

FLEXFORM (2mm & 2.5mm) PLANK & TILE INSTALLATION GUIDE

All instructions and recommendations in this guide are based on the most recent information and installation techniques available, please follow this guide to ensure a trouble free and warranty supported installation.

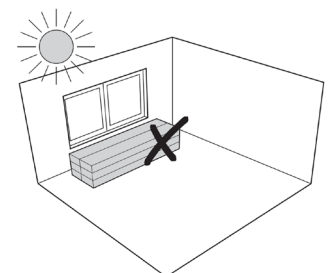
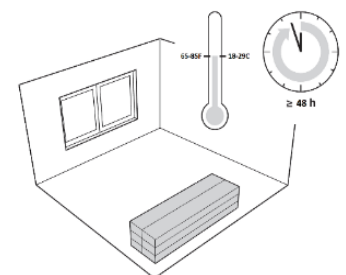
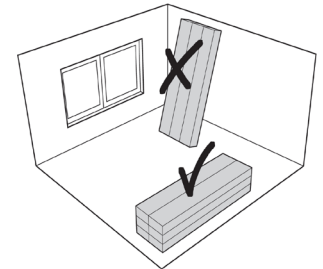
Always check millikenfloors.com for latest installation, warranty and maintenance guides. It is the responsibility of the installer to ensure that the most current documents are used during installation.

Installation contractor is responsible for reasonable inspection of the products prior to installation and for maintenance of dye lot integrity during installation. Milliken will not be responsible for visible defects after LVT has been installed.

Contact Milliken Technical support if there are any specific concerns or questions prior to installation.

Product Handling and Site Conditions

1. Check batch and product details and quantity are correct and match purchase order.
2. Store cartons of tile and/or plank with cartons stacked one on top of the other. Do not store on end or sides or allow cartons to bend during storage or transportation.
3. Acclimate product to job site conditions by delivering all materials, including adhesives and maintenance products, to the job site at least 48 hours prior to installation. Store all products at 65° to 85° Fahrenheit (18° to 29° Celsius) for 48 hours prior to installation. Unpalletized boxes laid of flat surface will acclimate more evenly. Floorcoverings left stacked may take longer to acclimate. In extreme heat or cold temperature situations acclimation may take longer.
4. The space where flooring is to be installed shall be fully enclosed and the permanent HVAC system shall be operational prior to installing flooring. The temperature shall be 65° to 85° Fahrenheit (18° to 29° Celsius) for 48 hours before installation, during installation and for 48 hours after installation. The temperature of the space shall be kept at a minimum of 50° Fahrenheit (10° Celsius) continually after installation.
5. To prevent damage to the newly installed flooring the installation of flooring products should be installed after all other trades have completed their work. To further prevent damage after install until space is occupied, use of a reinforced fiber-based temporary floor protector product is strongly recommended.



6. To prevent adhesion problems with direct-glue installations, areas to receive resilient flooring shall be permanently dry, clean, smooth, level and structurally sound. They shall be free of all contaminants, including but not limited to: dust, solvents, paint, wax, oil, grease, residual adhesive, adhesive removers, curing, sealing, hardening or parting compounds, alkaline salts, excessive carbonation or laitance, mold, mildew; any foreign material that might prevent a proper adhesive bond.
7. Install flooring perpendicular to direct light sources, including large windows, etc. Use of suitable window coverings during the times of most direct sunlight is recommended.
8. Never install LVT outdoors.
9. During installation, mix and install planks from several different cartons to minimize shade variation.
10. Inspect your shipment of LVT to ensure that all cartons are of the same lot/manufacturing run.
11. To minimize shade variation during installation of Milliken LVT, mix and install planks from several different cartons.
12. All subfloor/underlayment patching must be done with a non-shrinking, water resistant Portland cement patching compound.
13. Installed LVT must be rolled with a 3 section 100-pound roller.

APPROVED SUBSTRATES

The following are approved substrates for installation of Milliken Luxury Vinyl Tile. See the next section for proper testing and substrate preparation prior to installing your Milliken floorcovering.

All substrates regardless of composition must be smooth and flat to within 3/16" (4.76mm) in 10 feet or achieve an "F32" rating by use of mechanical grinding/sanding or suitable Portland cement-based patching and leveling compounds.

