Mats Inc. Installation Instructions for MultiLino™ WDK

These instructions supersede any verbal or written instructions from Mats Inc. representatives, and must be followed in order for the warranty to be in effect.

1. INTRODUCTION

1.1 MultiLino™ WDK is a multi layer multipurpose sports floor system consisting of a 4 mm thick linoleum wear surface, two steel inner layers, "elastic mat" high density cushion base layer and a moisture barrier.
1.2 MultiLino™ WDK is a floating floor system. The system cannot be restricted from its inherent characteristic of expansion and contraction that occurs through during climatic changes in the environment. It is essential that a 9/16" – 3/4" expansion gap be maintained at all walls around the perimeter of the flooring system. In addition it is also required that Mats Inc. be consulted prior to any equipment being permanently installed on top the flooring system.
1.3 MultiLino™ WDK shall be installed by experienced professional installers with a minimum of five years experience installing linoleum flooring products, including proper heat weld seaming techniques. Training programs such as those offered by International Standards & Training Alliance (INSTALL) or major linoleum manufacturers are recommended. Substrate testing and preparation shall follow industry standards (quoted herein in italics) and the following installation guidelines. For situations that are not covered in this document, contact Mats Inc. directly.

2. MATERIAL HANDLING AND STORAGE

2.1 Immediately remove from pallet upon receipt. If packaging is damaged, mark shipping documents as such before signing for the shipment. Contact shipper and/or Mats Inc. to report damage. If material is distorted or otherwise damaged during storage or transporting, do not install.
2.2 Protect all materials, including but not limited to, underlayment panels, patching/leveling compounds, floor covering, welding rods, adhesive, and maintenance products from extremes of temperature during shipping. Some products must not be allowed to freeze. Store all products in original packaging in areas on the job site where they are to be installed. Linoleum rolls must be stored standing on end. Areas shall be enclosed and weather tight, at 65°F - 80°F for a minimum of 48 hours prior to commencement of installation.
2. 3 Inspection of materials: 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 shall 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.

3. SUBSTRATE PREPARATION AND TESTING

3.1 All substrates must be sound, clean, permanently dry, smooth, and free of cracks and contaminants including paint, old adhesive, curing compounds, oil, grease, wax, asphalt, or other contaminants that could affect the adhesive bond. Any irregularities in the substrate will telegraph (show through) to the finished floor.
3.2 Concrete Substrates:

3.2.1 Follow guidelines of ASTM F710 *Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring*.* ASTM F710 includes requirements for moisture testing, smoothness, flatness, concrete strength, and the presence of a vapor retarder beneath the slab.
3.2.2 *The installation of a permanent, effective moisture vapor retarder with a minimum thickness of 0.010 in. and a permeance of 0.1 y, as described in Specification ASTM E 1745 is required under all on or below grade concrete floors. The use of such a moisture vapor retarder, provided its integrity has not been compromised, reduces potential severity of water vapor penetration.*

*Every concrete floor slab, on or below grade, to receive resilient flooring shall have a water vapor retarder (often improperly called a vapor barrier) installed directly below the slab.**

3.2.3 *Joints such as expansion joints, isolation joints, or other moving joints in concrete slabs shall not be filled with patching compound or covered with resilient flooring**

3.2.4 *All concrete slabs be tested for moisture, regardless of age or grade level.** The only acceptable test methods are the Calcium Chloride test (ASTM F 1869) and Relative Humidity test (ASTM F 2170). Moisture meters, plastic sheet test or other methods are not acceptable for determining the suitability of concrete slabs to receive resilient floor coverings. It is recommended testing be conducted by a qualified independent testing agency with experience conducting ASTM F 1869 and ASTM F 2170 testing. Test procedures shall be followed exactly in order for test results to be valid. Building shall be at in-service temperature and humidity, concrete shall be properly cleaned, and recommended number of tests shall be conducted. See ASTM standards for details.

3.2.5 Test methodology and test results shall be documented and provided to the flooring contractor, general contractor, owner and/or architect.

3.2.6 If concrete moisture conditions are outside the adhesive manufacturer's limits per section 5, do not commence installation. Allow the concrete to fully dry or apply a 100% solids epoxy Moisture Mitigation System. Although Mats Inc. does not endorse or prefer any manufacturer in particular; we provide the following list of leading Moisture Mitigation System manufacturers for information purposes.

