



RIGID CORE

installation guide

General Requirements:

- All instructions and recommendations are based on the most recent information available. If you receive a printed copy of these instructions, please refer to www.dlffloors.com to ensure you have the most up to date version of our installation instructions. By starting installation of this product, you are agreeing that you have read and understand all installer/owner's requirements and responsibilities and are aware that deviating from the instructions and recommendations in this installation guide may result in voiding the product warranty. If you need additional assistance, please contact North American Primo Flooring LLC Services at (281)766-1600.
- Always store and transport cartons stacked neatly on a smooth, flat, solid surface
- Never stack cartons on their sides or ends
- Do not stack more than 10 cartons high
- It is best to acclimate flooring and room at a constant temperature between 65°F and 85°F for 48 hours prior to, during, and 48 hours after installation.
- If these conditions can't be met, flooring should be acclimated in the install environment for 48 hours.
- Rigid Core can be installed in 3 season rooms that are completely enclosed and over a concrete slab, at least 5/8" must be allowed for expansion in these installations. Rigid Core can withstand temperatures between -20° F and 150° F, while not occupied. While occupied, the temperature range should be maintained between 55°F to 100°F. Careful acclimation is required when installing in 3 season rooms. Please note that extreme variances in temperature may increase expansion and contraction not only in the flooring itself but the structure as well.
- For new residential construction, Rigid Core may be installed under cabinets but it must be fully adhered to the floor using a high-quality pressure sensitive adhesive designed for LVT. If not fully adhered, cabinets or island may not be installed over Rigid Core.
- Additional underlayment pad is not recommended and may void your warranty.
- Mix planks from several different cartons to ensure a random appearance.
- Always allow a ¼" expansion space around the entire perimeter of the room and at all fixtures and pipes for any installation under 4,356 sq. ft. and runs less than 66 feet. For jobs above 4,356 sq. ft. and runs greater than 66 feet, allow at least 5/8 inch for expansion. Cover all exposed edges with trim or fill the gap with a high-quality silicone caulking.
- It is the sole responsibility of the installer/owner, prior to installation, to assure that the planned installation area is suitable for the flooring and meets local building codes. Confirm that all subflooring meets or exceeds all industry standards and local building codes; as well as the recommendations listed herein. The manufacturer accepts no responsibility for product failure extending from or related to failure to meet job environment and subflooring requirements. The installer/owner assumes full responsibility for the final inspection of this

product. Inspection should be done prior to installation and should include: print/color/texture/factory finish /visible conditions. If the product is not acceptable, **DO NOT INSTALL IT**. Contact your supplier immediately for assistance. Flooring that has been installed will be deemed to have been inspected and quality accepted. North American Primo Flooring LLC, LLC. will not accept any responsibility for any flooring installed with visible defects. Rigid Core is waterproof but is not a moisture barrier. Water traveling over or around the outer edges of the flooring can damage the subfloor. Elevated moisture levels below your flooring can migrate through the joints as vapor emissions possibly causing a milky white appearance known as Blushing. Blushing is a site related condition and will dissipate once the moisture levels have decreased to the specified level. Water damage and/or associated conditions are not warranted. In addition, other contaminants could migrate up as well. These are not manufacturing related conditions. When installing in a lavatory, bathroom, laundry room, or other area with frequent water usage, it is recommended that any gap be filled with a silicone caulk. This will lower the possibility of the water traveling under the floating floor and help to reduce bacterial growth and problems associated with it.

- To view below video, click picture
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Preparing the Area

- Remove all furniture and appliances from the room(s)
- Remove wall and doorway trim
- Undercut door casings
- Remove all debris and equipment that may damage finish
- **Do not install over soft, rough, uneven surfaces, or floating floors.**
- The Flooring should only be installed after all the other trades have finished and the jobsite has been cleared of any/all debris that could damage a finished installation.
- All sub-floors and substrates must be clean, flat (smooth) and dry prior to installation. Sweep or

vacuum your subfloor prior to installation ensuring nothing will interfere with the installation. All subfloors must be flat. High or low areas exceeding 3/16" per 10' (7.5 cm in 3 meter) or 1/8" per 6' (2.5 cm in 1.8 meter) must be corrected.