- Above, on or below-grade concrete without hydrostatic pressure, excess moisture or alkalinity. Must be fully cured and dry, free from curing compounds, sealers etc.
- Above or on grade lightweight concrete, properly prepared, without dust, without hydrostatic pressure, excess moisture or alkalinity
- Above or on grade Gypsum concrete surfaces, properly prepared, sealed and without hydrostatic pressure, excess moisture or alkalinity
- Properly prepared and well bonded existing resilient floor covering
- Cement Terrazzo, ceramic tile, marble - see adhesive for proper preparation.
- Certain metal floors - see adhesive for proper types and preparation. May require use of a 2-part epoxy; contact Milliken Technical Support for assistance
- Radiant heated floors where heat does not exceed 85° F (29° C)
- APA registered underlayment, sanded face exterior grade with minimum rating of B-C plugged face
- APA registered exterior grade plywood sanded and plugged face with ratings as follows: B-C, or better
- Milliken sound control underlayment

The following are not approved substrates for installing Milliken glue down Luxury Vinyl Tile:

- Epoxy terrazzo
- Rubber, cork or asphalt tiles
- Textured or cushion backed resilient flooring
- “Sleeper” floor systems and other uneven or unstable substrates
- Plywood floors that have been installed directly over a concrete slab
- Luan, OSB, particle or chip boards, CCA (pressure treated), oil treated or other coated plywood
- Advantech OSB if LVT is to be glued down (must be covered with plywood).
- CDX or other plywood with knots or open defects
- Underlayment made of pine or other soft woods
- Masonite™ or other hardboard underlayment
- Raised access flooring unless accessibility is not required
- Hardwood flooring
- Uneven or unstable substrates
- Paint, wax, oil, grease, residual adhesive, mold, mildew, and other foreign materials that might prevent adhesive bond

SUBSTRATE PREPARATION

All substrates must be properly prepared and tested according to the following guidelines.

1. Concrete Subfloors

- a. Shall be in accordance with the most current version of ASTM F710 - Standard Practice for Preparing Concrete to receive Resilient Flooring
- b. All patching and leveling is to be in accordance with the most current version of ASTM F2678 - Standard Practice for Preparing Underlayment's, Thick Poured Gypsum Concrete Underlayment's, Thick Poured Lightweight Cellular Concrete Underlayment's and Concrete Subfloors with Underlayment Patching Compounds to receive Resilient Flooring
- c. Concrete slab construction shall be in accordance to industry standards for specification related to concrete mix design, curing methods and drying times to prevent moisture problems.
- d. On-grade and below-grade slabs should be installed with a suitable vapor retarder directly underneath the concrete slab.
- e. New concrete shall be properly cured and dried prior to the installation of floor covering. Curing agents, surface hardeners and other membranes or compounds shall be mechanically removed immediately after initial cure to allow the slab to properly dry before installation. Approximately 30 days per 1” of slab thickness.
- f. All concrete substrates, regardless of grade or age of slab, must be properly tested using one of the methods outlined below for warranty to apply. Acceptable test method is ASTM F 2170 In Situ Relative Humidity. Testing shall be conducted according to the instructions of the manufacturer of the testing equipment.

Please note, Milliken provides adhesive options that do not require moisture testing. Specific requirements are outlined in the Adhesive Recommendations.

ASTM F 2170 In-Situ Relative Humidity Test

- i. Prior to conducting ASTM F 2170 in-situ testing, a preliminary evaluation of comparative moisture conditions of concrete, gypsum cement, and other flooring should be conducted using a non-destructive Electronic Moisture Meter. This will assist in determining areas that must then be tested per ASTM F 21070.
- ii. Relative humidity of the slab shall not exceed 98% when using Milliken LVT Adhesives as outlined in Adhesive Recommendations. Floor covering should not be installed until concrete is sufficiently dry or until corrective measures are taken by the contractor.
- iii. Testing should only be done when the test site is at the same temperature and humidity expected during normal use; or at a temperature of 65° - 80° F (18° - 26° C) and 45% - 50% humidity for minimum 48 hours prior to testing.
- iv. A minimum of 3 test holes for the first 1,000ft² (100 M²) and one additional test hole for each 1,000ft² (100 M²) thereafter.
- v. Test holes are to be drilled at a depth of 40% of slab thickness (one-side drying) or 20% of slab thickness (two sides drying).
- vi. Test holes should be allowed to acclimate for 72 hours prior to insertion of the test probe. Reusable probes should equilibrate at least 1 hour prior to use in the next test area.

