Broom
- Carpenter’s square
- Chalk line
- Crow, pull and/or power bar
- Electric and/or hand saw and jig saw with a carbide tipped blade
- Hammer
- Safety goggles and mask
- Soft rubber mallet
- Spacers (refer to your manufacturer’s guidelines for the proper width for your flooring)
- Tape measure
- Tapping block or clean piece of scrap wood
- Utility knife
- Any other tools recommended by the flooring manufacturer

Installing the Underlayment

Installing the underlayment is the first step in your flooring process. Acceptable underlayments for floating click lock installations include:

- Cork
- Standard Foam
- Combination Foam/Film
- Upgraded Foam
- Plastic Sheeting

1. Lay out the underlayment above the subfloor. Follow the manufacturer’s instructions for attaching the underlayment to the floor.

2. Trim all edges at the wall level using a utility knife.
Installing the First Row

Now that you’ve got your underlayment in place, you can begin installing your first row of hardwood flooring.

**IMPORTANT:** There are a variety of click lock flooring styles that vary by manufacturer. ALWAYS follow the instructions provided by your flooring manufacturer when installing a click lock floor. Only use these instructions as a reference if your manufacturer did not provide their own installation instructions or if your manufacturer’s instructions are vague.

1. Starting on the longest wall, measure out from the wall in at least two places to allow for your expansion/contraction space. Mark each spot. Snap a chalk line across the marks to form a straight line.

   **NOTE:** Always follow your flooring manufacturer’s recommendations for the expansion/contraction spacing.

2. Lay out the first row of flooring end to end with the groove toward the wall but DO NOT click together yet. Remember that not all walls are straight and square. Use the chalk line, a level and blocks or wedges to help you get this first row completely straight. Cut hardwood planks where needed to ensure the floor is straight even if the walls are not. If your first and last rows are less than a full plank width, cut all your first row planks to the correct width before laying out to evaluate the fit. (For more information, see The First and Last Rows are the Foundation of a Great Floor on page 32.)

3. Once you are satisfied with the fit of the first row, take apart and stack in the order they will be re-installed (the last board to be installed should be on the bottom of the stack).

4. Re-install the first row, clicking and locking the hardwood into place.

5. Continue working your way across the floor installing the first row and placing spacers along the walls. Take time to measure with a tape measure and/or level every foot or so to ensure your expansion/contraction spacing is adequate and equal throughout the whole length of the first row.

   Remember: Take more time with this first row as it is the foundation for the rest of the floor. Don’t forget to randomize hardwood across this first row to provide a natural looking floor.
6. When you get to the last plank in the first row, measure and cut the size plank you need, factoring in adequate expansion/contraction space. Click and lock the last piece in starter row. Place a spacer between the wall and the last plank that was installed. If the remainder of the plank you cut is 8” or longer, use it to start the next row.

✔️ **TIP:** Professionals recommend that any cut plank you use be 2 to 3 times the width of the flooring.

7. Use a tape measure and level to re-measure your starter row and expansion spacing. If you’re satisfied with the fit, you’re ready to continue installing your floor. If you’re not satisfied with the fit, remove and re-install the planks where necessary.

**Installing the Rest of the Floor**

Once your starter row is done, the rest of your hardwood floor will begin taking shape.

1. Use a short or partial hardwood plank to begin your second row. (Always stagger joints 6” or more for maximum stability and a more professional look.)

   Gently tap the boards together using a tapping block to ensure a tight fit. Click and lock the plank to the first row.

2. Continue working across the floor from left to right, fitting and locking the hardwood together along each row.

Remember to:

- Use hardwood from multiple packages to vary colors throughout your floor.
- Install spacers along all walls at the recommended intervals.
- Stagger joints so the floor has a random pattern.
- Stop and measure to ensure the floor is going down straight and level.
- Gently tap boards together using a tapping block. Do not hammer the planks directly. Always tap the tongue and not the groove. Do not hammer the face of a plank (even with a rubber mallet) as it may damage the finish.
Installing the Last Row

Your hardwood floor is almost complete and ready for the last row.

1. Measure in at least two places the space you have left between the wall and the edge of the new floor. Mark each spot. Subtract your expansion/contraction space. This measurement should be close to the width of your first row (if you cut the first row to be approximately the same width as your last row).

   Snap a chalk line across the marks to form a straight line.

2. Roughly layout the hardwood boards to identify how many you will need to complete the last row. Cut all boards to the correct width.

