



TEKNOFLOR®



Heterogeneous Sheet Installation Guide





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TEKNOFLOR™

Heterogeneous Sheet

PRODUCT SPECIFICATIONS	
Category	Commercial Sheet Goods
Construction	Heterogeneous
Thickness	See Full Spec Sheet
Roll Width	See Full Spec Sheet
Roll Length	See Full Spec Sheet
Material Weight	See Full Spec Sheet
Roll Weight	See Full Spec Sheet
Locational Use	Interior only
Grade Level	Below-grade, On-grade, Above-grade
Adhesive(s)	TEK One, TEK Five v2, PREVAIL 4000
Seaming Method	Recess Scribe
Seaming Treatment	Heat Weld
Directional Positioning	See Full Spec Sheet
Pattern Size	See Full Spec Sheet
Pattern Match	See Full Spec Sheet

GENERAL INFORMATION

The information in this document provides product specific requirements and guidance on installation practices. Always review the most current version of the Teknoflor Heterogeneous Sheet Installation Guide in its entirety prior to beginning installation. If there is uncertainty with any information provided in this document or if the installer is having a problem with the installation, stop all progress and contact HMTX's technical installation support for additional guidance. Technical Services can be reached at 800-522-9166, Monday through Friday, 8:00 a.m. to 4:00 p.m. CST or by email at technical@hmtx.global



Teknoflor Heterogeneous Sheet is intended to be installed only by trained and qualified professional installers with a proven history of successful installations with projects of similar size and scope. This guide provides the proper methods of installation of Teknoflor Heterogeneous Sheet. Before proceeding, review the Teknoflor Heterogeneous Sheet Installation Guide, Resilient Sheet Care & Maintenance Guide, and all relevant industry standards.

It is important to avoid problems from the outset. A construction meeting should be held with the General Contractor, Architect, Designer, Owner, and Flooring Contractor all in attendance. The event should review all installation and product requirements, project expectations, and detail plans for testing and assessment of the space and substrate.



WORKPLACE SAFETY



Safety is a cooperative effort of all involved, to identify, avoid, prevent, and eliminate hazards in the workplace. To reduce the risk of workplace injury, always use good judgement and follow appropriate safety protocols. Maintain compliance with all practices and regulations set forth by OSHA, the Occupational Safety and Health Administration.

Blade Safety: Knives and other sharp edges are dangerous and are capable of causing severe injury. Always keep blades sharp and in good condition. A sharp knife makes cutting easier and reduces the risk of applying unsafe pressure or improper angles while cutting. Maintain awareness and keep the path-of-travel clear of oneself and others. Cutting should be smooth and well managed. Knives should always be properly sheathed in suitable pouches with blades facing a safe direction. Unused knives should be kept in an organized space or toolbox. Blades need to be disposed of in a safe and appropriate manner, such as utilizing a container designed to handle sharp objects. Avoid carelessly discarding blades into a trash receptacle as this may put others at risk.

Dust Management and Indoor Air Quality: Proper ventilation, filtration, and work-practices should be implemented to maintain good Indoor Air Quality (IAQ). Dust and debris should be collected at the point of origin using an appropriate professional-grade vacuum equipped with a HEPA filter. Tools equipped with dust-collection ports should be connected to a suitable dust collection system. Whenever possible, vacuuming of floors or other surfaces should be performed in lieu of sweeping. Cleaning with the appropriate equipment can better manage hazards such as respirable crystalline silica. Sweeping causes dust and debris to become airborne, whereas vacuums immediately capture fine particulate helping to maintain IAQ. Implement appropriate ventilation measures to address fumes, vapors, Volatile Organic Compounds (VOCs), or other harmful air pollutants.

Electricity: It is important to use heavy-duty extension cords which are: no longer than is necessary to effectively perform the task, UL certified, of a gauge sufficient to perform the duties required, and compliant with all relevant regulations. Extension cords should not be used in series, be in service if the ground prong is missing, or be used in excess of the rated capacity. Plugs and cords should be connected to a ground fault circuit interrupter (GFCI) device when used around wet or damp areas. Regularly inspect electrical tools, equipment, and extension cords; discontinue use if broken, defective, or damaged. Do not allow cords to be used near sharp objects, corrosive chemicals, liquids, or in areas of rolling or automotive traffic.

Hazard Communication: Ensure that all applicable Safety Data Sheets (SDS) are readily accessible.

Hot Work: Resilient welding equipment is potentially dangerous when improperly handled. Portions of the equipment can reach very high temperatures and are capable of causing severe burns. Proper training and practices are necessary to safely handle equipment. Keep all sources of heat away from flammable or combustible materials.

Housekeeping: Always keep the work area clean and organized. Store supplies, materials, ancillary products, tools, and equipment when not in use. Staged materials should be neat, orderly, safe, and in an appropriate location. The premises needs to be kept free from accumulation of waste materials,

rubbish, and fire hazards. It is critical for emergency exits to remain clear and for walkways to be accessible for workers and materials. Take measures to prevent the spread of debris, dust, or other contaminants into the surrounding areas.

Labels: Maintain accurate and legible labels on all relevant items. Do not remove warning labels.

Lighting: Proper illumination improves visibility and helps to avoid preventable injuries; make certain the workspace is well lit.

Lifting: Ensure the path is unobstructed and without slip or trip hazards. It is important to realize limitations. If a load is too heavy or difficult to grasp, utilize moving equipment or request assistance from others. Don't lift by leaning forward; bend at the knees, grip the load firmly, keep the load close to the body, and straighten legs to lift. Refrain from turning or twisting while lifting or holding heavy objects. Avoid carrying items that will obstruct one's view.

Personal Protective Equipment (PPE):

- **Knee Protection:** Knee pads act as a cushioning barrier between an installer's knees and the floor, offering important protection and support to the joints. Knee pads can greatly help to minimize the risk of incidental injury and mitigate various conditions related to joint damage such as bursitis and osteoarthritis.
- **Head Protection:** Hard hats can protect from head impact, penetration injuries, and electrical injuries such as those caused by falling objects, fixed objects, or contact with electrical conductors.
- **Eye Protection:** Use appropriate eye protection to protect workers from flying debris. Ensure a snug and secure fit.
- **Hearing Protection:** Use hearing protection with an appropriate noise reductions rating (NRR) when working in an environment with noise levels above 90 decibels.
- **Respiratory Devices:** The use of suitable dust masks or respirators is recommended when the air is contaminated with harmful materials, or the air quality is otherwise poor.
- **Hand Protection:** Cut resistant gloves provide physical protection against sharp objects. These gloves utilize specialized materials to reduce the risks of cuts and lacerations. Although cut resistant gloves cannot provide complete protection from injuries, they can limit the extent of cuts.

Slip, Trip, and Obstructions: Keep work areas, stairs, doorways, and walkways clean and free of obstructions. Do not place extension cords or hoses across pathways or near stairs. Immediately clean up spills to prevent slip hazards. Dispose of scrap material, garbage, and wastewater in proper waste receptacles. Utilize barriers and/or signage to restrict traffic to areas where hazards are present.

Safety Guards: Make certain that all safety guards are in place and in good working condition.

Tool Safety: Properly functioning tools and equipment are a critical part of workplace safety. Inspect all tools and equipment for damage or disrepair; never use damaged or malfunctioning equipment. Clean and maintain equipment as needed and unplug devices during servicing.

MATERIAL RECEIVING, STORAGE, HANDLING, AND TRANSPORTATION

Receiving: Shrink wrap and strapping should be removed immediately upon receipt of goods. Carefully check all materials for shipping damage and note any damage on the bill of lading when signing for delivery. Immediately report any concerns or discrepancies to HMTX's Customer Service at 800-522-9166.

