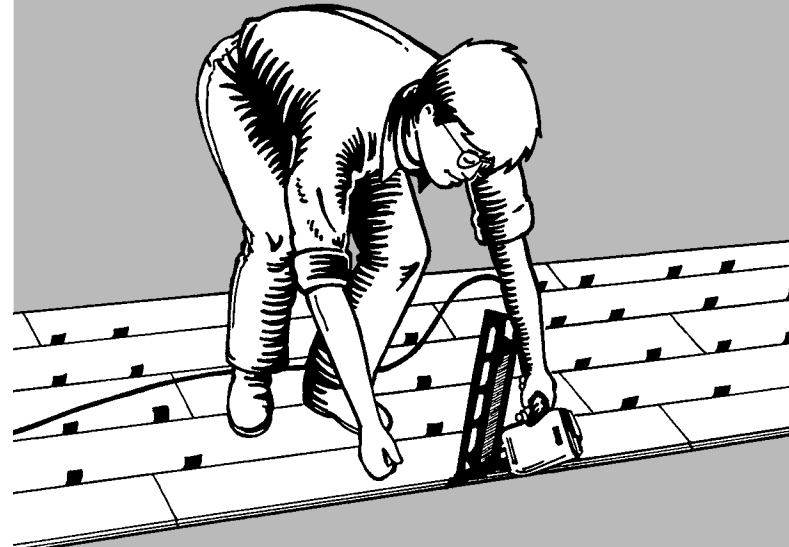



JUNCKERS
A NATURAL FEELING



Junckers – A Natural Feeling
Nail-Down Installation Instructions

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Before you begin installing your Junckers floor, read these instructions from start to finish. If you have any questions, contact your local Junckers dealer or Junckers US at 1-800-878-9663, Monday-Friday, 7:00 a.m.-5:00 p.m. P.S.T.

Tools & Materials List

15 lb. Roofing Felt	Cut-Off Saw	Space Shims
Approved Fastening System	Hammer	Table Saw
Broom	Jamsaw	Tapping Block
Chalk Line	Pull Tool	Wall Spacers
Crow Bar	Saw	

Pre-Installation Site Inspection

1 Visual Inspection

All new homes and renovation projects must be weather tight. All doors and windows must be installed prior to installation.

Exterior Checks

- Check the eaves overhang. Is all rain water carried away from the foundation?
- Inspect the rain gutters and downspouts. Is all rain water being drained away from the foundation?
- Check exterior grading. Will rainfall or landscape irrigation flood the slab or flow into the crawl space under the house (raised foundation)? Exterior soil elevation and slope are important factors in the house being able to shed water. Note: Is the exterior landscape/hardscape lower than the edge of the foundation? Does the lot slope away from the structure for proper drainage?
- Does the house have raised flowerbeds or planter boxes that adjoin the foundation? If yes, a moisture barrier must be installed by a landscaper.
- Is there an outdoor pool or natural body of water that is higher than the foundation that can overflow and flood the floor?
- If the home has a raised foundation, are exterior vents open and unrestricted? Size of available vents should equal 1.5% of the square footage within the crawl space.

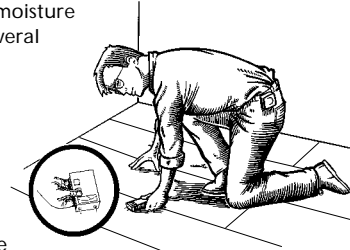
Interior Checks

- Does the interior have a musty smell?
- Check all sinks, toilets, dishwashers, refrigerator ice makers, and laundry rooms for leaks.
- Do outside doors, sliding glass doors, and windows appear to be properly sealed and are adjacent areas dry?
- Is HVAC operational?