Wood Subfloors

Rigid Core is suitable for installation over a minimum of 3/4" CDX Plywood, OSB, or APA approved plywood. All wood subfloors should be flat, structurally sound, and free from deflection (up and down movement). Sand high areas and fill low areas with a Portland based patching compound. To avoid squeaking of the subfloor, nail or screw the floor every 6". Repair or replace any damaged sheathing. Joist spacing should not exceed 19.2". Set fasteners 1/32" below the subfloor surface, sand joints, smooth and fill holes or gaps wider than 1/8 inch wide. Install suitable underlayment when necessary to achieve a flat or solid surface. Rigid Core planks can be installed over underlayment grade plywood, lauan plywood and other underlayments recommended by the manufacturer for use with rigid core flooring. Installation over oriented strand board and particle board is not recommended, unless it is underlayment grade and non-weathered since these panels present a greater risk of sub-floor instability and can detract from the performance of the floor. Wooden subfloors installed over a crawl space should have a moisture barrier installed in the crawlspace with at least 18 inches of ground clearance with a black ground cover minimum 8mm thick Polyethylene overlapped a minimum of 6" (115 cm) and taped using a moisture resistant tape to avoid moisture migration from the ground up through the flooring. Cross ventilation (vents located around the perimeter) equal to 1.5% of the square footage of the area should be highly considered (if not already a local code). Wood floors installed directly on concrete or installed over sleeper construction are not satisfactory for installation and should be removed. Repair all squeaks prior to installation. Wood subflooring moisture should not exceed 15%. Install planks at a 90 degree angle to any existing wood floor.

NOTE: Avoid subfloors with excessive vertical movement or deflection because subfloor movement will telegraph through to the finished installation. Indications of excessive deflection are subfloor fastener release, squeaking, compromised, or sectional contours such as bowing or dipping in floors and uneven flooring material. Nail or screw subfloor panels to secure boards with excessive vertical movement (deflection) before installation of the Rigid Core planks. If the subfloor has excessive vertical movement (deflection) before installation of the flooring, then it is likely it will do so after installation of the flooring is complete. Our warranties DO NOT cover any problems caused by inadequate substructures or improper installation of said structures. The suitability of any subfloor is the responsibility of the installer and the final consumer.

Concrete Subfloors

The flatness of concrete subfloors must meet or exceed the requirements of ACI FF25. Most concrete subfloors are not flat/smooth and must be properly prepared before installation. In all cases, verify the substrate is flat (See above subfloor and substrate requirements).

All concrete floors must be properly cured and allowed to dry for at least 60 days after the curing process. Rigid Core planks can be installed over concrete on all grade levels, if a proper moisture barrier is used. **BEFORE INSTALLATION: All installations must perform a moisture test and preserve the readings to have a valid warranty. THIS IS AN INDUSTRY STANDARD FOR MOST TYPES OF FLOORING, OVER 90% OF ALL FLOORING DAMAGE IS DUE TO EXCESSIVE MOISTURE.** Moisture vapor emissions must not exceed 3 lbs./24 hours per 1,000 sq. when tested with the Anhydrous

Calcium Chloride Test in accordance with ASTM F 1869 or 80% RH in accordance with ASTM F 2170 "Standard Test Method for Determining Relative Humidity in Concrete Slabs using in situ Probes. A 6-mil polyurethane moisture barrier that is overlapped by six inches must be used with concrete subfloors. Fill cracks, saw cuts and control joints and level uneven areas that exceed 1/16" in 3'. Do not install flooring over expansion joints. All subfloors must be patched or leveled with an industry standard latex fortified Portland Cement based patching compound product that is water resistant and non-shrinking.

