



WOOD FLOORING INSTALLATION GUIDELINES

SUBFLOOR PREPARATION

All substrates must be clean, dry, structurally sound, properly cured and free of dirt, oil, paint, old adhesive, wax, sealers and curing agents. General scouring with 20 grit or #3 1/2 open-coat sandpaper will remove most compounds. All loose materials must be vacuumed from the surface after scouring. The subfloor must be flat to a tolerance of 3/16" in a 10' radius. Hollow spots, popping spots and squeaks are related to unevenness in the subfloor. Grinding concrete floors is preferred over the use of filling compounds. If filling/flattening compounds are used, they must be Portland-based cementitious material and have a compressive strength equal to or greater than 3000 psi when cured. Use of adhesive over light weight concrete and all gypsum-based materials requires the use of Titebond Concrete primer or equivalent prior to application of adhesive.

MOISTURE CONTROL SYSTEM INSTALLATION

Titebond recommends the use of a moisture control system, like Titebond 531 or 531 PLUS, for concrete subfloors. Use of Titebond 531 or 531 PLUS over light weight concrete and all gypsum-based materials requires the use of Titebond Concrete Primer prior to application. Remove all existing base, shoe molding and door thresholds prior to continuing the installation.

Ventilation fans should be used to circulate air across the surface of the product after it has been applied to the subfloor to facilitate the drying process. This will help promote curing in a timely manner.

WOOD FLOORING INSTALLATION

Once the adhesive has been troweled, the wood flooring may be installed immediately into the wet adhesive. To reduce slippage, secure the first starter row with Titebond Tape (adhesive only method). Remaining planks must be placed firmly into adhesive. Planks which are not flat should be weighted for several hours. Normally, ultimate strength will be reached within 24 hours. Wait at least one day before finishing an unfinished floor. Do not walk on the floor during installation.

Adhesive installation of each Titebond product varies based on the adhesive technology. We recommend you review our website at Titebond.com for complete wood flooring installation instructions using each adhesive. The chart below provides a general guide.

231 SELECT	801 PREFERRED	811 ADVANTAGE	821 STEP	771 STEP	991 PROVANTAGE
ADHESIVE TECHNOLOGY					
Acrylic	Urethane	Urethane	Urethane (3 in 1)	Advanced Polymer (3 in 1)	Solvent
OPEN TIME					
45-60 Minutes	90 Minutes	90 Minutes	90 Minutes	25-45 Minutes	30-45 Minutes
INSTALLATION METHOD					
Wet Lay	Wet Lay/Flashed	Wet Lay/Flashed	Wet Lay/Flashed	Wet Lay	Wet Lay



231
SELECT

801
PREFERRED

811
ADVANTAGE

821
STEP

771
STEP

991
PROVANTAGE

APPLICATION RECOMMENDATIONS

Engineered

Engineered

Engineered, Parquet,
Solid (5/8" or less)
& Bamboo

Engineered, Parquet,
Solid (5/8" or less)
& Bamboo

Engineered, Parquet,
Solid (5/8" or less)
& Bamboo

Engineered, Parquet,
Solid (5/8" or less)
& Bamboo

ENGINEERED - TROWEL/COVERAGE

3/16" w x 1/4" d x 1/2"
c-c (or 5/16" space)
V-notch
(50 sq. ft. per gallon)

3/16" w x 1/4" d x 1/2"
c-c (or 5/16" space)
V-notch
(50 sq. ft. per gallon)

3/16" w x 1/4" d x 1/2"
c-c (or 5/16" space)
V-notch
(50 sq. ft. per gallon)

3/16" w x 1/4" d x 11/16"
c-c (or 1/2" space)
V-notch
(65 sq. ft. per gallon)

3/16" w x 1/4" d x 11/16"
c-c (or 1/2" space)
V-notch
(65 sq. ft. per gallon)

3/16" x 1/4" x 11/16
V-notch
(65 sq. ft. per gallon)

SOLID 3" WIDTH OR LESS - TROWEL/COVERAGE

N/A

N/A

3/16" w x 1/4" d x 1/2"
c-c (or 5/16" space)
V-notch
(50 sq. ft. per gallon)

3/16" w x 1/4" d x 1/2"
c-c (or 5/16" space)
V-notch
(50 sq. ft. per gallon)

