

Floorworks® by Mats Inc. Installation Instructions

1 GENERAL

Floorworks® is recommended for indoor use only and must be installed by professional flooring installers experienced at installing commercial resilient floor covering products. Installers must have sufficient professional liability insurance coverage (aka Errors and Omissions Insurance) for the project.

Training programs such as the International Standards & Training Alliance (INSTALL), The International Certified Floorcovering Installers Association (CFI), and Flooring American University are recommended. If this is your first project installing Mats Inc. Floorworks®, or if it has been several months since you last installed, please call Mats Inc. Technical Support at 781-344-1536 to review installation recommendations.

These have been developed to offer the best opportunity for proper and successful flooring installation and any deviation may result in failure. Installation instructions, all Safety Data Sheets (SDS) and label instructions must be read, fully understood and followed. For all situations that are not covered in this document, please contact Mats Inc.

Because 90% of all dirt in a building comes in on footwear, Mats Inc. strongly recommends installing and maintaining entrance matting (preferably permanently installed) at all outdoor entrances (20-30 linear feet for major entrances; less for infrequently used entrances). Doing this will improve indoor air quality, reduce maintenance costs, and lengthen the life of your floors.

Unless stated otherwise, follow the specific requirements of *ASTM F710 – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring*. Please visit www.astm.org for copies of any ASTM document.

The General Contractor (or owner) must provide a structurally sound subfloor; new concrete slabs must conform to *ASTM C33/C33M — Standard Specification for Concrete Aggregate*. When concrete slabs have or are suspected of having Alkali Silica Reaction (ASR) present, do not proceed, contact Mats Inc. All on and below grade concrete subfloors require a confirmed effective vapor retarder. The vapor retarder must have a low permeance (≤ 0.1) having a minimum thickness of 10 mils, or it must meet *ASTM E1745 requirements — Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs*. Confirm it was placed directly underneath the concrete, above the granular fill. If this is not possible, use a topically applied moisture mitigation system that conforms to *ASTM F3010 – Standard Practice for Two-Component Resin Based Membrane-Forming Moisture Mitigation Systems for Use Under Resilient Floor Coverings*. It must be applied following the manufacturers written instructions.

Note: Typically these will require a leveling compound applied over the membrane to provide an absorptive (porous) substrate. Chemical adhesive removers must not be used. Do not install where hydrostatic pressure can occur, contact Mats Inc. Also the concrete subfloors must not be subject to shrinking, curling, cracking or moving in any way. Mats Inc. accepts no liability for a failure or complaint due to slab movement of any kind.

Floorworks® may be installed on radiant heated slabs providing the maximum temperature of the surface of the slab does not exceed 85°F under any condition of use. The radiant heating system must be lowered or turned off for at least 48 hours before installation of the flooring material to allow proper adhesion of the adhesive to the subfloor,. The room temperature must be maintained at a minimum of 65°F for 48 hours prior, during and at least 72 hours after installation. Then the temperature of the radiant heating system can be increased gradually so that the substrate and the flooring material can adapt to the temperature change together. A rapid change could result in thermal shock and de-bonding.

To minimize the chance of damage, proper glides must be used on chairs and other furniture that may slide directly across the floor. They must have glides that are a minimum of 1 inch in diameter. Heavy objects such as equipment, appliances, fixtures and heavy furniture must not be moved directly across the floor. Using protective boards will reduce the chance of damage.

Direct sunlight can cause UV damage (fading or bleaching) to most interior finishes so Low E glass should be selected that will reduce the UV transmission to less than 1%. If glass without sufficient UV protection has already been installed, apply 3M™ protection film (or similar) on the windows to reduce the UV transmission to less than 1%. Please contact the film manufacturer for specific recommendations and application instructions.

Protect all materials and maintenance products from extremes of temperature during shipping. Do not stack pallets. These instructions supersede any verbal or written instructions from Mats Inc. representatives, and must be followed for the warranty to be in effect.

Make sure that you have everything you need to complete this installation with the Installation Tools Checklist (last page).