Concrete Alkalinity / pH Test

- i. Testing should only be done when the test site is at the same temperature and humidity expected during normal use; or at a temperature of 65° - 80° F (18° - 26° C) and 45% - 50% humidity for minimum 48 hours prior to testing.
- ii. Using distilled water, place drops of water to form a small puddle approximately 1" in diameter.
- iii. Wait 60 seconds, then dip a portion of the pH paper into the water.
- iv. Acceptable pH levels of the concrete are between 5 and 12 when compared to the color chart provided in the test kit. If higher Milliken LVT Moisture XT adhesive may be used.

Concrete Slab Preparation

- i. Concrete slabs shall be clean and smooth prior to installing floor coverings. Remove all sealers, curing agents and compounds, grease, oil, adhesive removers, old adhesive residue, dirt, paint, etc. to ensure a clean bond surface for the adhesives.
- ii. Concrete floors shall be smooth and level to prevent irregularities, roughness or other defects from telegraphing through the new resilient flooring. The surface of the slab shall be flat to within $\leq 1/8"$ over 6-foot and $\leq 3/32"$ over 1-foot in all directions.
- iii. Uneven areas should be mechanically ground to smoothness.
- iv. Cracks, depressions or other similar irregularities should be leveled using a suitable high moisture resistant Portland cement-based patching compound. Follow the patch manufacturer's instructions regarding mixing and applications.
- v. Overly porous, dusty, flaky or soft concrete surfaces are not suitable for resilient floor coverings. It may be necessary to mechanically remove the top layer concrete in such cases and/or these surfaces may need to be primed and covered with a cement-based underlayment compound. Follow the patching or leveling compound manufacturer's instructions regarding preparation of the concrete surface, priming, mixing of the product, thickness of application and drying time for resilient floor covering installation.
- vi. Expansion joints, isolation joints, control joints or other moving joints in the concrete slab shall not be filled with patching compound or covered with resilient flooring.

Please note, Milliken provides adhesive options that do not require moisture testing. Specific requirements are outlined in the Adhesive

Recommendations. Applicable requirements for each adhesive option outlined below.

RECOMMENDED ADHESIVES

- **Milliken LVT Standard Adhesive:** Packaged in 4-gallon (15.1 liter) pails is recommended for the installation of Milliken 2mm & 2.5mm Glue Down LVT products.
 - New Pour:
 - It is a new pour > 90 days.
 - Slab is on or above grade.
 - No visible water on the surface.
 - ASTM E-1745 Class B minimum conforming Vapor Retarder is in place in accordance with ACI 302-2001 and directly in contact with the concrete placement.
 - RH does not exceed 98% as measured by the in situ Relative Humidity Probe Test (per latest version of ASTM F2170).
 - Acceptable pH levels of the concrete are between 5 and 12.
 - Acclimatized to service conditions.
 - Bond test required in accordance with ASTM F3311 with archived photo documentation.
 - Renovation - On and above grade
 - Confirmed ASTM E-1745 Class B minimum vapor barrier in place or Rh does not exceed 98% as measured by the in situ Relative Humidity Probe Test (per latest version of ASTM F2170).
 - RH does not exceed 98% as measured by the in situ Relative Humidity Probe Test (per latest version of ASTM F2170).
 - Acceptable pH levels of the concrete are between 5 and 12.
 - No visible water on the surface.
 - Existing adhesive must be removed to a stain
 - Acclimatized to service conditions.
 - Bond test required in accordance with ASTM F3311 with archived photo documentation.
- **Milliken Mosaic 98 - Spray adhesive,** packaged in 22oz aerosol cans is recommended for the installation of all Milliken 2mm & 2.5mm Glue Down LVT products when:
 - New Pour - pH and RH testing required
 - It is a new pour > 45 days
 - Slab is on or above grade
 - RH does not exceed 98% as measured by the in situ Relative Humidity Probe Test (per latest version of ASTM F2170).
 - pH does not exceed 11
 - No visible water on the surface
 - Acclimatized to service conditions.
 - Bond test required in accordance with ASTM F3311 with archived photo documentation.
 - Renovation - On Grade: pH and RH testing required.
 - RH does not exceed 98%
 - pH does not exceed 11
 - There is no visible moisture on the surface.
 - Existing adhesive must be removed to a stain.
 - Acclimatized to service conditions.
 - Bond test is required in accordance with ASTM F3311 with archived photo documentation.
- **Milliken LVT Moisture XT :** Packaged in 2 gal pails is recommended for the installation of all Milliken 2mm & 2.5mm LVT products.
 - New Pour: NO pH or RH Testing required if the following requirements are met.
 - It is a new pour > 45 days
 - Slab is on or above grade.
 - No visible water on the surface.
 - Acclimatized to service conditions.
 - Bond test required in accordance with ASTM F3311 with archived photo documentation.
 - Renovation - On Grade: NO pH or RH Testing required if the following requirements are met.
 - There is no visible moisture on the surface.
 - Existing adhesive must be removed to open porous surface.
 - Must pass ASTM F3191 porosity test.