All sources of subfloor moisture must be remedied prior to installation. Your warranty will cover topical moisture that is dried in a reasonable amount of time but is immediately voided by flooding or standing water. Also, concrete's porous nature means that water from under your home can seep up through your concrete floor, making it damp. This can cause issues with hydrostatic pressure, mold, and mildew.

Rigid Core flooring is waterproof but it is susceptible to damage from excessive moisture that can cause hydrostatic pressure, mold, mildew, etc:

Excessive hydrostatic pressure:

For many reasons including weight and density, your foundation naturally causes moisture to rise into it. As it presses down into the soil, it forces moisture to gather around it and seep up into it. This is called hydrostatic pressure. Imagine what happens when you step onto a wet sponge. The moisture attempts to rise into and over the sponge. This is what happens when your foundation presses on the soil. Your home builder should have taken steps to mitigate this issue during construction. The most common method is the use of a vapor barrier below your foundation if it is concrete or adequate crawl space below the home if it is a wood foundation. If this moisture is not being mitigated, over time, excessive hydrostatic pressure will cause rigid core flooring to peak especially at the joints where the locking systems connect. A brief illustration to explain this very important point: Water vapor will always travel to the point of least resistance or where pressure can be released. This is usually at the locking system on the edges of a product but not always. Imagine steam venting from a tea kettle. It will always travel to the point of release or least pressure. Over time, water vapor forcing its way through the point of least resistance will shape your flooring to the point of no longer being functional. Once again, usually at a locking system joint because this is where water vapor will constantly vent. This constant pressure shapes your flooring until your locking system and flooring system are no longer functional. Constant pressure and moisture is how Spanish ship builders shaped huge Spanish oak trees into curved planks to make large wooden vessels. No vinyl flooring can prevent this type of warping over time. Thus, it is not covered by your warranty and is not a manufacturing defect. It is an installation/environmental issue.

Mold/Mildew

Mold/Mildew are not covered by your warranty and may destroy the functionality/aesthetics of your purchase. Mold/Mildew is a function of excessive moisture in the foundation of your home or from a water source in your home.

1. Mold and mildew both are fungi that develop as a result of excessive, unchecked moisture in confined spaces. Decomposers that are neither plant nor animal and produces microscopic fungi.

2. Mildew's white-gray spots spread outward, not upward, remaining on the surface. Mold, though, eats into its base—which makes it harder to remove—and sometimes grows upward.
3. Exist everywhere/carried by spores
4. In homes:
 - a. Can grow in 12-48 hours
 - b. Colonize (spread) in 1-12 days
5. Requires moisture/food/spores to grow
6. How to stop:
 - a. Remove incoming source of moisture
 - b. Limit relative Humidity to below 50%
 - c. Keep dirt/waste/accumulation off floors
 - d. Keep areas dry/clean
 - e. Ventilate crawl spaces to evaporate accumulated moisture
 - f. Ensure that foundations have moisture barrier below slab
 - g. Ensure that flooring has poly barrier below
7. Toxicity:
 - a. Humans are exposed every day via air borne mold spores
 - b. Usually harmless to most people in small quantities
 - c. If a person is sensitive to them inhaling a lot of spores can be harmful
 - d. While some people may not be affected at all, others who are especially sensitive may experience cold-like symptoms such as itchy eyes, wheezing, or a runny nose.

Mold vs. Mildew: Visual Differences

Mold

- Green, red, or black
- Often confused for dirt
- Darker shades
- Fuzzy

Mildew

- White/gray in early stages
- Turns brown
- Flat
- Powdery
- Small dot

How to Treat Mold and Mildew

These instructions are for cleaning a small area with mold/mildew for people who are not allergic or sensitive to it. If it is a large area or if you/household member are sensitive, you should ALWAYS hire a remediation specialist.