3. Lay out the last row of flooring end to end with the tongue toward the wall but DO NOT lock together yet. Remember that not all walls are straight and square. Like with your first row, cut planks where needed to ensure the floor is straight even if the walls are not.

4. Once you are satisfied with the fit of the last row, take apart and stack in the order they will be re-installed (the last board to be installed should be on the bottom of the stack).

5. Re-install the last row. Place a spacer between the wall and the last row of flooring.

6. Continue working your way across the floor installing the last row. Take time to measure with a tape measure and/or level every foot or so to ensure your expansion/contraction spacing is adequate and equal throughout the whole length of the last row.

   Like with the first row, take more time with the last row as it is holds the rest of the floor against the first row.

7. Once all planks are installed, use a tape measure and level to re-measure your last row and expansion spacing. If you’re satisfied with the fit, your floor is complete!

   If you’re not satisfied with the fit, remove and re-install the planks where necessary.

Letting the Floor Set

Unlike with the glue down method, a click lock hardwood installation does not need any time to set. Once the last row is installed, you can begin using your new hardwood floor.
FLOATING INSTALLATION FOR ENGINEERED FLOORING

Engineered tongue and groove hardwood flooring is most often installed as a floating floor above a concrete or wood subfloor or above radiant heating systems (if approved by the flooring manufacturer). Floating installations are not recommended if using 3/8” engineered hardwood flooring. While some manufacturers allow this type of installation, be sure to verify that this installation method will not void the manufacturer’s warranty.

**IMPORTANT:** Do not install solid hardwood flooring using the floating floor method unless specifically approved by your flooring manufacturer.

**Tools and Materials**

While specialized tools (such as nail guns or staplers) are not needed, you will need the following:

- 4’ or 6’ level
- Adhesive remover (as recommended by your flooring manufacturer or a flooring professional)
- Broom
- Carpenter’s square
- Chalk line
- Crow, pull and/or power bar
- Electric and/or hand saw and jig saw with a carbide tipped blade
- Hammer
- Safety goggles and mask
- Soft rubber mallet
- Spacers (refer to your manufacturer’s guidelines for the proper width for your flooring)
- Tape measure
- Tapping block or clean piece of scrap wood
- Tongue and groove flooring adhesive (as recommended by your flooring manufacturer or a flooring professional)
- Utility knife
- Utility towels (damp and dry)
- Any other tools recommended by the flooring manufacturer
**Types of Adhesives**

There are a number of quality adhesives on the market. When purchasing an adhesive, be sure to consider your flooring manufacturer’s recommendations. Always make sure the adhesive you choose is specifically designed for installing a floating hardwood floor. In most cases, the adhesive will be a urethane-based product. **DO NOT use an adhesive that has water as an ingredient.**

For floating hardwood floors, you should choose an adhesive that is designed to be applied to the tongue and groove NOT one that needs to be troweled on the subfloor. Always follow your flooring manufacturer’s instructions for choosing and applying an adhesive.

✔ **TIP:** If you are gluing the flooring to the subfloor, you are NOT installing a floating floor.

When working with a floor adhesive, follow the flooring and adhesive manufacturer’s guidelines.

**Installing the Underlayment**

Installing the underlayment is the first step in your flooring process. Acceptable underlayments for floating installations include:

- Cork
- Standard Foam
- Combination Foam/Film
- Upgraded Foam
- Plastic Sheeting

1. Lay out the underlayment above the subfloor. Follow the manufacturer’s instructions for attaching the underlayment to the floor, if necessary.

2. Trim all edges at the wall using a utility knife.
Installing the First Row

Now that you’ve got your underlayment in place, you can begin installing your first row of hardwood flooring.

1. Starting on the longest wall, measure out from the wall in at least two places to allow for your expansion/contraction space. Mark each spot. Snap a chalk line across the marks to form a straight line.

   **NOTE:** Always follow your flooring manufacturer’s recommendations for expansion/contraction spacing.

2. Lay out the first row of flooring end to end with the groove toward the wall but DO NOT glue yet. Remember that not all walls are straight and square. Use a chalk line, level and blocks or wedges to help you get this first row completely straight. Cut planks where needed to ensure the floor is straight even if the walls are not.

   If your first and last rows are less than a full plank width, cut all your first row planks to the correct width before laying out to evaluate the fit. (For more information, see The First and Last Rows are the Foundation of a Great Floor on page 32.)

3. Once you are satisfied with the fit of the first row, take apart and stack in the order they will be re-installed (the last board to be installed should be on the bottom of the stack).