Warehouse and Jobsite Storage: It is critical to store materials, adhesives, weld rods, and any other ancillary product in a dry, clean, and temperature-controlled interior environment. Storage should be in an area away from heating/cooling ducts, direct sunlight, and any other source of extreme temperature. The space should be between 65°F and 85°F (18°C and 29.4°C) with 40% to 65% ambient RH. Teknoflor Heterogeneous Sheet is packaged in rolls which must be safely stored on a flat surface, standing vertically on end, tightly rolled, face out, capped end down, on cardboard cores made for resilient sheet flooring. Rolls should be stored upright within 24 hours of receipt and caution should be taken to secure the rolls to prevent from falling. Stored rolls must be protected from forklift and other traffic in order to avoid damage. Using any type of uncontrolled storage such as temporary, outdoor, shipping container, or otherwise may result in product or installation concerns including bond failure, gapping, or buckling which are not covered under the product warranty.



Figure 1 - Rolls should always be stored vertically.

Transit and Delivery: Transportation should be performed in such a manner as to prevent damage or distortion. Ensure that rolls and pallets are fully secured during transportation to avoid load shifting and other preventable damage. When moving product avoid injury and material damage by utilizing proper procedures, equipment, and lifting techniques.



Material Confirmation: Verify the material is of the correct color, quantity, sequence number, and lot number. Prior to installation, check material for defect or damage and report any damage, concerns, or discrepancies. If any issues have been identified, the installation should not progress until all concerns have been resolved. Warranty claims of labor or material costs for defective material which has been permanently installed will not be covered.

Acclimation: The flooring material, ancillary products, and the project area should be acclimated for as long as necessary to reach occupancy-conditions. Acclimation should be done within climate-controlled structures between 65°F and 85°F (18°C and 29.4°C) and 40% to 65% ambient RH for a minimum of 48 hours before installation, during installation, and indefinitely thereafter. Teknoflor Heterogeneous Sheet shall be stored standing on end with measures taken to secure the rolls. Keep rolls away from heating/cooling ducts, direct sunlight, or any other source of extreme temperatures. If permanent HVAC is not yet in operation, an appropriate temporary measure should be used to continuously maintain the noted temperature and RH.

Handling: Always exercise caution when handling rolls of Teknoflor Heterogeneous Sheet, being careful not to damage material. Rolls of Teknoflor Heterogeneous Sheet can be heavy and bulky; be sure to use proper material handling equipment when moving these products. Avoid injury by using proper lifting techniques and never lift more than can be safely handled.

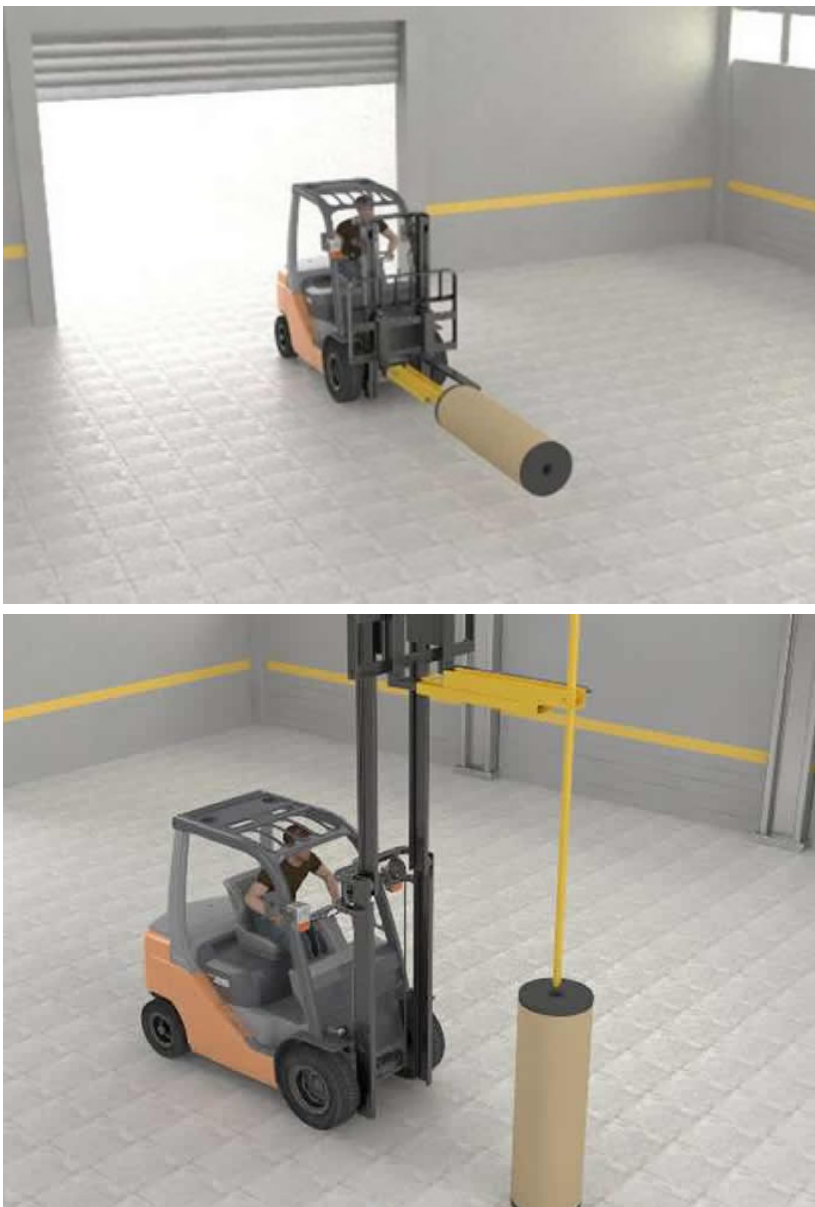


Figure 2 - The use of appropriate equipment allows for faster, easier, and safer means of moving materials.



Figure 3 - Flooring dollies are a safer way to move roll-goods.

EXTERIOR JOBSITE REQUIREMENTS

Proper inspections should be completed by the appropriate individuals.

Drainage: Driveways, parking lots, gutters, down spouts, drains, and landscaping surrounding the building are to be free of blockage and direct water away from the foundation.

Enclosed: The building envelope must be fully complete, sealed, and watertight: being under a roof, with a full perimeter of exterior walls, and having all permanent exterior windows and doors installed.

Suspended Floors: Crawl spaces must have cross-ventilation air vents equaling at least 1.5% per 100 square feet (9.3 m²) of floor space. Crawl space elevations should measure a minimum of 18" (46 cm) and should be insulated according to the latest building code requirements. The ground must be covered by a polyethylene vapor retarder with a minimum thickness of 6-mil and meet or exceed Class 1 vapor retarder requirements; sections must be overlapped by a minimum of 6" (16 cm), sealed with the appropriate tape, and extending up the perimeter not less than 6" (16 cm).

Compliant: The structure must comply with all local, state, national, or regional codes as well as any applicable regulations.



INTERIOR JOBSITE REQUIREMENTS

Teknoflor Heterogeneous Sheet is only intended for interior use; do not install Teknoflor Heterogeneous Sheet in exterior environments.

Lighting: Service lighting should be fully operational so the substrate evaluation, preparation, and flooring installation can be performed under lighting equal to occupancy-conditions and final assessment criteria. Spaces with inadequate lighting present safety hazards to workers. Poor lighting is not a valid cause for improper workmanship or the installation of visible defects.