Before [cleaning mold and mildew](#), always wear breathing protection, waterproof gloves, and eye protection. Use a mild detergent with water or a combination of vinegar and water with a new sponge.

1. Remove or Dispose of Unwanted Material

Begin with anything that can be removed and disposed of, such as wallpaper, rotted drywall, wood, and fabrics.

2. Mist With Clean Water

With mildew or dry mold, mist the remaining area with a squirt bottle filled with clean water to prevent the spores from being released into the air.

3. Mist With Soapy Water or Vinegar Solution

Mist the area with lukewarm soapy water or the vinegar-water solution.

4. Rub Off Mold or Mildew With a Sponge

Mechanically remove the mold and mildew by rubbing them with the sponge. Frequently change the water and use fresh sponges. Using old water can redeposit mold or mildew spores back in the same area.

5. Let the Area Dry

Let the area thoroughly dry for at least 48 hours. The area must be completely dry before it can be put back in service.

Existing Floors

Rigid Core planks can be installed over a variety of finished floors including single layer resilient sheet floor and tile, ceramic, marble and terrazzo. The surface must be in good condition and show no signs of excessive moisture conditions. Level deep or wide grout lines with embossing leveler. Do not install flooring over cushioned floors or over tile installed over concrete below grade level. The grout joints in ceramic tile and marble must be leveled so they are flush with the tile surface. Additionally, the tile may require several skim coats to achieve a flat surface.

Existing Resilient Floor Covering

The existing resilient must be single layered, non-cushioned backed, well bonded, fully adhered, and smooth. The flooring should show no signs of moisture or alkalinity. All topical waxes, polishes, airborne contaminants, etc. must be removed. Any irregularities must be repaired or replaced. Skim coating the surface is recommended to prevent telegraphing. Do not install over rubber-based substrates.

Old Adhesive Residue: North American Primo Flooring LLC does not recommend skim coating over existing adhesive. Because we cannot control how the adhesive was applied, the existing adhesive may break down, possibly leading to a failure. Remove existing adhesives using a scraper such as a razor scraper designed for scraping flooring surfaces. The adhesive must be removed to the level of a film. Do not use solvents or chemical adhesive removers to remove old residue. These products can leave a residue in the concrete that may affect the performance of your new flooring.

WARNING For installation over old resilient floor coverings or when considering removing existing resilient floors, please be advised that these products may possibly contain asbestos fibers or crystalline silica. Please follow all recommended Resilient Floor Covering Institute (RFCI) work practices as www.rfci.com.

Do not install additional backings or foam/cushioned underlays with Rigid Core.

Radiant Heated Systems

The Hydronic or Embedded radiant heating system needs to be operational and working for one week prior to install date to reduce any residual moisture. For radiant heating systems in use at the time of installation, lower the temperature to 65°F (18.3°C) for a minimum of three days prior to the installation date, during the entire installation, and for 24 hours following upon completion of the installation. The temperature can then be gradually increased in 5° increments. Temperature must never exceed 85°F (29°C). It is the responsibility of the purchaser to confirm the suitability of the radiant heating system for use with this product. Any damage to the floor caused by the radiant heating system will not be covered by the product warranty. Should the radiant heating system be an aftermarket system, North American Primo Flooring LLC requires confirming with the manufacturer of that system that Luxury Modular Flooring (considered resilient) can be installed over their system. Any problems associated with aftermarket radiant heating systems are not the responsibility of North American Primo Flooring LLC. Radiant heating systems that are installed on top of the subfloor surface and covered with self-

leveling underlayment are not recommended.

Asbestos Warning

WARNING! DO NOT MECHANICALLY CHIP OR PULVERIZE EXISTING RESILIENT FLOORING, BACKING, LINING FELT, ASPHALTIC "CUTBACK" ADHESIVES OR OTHER ADHESIVES.