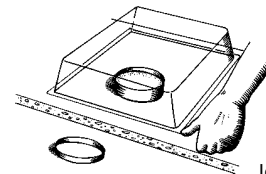
Pre-Installation Site Inspection

2 Subfloor Moisture Testing

Test wood subfloor with probe-type moisture meter. Check moisture content at several places in the room and calculate the average. In most areas, a subfloor is considered dry and ready for flooring if the moisture content is 12% or lower. If moisture content is higher, do not proceed until source of moisture has been determined, eliminated, and the subfloor moisture content is within specifications. The moisture content of the Junckers floor and subfloor should not vary by more than 4%. Subfloor material should be purchased from a supplier that stores the material indoors. Materials that have been stored improperly could contain high levels of moisture.



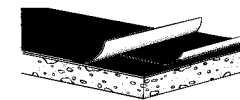
3 Subfloor Moisture Testing over Concrete



If plywood is being shot down onto concrete, a calcium chloride test needs to be conducted on the concrete subfloor (ASTM F-1869). For emission levels of up to 3 lbs. of pressure, per 1,000 sq. ft. per 24-hour period, proceed with the installation of the plywood. For all levels exceeding this amount, installation cannot proceed until corrective measures have been taken to eliminate the high moisture emission rate. Use 3/4" CDX or better plywood and follow NOFMA/NWFA instructions for this method of installation. See *NOFMA/NWFA Installation Manual, Wood Flooring, page 3*.

4 Moisture Barrier

When attaching plywood to concrete, a moisture barrier is required (NOFMA specification). Concrete should not exceed 3 lbs. on a calcium chloride test. This installation method is for above ground, on grade installation only (NWFA specification)!



5 Fasten Plywood to Concrete

To secure plywood to slab, use concrete nails or powder actuated gun to drive nails into concrete (NWFA specification).



Preparing for Installation

1 Subfloor Tolerance

Wood subfloors must be a firm surface such as plywood, O.S.B. or dimensional lumber. Surface variation should not exceed 3/16" within a ten-foot radius or 1/8" within a six-foot radius (NWFA specification). To determine flatness of the subfloor, use the edge of the Junckers flooring board, a straightedge or a level. Correct minor low spots by filling with roofing felt. Extensive low spots may require repair. Scrape, sand or grind any high areas.



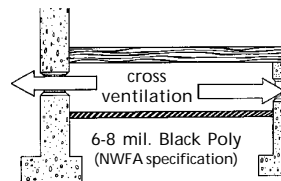
2 Subfloor Thickness

When installing over suspended subfloors, you must use 3/4" thick CDX or better veneer-core plywood. 3/4" O.S.B. (Oriented Strand Board) or 3/4" dimensional lumber. When using O.S.B., a staple system is required.

Note: Do not use O.W.B. (Oriented Wafer Board), Fiber Board (MDF, HDF) or Particle Board for nail-down installation. Check building code in the city of installation to ensure subfloor is of required thickness to handle the span between floor joists.

3 Crawl Space Ventilation

Adequate cross-ventilation must exist to allow proper air movement. Inadequate ventilation may result in increased humidity levels in crawl space. Size of crawl space vents should equal 1.5% of the square footage within crawl space. Soil must be dry and crawl space must be free from water. Lay 6 mil. plastic on the soil under the structure with seams overlapping 12". Seal the seam along its entire length with duct tape. The distance from soil level to the underside of the subfloor should be a minimum of 24" (NWFA specification).



6 **Nail-Down System** Installation Instructions

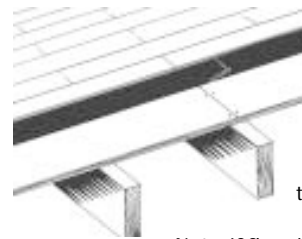
Preparing for Installation

4 Clean Subfloor

Scrape subfloor clean and sweep up all debris from construction site. Any debris left on the floor could affect the subfloor tolerance.



5 Determine Direction of Installation



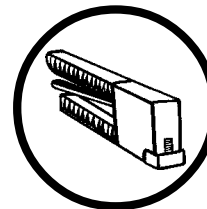
Decide which direction your flooring will be installed. The rule of thumb is to run the length of the flooring with the longest direction of the room. Other considerations are to install across the subfloor joists, parallel to the incoming light source, or parallel to the direction of the traffic flow.