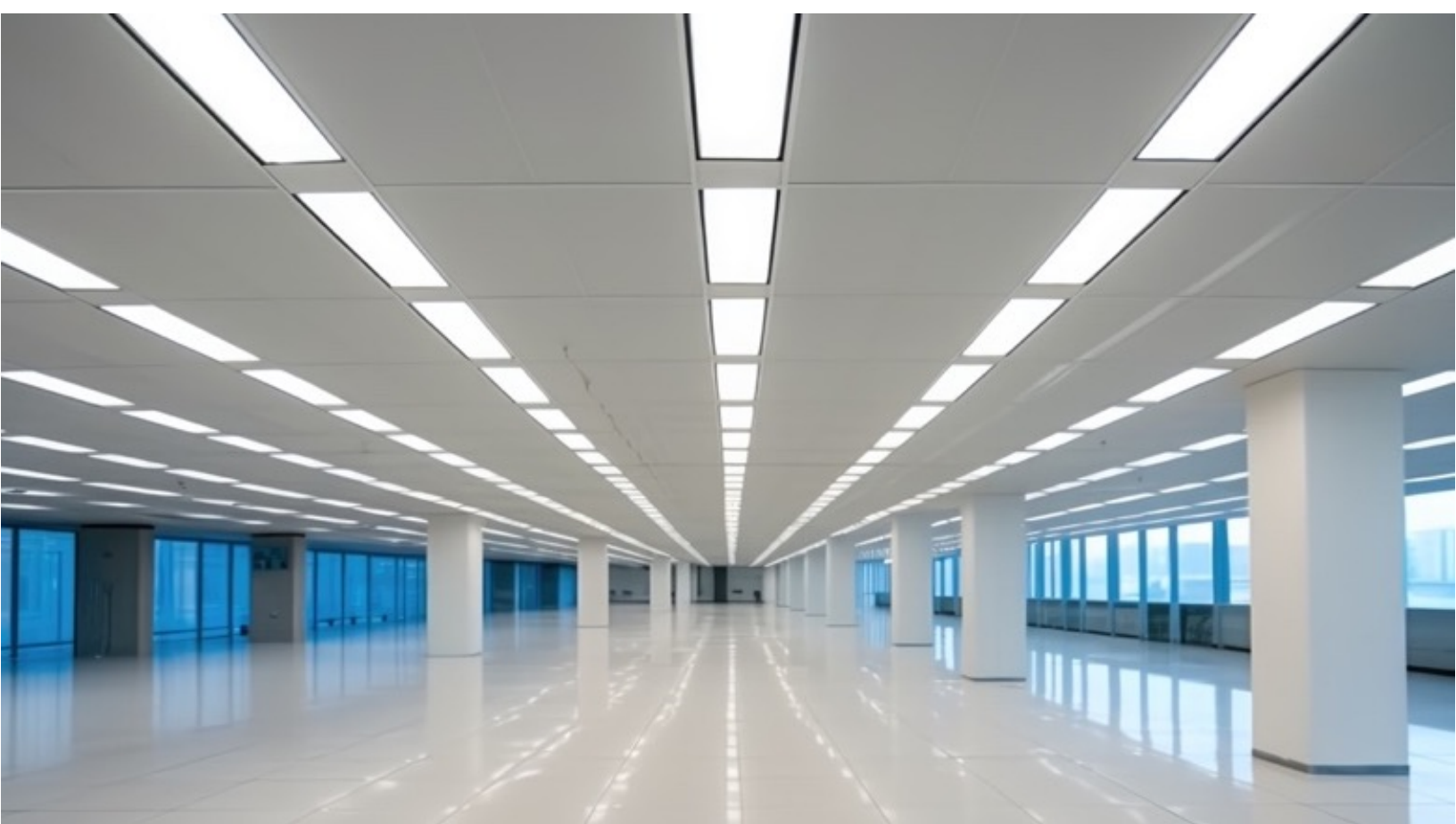


Figure 4 - Service lighting should be fully operational before installation begins.

Dry: Examine the installation site for faulty plumbing, including leaks from pipes or other water bearing fixtures. Prior to installation, substrate moisture levels must be tested, documented, and addressed when necessary.

Climate Controlled: Operating HVAC systems are critical to remove excess moisture and proactively condition the space to occupancy conditions. Before installation can begin the permanent HVAC system should be in full operation for as long as necessary for the project area to reach occupancy-conditions, but shall not be less than one week. Room temperature should be maintained between 65°F and 85°F (18°C and 29.4°C) at least 48 hours before installation, during installation, and indefinitely thereafter. Ambient relative humidity should be maintained between 40% and 65% RH. If the substrate is within 5°F (2.78°C) of dew point the installation should not proceed until addressed. Areas with intense direct sunlight may require window treatments before, during and after installation.



Figure 5 - HVAC shall be fully operational prior to installation.

Climate Control by Temporary HVAC Systems: Temporary HVAC systems are not recommended and should be avoided whenever possible. If temporary HVAC is employed, only suitable temporary HVAC systems should be utilized. Temporary HVAC systems must be in constant operation until a permanent HVAC system is fully operational and effectively maintain the specified temperature and humidity throughout the entirety of the project area. Appropriate temporary heating systems may include electrical heat or direct-vent heating systems. The use of any propane or kerosene forced-air heaters, any vent-free or ventless heaters, and/or any other type of unvented fuel-burning heating system is not permitted. It is strongly advised that projects installed while using temporary HVAC have extensive supporting documentation of the environmental conditions before, during, and after the installation.

Compliant: The structure must comply with all local, state, national, or regional codes as well as any applicable regulations.

Confirming jobsite suitability is a critical step of the installation process. HMTX will not be held responsible for any issues, warranties, guarantees, etc. related to the suitability of a project.

SUBSTRATE QUALIFICATION

It is highly recommended that all substrate qualifying, site evaluation, moisture & pH testing, and any other analysis is formally documented at the time of occurrence and permanently archived for future reference. Claims for any losses, damages, costs, or issues arising from or related to site conditions, working conditions, workmanship, or any other circumstances other than product defect claims will not be covered. All substrates, regardless of age, condition, composition, or construction, shall be properly prepared, must meet the conditions outlined in the SUBSTRATE QUALIFICATION section, and be evaluated and/or in compliance with the practices, methods, and specifications set forth in the most current versions of:

Industry standards can be obtained from the respective publishers.

For example, ASTM standards are available through www.astm.org

- ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
- ASTM F1482 Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring
- ASTM F2419 Standard Practice for Installation of Thick Poured Gypsum Concrete Underlayments and Preparation of the Surface to Receive Resilient Flooring
- ASTM F2471 Standard Practice for Installation of Thick Poured Lightweight Cellular Concrete Underlayments and Preparation of the Surface to Receive Resilient Flooring
- ASTM F2678 Standard Practice for Preparing Panel Underlayments, Thick Poured Gypsum Concrete Underlayments, Thick Poured Lightweight Cellular Concrete Underlayments, and Concrete Subfloors with Underlayment Patching Compounds to Receive Resilient Flooring
- ASTM F3191 Standard Practice for Field Determination of Substrate Water Absorption (Porosity) for Substrate to Receive Resilient Flooring
- ASTM F3311 Standard Practice for Mat Bond Evaluation of Performance and Compatibility for Resilient Flooring System Components Prior to Installation
- All local, state, national, or regional codes as well as any applicable regulations.

Every project is different.
Each one is constructed
with a unique combination
of various materials,
practices, and
circumstances.

To ensure a successful
installation, a
comprehensive assessment
should be performed on all
substrates before an
installation begins.



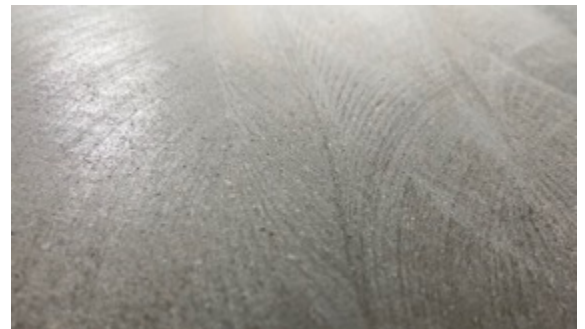
Acclimated: The substrate shall be acclimated to a temperature equal to that of occupancy-conditions while remaining within the acceptable temperature range of 65°F and 85°F (18°C and 29.4°C).