- Acclimatized to service conditions.
- Bond test is required in accordance with ASTM F3311 with archived photo documentation.

2. Gypsum and Lightweight Concrete Substrates

Gypsum and lightweight concrete subfloors and substrates should in accordance with the listed standard. Unprimed gypsum or lightweight concrete surfaces may have a dusty surface and a very open, porous surface, which will lead to an adhesion bond failure if not properly sealed and treated. It is the responsibility of the installation contractor to obtain verification from the GC, architect, owner or party responsible for the site that the gypsum or lightweight concrete substrate was properly sealed with the gypsum or lightweight concrete manufacturer's recommended sealer. If this data is not available, conduct testing according to the appropriate ASTM Test Method for Gypsum Surfaces.

- a. Gypsum surfaces shall be in accordance with and properly prepared to the appropriate ASTM specifications as listed in the above Reference Section
- b. All patching and levelling is to be in accordance with ASTM F2678 (latest version), Standard Practice for Preparing Panel Underlayment's, Thick Poured Gypsum Concrete Underlayment's and Concrete Subfloors with Underlayment Patching Compound to Receive Resilient Flooring Compounds

Conduct a surface porosity test to ensure that the surface is properly sealed. If the water is quickly absorbed, stop the installation and call Milliken Technical Services.

3. Wood Subfloors

- a. A combination of wood subfloor and panel underlayment construction shall be a minimum of 1" in total thickness.
- b. There shall be at least 18" of well-ventilated air space beneath all wood subfloors. Crawl spaces shall be insulated and protected by a suitable vapor barrier.
- c. Wood subfloors installed directly on concrete or over "sleeper" joist systems are not acceptable for use under Milliken Luxury Vinyl Tile.
- d. Panels designed as suitable underlayment shall be at a minimum:
 - i. Minimum 1/4" in thickness
 - ii. Dimensionally stable
 - iii. Fully sanded face to eliminate grain texture or show through
 - iv. Have a written manufacturer's warranty and installation instructions
 - v. Be free of substances such as ink, fillers and resins which may lead to staining of the resilient flooring
 - vi. Have all knots, voids and defects properly plugged and sanded
- e. Panels shall be installed according to manufacturer's instructions regarding stapling pattern, sanding and filling of joints, and acclimation to installed environment.
- f. Milliken will not cover or accept responsibility for the following:
 - i. Joint telegraphing, either as a "ridge" or "valley"
 - ii. Grain or texture telegraphing
 - iii. Discoloration of finished flooring due to materials used for filling of voids and defects in the face of the underlayment
 - iv. Use of Luan Plywood underlayment
- g. Unacceptable substrates shall be covered using a 1/4" or thicker panel underlayment recommended for commercial use. Consult underlayment manufacturer for:
 - 1) Recommended uses of product
 - 2) Warranty coverage
 - 3) Joint spacing
 - 4) Nailing or stapling pattern
 - 5) Seam treatment
- h. Suitable underlayment panels include Artic (Baltic) Birch, A/C grade plywood with sanded face, or other underlayment grade exterior plywood.

4. Existing Resilient Flooring

- a. When installing Milliken LVT over existing resilient floors, the existing flooring must be:
 - i. Single layer only
 - ii. Thoroughly stripped of all wax, floor finish, dirt and other contaminants that may affect adhesive bond
 - iii. Be firmly bonded to the substrate
 - iv. Flat and smooth with no curling edges or loose seams
 - v. Dry and free from excessive moisture. All concrete floors shall be tested for moisture regardless of age or grade level. Do not assume that an existing floor is free of moisture related issues. Conduct testing per Section 1.d above.
 - vi. Must not be of a cushion back, floating, or perimeter bonded floor
 - vii. Embossed surfaces may require use of appropriate embossing leveler in order to not telegraph.

Milliken is not responsible for problems leading to or from indentations, telegraphing of old floor or adhesion release of old floor after the Milliken LVT is installed.