3/16" w x 1/4" d x 1/2"
c-c (or 5/16" space)
V-notch
(50 sq. ft. per gallon)

3/16" x 1/4" x 1/2"
V-notch
(50 sq. ft. per gallon)

SOLID 3" WIDTH OR GREATER - TROWEL/COVERAGE

N/A

N/A

3/16" X 3/16" X 3/16"
Square-notch
(35 sq. ft. per gallon)

3/16" X 3/16" X 3/16"
Square-notch
(35 sq. ft. per gallon)

3/16" X 3/16" X 3/16"
Square-notch
(35 sq. ft. per gallon)

3/16" x 3/16" x 3/16"
Square-notch
(35 sq. ft. per gallon)

ALL PARQUETS MEASURING LESS THAN 3/4" THICKNESS - TROWEL/COVERAGE

N/A

N/A

1/8" X 1/8" X 1/8"
Square-notch
(65 sq. ft. per gallon)

1/8" X 1/8" X 1/8"
Square-notch
(65 sq. ft. per gallon)

1/8" X 1/8" X 1/8"
Square-notch
(65 sq. ft. per gallon)

1/8" x 1/8" x 1/8"
Square-notch
(65 sq. ft. per gallon)

ENGINEERED (ADHESIVE, MOISTURE & SOUND CONTROL) - TROWEL/COVERAGE

N/A

N/A

N/A

1/4" x 3/16" V-notch
(saw tooth)
(35 sq. ft. per gallon)

1/4" x 3/16" V-notch
(saw tooth)
(35 sq. ft. per gallon)

N/A

SOLID & BAMBOO UP TO 5/8" (ADHESIVE, MOISTURE & SOUND CONTROL) - TROWEL/COVERAGE

N/A

N/A

N/A

1/4" x 1/4" V-notch
(saw tooth)
(30 sq. ft. per gallon)

1/4" x 1/4" V-notch
(saw tooth)
(30 sq. ft. per gallon)

N/A



V-notch



V-notch (saw tooth)



Square-notch

TROUBLESHOOTING

1. GAPS

Problem - Spaces that appear between individual boards.

Cause

- Wood flooring shrinks as it loses moisture
- The installer fails to properly seat a plank
- A floor is sanded before the adhesive has fully dried
- Environmental conditions

Solution - Use humidifiers & dehumidifiers to control humidity fluctuation.



2. CROWNING

Problem - Crowning is where the center of the piece of flooring raises above the edges. This can be a temporary condition, and if the crowning is slight, the floor may remain well-anchored. The conditions persist only if there is a continuous source of moisture being introduced above or below the floor. Exposure to severe moisture levels, even for short periods of time, may also result in delamination of the flooring, or cracking or peeling of the surface finish.

Cause

- Continuous source of moisture being introduced above or below the floor
- Cupping had previously occurred, and flooring was sanded before the moisture content could return to normal

Solution - Allowing the wood to acclimate on site before it is installed serves to reduce the growth that occurs after installation, and reduces the potential for moisture related problems. Taking moisture readings on the top and bottom of the floor will allow moisture imbalance to be distinguished from unbalanced construction in the flooring. Once the moisture levels of the floor and subfloor have returned to normal, re-sand and finish.



3. BUCKLING

Problem - Flooring parting from the subfloor due to extreme expansion caused by excessive moisture. When a floor buckles, there will often be several feet of flooring along the edge of the room which remain flat, followed by several adjoining rows of flooring which are uplifted in an inverted "V". The floor may show signs of rotting, and there may be mold or mildew present on the wood. When moisture has been introduced through a concrete slab, there also may be discoloration of some adhesive types, with a reddish or purple color developing in certain areas.

Cause

- Moisture changes in wood
- Moisture caused by leaking pipes, wet slabs, extreme humidity
- Use of wrong trowel
- Inadequate adhesive use
- Floor runs out of room to expand

Solution - Allowing the wood to acclimate on site before it is installed serves to reduce the growth which will occur after installation, and reduces the potential for moisture related problems. It is important to check the subfloor to verify that the moisture level is reasonable before beginning the job, and to observe the recommended flash times for any water containing adhesives to minimize the moisture they can contribute to the floor. Because many moisture-related problems result from poor drainage outside the building, it may sometimes be wise to recommend that gutters be installed or drainage improved before a large investment is made on a wood floor. For damaged floors, reverse the high-moisture situation and let the floor/subfloor dry. Relieve flooring of stress caused by vertical obstacles (cabinets, walls, etc.). Sometimes repair or individual replacement is possible, but often a complete replacement is necessary.