2 INSTALLATION TOOL CHECKLIST

- Personal Protection Equipment (PPE): Dust mask, gloves, safety glasses, booties, suit, etc.
- String line
- Straight edge and pencil
- 100 lbs. roller
- Adhesive trowel and replacement blades
- Utility knife and blades
- Resilient tile cutter (optional)
- Scribing tool
- Tape measure

3 MOISTURE TESTING and ADHESIVE

Moisture testing is mandatory following the protocol of *ASTM F2170 – Standard Test Method for Determining Relative Humidity in Concrete Slabs using in situ Probes*, regardless of grade level or whether the concrete is freshly poured or classified as an older slab. It is the responsibility of the General Contractor/End User to have the concrete subfloor tested for moisture. It is the responsibility of the Flooring Contractor to request the moisture test results prior to installing the flooring or they may wish to perform the testing themselves. It is also recommended that an International Concrete Repair Institute (ICRI) Tier 2 Certified Technician performs the moisture testing. If for any reason you are unable to drill into the subfloor, contact Mats Inc.

The test results must not exceed the maximum acceptable relative humidity for the adhesive. If test results exceed the maximum relative humidity, the installation must not proceed until either the subfloor dries to an acceptable level or an effective mitigation system is used that conforms to *ASTM F3010* installed following the manufacturers written instructions.

Note: Testing for moisture following the protocol of *ASTM F1869 – Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride* may be an available option, depending on the manufacturer (see below).

The test results must not exceed the maximum for the adhesive. If they do the installation must not proceed until either the subfloor dries to an acceptable level or an effective mitigation system is used that conforms to *ASTM F3010* installed following the manufacturers written instructions.

Test methodology, results and photographs must be documented and provided to the flooring contractor, general contractor, owner and/or architect. Providing the moisture test results are acceptable to both Mats Inc. and the adhesive manufacturer then the installation may proceed.

- **Acceptable Adhesive:** Always follow the manufacturer's instructions and SDS.
Mats Inc. Perma-Bond:
ASTM F2170 (in-situ relative humidity) limit 90%RH.
Coverage ~ 150 - 175 sq. ft. / gallon depending on substrate
Working Time ~ 40 - 60 minutes depending upon conditions
1/16 inch x 1/16 inch x 1/16 inch V Square-notched trowel (FCA)

Note: Absorptive / porous substrate is required
ASTM F1869 and pH testing is not required.

Mats Inc. Release-Bond:

ASTM F2170 (in-situ relative humidity) limit 90%RH.
Coverage ~ 150 - 175 sq. ft. / gallon depending on substrate
Working Time ≤ 2 hours after it's dry-to-the-touch, depending upon conditions
1/16 inch x 1/16 inch x 1/16 inch V Square-notched trowel (FCA)
Note: Used over non-porous underlayments, without heavy rolling traffic
ASTM F1869 and pH testing is not required.

Mats Inc. Perma-Spray 2000:

ASTM F2170 (in-situ relative humidity) limit 85%RH
ASTM F1869 (calcium chloride) limit 7 lbs. / 1000 sq. ft. / 24 hours
Between 7 – 11 pH
Coverage ~ 160-190 sq. ft. / per spray can (application method)
Open time ~ 10-20 minutes (until dry to the touch)
Working time ~ 8 hours, depending upon conditions
Note: Not to be used over PVC underlayments

MI 3000 PU Adhesive:

Premium Two-Part Urethane Flooring Adhesive
ASTM F2170 (in-situ relative humidity) limit is 85%RH
Coverage ~ 185 - 245 sq. ft. / gallon depending on substrate
1/32 inch x 1/16 inch x 1/32 inch U-notched trowel (FFA)
Working Time ~ 40 minutes depending upon conditions
Testing for pH is not required
Preferred for areas that are often wet, hot, cold or with heavy rolling loads

Mapei Ultrabond G-21:

Premium Two-Part Urethane Flooring Adhesive
ASTM F2170 (in-situ relative humidity) limit is 75%RH
Coverage ~ 185 - 245 sq. ft. / gallon depending on substrate
1/32 inch x 1/16 inch x 1/32 inch U-notched trowel (FFA)
Working Time ~ 40 minutes depending upon conditions
Testing for pH is not required
Preferred for areas that are often wet, hot, cold or with heavy rolling loads
Note: The performance and defect warranty of this adhesive remains with its manufacturer.