Grade: Teknoflor Heterogeneous Sheet is suitable for above-grade, on-grade, and below-grade applications.

Flatness: Substrates must be flat to within 3/16" in a 10' radius (5 mm in a 3 m radius). Elevated, protruding, or high areas shall be corrected by grinding or sanding. Low areas shall be filled using a patch or leveling compound engineered and warranted by the patch manufacturer for this purpose and following their written instructions.

Smooth: Substrates shall be free of irregularities, roughness, excessive texture, or abrupt changes in elevation. Surface defects or deficiencies must be corrected before installing the flooring product. Low spots, cracks, holes, and other irregularities can be patched using a high-quality patching compound engineered and warranted by the patch manufacturer for this purpose and following their written instructions.

Profiled: Careful consideration should be used before skim-coating surfaces that are very smooth, highly polished, or otherwise having very little surface-profile such as heavily power-troweled concrete. A thin film or skimcoat of floor patch may not bond sufficiently to a smooth surface due to an inability to acquire a mechanical bond. Always perform a bond test prior to installation.



Absorbent/Porous: Always test the substrate for absorbency. It may be possible to determine surface porosity by placing a 1/4" (7 mm) size drop of potable water onto a properly cleaned substrate using a dropper or pipette from a height no greater than 1/2" (13 mm). If the drop of water is absorbed within one (1) minute the surface is likely considered porous/absorbent. If the drop of water is still beaded



Figure 6

*The left side has been abraded; the pores have been opened.
The right side has not been abraded.*



Figure 6

*Testing indicates the substrate on the left is absorbent.
The substrate on the right is non-absorbent.*

after one (1) minute, the surface is likely considered non-porous/non-absorbent. Testing must be done in compliance with the most current version of ASTM F3191. It may be possible to prepare a non-porous substrate such that it becomes absorbent by sanding, grinding, shotblasting, or by the application of a self-leveling compound with a minimum depth of 3/16" (5 mm); always verify results by retesting. Substrate absorbency testing should be performed in at least three (3) areas for each installation. For large projects, testing should be completed in distances not exceeding 50 feet (15m) in any direction. Testing locations should be documented and archived.

Dry: Substrates must be free of excess moisture. It is highly recommended that all moisture testing is formally documented at the time of testing and permanently archived for future reference. Moisture testing establishes the moisture conditions of the substrate at the time testing is performed; values may change thereafter, increasing or decreasing depending on circumstances.

Dry: Concrete slabs shall not exceed the MVER or RH moisture specifications set forth by the respective adhesive when measured in accordance with the latest version of ASTM F1869 or ASTM F2170. pH levels should be accurately tested, and readings should range between 7 - 10. It is highly recommended to have substrate moisture and pH testing conducted by a certified ICRI (International Concrete Repair Institute) Tier 2 technician. Documentation of moisture and pH test results may be required when submitting claims to HMTX.



Figure 7 - Always perform appropriate moisture testing.

Dry: Wood substrates must be checked for moisture using a reputable, pin or pinless moisture meter, with material specific settings. The wood-substrate moisture content should read less than 14%. Underlayment panels should be properly stored within the project space. Prior to installation, the wood panels shall be fully acclimated to occupancy-conditions and have reached equilibrium moisture content (EMC).

Clean and Free of Contaminates: Substrates to receive resilient flooring must be clean and free of any contaminants, bond-breakers, deleterious substances, or other material which could reduce adhesion, impair performance, affect the rate of moisture dissipation from the substrate, or cause a discoloration of the flooring. Contaminants are considered to be any substance that would impair, diminish, interfere, prohibit, deteriorate, degrade, or otherwise negatively affect the adhesion of the resilient floor covering to the substrate. Contaminates may include, but are not limited to dust, solvents, paint, wax, oil, grease, drywall compound, residual adhesive, markers, pen, crayon, adhesive remover, curing/hardening agents, film-forming curing compound, silicate penetrating curing compound, dissipative curing compound, sealing compound, hardening compound, parting compound, alkaline salts, excessive carbonation or laitance, mold, and mildew. Some curing compounds are advertised as being “dissipative”, but measures should be taken to make certain that they have been completely removed. Mechanically abrade surfaces to ensure 100% removal of any curing compounds or other contaminants.



Figure 8 - It is important to use a material-specific moisture meter.



Figure 9 - Contaminate removal is a critical part of a successful installation.

Sweeping Compounds: Sweeping compounds may introduce waxes, glycerin, paraffins, mineral oils, or other petroleum-based oils. All sweeping compounds, even those with marketing claiming to be safe for use, should be cautiously considered. Utilizing professional grade vacuums may eliminate the need for sweeping compounds by capturing and collecting dust and dirt without redistribution. Vacuuming with the appropriate equipment will also better manage hazards such as respirable crystalline silica and do so with introducing contaminants, dyes, aggregates, or film forming residues into an assembly.

Structurally Sound: Surfaces and structures must be free from flaw, deficiency, defect, decay, or deterioration and in compliance with all applicable building codes.

Free of Excessive Deflection: The maximum allowable deflection of the structure or substrate must not exceed $L/360$.

Compatible: Substrates must be evaluated to determine the compatibility and performance of the system's components prior to the actual full-scale installation. Always perform a mat bond test, making certain the test area and all system components are properly conditioned before and during the testing period. Select an area with light traffic, for example next to walls or columns; avoid placement in doorways, walkways, or near windows. Protect the test area from all traffic for the duration of the test. Flooring Contractor is to determine the appropriate placement and quantity of test locations. On large projects, it is recommended that a test be performed every 50 linear feet (15.25 m), on every level, and in any area where conditions may vary. To ensure accurate results, the test must include all aspects of the project and flooring assembly including: the concrete surface profile (CSP), any surface preparation products, the proper adhesive, the specified floor covering materials, temperature, humidity, and any other ambient or relevant conditions. Install a 36" x 36" section (1 m x 1 m) and cover the perimeter edges with duct tape (or equivalent) to prevent the adhesive from drying prematurely. After allowing the adhesive to cure for a minimum of 72 hours, the adhesive should be dry (although not fully cured) and the flooring should be difficult to remove. Slowly peel the floor covering from the substrate; if the material is easy to remove, do not proceed with the installation until corrections have been made. Perform any necessary corrective actions and repeat the mat bond test. All mat bond tests must be performed in accordance with ASTM F3311.

Warranty claims of labor or material costs for defective material which has been permanently installed will not be covered.

SUBSTRATE PREPARATION

Teknoflor Heterogeneous Sheet must be installed over a properly prepared substrate. All substrates, regardless of age, condition, composition, or construction, shall be properly prepared, must meet the conditions outlined in the SUBSTRATE PREPARATION section, and be evaluated and/or in compliance with the practices, methods, and specifications set forth in the most current versions of:

Industry standards can be obtained from the respective publishers.

For example, ASTM standards are available through www.astm.org

- ASTM C109/109M Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm Cube Specimens)
- ASTM C472 Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters, and Gypsum Concrete
- ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
- ASTM F1482 Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring
- ASTM F2419 Standard Practice for Installation of Thick Poured Gypsum Concrete Underlayments and Preparation of the Surface to Receive Resilient Flooring
- ASTM F2471 Standard Practice for Installation of Thick Poured Lightweight Cellular Concrete Underlayments and Preparation of the Surface to Receive Resilient Flooring
- ASTM F2678 Standard Practice for Preparing Panel Underlayments, Thick Poured Gypsum Concrete Underlayments, Thick Poured Lightweight Cellular Concrete Underlayments, and Concrete Subfloors with Underlayment Patching Compounds to Receive Resilient Flooring
- ASTM F3010 Standard Practice for Two-Component Resin Based Membrane-Forming Moisture Mitigation Systems for Use Under Resilient Floor Coverings
- ASTM F3311 Standard Practice for Mat Bond Evaluation of Performance and Compatibility for Resilient Flooring System Components Prior to Installation
- All local, state, national, or regional codes as well as any applicable regulations.