Ardex: 724.203.5000 (www.ardex.com)
Bostik: 978.777.0100 (www.bostik-us.com)
Koester: 757.425.1206 (www.koesterusa.com)
Mapei: 800.426.2734 (www.mapei.us)

3.3 Wood Substrates:

3.3.1 For wood subfloor systems, ensure the subfloor conforms to the guidelines of ASTM F1482, *Guide to Wood Underlayment Products Available for Use Under Resilient Flooring*. A typical wood subfloor system includes a joist spacing of 16" on center with a double layer subfloor/underlayment system - minimum one inch thickness.

3.3.2 Wood subfloor systems shall be suspended at least 18" above the ground. Crawl spaces shall have adequate cross ventilation and a moisture barrier shall be used on the ground to reduce humidity from ground moisture.

3.3.2 Do not install Mats Inc. products 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. To cover unsuitable substrates in a wood subfloor system, use underlayment grade plywood (i.e. arctic birch panels or A/C plywood).

3.3.3 Consult ASTM F1482 or underlayment manufacturer for recommendations regarding plywood thickness, fastener selection and spacing and conditioning of panels.

3.4 Gypsum Substrates:

3.4.1 Do not install over trowel applied gypsum patching compounds.

3.4.2 Do not use poured gypsum underlayment over concrete slabs on or below grade.

3.4.3 Compressive strength: Gypsum underlayment, *for commercial installations, shall provide a minimum of 3000 psi compressive strength after 28 days.** If the finished floor will be in a commercial use, this standard must be followed. Underlayment shall be mixed according to manufacturer's guidelines.

3.4.4 Drying Time: Manufacturer's recommended drying time and recommended testing method for dryness shall be followed. Usually a specific moisture meter is recommended by the manufacturer. The calcium chloride test method is not acceptable for testing gypsum underlayment.

3.4.5 Sealer/primer: After drying and prior to installing adhered floor coverings, Gypsum underlayment shall be sealed/primed per the underlayment manufacturer's instructions for covering the underlayment with adhered floor coverings. If the underlayment is not sealed, the surface will be overly porous and the floor covering adhesive will not work correctly.

3.4.6 Patching or "skimcoating" over gypsum substrates: There are a number of patching compounds that can be used over gypsum underlayment. Follow compound manufacturer's instructions for doing so. It may be necessary to prime the gypsum substrate prior to patching.

3.5 Do not install over existing resilient floor coverings.

3.5.1 Concrete Subfloors: Existing resilient floor coverings and adhesives over concrete shall be removed and the concrete shall be repaired using a cement based patching or leveling compound per manufacturer's guidelines. All adhesive residues must be removed prior to installing. Also remove any floor patch below the adhesive layer. DO NOT USE CHEMICAL ADHESIVE REMOVERS. Black asphaltic adhesive can be scraped to a thin, well-bonded residue and encapsulated with an approved patching or leveling compound per manufacturer's instructions. All other adhesives (carpet adhesive, VCT adhesive, epoxy, etc) shall be completely removed from concrete substrates.

3.5.2 Wood Subfloors: Existing resilient floor coverings and/or adhesive residue over a wood subfloor system shall be covered with a plywood underlayment per section 3.3.

3.5.3 NOTE: If removal of existing resilient flooring or adhesive is required, follow "Recommended Work Practices for Removal of Resilient Floor Coverings" available from the Resilient Floor Covering Institute at 706-882-3833 or www.rfci.com. Also, be aware that existing floors and/or adhesives may contain asbestos or lead. Various federal, state, and local government agencies regulate the removal of lead or asbestos containing material. Review and comply with all applicable regulations.

3.6 Other substrates such as terrazzo, stone, ceramic tile, metal shall be covered with cement based underlayment compound per the manufacturer's instructions and ensure compliance with ASTM F 710 for use of these compounds.

3.7 Do not install over non-compatible substrates such as asphalt, any bituminous or asphalt-saturated material, or floor coverings made of (or containing) rubber.