Previously installed resilient floorcovering products and the asphaltic or cutback adhesives used to install them may contain either asbestos fibers and/or crystalline silica. The products in this carton DO NOT contain asbestos or crystalline silica. Avoid creating dust. Inhalation of asbestos or crystalline dust is a cancer and respiratory hazard. Smoking by individuals exposed to asbestos fibers greatly increases the risk of serious bodily harm. Unless positively certain that the previously installed product is a non-asbestos containing material, you must presume it contains asbestos. Regulations require that the material be tested to determine asbestos content and may govern the removal and disposal of material. See current editions of the Resilient Floor Coverings Institute (RFCI) publication "Recommended Work Practices for Removal of Resilient Floor Coverings" for detailed information and instructions on removing all resilient covering structures.

Tools Required

- Electric Saw or tile cutter
- Utility knife
- Pull-bar
- Vinyl seam roller
- ¼" spacers
- Carpenter Square
- Chalk line
- Tape Measure
- Pencil

PRE-INSTALLATION:

- When calculating flooring square footage requirements, allow a minimum of an additional 10% for cuts, waste and defects. If installing a diagonal or other special pattern, allow for 15-20 % additional in material.
- All installations require estimating additional material, due to trimming and culling of material (overages occur). This overage then becomes what is commonly referred to as "Attic Stock". It is recommended the end user keep attic stock in the event their installation require additional service.
- Verify material prior to installing, checking for debris or damage. Clean, trim or discard any affected sections.
- It is recommended to mix panels from a minimum of 3 different boxes during installation to assure an even distribution of any minor color variations, slight variances in texture and gloss levels. Hint: Try dry racking (laying out) your panels prior to final assembly to confirm this is an acceptable layout.

- North American Primo Flooring LLC requires at least a ¼” expansion gap around the entire perimeter of the installation, any transitions to adjacent flooring materials, door frames, and heating vents.
- It is recommended to undercut doorjamb so the material slides easily under them. A ¼” (5cm) expansion space is necessary here as well. If the door casings are metal the ¼” (5cm) expansion space can be filled using a silicone or acrylic silicone caulk. **Please note the expansion gap must be maintained under the doorjamb.**

ACCLIMATION: (Uncontrolled storage) Acclimate all materials in the area to be installed between the temperatures of 55°F to 100°F a minimum of 48 hours before, during, and after the installation. Protect flooring from excessive heat/cold during storage. If the product is stored in an environment different from the installation site, the temperature ranges should be controlled within the 55°F to 100°F. Offsite acclimation is acceptable. Please note the material will need to be delivered directly to the installation site with no stops in between.

Installation

- For best appearance planks should be installed parallel to the long dimension of the room and preferably parallel with outside light sources, i.e. windows and doors.
- Determine the layout to achieve the largest cut planks at the walls and snap a chalk line at the starting point.
- Install planks in a random layout. Start with a whole plank in the left-hand corner of the room with the tongue side and end toward the wall. Lay the first row of planks along the chalk line and trim to fit to the wall allowing the appropriate amount of expansion space. Note: If starting the first row with a whole width plank it will be necessary to trim the tongue off against the wall. Always place the cut edge against the wall.
- Your Rigid Core flooring has the best locking system in the industry, UniPush®. It has an angle/angle locking system for stability, convenience, and quickness. This system requires that the long sides be installed first by engaging the joint at a shallow angle while lining up the short side drop lock mechanism. Once the long side is engaged, firmly press the top left of the drop lock joint down with the thumb to properly seat and align the joint. **The installing plank should not be resting on the face of the adjacent plank nor should there be any gaps in between the two planks. Once properly aligned, the end joint can be carefully seated with a rubber mallet while tapping approximately 1” from the end of the joint. Note: Care must be taken while aligning the end joints. If they are not properly aligned, it will damage the locking system. If a plank needs to be removed, SLIDE the plank horizontally to disengage or lift evenly on both ends. DO NOT pull a single plank up to disengage as this will damage the locking system. The resulting damage is not considered a manufacturing defect or covered by warranty.**
- Attach the end joints of the planks in the first row. Insert the tongue into the groove while holding the plank at a 20° to 30° angle to the floor. Apply pressure inward and down until the planks lock together. Use spacers between the edge and end of the planks and the wall to maintain the appropriate amount of expansion space.
- Start the second row using 1/3rd of a plank. Place the cut end against the wall. Insert the tongue on the long side of the plank into the groove of the plank in the first row. Hold the plank