Flatness: Substrates must be flat to within 3/16" in a 10' radius (5 mm in a 3 m radius). Elevated, protruding, or high areas shall be corrected by grinding or sanding. Low areas shall be filled using a patch or leveling compound engineered and warranted by the patch manufacturer for this purpose and following their written instructions.

Before anything else,
Preparation
is the
Key
to
Success

-Alexander Graham Bell

Smooth: Substrates shall be free of irregularities, roughness, excessive texture, or abrupt changes in elevation. Surface defects or deficiencies must be corrected before installing flooring product. Low spots, non-moving joints or cracks, holes, and other irregularities can be patched using a high-quality patching compound engineered and warranted by the patch manufacturer for this purpose and following their written instructions.

Profiled: Careful consideration should be used before skim-coating surfaces that are very smooth, highly polished, or otherwise having very little surface-profile such as heavily power-troweled concrete. A thin film or skimcoat of floor patch may not bond sufficiently to a smooth surface due to an inability to acquire a mechanical bond. These surface conditions may adversely affect bond of floor preparation materials and adhesive and should be mechanically prepared by grinding or shot blasting to improve the surface profile and bond. Always perform a bond test.

Preparation Materials or Other Ancillary Products: The selection of preparation products is dependent upon the unique circumstances of each project. The application of all products must be performed in strict accordance with the respective manufacturer’s instructions. HMTX will not be held responsible for the selection, suitability, or performance of any third-party preparation or ancillary product including, underlayments, moisture mitigation systems, floor patching compounds, sealers, primers, or other such items.



Figure 10 - Always perform floor preparation in accordance with ancillary manufacturer’s instructions.

Patch Material Requirements: Patching or underlayment compounds shall be resistant to mildew, moisture, and alkali. Materials must attain a minimum compressive strength of 3,000 PSI after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever appropriate. Various manufacturers of flooring preparation products are provided in the table below:

MANUFACTURER	WEB ADDRESS	PHONE NUMBER
Ardex	www.ardexamericas.com	(888) 512-7339
Mapei	www.mapei.com/us-en	(800) 992-6273
Schonox	www.schonox.us	(855) 391-2649
Uzin	www.uzin.us	(720) 374-4810

Compatible: Substrates must be evaluated to determine the compatibility and performance of the system's components prior to the actual full-scale installation. Always perform a mat bond test, making certain the test area and all system components are properly conditioned before and during the testing period. Select an area with light traffic, for example next to walls or columns; avoid placement in doorways, walkways, or near windows. Protect the test area from all traffic for the duration of the test. Flooring Contractor is to determine the appropriate placement and quantity of test locations. On large projects, it is recommended that a test be performed every 50 linear feet (15.25 m), on every level, and in any area where conditions may vary. To ensure accurate results, the test must include all aspects of the project and flooring assembly including: the concrete surface profile (CSP), any surface preparation products, the proper adhesive, the specified floor covering materials, temperature, humidity, and any other ambient or relevant conditions. Install a 36" x 36" section (1 m x 1 m) and cover the perimeter edges with duct tape (or equivalent) to prevent the adhesive from drying prematurely. After allowing the adhesive to cure for a minimum of 72 hours, the adhesive should be dry (although not fully cured) and the flooring should be difficult to remove. Slowly peel the floor covering from the substrate; if the material is easy to remove, do not proceed with the installation until corrections have been made. Perform any necessary corrective actions and repeat the mat bond test. All mat bond tests must be performed in accordance with ASTM F3311.

Absorbent/Porous: It may be possible to prepare a non-absorbent substrate such that it becomes absorbent by sanding, grinding, shotblasting, or by the application of a self-leveling compound with a minimum depth of 3/16" (5 mm); always verify results by retesting.

Dry: Concrete substrates with excess moisture may require a moisture mitigation system using a high-quality product engineered and warranted by the manufacturer for this purpose and applied in accordance with their written instructions.

CONCRETE SUBSTRATES

All applicable substrates shall be properly prepared, must meet the conditions outlined in the CONCRETE SUBSTRATES section, and be evaluated and/or in compliance with the practices, methods, and specifications set forth in the most current versions of:

Industry standards can be obtained from the respective publishers.

For example, ASTM standards are available through www.astm.org

- ASTM D4259 Standard Practice for Preparation of Concrete by Abrasion Prior to Coating Application
- ASTM E1745 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs
- ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
- ASTM F1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
- ASTM F2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes
- ASTM F2678 Standard Practice for Preparing Panel Underlayments, Thick Poured Gypsum Concrete Underlayments, Thick Poured Lightweight Cellular Concrete Underlayments, and Concrete Subfloors with Underlayment Patching Compounds to Receive Resilient Flooring
- ASTM F3010 Standard Practice for Two-Component Resin Based Membrane-Forming Moisture Mitigation Systems for Use Under Resilient Floor Coverings
- ASTM F3191 Standard Practice for Field Determination of Substrate Water Absorption (Porosity) for Substrate to Receive Resilient Flooring
- ASTM F3311 Standard Practice for Mat Bond Evaluation of Performance and Compatibility for Resilient Flooring System Components Prior to Installation
- ACI 302.1/1R-95 Guide to Concrete Floor and Slab Construction
- ACI PRC-302.2 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials
- All local, state, national, or regional codes as well as any applicable regulations.

Proper Construction and Formulation: Below-grade and on-grade concrete substrates must have a suitable and uncompromised vapor retarder properly installed beneath the slab (in accordance with ASTM E1745). Concrete slabs shall have a minimum 3,500 psi cured compressive strength, a dry density of 115 pounds per cubic foot, and a water-cement ratio of 0.45 to 0.5 which is recommended by the concrete construction industry and appropriate for slabs to receive moisture sensitive finishes. Higher water-cement ratios lead to longer dry times and issues associated with elevated moisture conditions that cause floor failures. Slabs must not have crazing, dusting, scaling, spalling, laitance, or blistering. Whenever possible concrete slabs should be wet cured using plastic sheeting or another suitable moisture retaining cover. Curing compounds and other admixtures can act as a bond breaker. Concrete substrates must be comprised of suitable components and aggregates which are not subject to deleterious chemical reactions including Alkali-Aggregate Reactions (AAR), Alkali-Silica Reactions (ASR), and Alkali-Carbonate Reactions (ACR).

Formulation: Coal Fly Ash is used as recycled content replacing portland cement in concrete slabs. It is becoming more prevalent with the popularity of sustainable LEED construction practices. Fly ash contains silicon dioxide and calcium oxide. Silicon dioxide are spherical particles with an extremely smooth surface that is difficult for adhesives to bond to. Calcium oxide is a caustic, highly alkaline component which also acts as a bond breaker. Concrete slabs containing fly ash in higher concentrations are difficult to bond to and may require further measures to prepare the substrate.

Formulation: Silicates are known to have bond-breaking properties; adhesives cannot be applied directly over substrates that have been treated with any type of compound that contains silicate material (whether entrained or topically applied).

Flat and Smooth: Substrates must be flat to within 3/16" in a 10' radius (5 mm in a 3 m radius) and free of irregularities, roughness, excessive texture, or abrupt changes in elevation.