Note: If floor is being installed over wood subfloor with joists, the floor should run perpendicular to the joists. If the floor must be installed in the same direction of the joists, it may be necessary to reinforce the subfloor with 3/8" or 1/2" plywood screwed to the joists to firm up the subfloor.

When the subfloor is dimensional lumber (1x6) installed on a 45° angle over joists, the hardwood flooring cannot be installed on the same 45° angle as the lumber subfloor. If the flooring must be installed in the same direction as the lumber subfloor, a secondary subfloor must be installed by attaching 1/2" plywood directly to the joists with screws.

6 Underlayment

It is necessary to use 15 lb. roofing felt as underlayment for installation. Staple felt into place to prevent movement during flooring installation. Lay 15 lb. roofing felt at a 90° angle to direction of installation (cross grain) and lap edges 4", butt ends.



Junckers Hardwood, Inc. 7

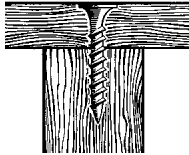
Common Subfloor Repairs

1 Subfloor Repairs

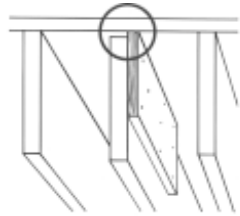
When installing in an existing home, you may encounter situations that require subfloor repairs before a successful installation can take place.

a Locate Squeaks

Drill hole through to joist and fasten subfloor securely. Use good quality wood screws for best performance. Countersink all wood screws.



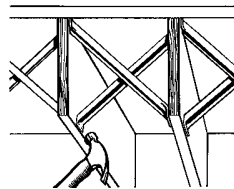
b Sagging Joist



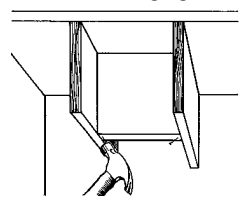
To correct sag in floor, force a piece of hardwood lumber longer than the sag in place and secure to joist. This will eliminate the low spot in the subfloor.

c Diagonal Bridging

Nail or screw diagonal bridging. This eliminates joist movement and makes joists rigid. Recommended spacing is every 8 feet.



d Solid Bridging



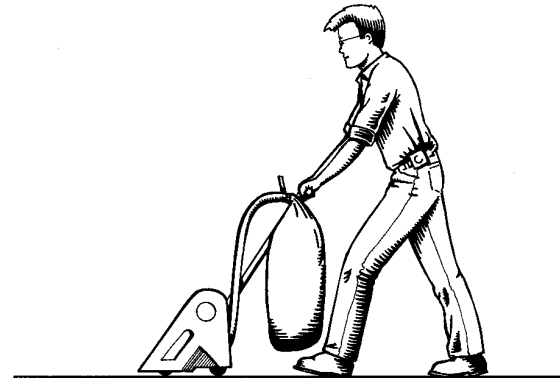
Cut to size and force into space. Nail or screw top and bottom of bridging. Recommended spacing is every 8 feet.

Note: Items b, c and d generally require a General Contractor's License to perform the repairs described.

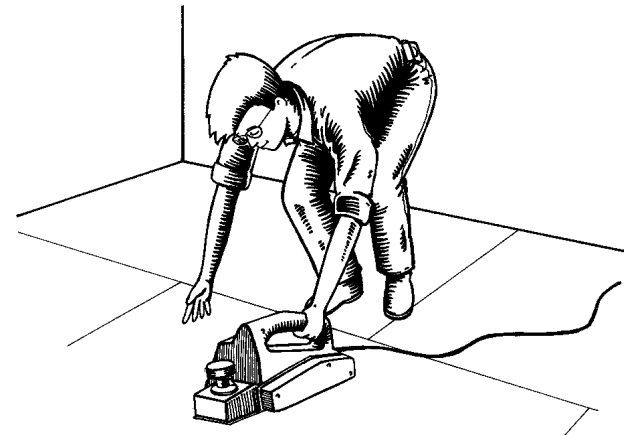
Common Subfloor Repairs

2 Leveling Subfloors

A flat subfloor tolerance must be achieved, *see page 6, Subfloor Tolerance*. It may be necessary to sand the subfloor flat. Do not use a leveling agent, it will not hold the nails. For small variations between sheets of plywood, you can use a belt sander to soften the edges. Small bumps in the subfloor can also be removed in this fashion.