4. Re-install the first row, applying adhesive along the entire top of the tongue of the installed plank and on the bottom of the groove of the plank to be installed. Squeeze hardwood boards together so they fit tightly. Immediately wipe away any adhesive that seeps from the joint.

   **CAUTION:** Too much adhesive will interfere with the way the boards are manufactured, keeping them from fitting tightly together.

5. Continue working your way across the floor installing the first row and placing spacers along the walls. Take time to measure with a tape measure and/or level every foot or so to ensure your expansion/contraction spacing is adequate and equal throughout the whole length of the first row.

   Remember: Take more time with this first row as it is the foundation for the rest of the floor. Don’t forget to randomize hardwood across this first row to provide a natural looking floor.
6. When you get to the last plank in the first row, measure the size plank you need, factoring in adequate expansion/contraction space. Glue down the last piece in the starter row. If necessary, use a pinch bar to install the last plank in the first row. Place a spacer between the wall and the last plank that was installed.

If the remainder of the hardwood you cut is 8” or longer, use it to start the next row.

✔ TIP: Professionals recommend that any cut plank you use be 2 to 3 times the width of the flooring.

7. Use a tape measure and level to re-measure your starter row and expansion spacing. If you’re satisfied with the fit, you’re ready to continue installing your floor.

If you’re not satisfied with the fit, remove and re-install the planks where necessary.

**Installing the Rest of the Floor**

Once your starter row is done, the rest of your hardwood floor will begin taking shape.

1. Use a short or partial hardwood plank to begin your second row. (Always stagger joints 6” or more for maximum stability and a more professional look.)

Adhere the long and short edges of the planks together with the adhesive. Gently tap the boards together using a tapping block to ensure a tight fit.

2. Continue working across the floor from left to right, securing the hardwood together with the adhesive along each row.

Remember to:

- Use hardwood from multiple packages to vary colors throughout your floor.
- Install spacers along all walls at the recommended intervals.
- Stagger joints so the floor has a random pattern.
- Stop and measure to ensure the floor is going down straight and level.
- Gently tap boards together using a tapping block. Do not hammer the planks directly. Always tap the tongue and not the groove. Do not hammer the face of a plank (even with a rubber mallet) as it may damage the finish.
- Immediately wipe away any excessive adhesive.

**Installing the Last Row**

Your hardwood floor is almost complete and ready for the last row.
1. Measure in at least two places the space you have left between the wall and the edge of the new floor. Mark each spot. Subtract your expansion/contraction space. This measurement should be close to the width of your first row (if you cut the first row to be approximately the same width as your last row).

   Snap a chalk line across the marks to form a straight line.

2. Roughly layout the hardwood to identify how many you will need to complete the last row. Cut all boards to the correct width.

3. Lay out the last row of flooring end to end with the tongue toward the wall but DO NOT glue yet. Remember that not all walls are straight and square. Like with your first row, cut planks where needed to ensure the floor is straight even if the walls are not.

4. Once you are satisfied with the fit of the last row, take apart and stack in the order they will be re-installed (the last board to be installed should be on the bottom of the stack).

5. Re-install the last row, applying adhesive where necessary. Use a pull bar to squeeze planks together so they fit tightly. Immediately wipe away any adhesive that seeps from the joint. Place spacers between the wall and the last row of hardwood flooring.

   If your subfloor is wood, you can use small finishing nails to hold the last row in place, if necessary.

6. Continue working your way across the floor installing the last row. Take time to measure with a tape measure and/or level every foot or so to ensure your expansion/contraction spacing is adequate and equal throughout the whole length of the last row.

   Like with the first row, take more time with the last row as it is holds the rest of the floor against the first row.

7. Once all hardwood planks are installed, use a tape measure and level to re-measure your last row and expansion spacing. If you’re satisfied with the fit, your floor is almost complete!

   If you’re not satisfied with the fit, remove and re-install the planks where necessary.