3 HANDLING and STORAGE

If packaging is damaged, take photos and mark shipping documents as such before signing for the shipment.
Contact shipper and/or Mats Inc. and report the damage.

Planks/Tiles must be delivered on site at least 48 hours before installation. Deliver the material to the jobsite, remove them from the pallet, and restack on a hard, flat, smooth surface with a maximum of 5 boxes high. If material is flattened, distorted or otherwise damaged during storage or transporting, do not install it.

4 SITE CONDITIONS

Areas must be enclosed weather tight and properly conditioned at a constant ($\pm 5^{\circ}\text{F}$) service temperature that is between 60°F and 80°F with an ambient relative humidity between 35% - 65% for a minimum of 72 hours prior to commencement of installation, during the installation and 72 hours after the installation.

The substrate surface must be at least 5°F above dew point. Example: If the ambient conditions are 70°F and 65%RH, the dew point is 57°F and you must not proceed unless the surface temperature is at a minimum of 62°F . Dew point calculators are available on the web.

Areas of the flooring subjected to direct sunlight, for example through doors or windows, must be covered using blinds, curtains, cardboard or similar materials for 24 hours before, during, and for a period of 72 hours after the installation to allow the adhesive to cure.

5 SUBSTRATE PREPARATION

When cleaning the substrate, use only dustless vacuum cleaners to remove all dirt and debris.

5.1 Concrete Subfloors:

5.1.1 Mats Inc. Perma-Bond Adhesive Concrete Substrates Requirements:

When using Perma-Bond adhesive, all subfloors must be absorptive, permanently dry, clean, smooth and structurally sound per *ASTM F710 — Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring*. Concrete subfloors must be free of dust, solvents, paint, wax, varnish, oil, grease, asphalt, old adhesives and other extraneous materials that may interfere with the bond or void the warranty of the flooring. These must be completely removed by mechanical means only. Dustless diamond grinding is one method to remove contaminants and bond breakers, as it also helps to smooth the concrete.

It is the responsibility of the installing party to determine the suitability and porosity of the subfloor being covered. To determine if a subfloor is absorptive, perform the water droplet test. For installed leveler or patch (over non absorptive substrates), they must be a minimum of 1/8 inch deep to be considered absorptive.

- **Water Droplet Test:** To determine if a substrate is indeed absorptive as detailed within *ASTM F710*, the installer must perform the water droplet test in a sufficient number of places throughout the project. To perform the water droplet test, simply place a dime sized droplet of potable water on clean concrete, without any patch or leveling compound. The water must begin to absorb into the concrete within five minutes to be considered absorptive, or the substrate must be considered non-absorptive.

If the concrete is non-absorptive, polished or burnished, then mechanical preparation is required to open up the surface and make it absorptive. This can be achieved by shot-blasting, Diamond grinding or using a DiamaBrush™ concrete prep plus tool, 100 or 25 grit on a rotary sanding machine with a suitable dust control system in place. Please note the warning below.

No expansion joint or moving joint can be covered over or filled. Use a suitable industry standard expansion joint assembly system as required. All substrates should be both smooth (ridge free) and with a minimum flatness tolerance of $\leq 3/16^{\text{th}}$ inch over 10 feet. Irregularities in the substrate must be repaired using only commercial grade leveling compound or patching compounds that have a minimum compressive strength ≥ 3000 psi. All leveling compound must be a minimum of $1/8^{\text{th}}$ inch deep and be fully warranted by the manufacturer for the use of the project including the moisture conditions, priming, etc. When dry, sand the surface smooth using a 36 grit sanding disc, screen or similar on a single disc rotary machine with a suitable dust control and clean the floor.

Permanently dormant control joints and cracks must be properly cleaned out to remove all dirt and debris or contaminates and filled to a smooth finish using a suitable commercial grade underlayment, following the manufacturers written instructions. **Note:** the warning after 5.1.5.