3.8 Radiant Heat. *Most resilient flooring can be installed on radiant heated slabs providing the maximum temperature of the surface of the slab does not exceed 85°F (29°C) under any condition of use.** To allow proper adhesion of the adhesive to the subfloor, the radiant heating system should be lowered, or turned off for at least 48 hours prior to installation of the flooring material. The room temperature must be maintained at a minimum of 65°F prior to, during and after installation for 72 hours after which the temperature of the radiant heating system can be increased. When raising the floor temperature, do so gradually so that the substrate and the flooring material can adapt to the temperature change together. A rapid change could result in bonding problems.

4. SITE CONDITIONS

4.1 Install new floor coverings after all other trades have completed their work.

4.2 Protect areas where floor covering shall be installed from all traffic before, during and after installation.

4.3 Extremes of temperature and humidity can affect floor covering products and can alter the proper cure of patching compounds and adhesives. Building shall be between 65°F and 80°F for 48 hours before installation, during installation and for 48 hours after installation. Thereafter maintain minimum 55°F. Maintain relative humidity of 35% - 65%.

NOTE: If a system other than a permanent HVAC system is utilized, it must provide constant temperature and humidity control at specified levels for the specified time frame.

4.4 Maximize fresh air ventilation by using exhaust fans at point of use. Face fans out of the area where flooring is being installed, not into the area. Never force dry adhesives or patching compounds by using fans.

5. MATERIALS, ADHESIVES AND ACCESSORIES

5.1 Flooring Materials:
MultiLino™ Linoleum Top Surface, Foam, PVC Foil Moisture Barrier, Plumbers PVC pipe adhesive, Polyethylene Film, Adhesives & Leveling Compound.

5.2 Linoleum Adhesive:

5.2.1The Linoleum sheet is adhered to the steel using Mats Inc. Multi-Bond Adhesive applied with a 1/16" square notch trowel. Coverage is approximately 440 - 500 square feet per 4 gallon unit.
5.2.2 Over concrete substrates, PVC Foil Moisture Barrier sealed with a plumbers PVC pipe adhesive is installed "loose lay" over the concrete slab.
5.2.3 Concrete test limits for the MultiLino™ WDK system, installed over 0.5 mm PVC FOIL vapor barrier sealed with plumbers PVC pipe adhesive:

ASTM F 1869: maximum MVER of 12 lbs/1000 sq ft/24 hrs.
ASTM F 2170: relative internal humidity of 75% or less.

5.3 Wood Panels Adhesive:

5.3.1 #528 Wood to Wood Adhesive is used to glue the wood panels together in the areas where the edges overlap.
5.3.2 Pails are 13 kilos (approximately 3.58 gallons).
5.3.3 Spread rate is approximately 1,000 square feet per pail.

5.4 Foam Adhesive:

5.4.1 Mats Inc. Perma-Bond Adhesive is used to spot glue the Foam onto the Moisture Barrier.
5.4.2 Pails are 1 gallon.
5.4.3 Spread rate is approximately 160 – 260 square feet per pail.

5.5 Wood Panel Seams:

5.5.1 Use #900 Leveling Compound to fill wood panel seams.
5.5.2 Pails are 14 kilos (approximately 3.85 gallons).
5.5.3 Spread is approximately 2,400 square feet per pail.

5.6 MultiLino™ welding rods, 4.0mm in diameter, 196 lineal feet per coil.

5.7 Protective Finish for seams such as Armstrong Commercial Polish S-480.

5.8 Vented Cove Base.

5.9 Tools: 1/16" square notch trowel (one per can of adhesive); vacuum; commercial grade utility knife (recommended to use one new blade per length of material required); heat welding tools appropriate for 4.0mm welding rods: grooving machine (robotic or automated machine suggested), automated welding machine, hand held welding machine; linoleum seam cutter (one new blade per edge), quarter moon knife with spatula/guide, triangular scraper, short scriber, combination bar scriber, 6' steel ruler, 100 lbs. linoleum pressure roller, 4 roller trough truck – must accommodate 6'7" roll width, silicone hand roller, hand groover, wood floor sander (rotary or disc style) and medium grade sandpaper, circular saw, jig saw, 20 cm wide plywood strips, tapping block and hammer, other tools appropriate for installing sheet linoleum (see section 6); paint brush; and squeeze bottle with nozzle.