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**Letting the Floor Set**

Most adhesives take between 8 and 24 hours to fully set. During this setting time, no one should walk, move or place anything upon the newly installed hardwood floor. All spacers must be left in place during the setting time. Removing spacers could cause the floor to expand and set improperly.
SPECIAL CIRCUMSTANCE INSTALLATION

In almost every flooring installation, you are going to run into areas that require special attention. In this section, we’ll discuss:

- Types of Trim, Molding, and Transition Pieces
- Molding Installation Methods
- Using T-Molding for Interior Doorways
- Using End Molding for Exterior Doorways
- Working around Vents
- Installing Hardwood Flooring on Stairs
- Working around Fireplaces and Brickwork
- Using End Molding for Carpet Transitions
- Using Flush Reducer for Vinyl Transitions
- Using Overlap Reducer for Vinyl Transitions

**Types of Trim, Molding, and Transition Pieces**

There are a variety of trim, molding and transition pieces to help you when working around doorways, stairs or between different types of flooring.

- **T-Molding:** This molding is used between hardwood floors and exterior doorway thresholds.
- **Overlap Reducer:** This transition piece is used to join floating hardwood floors to flooring that is a different height such as vinyl, tile or carpeting.
- **Overlap Stair Nose:** This transition piece is used in on steps to provide the proper overhang from a floating hardwood floor to flooring surface on a lower level.
- **Flush Reducer:** This transition piece is used to join glue or nail/staple down hardwood floors to flooring that is a different height such as vinyl, tile or carpeting.
- **Flush Stair Nose:** This transition piece is used on stairways or steps to provide the proper overhang from one level to the next.
- **End (or Threshold) Molding:** A type of floor trim used to separate and transition between carpet, fireplaces, sliding doors or any other outside door jamb. End molding is
also used around brickwork. (Also called, medium threshold or baby threshold depending on the profile height.)

- **Wall Base:** This molding is placed along the bottom of the wall above the flooring to hide the expansion/contraction space as well as to give the room a finished look. Wall base can also be used under cabinets.

- **Quarter Round:** This molding is placed along wall base above the flooring to help hide the expansion/contraction space as well as to give the room a finished look. It can also be used under cabinets if wall base is too large or at the bottom of stairs for aesthetics.

Like with your flooring, molding comes in a variety of natural color variations. When choosing your molding, be sure to match the color and grain to your hardwood floor. Prior to installation, choose the pieces of molding you want to install and compare them to the coloring in the floor. Install moldings that are complimentary to the flooring color variations in each installation area.

### Molding Installation Methods

Moldings and trim can be installed two different ways:

- **Using adhesive.** With this method, you glue the molding to the subfloor (or in some cases to the flooring) using a non-water based adhesive. This is the easiest and most common way most molding and trim is installed around hardwood floors.

  [NOTE: This manual provides instructions for installing molding and trim with adhesive.]

- **Using trim tracks.** With this method you nail or screw a trim track to the subfloor then slide and lock the molding into place over the track. The following steps provide a basic overview of how to install molding using trim tracks.

  1. Measure your molding.

  2. Position the molding approximately where you want to install it.

     Lift the molding straight up and use a pencil to mark the subfloor where the track should be placed. The grooves on the back of the molding indicate where the track will be inserted into the channel.

  3. For wood subfloors, screw the track to the floor using a 4 x 1/2” screws.

     For concrete subfloors, attach the tracks to the floor using concrete nails or cement adhesive.
4. Working from right to left, position the molding to fit into the track on the floor. Gently push the molding onto the track until the entire piece is installed.

Many professionals recommend using a miter saw with a carbon tipped blade to cut your molding to ensure you get clean, smooth cuts. When sawing, cut into the pre-finished side first to avoid chipping the finish.

During your installation always handle your molding carefully (especially pre-finished moldings) to ensure you do not scratch, dent or chip the finish. If you are nailing the molding to the walls or subfloor, most professionals recommend pre-drilling holes to help ensure the molding does not split or crack. Additionally, do not nail too closely to the end of the molding to avoid splitting.

Using Shims for Floating Floor Installations
Installing molding for floating floors is slightly different than for glue or nail/staple installations. Since floating hardwood floors rest upon the subfloor, you should use shims at the edges of the hardwood flooring to support the flooring and molding (like a foundation). Shims should butt up against the pad underlayment and extend approximately ¼” beyond the hardwood flooring. Shims are either nailed or glued to the subfloor. When you install the molding, it should extend over the shims and the edge of the flooring.

Using T-Molding for Interior Doorways
Doorways can be tricky during installations because they are narrow. It is sometimes hard to continue laying even, consistent boards into another room. You can use T-molding to join hardwood flooring in connected rooms, especially if the doorway is less than 6” wide. However, hardwood flooring that is “laced in” or laid continuously from room to room provides a more professional look. T-molding can also be used to transition between your hardwood floor and another floor of similar height.