Profiled: Careful consideration should be used before skim-coating surfaces that are very smooth, highly polished, or otherwise having very little surface-profile such as heavily power-troweled concrete. A thin film or skimcoat of floor patch may not bond sufficiently to a smooth surface due to an inability to acquire a mechanical bond. These surface conditions may adversely affect bond of floor preparation materials and adhesive and should be mechanically prepared by grinding or shot blasting to improve the surface profile and bond. Always perform a bond test.



Compatible: Substrates must be evaluated to determine the compatibility and performance of the system's components prior to the actual full-scale installation. Always perform a mat bond test, making certain the test area and all system components are properly conditioned before and during the testing period. Select an area with light traffic, for example next to walls or columns; avoid placement in doorways, walkways, or near windows. Protect the test area from all traffic for the duration of the test. Flooring Contractor is to determine the appropriate placement and quantity of test locations. On large projects, it is recommended that a test be performed every 50 linear feet (15.25 m), on every level, and in any area where conditions may vary. To ensure accurate results, the test must include all aspects of the project and flooring assembly including: the concrete surface profile (CSP), any surface preparation products, the proper adhesive, the specified floor covering materials, temperature, humidity, and any other ambient or relevant conditions. Install a 36" x 36" section (1 m x 1 m) and cover the perimeter edges with duct tape (or equivalent) to prevent the adhesive from drying prematurely. After allowing the adhesive to cure for a minimum of 72 hours, the adhesive should be dry (although not fully cured) and the flooring should be difficult to remove. Slowly peel the floor covering from the substrate; if the material is easy to remove, do not proceed with the installation until corrections have been made. Perform any

necessary corrective actions and repeat the mat bond test. All mat bond tests must be performed in accordance with ASTM F3311.

Clean and Free of Contaminates: Substrates to receive resilient flooring must be clean and free of any contaminants, bond-breakers, deleterious substances, or other material which could reduce adhesion, impair performance, affect the rate of moisture dissipation from the substrate, or cause a discoloration of the flooring. Contaminants are considered to be any substance that would impair, diminish, interfere, prohibit, deteriorate, degrade, or otherwise negatively affect the adhesion of the resilient floor covering to the substrate. Contaminates may include, but are not limited to dust, solvents, paint, wax, oil, grease, drywall compound, residual adhesive, markers, pen, crayon, adhesive remover, curing/hardening agents, film-forming curing compound, silicate penetrating curing compound, dissipative curing compound, sealing compound, hardening compound, parting compound, alkaline salts, excessive carbonation or laitance, mold, and mildew. Some curing compounds are advertised as being “dissipative”, but measures should be taken to make certain that they have been completely removed. Mechanically abrade surfaces to ensure 100% removal of any curing compounds or incompatible sealers.



Abatement and Solvents: NEVER use chemicals or solvents to remove adhesives or other substrate surface contaminants. Solvents may penetrate into and reside within a concrete slab causing permanent contamination. It is not reasonably possible to determine if the solvents have been properly neutralized nor how deeply into a slab any solvents may reside. Non-chemical methods for removal, such as scraping, abrasive cleaning, grinding, bead or shot blasting, including methods described in ASTM D4259, may be used on slabs with deleterious residues or other contaminants. The use of adhesive removers or solvents (including soy and citrus type products) is not recommended and will void any warranty.



Figure 11 - Check for absorbency using methods outlined in ASTM F3191

Absorbent/Porous: Always test the substrate for absorbency. Testing must be done in compliance with the most current version of ASTM F3191. It may be possible to prepare a non-absorbent substrate such that it becomes absorbent by sanding, grinding, shotblasting, or by the application of a self-leveling compound with a minimum depth of 3/16” (5 mm); always verify results by retesting.

Moisture Mitigation Systems: The use of products that are in compliance with ASTM F3010 is recommended and provides full product and bond warranty coverage. A few manufacturers of such systems are provided in the table below:

MANUFACTURER	WEB ADDRESS	PHONE NUMBER
Ardex	www.ardexamericas.com	(888) 512-7339
Mapei	www.mapei.com/US-EN	(800) 992-6273
Schonox	www.schonox.us	(855) 391-2649
Uzin	www.uzin.us	(720) 374-4810

Non-moving Joints or Cracks: Non-moving joints and cracks shall be properly filled and smoothed using an appropriate high-quality patching compound.

Moving Joints and Expansion Joints: Expansion joints and isolation joints are intentionally incorporated into slabs and structures to accommodate expected movement. These and any other active or moving joints must be honored through the flooring assembly with the finished floor terminating on both sides. Do not fill these joints with patch, underlayment products, and/or cover with the floor covering. Cover moving or expansion joints with an expansion joint covering system. These systems should be specified and detailed by the architect, designer, or engineer based upon requirements and aesthetic interests.

Expansion Joint Covering Systems: Expansion joint systems should be determined and detailed by the architect or engineer and based upon usage and aesthetic considerations. There are several companies that offer compliant expansion joint systems that can also provide expertise to effectively deal with these issues:

MANUFACTURER	WEB ADDRESS	PHONE NUMBER
Balco USA	www.balcousa.com	(800) 767-0082
C-S Group	www.c-sgroup.com	(800) 233-8493
EM Seal Joint Systems	www.emseal.com	(800) 526-8365
InPro Corp	www.inprocorp.com	(800) 222-5556
MM Systems	www.mmsystemscorp.com	(800) 241-3460
Nystrom	www.nystrom.com	(800) 547-2635
Watson Bowman Acme	www.wbacorp.com	(800) 677-4922

Telegraphing, aesthetic concerns, or other performance issues arising as a result of movement of concrete slabs are not warranted. Such instances are not to be considered a product issue or failure but rather a structural or site related condition.

Moisture and Alkalinity: Moisture and pH testing is necessary on all concrete substrates, regardless of age or grade level. Concrete slabs shall not exceed the MVER or RH moisture specifications set forth by the respective adhesive when measured in accordance with the latest version of ASTM F1869 or ASTM F2170. pH levels should be accurately tested, and readings should range between 7 - 10. It is highly recommended to have substrate moisture and pH testing conducted by a certified ICRI (International Concrete Repair Institute) Tier 2 technician. All moisture testing should be formally documented at the time of testing and retained for future reference.



WOOD SUBSTRATES

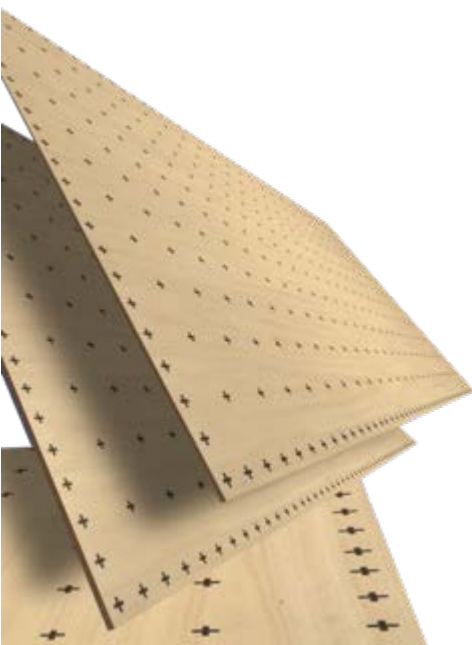
All applicable substrates shall be properly prepared, must meet the conditions outlined in the WOOD SUBSTRATES section, and be evaluated and/or in compliance with the practices, methods, and specifications set forth in the most current versions of:

Industry standards can be obtained from the respective publishers.