Note: Do not sand subfloor to point of compromising structural integrity!



Expansion & Contraction Planning

1 Acclimation & Seasonal Movement

Wood flooring will perform best when the interior environment is controlled to stay within a relative humidity range of 30%-50% and a temperature range of 60°-80°F. The size of the individual boards will correspond to the environment in which they are placed.

Relative Humidity (%)	Climate Zone	Spacer Size	Moisture Content	1 Board Measure (mm)
10	1	None	3.0	128.18
20			4.5	128.51
30			6.0	128.78
40	2	0.2 mm	7.5	129.00
50			9.0	129.10
60	3	0.4 mm	10.5	129.25
70			13.0	129.45
80	4	0.6 mm	15.5	129.75
90			18.0	130.25

Beech is used as an example. Other species reactions vary slightly.

This chart is intended for general use. Factors such as heat and additional moisture from structural or plumbing leaks, lack of climate control before and after installation, and improper maintenance will have additional impact on board size and moisture content.

The relative humidity range indicated on the chart above shows the high and low relative humidity ranges of each zone. At the highest humidity percentage, the boards will "expand" in the width. At the lowest humidity percentage, boards will "contract" and become narrower. This represents the normal movement associated with seasonal changes in relative humidity.

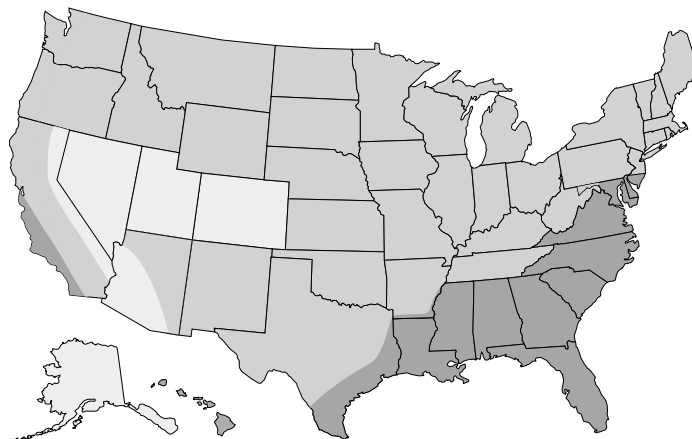
Climate Zone 1: This geographic area represents a lower humidity cycle of 10%-30%. It is necessary in this drier/low-humidity zone to contract the boards in width and establish a lower moisture content in the boards through acclimation. The boards should be contracted/acclimated to represent the upper (more humid) end of the humidity cycle for this zone. If the relative humidity is at the drier (lower) end of the humidity cycle, a humidifier can be used to prevent over-drying (over-contracting) of the boards. To acclimate, remove material from boxes, cross-stack to promote air movement to all sides of the flooring and allow the boards to "contract" to the appropriate size and moisture content. The boards will now have room to contract further (during low-end of humidity swing) and expand back in size (during high-end of humidity swing).

Climate Zones 2, 3, & 4: Install material directly from the box and insert spacers between boards (side joints only), using spacer size indicated for the climate zone. Spacers will create adequate room between the boards, allowing them to expand and contract in response to seasonal changes in relative humidity.

Note: If acclimation of the material vs. spacers is utilized, effective acclimation occurs when the humidity is at the higher end of the humidity cycle for the climate zone in which the floor is being installed. If the humidity is at the lower end of the cycle, it is necessary to raise the humidity to represent the higher end of the cycle. To acclimate, remove material from boxes, cross-stack to promote air movement to all sides of the flooring and allow the boards to "expand" to the appropriate size and moisture content. Remember: A humidifier can be used to establish higher end of humidity scale in all installation zones. See page 12 for additional information. For additional industry information on wood flooring's reaction to seasonal humidity cycles, see NWFA publication A100 pages 5-6 and 12-13.