T-Molding can be used for glue or nail/staple down installation methods. If you’re installation a floating hardwood floor, most professional installers highly recommend using T-molding in any doorway that is less than 6’ wide. For large floating hardwood floor installations (40ft or more), T-molding is also used to provide expansion joints.

When installing T-molding, always factor in adequate expansion space between the molding and the flooring. There should be at least 1 1/8” gap between the two flooring surfaces.
1. Measure and cut your T-molding to fit snugly in the door frame.

2. Position the T-molding approximately where you want it between the hardwood flooring and the door threshold to ensure it fits properly BEFORE securing it.

3. Apply a thin line of adhesive on one side of the T-molding.

4. Attach the molding to one side of the flooring and press down firmly to ensure a tight bond. The molding should overlap the other side of flooring at least a ¼ inch.

**TIP:** If installing between two hardwood floors, glue the molding to the hardwood on one side only. If installing between hardwood and another flooring type (such as ceramic tile) glue the molding to the other flooring type so the hardwood floor has room to expand and contract without affecting the position of the molding.

**IMPORTANT:** Never glue the molding directly to the subfloor as the space between the top of the floor and the bottom of the molding is need for expansion.

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**Using End Molding for Exterior Doorways**

End molding (also called threshold molding) is used along exterior doorways or to transition to a flooring surface that is similar in height to the hardwood floor (such as tile or high pile carpet). End molding can also be used around fixed objects like fireplaces and brickwork.

1. Measure and cut your end molding to fit snugly in the door frame.

2. Apply a thin line of adhesive on one side of the end molding.

3. Position and attach the end molding to the subfloor between the hardwood flooring and exterior doorway. The molding should butt up against the exterior doorway and overlap the hardwood floor by ½” to ¾”.

**IMPORTANT:** Do not attach the molding directly to the hardwood floor as the floor needs room to expand and contract below the molding.
Working around Vents

Working around vents, piping and other fixed objects is a necessary part of installing any hardwood floor. Since each object is unique, measure and cut carefully. Always leave a ½” expansion/contraction gap between the fixed object and the flooring. These gaps will be covered by vent covers, pipe rings or molding. Always ensure the lip of the vent cover or molding is wide enough to adequately cover the expansion gap.

Installing Hardwood Flooring on Stairs

There are two methods for installing hardwood flooring on stairs:

- Using prefabricated hardwood stair treads and risers. Stair treads combine the flooring and nosing into one piece as opposed to installing both separately.
- Using the same hardwood flooring as for your floor and adding stair nosing.

When installing stairs, you can begin with the top step and work your way down or begin at the bottom and work your way up. If working from the bottom up, ALWAYS take care when using and resting tools on your newly installed hardwood stairs. Protect your new flooring from nicks and scratches by using cardboard between any tools and the hardwood flooring.

All flooring installed on stairs should be glued (with a non-water based adhesive) as well as nailed or screwed down every 8” for safety. You can fill all nail/screw holes with matching filler once you’re finished with your installation.

Many existing staircases have nosing already built into the stair subfloor. While some professionals suggest cutting the nosing off, this method can violate building codes in many areas. In most cases, it is easier to add plywood to each riser so that the existing nosing becomes flush with the riser. This not only avoids building code issues, it also enables you to remove the plywood down the road if you ever change the type of flooring on your stairs.

If you are refinishing the wall stringers, do all sanding, painting and installing BEFORE you begin installing your hardwood flooring. Additionally, after completing the stairs, you can caulk and paint around the sides of each stair tread and riser to hide any defects.

For help estimating how much flooring you’ll need for your stairs installation, use the Advanced Estimator tool on FindAnyFloor.com.
Completing Stairs with Stair Tread

Completing stairs with stair tread is somewhat easier than using hardwood boards since the stair treads are already pre-cut to the width of the stairs. Some manufacturer’s offer two types of stair treads:

- Stair tread designed to be used in a stairwell with walls on both sides (also called a boxed stair system).
- Stair tread designed to be used in open stairwells (in which you'll see the tread from the side like the image to the right).

When using stair treads, you can choose to install the tread then the riser or the riser then the tread. Installing the tread then the riser usually creates a more professional looking staircase, especially if you choose to paint your stair risers a complimentary color for a more dramatic look.

**NOTE:** There may be some color differences between the flooring and the risers/treads. Like with your flooring, randomize treads and risers from various boxes to distribute the color variations.

1. If you are installing flooring over existing stairs, cut and add plywood to each riser so that the existing nosing becomes flush with the riser.