in a 20° to 30° angle while applying pressure inward and down until they lock together. To complete the second and all successive rows it will be necessary to lock the short end into the previous plank first before locking the long side of the plank.

- Start the third row using 2/3rds of a plank with the cut end against the wall. Complete each row thereafter using a random layout with end joints off-set by at least 8". Plan the layout to avoid using small planks (less than 6") at the walls. The cut piece at the end of the row can often be used to start the next row provided it achieves a random layout. Always place the cut end against the wall and allow the proper amount of expansion space.
- Rigid Core planks are unique in that they can also be installed with a pull bar or tapping block and rubber mallet in difficult areas, such as the last row, and when fitting around door trim. Use a pull bar and rubber mallet to lock the joints together in the last row. Always use a pull bar on the cut edge of the plank. Factory edges can be damaged if the pull bar is used directly against them.
- When fitting around door trim it will be necessary to slide the plank under the trim. This can be accomplished easily by starting the row on the side of the room with the door trim and then sliding the plank into place once it is attached. The row can be completed by inserting the tongue into the groove or the groove into the tongue depending on the direction. Use a series of light taps until the joint is gradually locked together.

Special Instructions:

Bathrooms

Rigid Core can be installed around the toilet leaving a 1/8" expansion space. Use a high quality silicone caulking to fill the expansion space at the tub, shower and all wet areas to prevent surface water seepage under the floor.

Stairs

Rigid Core planks can be installed fully adhered over steps using a high-quality pressure sensitive luxury vinyl tile adhesive. Follow the instructions on the adhesive for trowel size and drying time. Always use a flush stair nose molding to finish each step at the nose.

Finishing the Job

Remove all spacers. Install wall trim lightly over the floor surface. Drive fasteners into the wall and not the floor. When installing doorway transition moldings allow a ¼" expansion space between the edge of the floor and the molding. Do not drive fasteners into the floor. Return appliances to the room by rolling or sliding over strips of hardboard to prevent damaging the floor.

Plank Replacement

Should one of the planks/tiles become damaged and need to be replaced, follow these simple instructions:

1. Score top of damaged plank/tile with a utility knife. Make two triangle cuts near the end joint and then connect the points with one long cut in the middle of the plank/tile. (See diagram below.)



SCORE TILE AS SHOWN

2. Use an awl or screwdriver to tap down through plank/tile on scored triangle cut points.
3. Lift and remove damaged tile.
4. With the pattern side facing up on the new replacement plank/tile, trim off the short lip on the tongue side and the groove on the compression joint side, making it flush with the edge of the plank/tile. Be careful not to damage the finish surface of the tile.



5. Cut several pieces of acrylic double sided tape made for vinyl floors and slide under the edges of the existing floor on the two edges where the replacement plank/tile will have its lips cut off. Tape should face sticky side up; leave the paper on the side facing the floor.
6. Using a Premium Seam Bond, run a small bead of sealer on the groove edge of the panel of the existing floor where the replacement plank/tile will rest.

NOTE: The long tongue of the replacement plank/tile and the uncut compression fit end joint will not need tape or seam adhesive as you will be using the plank's/tile's locking mechanism.

7. Install replacement plank/tile by angling the long groove of the replacement panel under and over the tongue of the floor panel until the finish edge of the replacement panel is tight against the finish edge of the floor panel, and the compression end joint is lined up. Rotate down, locking the length tongue joint then pressing the end joint with your thumb or palm of your hand to lock into place.