Expansion & Contraction Planning

2 Nail Spacer Sizes/Selection



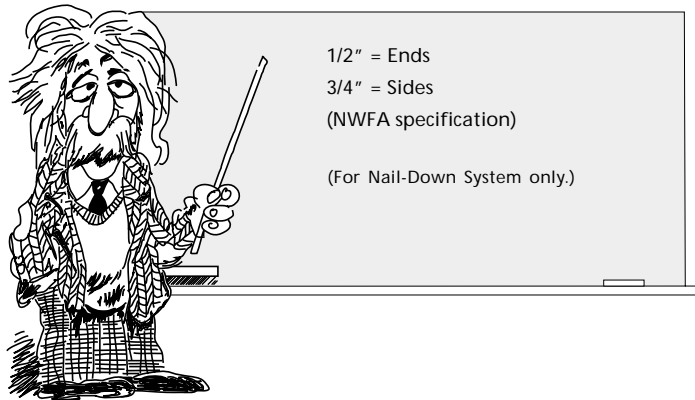
Climate Zone	Anticipated Site Conditions	Relative Humidity	Floor Moisture Content	Spacer Size/Color Code
1	Extremely Dry	10% - 30%	3.0 - 6.0	None / None
2	Comfortable	30% - 50%	6.0 - 9.0	0.2 mm / Red
3	Humid	45% - 65%	7.5 - 12.0	0.4 mm / Green
4	Extra Humid*	60% - 90%	10.5 - 18.0	0.6 mm / Yellow-Blue

* Yellow Spacers (0.6 mm) or Blue Spacers (0.8 mm) are used in high humidity zones when no climate control or swamp coolers are used. The climate conditions in a home are optimum when kept between 30%-50% relative humidity. Fluctuations in humidity can result in seasonal gapping of floors.

Expansion & Contraction Planning

3 Expansion Space – Doing the Math

To calculate the correct expansion space for the width for nail down installations, use the following table:



Depending on the anticipated relative humidity, it may be necessary to use internal expansion spacers. See charts on pages 10-11 for appropriate spacer size. It is critical that a clear understanding of the acclimated size of the individual flooring boards be understood to determine the correct spacer size. If joint spacers are not used, the floor can be acclimated prior to installation by opening all the boxes, cross-stacking boards, and allowing them to acclimate to size.

Remember: Acclimation is not a question of how long the boards are acclimated, but when the moisture content and board width are in the general range (moisture content: +/- 0.5%, board width: +/- 0.15 mm) of the corresponding chart on page 10. Using a fixed time formula when the humidity cycle is at its lowest can produce errors (humidity conditions vary seasonally). Acclimation should only be performed in a residence after wet-trades have left, windows and doors installed, and HVAC is operational and in use (NWFA specification).

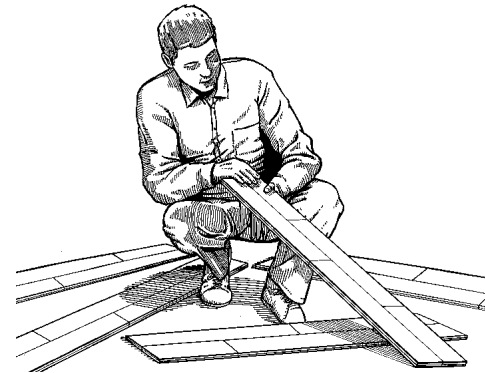
When using Junckers spacers, the nail-down system offers greater installation flexibility and control.