2. Starting at the bottom of the stairs, take measurements for the first stair riser:
   - Measure lengthwise at the top of the stair riser.
   - Measure lengthwise at the bottom of the stair riser.
   - Measure widthwise between the two stair treads. (If you are installing the riser on top of the tread, take the tread width into consideration.)

**NOTE:** There may be some slight variations in measurements between the bottom and top of the stair riser due to how the stairs were initially installed. Some installers use these first measurements to make a template for all other stair risers. While other installers measure each stair riser separately as there can be minor variations due to walls not being completely straight.
3. With a utility knife and a straight edge, score the stair riser where you will be making the cut based on your measurements. Scoring helps you identify where to cut as well as breaks through the wear layer and provides some protection from marring the hardwood.

4. Cut the stair riser using your score mark as a guide.

**TIP:** Radial arm saws work well to make straight cuts. Always cut into the prefinished side of the flooring first.

5. Install the newly cut riser onto the stairs but do NOT glue yet. Make sure the riser fits snugly between the walls (and tread, if necessary).

6. Apply a thin, wavy line of adhesive on the back of the riser then fit into place on the stair riser subfloor. Take care not to get any adhesive on the newly installed stair tread.

7. Top nail the riser to the stair subfloor:
   - Place two nails on either side of the riser near each wall.
   - Place two nails in the center of the riser.

**TIP:** Make sure all nails are in line with each other throughout the installation for a clean, professional look.

8. Take measurements for the first stair tread:
   - Measure lengthwise at the front of the stair tread.
   - Measure lengthwise at the back of the stair tread.
   - Measure widthwise from the front of the stair to the riser. (If you are installing the riser behind the tread, take the riser width into consideration.)

**NOTE:** There may be some slight variations in measurements between the bottom and top of the stair riser due to how the stairs were initially installed. Some installers use these first measurements to make a template for all other stair treads. While other installers measure each stair tread separately as there can be minor variations due to walls not being completely straight.
9. Using a straight edge as a guide, score the stair tread using a utility knife where you will be making the cut based on your measurements. Scoring helps you identify where to cut as well as breaks through the wear layer and provides some protection from marring.

10. Cut the stair tread using your score mark as a guide.

**TIP:** Radial arm saws work well to make straight cuts. Always cut into the prefinished side of the flooring first.

11. Install the newly cut tread onto the stairs but do NOT glue yet. Make sure the tread fits snugly between the walls. Use a level to ensure the tread sits flat on the stairwell subfloor. If adjustments are needed, use shims to level the tread.

12. Apply a thin, wavy line of adhesive on the back of the tread then fit into place on the stair tread subfloor. Ensure the tread is level on the subfloor.

13. Top nail the tread to the stair subfloor:
   - Place three nails on either side of the tread near each wall.
   - Place three nails in the center of the tread.

**TIP:** Make sure all nails are in line with each other throughout the installation for a clean, professional look.

**NOTE:** Some professional installers also recommend nailing the front of the tread to the riser below it. Place one nail on each side of the tread near the wall and two nails near the middle of the tread.

**IMPORTANT:** Always ensure stair treads are nailed and glued securely to the subfloor. This is the part of the stairs that gets the most use. Improperly secured stair treads that come loose during use can cause serious injuries and can damage to the surrounding flooring.

14. Repeat the measuring, cutting and installation process for each stair tread and riser until you reach the top of the staircase.

15. Use stair nosing or other molding to transition to the type of flooring at the top of the staircase. Install any other moldings as desired.
Completing Stairs with Stair Nosing

Completing stairs with hardwood flooring and nosing gives your stairs the same look and feel as your new hardwood floor. There are two types of stair nosing (in a variety of thickness):

- Flush stair nose is used for full or partial hardwood staircases.
- Overlap stair nose is used for single steps adjacent to a floated hardwood floor.

**NOTE:** Floating hardwood on full staircases is NOT recommended for safety reasons. Hardwood installed on stairs should be glued and nailed down to ensure the flooring does not come loose during use.

Stair nosing should always be installed first and overlap the riser. This method ensures that the stair nosing hides any cuts made to the flooring installed on the riser as well as provides the starting point when installing flooring on the stair tread. Stair nose can also be used to transition into other split level rooms (such as sunken living rooms) using the same installation method as with stairs.

Like with the rest of your floor, when using hardwood flooring on stairs, you must still provide expansion/contraction space around the perimeter of the flooring.