6. INSTALLATION

6.1 Remove packaging from all flooring materials and allow materials to acclimate to temperatures in area to be installed at least 24 hours before installation.

6.2 Moisture Barrier

6.2.1 Thoroughly sweep or vacuum the substrate to remove all dirt and debris.
6.2.2 Loose lay the PVC Foil Moisture Barrier over the substrate.
6.2.3 Overlap seams at least 6 inches and seal using PVC Pipe adhesive.

6.3 Elastic Mat

6.3.1 At the outer edges, a strip of plywood approximately 20 cm wide should be laid as a rigid base to create a space between the floor system and the walls.
6.3.2 Loose lay the 6'7 x 4'11 (200 cm x 150 cm) Foam sheets onto the Moisture Barrier.
6.3.3 Stagger the seams of the Moisture Barrier and the Foam layer. Do not allow Foam seams to fall on top of the Moisture Barrier seams.
6.3.4 Using a paint brush, spot glue 12" x 12" are of Mats Inc. Perma-Bond Adhesive in the center of the Foam sheets to secure to the Moisture Barrier.
6.3.5 If there are any apparatus sleeves in the subfloor, the Foam layer should be cut out.
6.3.4 Maintain a 9/16" to 3/4" expansion gap between all walls and the MultiLino™ WDK flooring system.

6.4 Polyethylene Film (PE Film)

6.4.1 Spread the 0.5mm thick PE Film over the Foam layer.
6.4.2 The individual runs of PE Film must overlap 10 cm.
The PE Film acts as a slip layer for the Wood panels.

6.5 Wood Panels

6.5.1 The first row of Wood boards must be laid with the grooved side facing the wall. (Suggested installation method; run the seams of the Wood panel system perpendicular to the seams of the sheets of linoleum)
6.5.2 Offset the seams of the Wood panels approximately 40 – 50 cm.
6.5.3 Apply #528 Wood to Wood Adhesive to the key of each board and bring the front edges together.
6.5.4 The longitudinal side is then pressed into place using a tapping block and hammer.
6.5.5 Apparatus sleeves should be cut out with a circular saw or jig saw. Maintain a 9/16" to 3/4" expansion gap between the floor and all walls.
6.5.6 Once the entire surface is covered with the Wood panels, fill and level the seams with Leveling Compound.
6.5.7 Sand the seams with a commercial floor sanding machine (disc or rotary style) using a medium grade sandpaper. (Failure to sand the top layer may cause the seams to "flash" through the surface of the linoleum.)

6.6 Linoleum Top Layer

6.6.1 Each Linoleum roll is assigned a roll number. The rolls are to be installed in an ascending roll number order across the room.
6.6.2 After the floor covering has acclimated (per section 6.1), lay out the rolls edge to edge.
6.6.3 Establish the center of the room. The linoleum is to be installed from the center of the room to the outside walls.

6.6.4 Do not use factory edge for seams. Both edges must be trimmed. Lay the second sheet over the trimmed edge of the first sheet with a one inch overlap, and then use Linoleum edge trimmer to double cut edges to match seams.
6.6.5 Sheets shall be fitted and laid precisely next to each other, with 0.5 mm gap between the sheets, approximately the thickness of a knife blade.
6.6.6 Stagger the seams of the Linoleum and the Wood panels.
6.6.7 Repeat this process across the room, trim or scribe against the walls to remove excess material.
6.6.8 Linoleum requires a full spread adhesion application. Mark the glue area on the floor in chalk, fold back the sheets of linoleum and apply the Mats Inc. Multi-Bond Adhesive using a 1/16" x 1/6" x 1/6" trowel.
6.6.9 Linoleum must always be set into WET adhesive, so only spread as much adhesive as can be covered while the adhesive is still wet.
6.6.10 Once the Linoleum has been set into the adhesive, use a flat edge hammer over the seams to ensure that the seams have tacked to the adhesive.
6.6.11 Roll the adhered Linoleum with a 100 lbs. roller in both directions.
6.6.12 After 30 minutes, repeat the rolling of the seams and edges.