Pre-Installation **Material Inspection**

1 Inspect Material



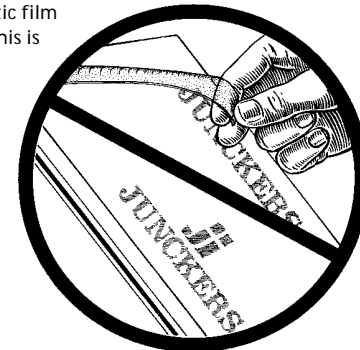
Examine all material for any defects *before* installation and confirm the color, species, style and thickness. Should any defects be present, **STOP THE JOB** and contact your Junckers representative right away. Do not install any plank that is obviously defective. A Junckers representative will arrange to view the job or view samples of the material as soon as possible. Junckers strives to make a product that is second to none in quality. However, the time to correct a possible defect is before the material is installed.



2 Polyfilm Backer

Many Junckers products have a plastic film adhered to the back of the board. This is designed to balance the top surface with the underside of the plank, which makes for a more dimensionally stable floor.

Do not remove Polyfilm backer!!



Installing Nail-Down System

1 Approved Nailing Systems

Junckers recommends the use of air driven guns. This allows the installer to carefully control the expansion space between the planks.

For
9/16"
products



PowerNail 200
For use on all 9/16" (14 mm)
products. Uses 1-1/4" E-Powercleats.

OR



Senco SNT SKS L17-J
For use on all 9/16" (14 mm)
products. Uses 1/4" crown 1-1/2"
leg staple, Senco # L1738BAB.
A special adapter tip ensures
proper angle during the installa-
tion process.

For
7/8" & 3/4"
products



Stanley Bostich Mark III
For use on all 7/8" (22 mm) and
3/4" (20.5 mm) products. Uses 2"
(50 mm) staple.

OR



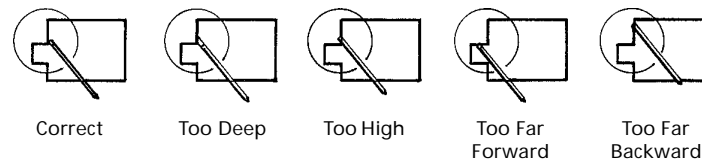
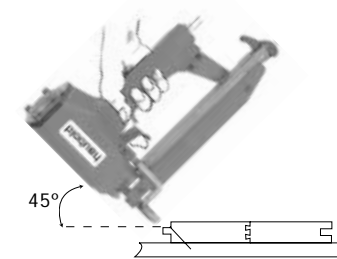
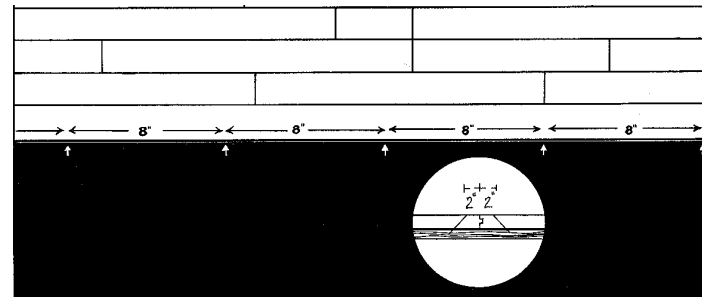
Haubold PNA SKN64A20
For use on all 7/8" (22 mm) and
3/4" (20.5 mm) products. Uses 2"
(50 mm) T-nail. Haubold
PAS6TF8050.

Note: **DO NOT** use guns that specified for 3/4" and 7/8" to install 9/16" thick products.

Installing Nail-Down System

2 Nailing Schedule

Use the staple/nail gun and fastener specified for the thickness of floor being installed, *see page 14, Approved Nailing Systems*. Staple/nail spacing is every 8" (NWFA specification) for all installations regardless of thickness of flooring. Install all flooring by driving staple/nail in at a 45° angle. Care must be exercised to insure staple/nail is driven into nailing pocket. Improper position of the staple/nail will create bumps on the surface of the wood or create difficulty in fitting boards together. Note: Keep fastener 2" from stave and plank ends.