1. If you are installing flooring over existing stairs, cut and add plywood to each riser so that the existing nosing becomes flush with the riser.

2. Beginning at the bottom of the stairs, measure then cut the hardwood flooring for the first riser. If you need to cut a board widthwise to fit, install the cut board at the top of the riser so the cut is hidden by the stair nose. When measuring, be sure to leave adequate expansion space.

3. Apply a thin wavy line of adhesive on the back of each cut hardwood board then flip over and install on the riser. Top nail the hardwood forming the risers into place near each edge as well as in the middle.

**TIP:** Make sure all nails are in line with each other throughout the installation for a clean, professional look.
4. Measure and cut a piece of flush stair nosing for the first step taking into account any expansion space.

   Apply a thin wavy line of glue on the back of the flush stair nosing then fit into place. Top nail the nosing to the stairs along the sides as well as in the middle.

5. Measure and cut the hardwood flooring for the first stair tread. If you need to cut a board widthwise to fit, install the cut board at the back of the tread so that the cut is hidden by the stair riser. When measuring, be sure to leave adequate expansion space.

6. Apply a thin, wavy line of adhesive on the back of each cut hardwood board then flip over and install on the stair tread. Use blue painters tape to tape the stair nose to the first row of hardwood flooring on the stairs. This ensures the nosing and the flooring stay tightly fitted together as you install the second piece of flooring at the back of the tread.

   Top nail the hardwood tread into place near each edge as well as in the middle.

7. Work your way up the stairs installing flooring on the riser first then adding the flush stair nose then adding flooring on the stair tread.

8. Once you reach the top of the stairs, install any transition pieces and any moldings, as desired.

**Stair Nose and Floating Floor Installations**

Both flush and overlap stair nose can be used to transition between sunken rooms when installing a floating floor; however, the installation method for each is slightly different.

When using flush stair nose for floating installations, glue or nail shims to the subfloor below where the stair nose will be placed. The shims should extend just under the edge of the hardwood floor and butt up against the underlayment. (This usually takes two or more shims.) When the stair nose is placed upon the shims, it should support the stair nose so that it does not bend or break during use. Once the shims are in place, glue the stair nose directly to the shims. Use blue painters tape to hold the stair nose in place.

When using overlap stair nose for floating installations, butt the shim up against the underlayment while keeping the shim approximately 1¾" from the edge of the riser. (The overlap stair nose should NOT rest on the shim.) Glue or nail the shim in place. When installing the floating floor over the shim, ensure at least a ¼" of shim is showing from beneath the floating floor (on the riser side). Then glue or nail the overlap stair nose to the subfloor so that it covers the riser on one side and extends over the shim past the top of the floating floor on the other side. When installing overlap stair nose over a floating floor, do not glue directly to the flooring as the hardwood needs adequate expansion space.
Working around Fireplaces and Brickwork

There are two ways to install hardwood flooring around fireplaces and brickwork:

- Installing flush to the brickwork and adding end molding to hide expansion spaces.
- Undercutting the brickwork and installing the flooring underneath to hide any expansion spaces.

Installing Flush to Brickwork

Installing hardwood flooring flush to brickwork is much like installing flooring up to walls or doorways.

1. Measure and cut your end molding to fit along the fireplace or brickwork. Be sure to factor in your expansion spacing.

2. Apply a thin line of adhesive on one side of the end molding.

3. Position and attach the end molding to the subfloor between the hardwood flooring and fireplace/brickwork. The molding should butt up against the brickwork and overlap the hardwood floor by ½” to ¾”.

⚠️ IMPORTANT: Do not attach the molding directly to the hardwood floor as the floor needs room to expand and contract below the molding.

Undercutting Brickwork

Undercutting brickwork (much like undercutting door casings) provides for a more seamless looking floor.

1. Use the scrap piece of hardwood flooring to bring your saw up to the right height beside the brickwork. Make sure to account for your underlayment in the total height. Use a pencil to mark or draw a line at the top of the flooring/underlayment. This is how much you’ll be cutting off the bottom of the brickwork so that the flooring will fit underneath it.

2. Determine how deep to make your cut. You should allow for up to a ½” of flooring under the brickwork plus your expansion space.
3. Use the saw to cut along the line you drew.

💡 **TIP**: Consider wearing a respirator while cutting so you do not inhale fine particles of dust.

Now when you reach the brickwork or fireplace, you can cut your hardwood flooring to fit under the brickwork.