8. Wipe any excess sealer that comes to the surface of the tiles with a damp cloth and follow with a dry cloth to ensure all sealer is removed from tile surface.

9. Keep foot traffic off the replaced plank/tile for 24 hours.

Floor Care

- Frequently moved furniture should be equipped with felt pads to avoid scratching the floor. Heavy furniture and appliances should be equipped with non-staining large surface floor protectors. Furniture with castors or wheels must be easy swiveling, large surface non-staining and suitable for resilient floors. Do not use ball type castors as they can damage the floors.
- Avoid exposure to long periods of direct sunlight. Close blinds or drapes during peak sunlight hours.
- Use walk off mats at entrance stop prevent dirt and grit from being tracked on to the floor.
- Sweep or vacuum the floor regularly to remove loose dirt. Avoid using a vacuum with a beater bar.
- Clean up spills immediately.
- Damp mop as needed using clean water and a diluted floor cleaner. Do not use harsh cleaners or chemicals on the floor.
- We recommend using a pH neutral vinyl floor cleaner as required. Examples of acceptable cleaners are Bona Stone, Tile, and Laminate Cleaner and ZEP. We do not warrant any of the cleaning agents or conditions associated with them as the application is beyond our control.
- Always rinse the floor with clean water and allow to dry as the floor may be slippery when wet. Air movers or fans will speed up drying time.
- Never saturate your floor.
- Do not buff, wax, or use cleaning products that contain surfactants. Dish lotions, laundry detergents, Murphy Oil Soap cleaners should never be used to maintain your floor.
- Never use a steam cleaner or a steam mop on the flooring.
 - To view below video, click picture
 - To return to instructions after viewing video, press Esc



How vinyl flooring can be damaged by moisture in your slab (cupping, locking system failure, peaking, etc.)

One advantage to vinyl flooring is its ability to resist water saturation, but this is when exposure time is limited. Extended exposure to water causes vinyl flooring materials to warp and curl at the edges.

What does waterproof mean?

While the definition for waterproof is straight forward, the concept behind it is not. Currently, there is no established industry standard for flooring to classify it as waterproof.

Waterproof means impervious to water, not allowing fluid to pass through or impenetrable. Water-resistant means able to resist the penetration of water to some degree but not entirely. Water-repellent is defined as not easily penetrated by water, especially because of being treated for such a purpose with a surface coating.

Two things that are virtually impossible to block are air and moisture vapor. Moisture vapor often comes from below the floor, where it can condense and turn to water. This occurrence cannot be prevented by waterproof flooring.

The condition of your slab matters

Adhesives, floating floors, and grout or cementitious bonds are 3 common flooring materials that can run the risk of causing moisture-related problems. Moisture control is often one of the most crucial, yet most overlooked, elements of any floor's success over time. Responsible moisture control (having accurate moisture measurements) starts with the concrete slab.

As concrete dries, water vapor from the original concrete mixture exits the slab, creating small capillary networks. These pathways remain open until properly sealed and can be the path of least resistance when water pressure builds up against a concrete contact point. While newer high-strength concretes can resist higher levels of pressure than older mixtures, they still can be susceptible if cracks form or hydrostatic pressure builds high enough.

The age of the slab is going to be important to understanding what is going on. Slabs poured BEFORE the late-80's may not have plastic sheeting underneath it. Slabs from the 70's and earlier DEFINITELY do not have plastic underneath it.

Concrete is POROUS. It is a RIGID sponge. It loves to grab water from the bottom and syphon it to the top and allow it to release into the home. This usually does not cause issues UNLESS you 'cap' it with something like solid flooring. Now the water has nowhere to go but sit underneath the vinyl. That is when you find out that hydrostatic

pressure or some external factor of incoming moisture is destroying your flooring system.