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6.7 Heat Welding

6.7.1 Proper temperature of the heat welding gun is critical to its success. The processing temperature is approximately 750 – 840 degrees Fahrenheit. Heat welding also depends on the speed of application, temperature, and accuracy of the welding tip directly on the seam. Do not put the tip on the face of the material, as doing so may burn the material. Because site conditions vary, practice the entire procedure, from grooving to glazing, on scrap material to determine the proper procedure for the product. Test seam strength by tugging at a length of welding rod: it should break before pulling away from the flooring.
6.7.2 Wait at least 24 hours after installation before doing any heat welding.
6.7.3 Set the depth of the grooving tool for 2/3 the thickness of the linoleum. The width of the groove should be 1/8" wide. Maintain a consistent depth in the groove. Keep the groove area clean and dry.
6.7.4 Weld the seam according to ASTM F1516 *Standard Practice for Sealing Seams of Resilient Flooring Products by the Heat Weld Method.*
6.7.5 Trim the excess welding rod in a two step process:
6.7.5.1 While the weld is still warm, use a spatula knife with a sharp spatula and a trim plate for the first pass to release heat in the weld.
6.7.5.2 Wait for welded seam to cool – approximately 30 minutes. Then trim the weld rod flush using the spatula knife without the trim plate, taking care not to gouge the surface. Dampening the surface with soapy water will help the spatula knife glide more smoothly.
6.7.5.3 There are also plane tools designed to make the first and final trim cuts at one time, but should only be used after the weld has cooled.
6.7.6 Optional step: If desired, "glaze" the surface of the finished seam. Remove the tip from the heat welding gun and apply hot air to the surface of the weld. This will darken the weld slightly and increase the gloss, which will make the seam less visible and more stain resistant.
6.7.7 After all seaming is complete, wipe the seams with a clean, damp cloth and apply a narrow band of protective finish such as Armstrong Commercial Polish S-480 using a squeeze bottle with nozzle. Apply to cover only the seams, do not allow on Linoleum.
6.7.8 The installation of vented cove base (supplied by others) is required to cover the 9/16" to 3/4" expansion gap.

7. CLEAN UP AND FINAL FINISH

7.1 Keep all traffic off flooring for 24 hours to prevent indentation while the adhesive sets. Wait 72 hours before initial cleaning or allowing rolling traffic or furniture on the floor. Initial cleaning shall follow the latest version of the maintenance instructions for MultiLino™ ST, available from www.matsinc.com.
7.2 Maintain the room temperature between 65°F and 80°F for 48 hours after installation. Thereafter, maintain temperature at a minimum of 55°F.
7.3 Check appearance of entire installation. Carefully, use denatured alcohol on a clean white cloth to clean adhesive smudges from the flooring material's surface and the tools while the adhesive is still fresh. Once cured, the adhesive can only be removed mechanically.
7.4 Dust mop or vacuum to clear the area of debris and grit. Do not use a "beater bar" vacuum.
7.5 If construction is to continue after the floor is installed, wait 24 hours, sweep or vacuum the floor, cover with brown Kraft paper and plywood or hardboard panels.
7.6 Do not roll heavy equipment or furniture directly on top of the floor. Cover with brown Kraft paper and plywood or hardboard panels.

8. INITIAL MAINTENANCE

For initial cleaning and complete maintenance process, see MultiLino™ Maintenance Instructions at www.matsinc.com.

8.1 Initial maintenance is to be performed using LinoCare Remover (available from Mats Inc.) followed by LinoCare Gym Care as the second step. DO NOT use traditional floor finishes. They will affect the safe slide coefficient level of the surface. Use LinoCare products only.
8.2 Entrance matting: 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 flooring maintenance costs, and lengthen the life of your interior floors.
8.3 Furniture: To minimize the chance of damage, proper glides must be used on chairs and other furniture that may side directly across the floor. Chairs shall have glides that are a minimum of one inch in diameter. Heavy objects such as equipment, appliances, fixtures and heavy furniture shall not be moved directly across the floor. Using protective boards will reduce the chance of damage in these cases.
8.4 Sunlight: Direct sunlight can damage most interior finishes so proper protection in the form of window coverings is recommended.

* ASTM Standard F 710 *Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring*, ASTM International, West Conshohocken, PA, 2003, www.astm.org.