**Using End Molding for Carpet Transitions**

End molding is used to transition between hardwood flooring and carpet. Re-tack carpet at all points where it meets your new hardwood for a more professional look and to ensure the carpet does not come loose during use.

1. Measure and cut your end molding to fit snugly along the edge of the carpet (between the carpet and hardwood).

2. Apply a thin line of adhesive on one side of the end molding.

3. Position and attach the end molding to the subfloor between the hardwood and carpet. The molding should butt up against the carpet and overlap the hardwood floor by ½” to ¾”.

⚠ **IMPORTANT**: Do not attach the molding directly to the hardwood floor as the floor needs room to expand and contract below the molding.
Using Flush Reducer for Vinyl Transitions

Flush reducer is used to transition from hardwood floors to vinyl, concrete or any floor that is lower than your hardwood floor. You should use flush reducer when the hardwood floor is parallel to the lower surface since the tongue of the hardwood will line up with the groove of the flush reducer.

✔️ TIP: You can use overlap reducer if your hardwood floor is perpendicular to the vinyl.

1. Measure and cut your flush reducer to fit snugly along the edge of the vinyl (between the vinyl and hardwood).

2. Apply a thin line of adhesive on the bottom edge of the flush reducer. If recommended by your flooring manufacturer, glue the tongue of the flooring to the groove of the reducer.

3. Fit the tongue of the flooring into the groove of the reducer. Position and attach the reducer to the subfloor between the hardwood flooring and the vinyl. The molding should butt up against the vinyl and be flush with the hardwood floor.

4. Apply painters tape along the full length of the seam between the molding and the hardwood floor to hold the molding in place until the adhesive sets completely.
Using Overlap Reducer for Vinyl Transitions

Overlap reducer is most often used in floating installations to transition from hardwood floors to vinyl, concrete or any flooring that is lower than your hardwood floor. Overlap reducer can be used in glue and nail/staple installations when your hardwood floor is perpendicular to the lower surface since there is no tongue and groove to line up to like with flush reducer.

1. Measure and cut your overlap reducer to fit snugly along the edge of the vinyl (between the vinyl and hardwood floor).

2. Apply a thin line of adhesive on the bottom edge of the overlap reducer.

3. Position and attach the reducer to the subfloor between the hardwood and vinyl floors. The molding should butt up against the vinyl and be flush with the hardwood floor.

4. Apply painters tape along the full length of the seam between the reducer and the hardwood floor to hold the molding in place until the adhesive sets completely.
FINISHING THE JOB

Congratulations! You’ve reached the home stretch of your hardwood flooring installation. All that’s left to do is:

- Installing Wall Base and Quarter Round Trim
- Correcting Defects
- Sealing Moisture Prone Areas

**Installing Wall Base and Quarter Round Trim**

Installing wall base and quarter round trim hides the expansion and contraction spaces as well as puts the finishing touches on your room. Base shoe molding can be used instead of wall base in areas where wall base will not fit (such as under cabinets).

⚠️ **IMPORTANT**: Do not nail or glue the wall base or trim directly to your hardwood floor. These moldings should fit snugly, but not tightly, so your hardwood floor can expand and contract naturally.

1. Measure and cut the wall base and quarter round trim for your installation area.
2. Remove the spacers along the wall.
3. Using a construction adhesive, apply a thin, wavy line down the length of the wall base molding.
4. Gently press the wall base molding to the wall. Nail the molding to the wall at an angle every 16”.

✔️ **TIP**: Always nail the wall base to the wall at an angle. If you nail straight into the wall, the nails may not hold well into the drywall.

5. Apply a thin, wavy line down the length of the quarter round molding.
6. Gently press the quarter round molding to the bottom of the wall base molding. Nail the molding to the wall at an angle every 16”.

**TIP**: Always nail the wall base to the wall at an angle. If you nail straight into the wall, the nails may not hold well into the drywall.

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**Correcting Defects**

Once all your hardwood flooring, transitions and trim is installed, use wood filler, putty sticks or stain to fill nail holes and correct any flooring defects. Always use fillers designed to be used with hardwood flooring. Other fillers may damage your new hardwood floor.

If there are significant gaps between the molding and the wall, use calk to help hide the flaws.

**Sealing Moisture Prone Areas**

Some manufacturers recommend that expansion spaces be sealed around moisture prone areas (such as outside doors and near kitchen appliances). Check with your manufacturer for specific recommendations. If none are provided, seal the area with weather stripping and a silicone sealant.
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