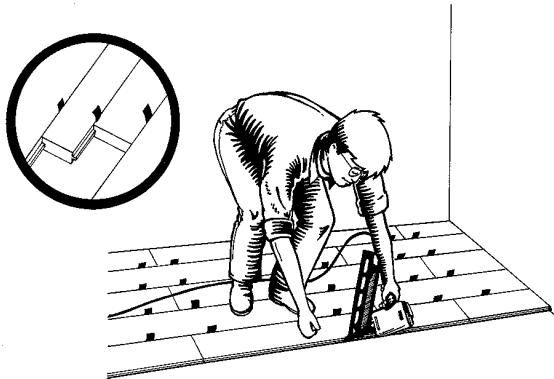


Installing Nail-Down System

3 Joint Spacing

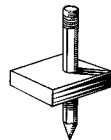
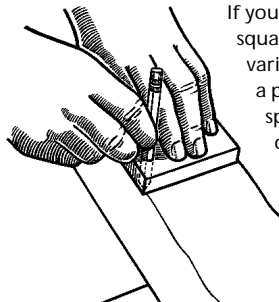
Use joint spacers to create expansion space between the boards that corresponds to the anticipated temperature and relative humidity of the home. Joint spacers are available to help with consistent joint spacing to accommodate the final size of the floor. These spacers are not intended to replace perimeter expansion, but are used to create a space for the floor to grow internally. After installing 6 rows, remove the spacers to prevent them from becoming shimmed in too tight and ripping upon removal. This helps avoid internal stress or damage to the edges.

To plan joint spacing use the charts on pages 10-11



4 Irregular & Out-of-Square Walls

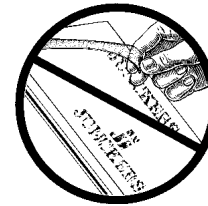
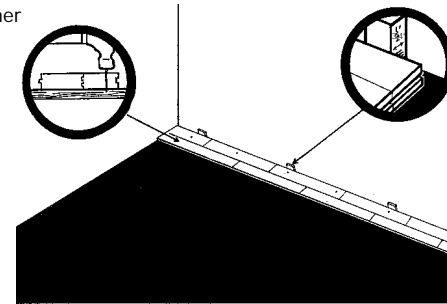
If your starting or ending wall is irregular or out-of-square, scribe and cut that first row to match variations. A simple scribe can be made by drilling a pencil-sized hole the appropriate expansion space from the wall. Mark the irregular surface onto plank to be cut.



Installing Nail-Down System

5 Starting Row

Begin in the left-hand corner with a full uncut plank. Make sure the row is completely straight by snapping chalk line and establishing a straight edge. Face nail planks on groove side every 16". Countersink nail and fill with matching Junckers Flexible Joint Filler.

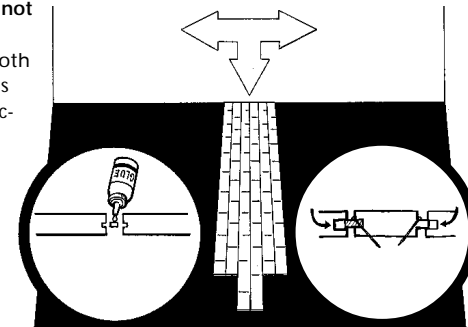


**DO NOT REMOVE
POLYFILM BACKER!**

6 Starting at Center of Room

For large areas, it may be wise to start in the center of the room. If this is the case, snap chalk line in center of room. Nail in stop blocks to hold starting row in place. Nail row into place; glue and tap slip tongue into place and nail down to floor (as shown below). Slip tongue must be completely into groove or next row will not fit properly. The floor is now ready to install in both directions. This method is also used to change direction of the installation.