For example, ASTM standards are available through www.astm.org

- ASTM F1482 Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring
- ASTM F2678 Standard Practice for Preparing Panel Underlayments, Thick Poured Gypsum Concrete Underlayments, Thick Poured Lightweight Cellular Concrete Underlayments, and Concrete Subfloors with Underlayment Patching Compounds to Receive Resilient Flooring
- ASTM F3191 Standard Practice for Field Determination of Substrate Water Absorption (Porosity) for Substrate to Receive Resilient Flooring
- ASTM F3311 Standard Practice for Mat Bond Evaluation of Performance and Compatibility for Resilient Flooring System Components Prior to Installation
- All local, state, national, or regional codes as well as any applicable regulations.

Proper Construction and Subfloor Panels: Wood subfloors shall be suspended double layer construction with a minimum 18" (46 cm) of cross ventilated space. Subfloors must have a total thickness not less than 1" (2.5 cm), be properly secured with appropriate fasteners, and incorporate a 1/4" (6.4 mm) or thicker underlayment grade panel on the surface. Wood subfloors must be structurally sound, dry, and compliant with all applicable building codes. Subfloor panels must have an A.P.A. approved "Exterior" bond-classification, with a minimum face-veneer grade of "C" and a minimum back-veneer grade of "D". Fastening adhesives containing solvents or other off-gassing components have the potential to affect overlying layers of the assembly and cause discoloration of the finished surface. Do not install over wood floors in direct contact with the earth, concrete slabs, or over a sleeper floor assembly.



Underlayment Panels: The subfloor shall be covered with an underlayment panel which is suitable, approved, and warranted for use under resilient floor coverings. Panels should have a minimum thickness of 1/4" (6.4 mm) and be dimensionally stable, smooth, without voids or knots, robust and consistent in density and porosity, free of any substance that may cause staining, of uniform thickness, and resistant to static and impact indentation. Panel storage and installation shall be performed in strict compliance with the manufacturer's instructions, this includes but is not limited to, conditioning, subfloor flatness, panel spacing, panel layout, fastener attributes, fastener placement, fastener schedule, and joint preparation. Do not install subfloor or underlayment panels over surfaces that are sticky, tacky, or may otherwise become such. Doing so, may result in issues including undesirable popping, snapping, or clicking type noises.

Flat and Smooth: Substrates must be flat to within 3/16" in a 10' radius (5 mm in a 3 m radius) and free of irregularities, roughness, excessive texture, or abrupt changes in elevation.

Figure 12 - Always use suitable underlayment panels.

Clean and Free of Contaminates: Substrates to receive resilient flooring must be clean and free of any contaminants, bond-breakers, deleterious substances, or other material which could reduce adhesion, impair performance, affect the rate of moisture dissipation from the substrate, or cause a discoloration of the flooring. Contaminants are considered to be any substance that would impair, diminish, interfere, prohibit, deteriorate, degrade, or otherwise negatively affect the adhesion of the resilient floor covering to the substrate. Contaminates may include, but are not limited to dust, solvents, paint, wax, oil, grease, drywall compound, residual adhesive, markers, pen, crayon, adhesive remover, sealing compound, mold, and mildew.

Compatible: Substrates must be evaluated to determine the compatibility and performance of the system's components prior to the actual full-scale installation. Always perform a mat bond test, making certain the test area and all system components are properly conditioned before and during the testing period. Select an area with light traffic, for example next to walls or columns; avoid placement in doorways, walkways, or near windows. Protect the test area from all traffic for the duration of the test. Flooring Contractor is to determine the appropriate placement and quantity of test locations. On large projects, it is recommended that a test be performed every 50 linear feet (15.25 m), on every level, and in any area where conditions may vary. To ensure accurate results, the test must include all aspects of the project and flooring assembly including: the concrete surface profile (CSP), any surface preparation products, the proper adhesive, the specified floor covering materials, temperature, humidity, and any other ambient or relevant conditions. Install a 36" x 36" section (1 m x 1 m) and cover the perimeter edges with duct tape (or equivalent) to prevent the adhesive from drying prematurely. After allowing the adhesive to cure for a minimum of 72 hours, the adhesive should be dry (although not fully cured) and the flooring should be difficult to remove. Slowly peel the floor covering from the substrate; if the material is easy to remove, do not proceed with the installation until corrections have been made. Perform any necessary corrective actions and repeat the mat bond test. All mat bond tests must be performed in accordance with ASTM F3311.

Absorbent/Porous: Always test the substrate for absorbency. Testing must be done in compliance with the most current version of ASTM F3191. It may be possible to prepare a non-absorbent substrate such that it becomes absorbent by sanding, grinding, shotblasting, or by the application of a self-leveling compound with a minimum depth of 3/16" (5 mm); always verify results by retesting.

Moisture: All wood substrates must be checked for moisture. Using a reputable, pin or pinless moisture meter, with material specific settings. The wood substrate moisture content should read less than 14%. Underlayment panels should be properly stored within the project space. Prior to installation, the wood panels shall be fully acclimated to occupancy-conditions and have reached equilibrium moisture content (EMC). It is highly recommended that all moisture testing is formally documented at the time of testing and archived for future reference.



Crawl Spaces: Crawl spaces must have cross-ventilation air vents equaling at least 1.5% per 100 square feet (9.3m²) of floor space. Crawl space elevations should measure a minimum of 18" (46cm) and should be insulated according to the latest building code requirements. The ground must be covered by a polyethylene vapor retarder with a minimum thickness of 6-mil and meet or exceed Class 1 vapor retarder requirements; sections must be overlapped by a minimum of 6" (16 cm), sealed with the appropriate tape, and extending up the perimeter not less than 6" (16 cm).

GYPSUM CONCRETE SUBSTRATES

Gypsum concrete substrates are relatively common in the marketplace and have various compositions and performance characteristics. While these substrates are not recommended, successful installations may be possible. All applicable substrates must be properly prepared, must meet the conditions outlined in the GYPSUM CONCRETE SUBSTRATES section, and be evaluated and/or in compliance with the practices, methods, and specifications set forth in the most current versions of:

Industry standards can be obtained from the respective publishers.
For example, ASTM standards are available through www.astm.org

- ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
- ASTM F2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes
- ASTM F2419 Standard Practice for Installation of Thick Poured Gypsum Concrete Underlayments and Preparation of the Surface to Receive Resilient Flooring
- ASTM F2471 Standard Practice for Installation of Thick Poured Lightweight Cellular Concrete Underlayments and Preparation of the Surface to Receive Resilient Flooring
- ASTM F2678 Standard Practice for Preparing Panel Underlayments, Thick Poured Gypsum Concrete Underlayments, Thick Poured Lightweight Cellular Concrete Underlayments, and Concrete Subfloors with Underlayment Patching Compounds to Receive Resilient Flooring
- ASTM F3191 Standard Practice for Field Determination of Substrate Water Absorption (Porosity) for Substrate to Receive Resilient Flooring
- ASTM F3311 Standard Practice for Mat Bond Evaluation of Performance and Compatibility for Resilient Flooring System Components Prior to Installation
- All local, state, national, or regional codes as well as any applicable regulations.

Proper Construction and Formulation: Gypsum concrete underlayments must be manufactured and installed in compliance with ASTM F2419. It is necessary that a premium high-performance product is used from a reputable manufacturer offering a warranty for use with commercial resilient floor coverings. The underlayment must be capable of performing in the environment for which it has been installed without degrading. Gypsum or lightweight concrete must have a density and compression strength exceeding the minimum values set forth in ASTM F2419 or ASTM F2471 respectively but also not less than 115 pounds per cubic foot and 3,000 psi.

Priming: Many gypsum concrete underlayments require a primer be applied to the surface prior to the installation of flooring. Contact the material manufacturer for proper preparation methods, and always perform a bond test before proceeding. The primed surface must be tested to determine porosity.

Flat and Smooth: Substrates must be flat to within 3/16" in a 10' radius (5 mm in a 3 m radius) and free of irregularities, roughness, excessive texture, or abrupt changes in elevation.