- **Adhesive Test:** Perform a simple adhesive test in an area away from your start lines. This requires applying ~ one square foot of Perma-Bond adhesive using the correct notched trowel on the prepared substrate and record the “working time”. Every ten minutes use a finger-tip with a light touch to see when it has “strings” and is still moist to the touch (start), when there is no adhesive transfer to your finger also with a light touch (end). This is to be regarded as the “working time”. When installing, it is the flooring contractor’s responsibility to take into consideration the available working time and make adjustments for areas that will dry faster or slower, due to air movement etc.

5.1.2 Mats Inc. Release-Bond Adhesive Concrete Substrates Requirements:

When using Release-Bond adhesive, all subfloors must be permanently dry to an acceptable level for the adhesive or underlayment, clean, smooth and structurally sound per *ASTM F710 — Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring*. Typically recommended for use over Mats Inc. QC, MC or SL underlayments.

No expansion joint or moving joint can be covered over or filled. Use a suitable industry standard expansion joint assembly system as required. All substrates should be both smooth (ridge free) and with a minimum flatness tolerance of $\leq 3/16^{\text{th}}$ inch over 10 feet. Irregularities in the substrate must be repaired using only commercial grade leveling compound or patching compounds that have a minimum compressive strength ≥ 3000 psi and be fully warranted by the manufacturer for the use of the project including the moisture conditions, priming, etc. When dry, sand the surface smooth using a 36 grit sanding disc, screen or similar on a single disc rotary machine with a suitable dust control and clean the floor, please note the warning below.

Permanently dormant control joints and cracks must be properly cleaned out to remove all dirt and debris or contaminates and filled to a smooth finish using a suitable commercial grade underlayment, following the manufacturers written instructions. **Note:** the warning after 5.1.5.

5.1.3 Mats Inc. Perma-Spray 2000 Adhesive Concrete Substrate Requirements:

When using Perma-Spray 2000 adhesive, all subfloors must be permanently dry, clean, smooth and structurally sound per *ASTM F710 — Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring*. Concrete subfloors must be free of dust, solvents, paint, wax, varnish, oil, grease, asphalt, old adhesives and other extraneous materials that may interfere with the bond or void the warranty of the flooring. These must be completely removed by mechanical means only. This can be achieved by Diamond grinding or using a DiamaBrush™ concrete prep plus tool, 100 or 25 grit on a rotary sanding machine with a suitable dust control system in place, please note the warning below. It is the responsibility of the installing party to determine the suitability of the subfloor being covered.

No expansion joint or moving joint can be covered over or filled. Use a suitable industry standard expansion joint assembly system as required. All substrates should be both smooth (ridge free) and with a minimum flatness tolerance of $\leq 3/16^{\text{th}}$ inch over 10 feet. Irregularities in the substrate must be repaired using only commercial grade leveling compound or patching compounds that have a minimum compressive strength ≥ 3000 psi and be fully warranted by the manufacturer for the use of the project including the moisture conditions, priming, etc. When dry, sand the surface smooth using a 36 grit sanding disc, screen or similar on a single disc rotary machine with a suitable dust control and clean the floor, please note the warning below.

Permanently dormant control joints and cracks must be properly cleaned out to remove all dirt and debris or contaminates and filled to a smooth finish using a suitable commercial grade underlayment, following the manufacturers written instructions. **Note:** the warning after 5.1.5.

5.1.4 MI 3000 PU Adhesive Concrete Substrate Requirements:

When using Mapei Ultrabond G21 adhesive, all subfloors must be permanently dry, clean, smooth and structurally sound per *ASTM F710 — Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring*. Concrete subfloors must be free of dust, solvents, paint, wax, varnish, oil, grease, asphalt, old adhesives and other extraneous materials that may interfere with the bond or void the warranty of the flooring. These must be completely removed by mechanical means only. This can be achieved by Diamond grinding or using a DiamaBrush™ concrete prep plus tool, 100 or 25 grit on a rotary sanding machine with a suitable dust control system in place, please note the warning below. It is the responsibility of the installing party to determine the suitability of the subfloor being covered.