5. Old Adhesives

- a. Adhesive residue shall be properly prepared prior to the installation of Milliken LVT. It is recommended that mechanical scraping or grinding be used as a primary means of completely removing old adhesive residue.
 - a. Surface must be porous - pass ASTM F3191 porosity test
- b. Residues include, but are not limited to carpet, vinyl, VCT, and or wood flooring adhesives.
- c. Black cutback/asphalt adhesives shall be scraped by hand to remove any loose patches, trowel ridges and puddles so that only a thin residue layer remains. This layer shall then be properly covered using a Portland based patching compound properly mixed with the manufacturer's recommended latex/acrylic additive.
- d. If chemical/liquid adhesive removers are utilized, the manufacturer's recommended instructions for cleaning after use of the remover shall be followed fully. Milliken is not responsible for any adhesive failures, indentation, bubbling, or delamination of new flooring due to improper cleaning of residue left from liquid adhesive removers.

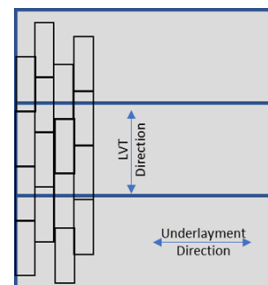
6. Radiant Heated Substrates

- a. Must not be in direct contact with LVT, must be $\geq 1/2$ " separation between LVT and heating coils.
- b. Temperature of subfloor and floor does not exceed 85° F (29C).
- c. System must be off 48 hrs. prior to and post installation.
- d. When ready to start the radiant heat for the first time after installation, limit the temperature increase to 5° F every 6 hours until desired operating temperature is obtained. (The final floor temperature must be less than 85°F (29C) as said in 6.b).
 - a. This will minimize thermal shock and potential bond failure.
- e. Full spread coverage of transitional hard setting adhesive is required
 - a. Milliken LVT Standard Adhesive or Milliken LVT Moisture XT adhesive.
- f. Use of an in-floor temperature sensor is recommended to avoid overheating.

7. Milliken Underlayment Installation

- a. Install Milliken Underlayment according to instructions as follows (also on Underlayment package label):
 - i. Underlayment must first be bonded to the subfloor with **FULL COVERAGE** of Milliken LVT Standard adhesive or Milliken Mosaic 98 - Spray adhesive. This prevents any movement on the floor. "Double-stick" glue down procedure is required.

- ii. First, plan the layout of the installation space. The underlayment should be applied to floor with long direction perpendicular to the long direction of the LVT, as shown in adjacent picture.
- iii. Underlayment is easily cut with a knife or scissors.
- iv. Roll out underlayment next to wall. Roll out next row in same manner butting underlayment close to first row (do not overlap). 1-2 inches extra can be left at wall that is easily trimmed with razor knife after underlayment is glued to floor.



- v. Install Milliken Underlayment with **film UP, polyurethane down.**
 1. **Double glue installation instructions for Milliken LVT Standard adhesive:** Spread adhesive with a 1/16" x 1/32" x 1/32" U-notch trowel in an area that can be installed within the working time of the adhesive. Allow adhesive to dry to touch, creating a tacky adhesive surface.
 2. Roll out underlayment, starting next to wall if possible. Roll with a 75 - 100 lb. roller to smooth out any air pockets and to secure a good bond to the adhesive.
 3. Continue with next row of underlayment, rolling out in the same manner, butting underlayment close to first row (do not overlap). Again, roll with a 75 - 100 lb. roller to smooth out any air pockets and to secure a good bond to the adhesive. Continue until desired space is covered.
 4. Next, apply an underlayment seam tape to the seam, sealing the underlayment.
 5. Continue with installation of the LVT to the top side of the underlayment using adhesive as instructed below.
- vi. **Double glue installation instructions for Milliken Mosaic 98 - Spray adhesive:**
 1. Shake can well before use. Point can downward and press the side of the nozzle tip as you slowly walk back and forth to achieve full floor coverage of the adhesive. The coverage should be about 100-125 sq. ft. per can. Allow adhesive to dry to touch, creating a tacky adhesive surface.
 2. Roll out underlayment, starting next to wall if possible. Roll with a 75 - 100 lb. roller to smooth out any air pockets and to secure a good bond to the adhesive.
 3. Continue with next row of underlayment, rolling out in the same manner, butting underlayment close to first row (do not overlap). Again, roll with a 75 - 100 lb. roller to smooth out any air pockets and to secure a good bond to the adhesive. Continue until desired space is covered.
 4. Next, apply an underlayment seam tape to the seam, sealing the underlayment.
 5. Continue with installation of the LVT to the top side of the underlayment using adhesive as instructed below.