A beautiful wood floor is often the main feature of a home, and a problem with the floor is almost always a major concern for the homeowner. Although there are a variety of different problems which can occur in a wood floor, the vast majority of problems fall into just a few categories. Below are brief descriptions of the 8 main wood flooring problems found in a home and their cause and solution.

4. CUPPING

Problem - The edges of an affected piece of flooring rise above the center of the piece. This can be a temporary condition, and if the cupping is slight, the floor may remain well-anchored.

Cause

- Different moisture levels within individual layers of flooring
- Low levels of humidity (referred to as “dry cupping”)
- Rapid drying of floor surface

Solution - Allowing the wood to acclimate on site before it is installed serves to reduce the growth which will occur after installation, and reduces the potential for moisture related problems. Taking moisture readings on the top and bottom of the floor will allow moisture imbalance to be distinguished from unbalanced construction in the flooring. When the excessive moisture is removed, the flooring can return to its original shape, but it could take months. If it does not return to its original shape, the floor is probably permanently damaged and the edges that are cupped may be sanded off. Floors may also cup due to rapid drying, and in this case, it is recommended that humidification be used.



5. ENDLIFTING

Problem - Wood flooring boards look as if they are raised at the end.

Cause

- Incorrect maintenance
- Use of wrong trowel or adhesive
- Mistake during manufacturing
- Inadequate spacing of cleats or staples
- Excessive moisture during installation, adhesive not being able to dry

Solution - If the problems are related to excessive moisture, once the moisture is removed, the affected areas may be repaired.



6. SLOW DRYING ADHESIVE

Problem - A few areas of the floor have not firmed up as well as surrounding areas, and in that case the problem is likely a result of a few hollow or popping areas. The drying time is affected by the amount of adhesive used, the open or flash time provided, and such factors as the temperature, humidity and ventilation during and after the installation. Polyurethane adhesives react and cure rather than drying.

Cause

- Use of wrong trowel
- Additional adhesive creates additional moisture
- Cleaning after installation can cause mineral spirits to run down under the floor

Solution - Allowing the recommended flash time for the adhesive is also important. It serves to firm up the adhesive beads to provide better support for any flooring installed over low spots in the subfloor, but it also reduces the amount of drying which needs to occur after the floor has been installed. It should also be clear that, in order for the adhesive to dry, solvent or moisture needs to be lost. In some jobs, that material is absorbed into or moves through both the flooring and the subfloor, but when the floor is installed over a non-porous surface like vinyl, drying will always be somewhat slower. In any event, increasing the general dryness of the site, maintaining a temperature of at least 60°F, and providing good ventilation during the installation, and at least some ventilation for the next few days, will allow the drying to proceed at a normal pace. When cleaning, apply mineral spirits in such a manner as to minimize the amount of material which may flow under the floor.

7. DELAMINATION

Problem - The layers within a piece of engineered wood flooring separate from each other and pull apart.

Cause

- Excessive moisture, flooding or extreme humidity fluctuation if delamination occurred on the job site
- Lack of glue causing minimal or no wood tissue to be attached to connecting layers

Solution - Replace affected boards.

8. SQUEAKY/LOOSE FLOORS

Problem - Squeaking, popping or other noises in flooring.

Cause

- Uneven subfloor, or incorrect subfloor material
- Traffic on the floor before the adhesive has dried
- Use of wrong trowel
- Inadequate adhesive use, spacing or nailing
- Floor exposed to excessive moisture or dry conditions
- Aged flooring

Solution - Utilize our Titebond Urethane Repair Kit, which is specifically designed to repair hollow or popping spots in the floor. By filling the gap which exists between the flooring and the subfloor in these areas, the adhesive serves both to eliminate further movement in this area and to eliminate any sounds.

VISIT WWW.TITEBOND.COM FOR THE
MOST UP-TO-DATE PRODUCT INFORMATION

Franklin International

Columbus, Ohio 43207



614.443.0241

(Technical Service 1.800.347.4583)



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