No expansion joint or moving joint can be covered over or filled. Use a suitable industry standard expansion joint assembly system as required. All substrates should be both smooth (ridge free) and with a minimum flatness tolerance of $\leq 3/16^{\text{th}}$ inch over 10 feet. Irregularities in the substrate must be repaired using only commercial grade leveling compound or patching compounds that have a minimum compressive strength ≥ 3000 psi and be fully warranted by the manufacturer for the use of the project including the moisture conditions, priming, etc. When dry, sand the surface smooth using a 36 grit sanding disc, screen or similar on a single disc rotary machine with a suitable dust control and clean the floor, please note the warning below.

Permanently dormant control joints and cracks must be properly cleaned out to remove all dirt and debris or contaminates and filled to a smooth finish using a suitable commercial grade underlayment, following the manufacturers written instructions. **Note:** the warning after 5.1.5.

5.1.5 Mapei Ultrabond G21 Adhesive Concrete Substrate Requirements:

When using Mapei Ultrabond G21 adhesive, all subfloors must be permanently dry, clean, smooth and structurally sound per *ASTM F710 — Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring*. Concrete subfloors must be free of dust, solvents, paint, wax, varnish, oil, grease, asphalt, old adhesives and other extraneous materials that may interfere with the bond or void the warranty of the flooring. These must be completely removed by mechanical means only. This can be achieved by Diamond grinding or using a DiamaBrush™ concrete prep plus tool, 100 or 25 grit on a rotary sanding machine with a suitable dust control system in place, please note the warning below. It is the responsibility of the installing party to determine the suitability of the subfloor being covered.

No expansion joint or moving joint can be covered over or filled. Use a suitable industry standard expansion joint assembly system as required. All substrates should be both smooth (ridge free) and with a minimum flatness tolerance of $\leq 3/16^{\text{th}}$ inch over 10 feet. Irregularities in the substrate must be repaired using only commercial grade leveling compound or patching compounds that have a minimum compressive strength ≥ 3000 psi and be fully warranted by the manufacturer for the use of the project including the moisture conditions, priming, etc. When dry, sand the surface smooth using a 36 grit sanding disc, screen or similar on a single disc rotary machine with a suitable dust control and clean the floor, please note the warning below.

Permanently dormant control joints and cracks must be properly cleaned out to remove all dirt and debris or contaminants and filled to a smooth finish using a suitable commercial grade underlayment, following the manufacturers written instructions.

- **Warnings:** All local, state and federal regulations must be followed. Do not sand, dry sweep, dry scrape, drill, saw, shot-blast or mechanically chip or pulverize existing resilient flooring, backing, lining felt, asphalt “cutback” adhesive or other adhesive. These products may contain asbestos fibers and/or crystalline silica. Avoid creating dust. Inhalation of such dust is a cancer and respiratory tract hazard. 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. Various local, state and federal government agencies have regulations governing the removal of in-place asbestos-containing material. If you contemplate the removal of a resilient floor covering structure that contains (or is presumed to contain) asbestos, you must review and comply with all applicable regulations. Do not use any chemical adhesive removers. The RFCI’s (Resilient Floor Covering Institute) “Recommended Work Practices for Removal of Resilient Floor Coverings” is a defined set of instructions that addresses the task of removing all resilient floor-covering structures, including adhesive and adhesive residues. For more information, contact RFCI directly at www.rfci.com or 706-882-3833. **Note:** Occupational Safety and Health Administration (OSHA) has amended its existing standards and determined that people exposed to respirable crystalline silica at the previous permissible exposure limits face a significant risk of material impairment to their health. For more information go to <https://www.osha.gov/silica/>.

5.2 Wood Substrates:

All wooden subfloors must be a total minimum thickness of 1-1/4th inch and overlaid with overlapping joints using APA (American Plywood Association) underlayment grade plywood, installed per *ASTM F1482 — Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring*.

Wooden substrates must not be in direct contact with concrete subfloors, even if built on sleepers. All suspended wood floors must have adequate under floor ventilation and a permanently effective vapor retarder or membrane placed directly on the ground beneath the air space. **Note:** As plywood will expand and contract due to changes in moisture content and temperature, Mats Inc. cannot accept any liability of the plywood joints telegraphing through the finished floor.