Hydrostatic Pressure: What It Is and What It Is not

Hydrostatic pressure is a term that is often used when excess moisture has created problems with concrete slabs and connected flooring systems. However, it is not as generic a term as people in the industry often think.

At its simplest, hydrostatic pressure is the pressure created by standing or resting (“static”) water (“hydro”). It is a natural force that can move rocks, buckle walls, and cause havoc with your concrete. That same relentless pressure can impact your floors too.

While concrete is a relatively solid material when dry, it is not technically solid in the same way that stainless steel is. It is not impervious to moisture.

Poor drainage may cause water to collect against a concrete foundation. Sites cut into a hillside or in the natural path of drainage stand a greater risk of having the “hillside side/water side” be affected by hydrostatic pressure if adequate steps to redirect the water (and the subsequent pressure that might build up as it accumulates) are not taken.

What Hydrostatic Pressure Is not?

Hydrostatic pressure is a term often used rather generically to explain any moisture problem that occurs in a concrete slab, but several other sources of moisture could equally be responsible for water intrusion or moisture-related flooring issues.

Rain, snow, groundwater, leaks, increasing water content, and sprinkler systems are all potential sources of free water. Any moisture the slab does not need is moisture that can undermine your flooring installation.

Only identifying the correct source of excess moisture will make proper remediation possible. Other possibilities include:

- **Water Supply Sources**
Sprinklers, plumbing, city mains, and other water supply lines may be a source of moisture if they break or if a joint failure. If this occurs in a location with poor drainage or very dense soil, the water may end up in extended contact with the concrete and increase its internal moisture content, or relative humidity (RH). The pressure formed by a burst pipe is technically a type of hydraulic (or a mechanical force) pressure.
- **Inadequate Installation**
Obviously, we want to believe that every concrete and flooring professional is fully educated in his or her trade and uses the strictest standards to be sure each job is completed correctly. Unfortunately, the high level of

flooring failure costs annually suggests that there is more to be learned. Some installation culprits that can result in excess concrete slab moisture may include a [vapor retarder](#) with insufficient or poor “perm” (permeability) rating, insufficient site evaluation or geotechnical survey to identify natural water sources, excessive [troweling](#) that prematurely seals the slab surface, or surface membranes applied before the slab was [adequately dry](#).

- **Improperly Dried Concrete**

In cases where flooring failure is attributed to excess moisture, it is important to be sure that the slab was adequately dry before flooring was installed. Calcium Chloride test or RH testing should ALWAYS be done before installing any flooring system.

Ultimately, if hydrostatic pressure is the culprit, the only way to correct it is to eliminate the pressure of standing water. Accurate and comprehensive moisture testing and site evaluation can indicate the true source of concrete moisture intrusion to ensure proper and lasting remedies.

The most widely recognized moisture testing standards are:

1. ASTM F1869 (Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride)
2. ASTM F2170 (Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes)

Excess moisture can be indicated in several ways including cupping, peaking, molding, mildewing, seeing efflorescence (white residue) on the concrete floor, or the floor over the concrete is blistering or peeling away.

If this moisture is not mitigated, over time, excessive moisture/hydrostatic pressure will cause rigid core flooring to peak especially at the joints where the locking systems connect.

A brief illustration to explain this very important point: Water vapor will always travel to the point of least resistance or where pressure can be released. This is usually at the locking system or on the edges of a product but not always. Imagine steam venting from a tea kettle. It will always travel to the point of release or least pressure. Over time, water vapor forcing its way through the point of least resistance will shape your flooring to the point of no longer being functional. Once again, usually at a locking system joint because this is where water vapor will constantly vent.

This constant pressure shapes your flooring until your locking system and flooring system are no longer functional. Constant pressure and moisture are how Spanish ship builders shaped huge Spanish oak trees into curved planks to make large wooden vessels. No vinyl flooring can prevent this type of warping over time. Thus, it is not covered by your warranty and is not a manufacturing defect. It is an installation/environmental issue.