8. Other substrates

- a. Cement terrazzo and metal floors may be suitable for installation and need to be properly prepared for adhesion. Most will need to be prepared with a suitable Portland-based cement patching compound, see manufacturer's recommendations for use and preparation of subfloor.
- b. Ceramic, porcelain, marble and granite tiles are suitable as substrates when the following conditions are met:
 - i. Tiles must be properly bonded with intact grout joints and free of cracks
 - ii. Surface of tile and grout joints should be free from sealers, coatings, dirt and contaminants.
 - iii. Properly prepare the surface of tiles by grinding any high areas and using a suitable Portland based leveling compound and primer to fill in all low areas. Follow leveling compound manufacturer's recommendations for surface preparation and application of product.

The following are not suitable substrates for installation of Milliken LVT:

Rubber, cork, or asphalt tiles; epoxy terrazzo flooring; stained or painted concrete and any other material covered in the sections above and listed as unsuitable. Unsuitable substrates should be covered with an approved 1/4" wood underlayment or suitable Portland-based cement leveler or patching compound. Always follow the manufacturer's recommended practices when covering an existing substrate.

WARNING!

DO NOT SAND, DRY SWEEP, BEAD BLAST, SHOT BLAST OR USE ANY OTHER MECHANICAL MEANS TO PULVERIZE

EXISTING TILE FLOORING, BACKING, LINING FELT, ASPHALTIC "CUT - BACK" OR ANY OTHER ADHESIVES. THESE PRODUCTS MAY CONTAIN ASBESTOS FIBERS AND /OR CRYSTALLINE SILICA. AVOID CREATING DUST. INHALATION OF SUCH DUST IS A CANCER AND RESPIRATORY TRACT HAZARD. SMOKING BY INDIVIDUALS EXPOSED TO ASBESTOS FIBERS GREATLY INCREASES THE RISK OF SERIOUS BODILY HARM. UNLESS POSITIVELY CERTAIN THAT THE PRODUCT IS A NON - ASBESTOS CONTAINING MATERIAL, YOU MUST PRESUME IT CONTAINS ASBESTOS. REGULATIONS MAY REQUIRE THAT THE MATERIAL BE TESTED TO DETERMINE ASBESTOS CONTENT.

INSTALLING MILLIKEN LUXURY VINYL PLANK

1. General

- a. When using more than one carton, make sure that the cartons are all the same dye lot. Different lots may have a variation in color, texture or gloss so they should not be mixed in the same room. Contact Milliken before installing product from differing runs or lots.
- b. Milliken plank simulates wood planks and can be installed in the same pattern as a wood plank floor in a random pattern, staggered design, diagonally or other design.
- c. Planks are best in appearance when lying parallel to the longest walls in the room.
- d. Milliken products can be cut using a tile cutter or a utility knife. Keep knife blades sharp for easy, accurate and safe cuts. Fit tiles to walls, columns, door jambs, etc. using the same methods other floor tiles; overlap, pattern scribe, wall scribe and free hand. If it is necessary to heat the planks to achieve a cut, heat slightly from the back only with minimal heat setting (a standard hair dryer will produce enough heat). Carefully make cuts with a sharp utility knife on the heated plank.

2. Adhesive selection

- a. Milliken adhesives are designed to be used on most interior installations over most concrete and wood substrates, and other approved substrates that are properly prepared and leveled.
- b. Use of non-Milliken adhesive does not affect Milliken LVT product warranties, however, any claim related to adhesive performance or workmanship and any damage caused by this would be the total responsibility of the party responsible for using the non-recommended product.
- c. Milliken LVT adhesive is especially formulated to give superior performance with Milliken LVT products. Adhesive should be purchased with the LVT for maximum convenience and lowest total cost.
- d. Some commercial applications and special substrates a two-part epoxy or urethane adhesive is recommended. Typical applications for these types of adhesives are topical wet areas, floors subjected to heavy point loads and/or rolling loads, and floors that will be exposed to extreme temperature changes or extreme temperatures. Contact Milliken for proper adhesives and installation procedures.