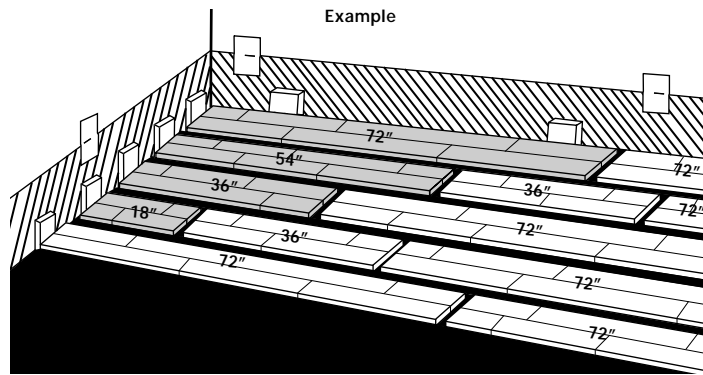
Note: This method should be used for all nail-down floors wider than 30'.



Installing Nail-Down System

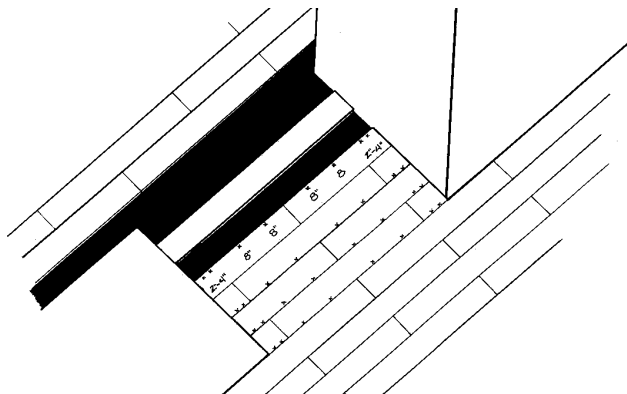
7 Starting Next Row & End-Joint Spacing

To start the next row of boards, begin with the cut piece left over from the first row (if cut piece is under 16", cut a new piece at least 16" from a full plank to stagger the end-joint). This end-gap spacing is critical to the structural integrity of the floor. Spacing the end-joints 16" or more creates proper interlocking strength for the floor.



8 Nailing at Corners

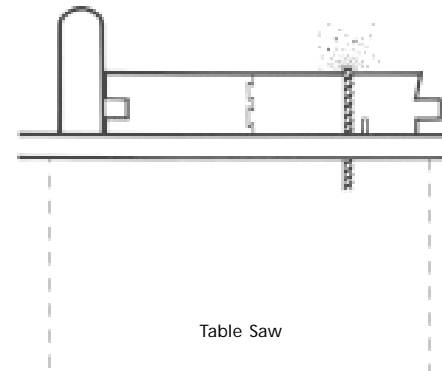
To prevent end-joint gaps when going around corners, through short tight hallways, or between counters and kitchen islands, place two nails at the ends of the boards to prevent movement.



Installing Nail-Down System

9 Fitting Last Row

Cut the last row of planks as needed to fit in the remaining space. Remember to allow for the expansion gap at the wall. If needed, the width of the last row of planks can be scribed with a pencil, see *page 16, Irregular & Out-of-Square Walls*.



Moldings, The Finishing Touch

Matching Wall Base

This stylish molding adds a luxurious look for the transition from floor to walls. Available in the size of 3/4" x 3-1/2" x 96".



Base Shoe Molding



This versatile molding is used primarily in conjunction with the matching wall base or existing wall base to hide the contraction and expansion space.

Flush Reducer

For use on nail-down applications only. For transition from wood flooring to vinyl or tile. It can also be used as a transition to low-pile carpet. *Note: For a clean match up to low-pile carpet, trim front of reducer to match carpet profile.*



Stair Nosing



For use on nail-down applications only. Provides transition from horizontal to vertical surfaces. Also used for stair tread construction.

Moldings, The Finishing Touch

SPECIAL NOTES

1. Some molding profiles noted in this section are available in a flexible format. These can be purchased through Resinart at 949-642-3665 and are offered unfinished only. *NOTE: This is a custom item not carried by Junckers Hardwood, Inc.*
2. Do not install built-in cabinets on top of floor. Install cabinets prior to installation of the floor.

Notes

Notes

Junckers – A Natural Feeling

For more information visit us on the web at
www.junckershardwood.com
or contact your local Junckers dealer.



2.5M0404