Do not install over lauan panels, plywood with knots, OSB, hardwood flooring, treated wood (i.e. CCA, fire-rated plywood, or other coated wood), particle board, chipboard, flakeboard, fiberboard, Masonite™, pressboard, or other hardboard underlayment, or other uneven or unstable substrates.

5.3 Gypsum Substrates:

Gypsum underlayment's patching and leveling compounds can be acceptable substrates providing they meet the requirements of *ASTM F710* including the smoothness/levelness and having a minimum compressive strength of 3000 psi. It must also be fully warranted for the use of the project including the relative humidity (%RH) content of the subfloor (unless an *ASTM F3010* compliant mitigation system is also used) and have a written, project specific confirmation from the Gypsum manufacturer.

The manufacturer's written instructions must also be followed including the amount of mixing water used, the drying time and any requirements for priming (typically before application). When dry, sand the surface smooth using a 36 grit sanding disc, screen or similar on a single disc rotary machine with a suitable dust control and clean the floor. Mat Bond testing is required prior to any installation to confirm the suitability of the preparation method, application and all of the proposed products to be used.

5.4 Other Subfloors:

Do not install over existing resilient floor coverings. Remove the flooring and adhesive and prepare the subfloor properly. Do not install over non-compatible substrates such as asphalt, any bituminous or asphalt-saturated material.

Substrates such as terrazzo, stone, ceramic tile, or metal must be covered with a suitable underlayment/leveling compound following the manufacturer's written instructions. Please contact Mats Inc. directly for specific recommendations for all other types of subfloors/substrates.

6 LAYOUT

After substrate is prepared properly, the area must also be kept free of any other trades or traffic (protect if necessary) and clean. When cleaning the substrate, use only dustless vacuum cleaners to remove all dirt and debris

The material layout should be decided by the architect, designer or end user, however for planks Mats Inc. recommends the head or cross seams are at least 12 inches apart and random (without any pattern repeating). In general, the length of plank should be installed in the same direction as the length of the room but other options are acceptable.

Measure and mark your starting lines perpendicular to each other using a string line, straight edge/pencil and the 3:4:5 method. Take care in planning so you do not have small cuts at the perimeter.

Great care is taken to properly label and inspect materials for defects at all phases of manufacturing and handling by Mats Inc. However, in the rare case where the wrong product or material with visible defects is shipped, these products must not be installed. Careful inspection of the product before installing is the responsibility of the installer. Installation of the product denotes acceptance of the product. Mats Inc. will not honor any warranty complaints for materials installed in the wrong color, with visible defects or other damage.

7 INSTALLATION

Following your start lines, apply the selected adhesive to a workable section of the floor, not so large an area to avoid late placement into the adhesive bed. After the appropriate open-time, install the flooring following the start lines exactly. Trim and install all cuts as you go, do not allow the adhesive to dry. If it does, remove and replace the adhesive.

Do not pressure fit or allow the seams to peak. Prior to starting the next section and before the working time expires, use a 100-lb (45kg), three-section floor roller, slowly roll the entire floor in each direction at least three times, repeat these steps for the remaining floor. Once finished, roll the entire floor again.

Note: For installations with MI 3000 PU and Mapei Ultrabond G21 Adhesive any lifting or curling edges must be weighed down overnight, until the adhesive has set.

8 CLEAN UP

Remove any fresh adhesive from the surface of the flooring with water and a clean cloth. Dried adhesive may be removed using 70% Isopropyl alcohol and a clean cloth. With Perma-Bond installations, do not wash or perform any maintenance of the floor for a minimum of 72 hours after the installation is completed to allow adhesive to cure, or a minimum of 8 hours for all other recommended adhesives.

8 PROTECTION

For Perma-Bond, MI 3000 PU and Mapei Ultrabond G21 adhesive installations, keep traffic off flooring for a minimum of 24 hours to prevent indentation while the adhesive sets. Wait 72 hours before allowing rolling traffic or furniture on the floor. With Release-Bond and Perma-Spray 2000 adhesive, wait 8 hours before allowing heavy traffic and cleaning.

If construction is to continue or if heavy rolling loads or furniture is to be moved over the finished flooring, wait 24 hours, sweep or vacuum the floor, cover with brown Kraft paper and then plywood or hardboard panels.