3. Lay out

- a. Determine the center of the room by measuring each end wall and marking the center of the wall. Chalk a line across the points and measure to determine the center point. At a right angle to the chalk line, using the center point, chalk another line out to the other walls.
- b. Dry lay a section of tile/plank from the center line to one wall to determine that the pattern is centered and fit. Border cuts and planks along walls should be measured and should not be less than half the width of a plank. If the cut is less than half the width of the installed plank, adjust the first row at the center line to make the centerline match the centerline of the row of planks.
- c. Planks should never be less than 9 inches long or less than half of the width of the plank. Avoid small pieces in border areas and adjust the center lines to achieve the proper pattern.

4. Installation of flooring

Spread adhesives using the proper trowel notch. Trowel notch is dependent on the type of subfloor being installed upon; porous substrate or non-porous substrate. Use only the notches shown below for installing the planks. More adhesive is not a good thing with LVT products.

- a. ***Porous & Non-porous substrates***

- i. To determine if a substrate is porous, sprinkle a few drops of water in the prepared substrate. If the water is absorbed within 2 minutes the substrate should be considered to be porous.
- ii. Examples of porous substrates are wood underlayment panels, APA A/C grade plywood, cementitious underlayment, and many concrete substrates.
- iii. It is recommended that you not work on the freshly installed flooring. This means that you will have to start from the wall or area opposite of an exit, and work towards that exit. Only spread enough adhesive that can be utilized before the initial set or tack. See adhesive container label for approximate times and further instruction.
- iv. Before spreading adhesive, strike a parallel chalk line to the centerline of the length of the room approximately 2' to 3' from the wall. Actual position is to be determined by the layout of the planks, ensure that the pattern is followed from your initial starting point determined in the dry layout performed earlier. If necessary, relay part of the pattern from centerline starting point to determine the exact measurement of the parallel line.
- v. For both substrates, spread adhesive with a 1/16" x 1/32" x 1/32" U-notch trowel in an area that can be installed within the working time of the adhesive.
- vi. Application of Milliken LVT Moisture XT adhesive requires an open porous slab (No residual adhesive).
 - i. LVT Moisture XT is a wet-set adhesive. **Do not** walk, kneel, or work directly on top of flooring without the proper use of knee-boards for at least 60 minutes after flooring is installed.
 - ii. Spread adhesive using a 1/16" x 1/32" x 1/32" (1.6mm x .8mm x .8mm) U Notch trowel.
 - iii. Wait 10 minutes after adhesive is spread to build surface tack and reduce movement. Adhesive ridges will dissipate and level-out during that time.
 - iv. Working time is approximately 45 min.
 - v. Use a hand roller and apply normal pressure to ensure a good bond.
 - vi. Periodically lift flooring material to verify proper transfer of adhesive to tile.
 - vii. Wait a minimum of 1 hour, but no more than 2 hours, after the installation to roll and cross roll floor with a 75-100 lbs. (34-45 kg) roller to ensure proper transfer of adhesive.
- vii. The adhesive should be allowed to level and tackify to prevent slippage and oozing. Loss of adhesion can result if the flooring is not installed within the working time of the adhesive.
- viii. Roll the area with a 100lb. roller in both directions immediately after installation.

Do not install flooring into wet adhesives on non-porous substrates.

- b. After determining the starting point and spreading your adhesive; continue to lay the tile by tightly butting the edges of the plank together, making sure that the runs are parallel to your centerline or layout lines.
- c. Be sure to stagger all end joints by at least 6" or the width of one plank. If need be, vary the length of your planks during installation to ensure that end joints are not bunched and a randomness is achieved in the pattern.
- d. If you need to be directly on freshly laid planks, use of a kneeling board is recommended to evenly distribute weight across the planks and keep them from creeping in the wet adhesive.
- e. During installation, roll the floor with a 3-section 100 lb. roller to ensure proper transference of adhesive to the plank backing.
- f. Tiles can be cut using a vinyl/ VCT tile cutter or using a utility knife with heavy-duty blades by scoring and snapping tiles carefully along the score line. Use a steel straight edge for cutting tile along the length with a utility knife.

5. After Installation

1. Be sure planks are set, flat and have tight edges. Re-roll the entire installation, along the length and width of the planks with a 3-section 100 lb. roller to ensure all tiles are properly set into the adhesive. If necessary, weigh down any loose planks overnight to ensure bond. Adhesive can be carefully reactivated using a heat gun after drying to reinstall planks.

2. Clean adhesive residue from the face of the flooring following these directions:
 - a. Wet adhesive residue on the surface of the planks can be cleaned with a clean, white cloth dampened with warm, soapy water. Do not use excess water as this can seep between the seams of planks and lead to an adhesion failure!
 - b. Dry adhesive residue can be cleaned with mineral spirits or denatured alcohol and a clean cloth in a sparingly manner. Carefully follow the directions on the mineral spirits container. Please note: **improper use of any chemical can harm the finish of the LVT.**
 - c. Do not pour soapy water, mineral spirits or denatured alcohol directly on the LV planks.
 - d. If working with epoxy or urethane adhesives you must clean these up while wet according to the adhesive manufacturer's instructions, which can be generally found on the container label.
3. Proper rolling of floors during and after installation is a must on Luxury Vinyl products. Use a 3-section, 100-pound roller to set flooring into the adhesives.
4. In the event that the plank flooring is not the last portion of the construction project, the floor must be protected from construction traffic and damage. Wait 24 hours and utilize a reinforced fiber protective board (i.e. Ram Board) or a heavy kraft paper (min. 60 lbs.) and cover the floor. Do not tape directly to the floor. Must be taped to itself. Failure to wait 24 hours before covering can impact adhesive curing.

MILLIKEN ADHESIVES

Milliken adhesives are engineered to be used on a variety of interior installations including most concrete, wood and other approved substrates that are properly prepared.

Use of non-Milliken adhesives does not affect Milliken LVT product warranties, however, any claim related to adhesive performance or workmanship and any damage caused by this would be the total responsibility of the party responsible for using the non-recommended product.

Milliken LVT adhesives are specially formulated to give superior performance with Milliken LVT products. Adhesives should be purchased with the LVT for maximum convenience and lowest total cost.

NOTE: THE ABOVE INSTALLATION INSTRUCTIONS ARE GENERAL IN NATURE AND ARE NOT COMPLETE FOR EVERY MILLIKEN LVT PATTERN. SOME MILLIKEN LVT PATTERNS REQUIRE SPECIFIC INSTALLATION METHODS TO ACHIEVE THE DESIRED APPEARANCE. ALWAYS CONSULT YOUR MILLIKEN REPRESENTATIVE OR TECHNICAL SERVICES IF THERE ARE QUESTIONS ABOUT THE CORRECT INSTALLATION METHOD.

This information is supplied by Milliken & Company

300 Lukken Industrial Drive West, LaGrange, Georgia 30240

BACKED BY THE LARGEST, MOST PRODUCTIVE RESEARCH AND DEVELOPMENT FACILITY IN THE CARPET INDUSTRY.

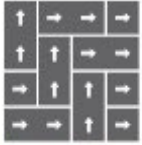
Call Quality Assurance Toll Free 1-800-528-8453 - Select Option #2

The above instructions represent the best available data and are deemed to be correct and complete; however, Milliken assumes no liability for installation-related problems.

01/2023

LVT Installation Methods

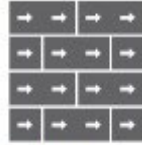
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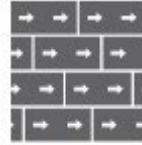
Herringbone



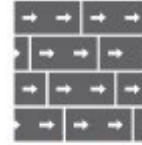
Monolithic



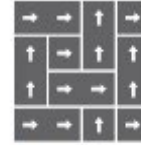
Half Drop



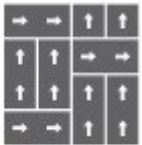
Random



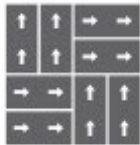
Brick Ashlar



Maze

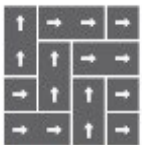


Tile Half Drop

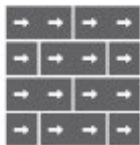


Basketweave

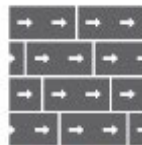
18" x 36"



Herringbone



Half Drop

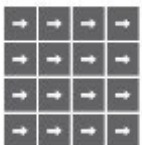


Brick Ashlar

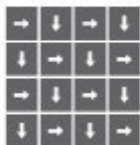


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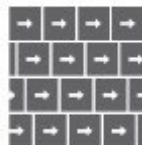
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Monolithic

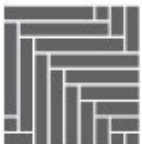


Quarter Turn

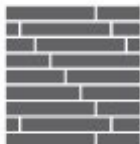


Brick Ashlar

Planks



Herringbone



Traditional