Compatible: Substrates must be evaluated to determine the compatibility and performance of the system's components prior to the actual full-scale installation. Always perform a mat bond test, making certain the test area and all system components are properly conditioned before and during the testing period. Select an area with light traffic, for example next to walls or columns; avoid placement in doorways, walkways, or near windows. Protect the test area from all traffic for the duration of the test. Flooring Contractor is to determine the appropriate placement and quantity of test locations. On large projects, it is recommended that a test be performed every 50 linear feet (15.25 m), on every level, and in any area where conditions may vary. To ensure accurate results, the test must include all aspects of

the project and flooring assembly including: the concrete surface profile (CSP), any surface preparation products, the proper adhesive, the specified floor covering materials, temperature, humidity, and any other ambient or relevant conditions. Install a 36" x 36" section (1 m x 1 m) and cover the perimeter edges with duct tape (or equivalent) to prevent the adhesive from drying prematurely. After allowing the adhesive to cure for a minimum of 72 hours, the adhesive should be dry (although not fully cured) and the flooring should be difficult to remove. Slowly peel the floor covering from the substrate; if the material is easy to remove, do not proceed with the installation until corrections have been made. Perform any necessary corrective actions and repeat the mat bond test. All mat bond tests must be performed in accordance with ASTM F3311.

Clean and Free of Contaminates: Substrates to receive resilient flooring must be clean and free of any contaminants, bond-breakers, deleterious substances, or other material which could reduce adhesion, impair performance, affect the rate of moisture dissipation from the substrate, or cause a discoloration of the flooring. Contaminants are considered to be any substance that would impair, diminish, interfere, prohibit, deteriorate, degrade, or otherwise negatively affect the adhesion of the resilient floor covering to the substrate. Contaminates may include, but are not limited to dust, solvents, paint, wax, oil, grease, drywall compound, residual adhesive, markers, pen, crayon, adhesive remover, curing/hardening agents, film-forming curing compound, silicate penetrating curing compound, dissipative curing compound, sealing compound, hardening compound, parting compound, alkaline salts, excessive carbonation or laitance, mold, and mildew. Some curing compounds are advertised as being "dissipative", but measures should be taken to make certain that they have been completely removed. Mechanically abrade surfaces to ensure 100% removal of any contaminants.

Absorbent/Porous: Always test the substrate for absorbency. Testing must be done in compliance with the most current version of ASTM F3191. It may be possible to prepare a non-absorbent substrate such that it becomes absorbent by sanding, grinding, shotblasting, or by the application of a self-leveling compound with a minimum depth of 3/16" (5 mm); always verify results by retesting.

Moisture and Alkalinity: Make certain the assembly has thoroughly cured and dried. Gypsum concretes should be tested using ASTM F2170 to ensure proper moisture levels. Gypsum concrete substrates shall not exceed the RH moisture specifications set forth by the respective adhesive when measured in accordance with the latest version of ASTM F2170. pH levels should be accurately tested, and readings should range between 7 - 10. It is highly recommended that all moisture testing is formally documented at the time of testing and retained for future reference. It may be necessary to also test and evaluate gypsum concrete underlayments in accordance with underlayment manufacturer's recommendations.



HMTX will not be held responsible for any issues, warranties, performance guarantees, etc. related to the use of any third-party ancillary products. The surface of the prepared substrate must be compliant with all specifications and standards set forth in the SUBSTRATE QUALIFICATION and SUBSTRATE PREPARATION portion of this document.

OTHER SUBSTRATES

Whenever possible, it is recommended to remove any pre-existing floor coverings and begin new over the original base. HMTX recognizes that there are certain situations in which this is not possible. Outlined below are some of the substrates which might be able to be installed over if properly prepared in such a way as to bring them into compliance with the specifications outlined in the SUBSTRATE QUALIFICATION and SUBSTRATE PREPARATION portions of this document. Always check your substrate absorbency/porosity before beginning installation. All substrates, regardless of age, condition, composition, or construction, shall be properly prepared, must meet the conditions outlined in the OTHER SUBSTRATES section, and be evaluated and/or in compliance with the practices, methods, and specifications set forth in the most current versions of:

Industry standards can be obtained from the respective publishers.
For example, ASTM standards are available through www.astm.org

- ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
- ASTM F1482 Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring
- ASTM F2419 Standard Practice for Installation of Thick Poured Gypsum Concrete Underlayments and Preparation of the Surface to Receive Resilient Flooring
- ASTM F2471 Standard Practice for Installation of Thick Poured Lightweight Cellular Concrete Underlayments and Preparation of the Surface to Receive Resilient Flooring
- ASTM F2678 Standard Practice for Preparing Panel Underlayments, Thick Poured Gypsum Concrete Underlayments, Thick Poured Lightweight Cellular Concrete Underlayments, and Concrete Subfloors with Underlayment Patching Compounds to Receive Resilient Flooring
- ASTM F2873 Standard Practice for the Installation of Self-Leveling Underlayment and the Preparation of Surface to Receive Resilient Flooring
- ASTM F3191 Standard Practice for Field Determination of Substrate Water Absorption (Porosity) for Substrate to Receive Resilient Flooring
- ASTM F3311 Standard Practice for Mat Bond Evaluation of Performance and Compatibility for Resilient Flooring System Components Prior to Installation
- All local, state, national, or regional codes as well as any applicable regulations.

Terrazzo, Tile, and Stone Substrates: It may be possible to prepare a terrazzo, tile, or stone substrate such that it can receive resilient flooring by sanding, grinding, shotblasting, or by the application of a self-leveling or patching compound; always verify results by retesting. Be sure to fill all grout joints and other imperfections on ceramic tiles, terrazzo, quarry tiles, and similar floors with a leveling or patching compound. The surface of the prepared substrate must be compliant with all specifications and standards set forth in the SUBSTRATE QUALIFICATION and SUBSTRATE PREPARATION portions of this document.

Metal Substrates: It may be possible to prepare a metal substrate such that it can receive Teknoflor Heterogeneous Sheet by the application of a self-leveling compound with a minimum depth of 3/16" (5 mm). The surface of the prepared substrate must be compliant with all specifications and standards set forth in the SUBSTRATE QUALIFICATION and SUBSTRATE PREPARATION portions of this document.

Polymeric Poured or Resin-Based Floors: It may be possible to prepare a polymeric poured or resin-based substrate such that it can receive Teknoflor Heterogeneous Sheet by the application of a self-leveling compound with a minimum depth of 3/16" (5 mm). The surface of the prepared substrate must be compliant with all specifications and standards set forth in the SUBSTRATE QUALIFICATION and SUBSTRATE PREPARATION portions of this document.

Radiant Heat Assemblies: Teknoflor Heterogeneous Sheet may be installed over radiant heat assemblies. The temperature must remain steady and any changes in temperature must be slow and gradual. Tubing, piping, coils, cables, or other embedded heating elements must be cast a minimum of 1/2" (13 mm) below the surface of the substrate and be operating at least 2 weeks before the installation of Teknoflor Heterogeneous Sheet. Set and maintain the temperature of the radiant heating system to 65°F (18°C) 72 hours before, at all times during, and 72 hours after installation. The temperature of the radiant heat floor may be gradually increased 72 hours after installation, not to exceed 5°F (2.78°C) per day, but the surface temperature must never exceed 85°F (29.4°C). Contact the radiant heating system manufacturer for further recommendations. The surface of the prepared substrate must be compliant with all specifications and standards set forth in the SUBSTRATE QUALIFICATION and SUBSTRATE PREPARATION portions of this document.

Various manufacturers of flooring preparation products are provided in the table below:

MANUFACTURER	WEB ADDRESS	PHONE NUMBER
Ardex	www.ardexamericas.com	(888) 512-7339
Mapei	www.mapei.com/us-en	(800) 992-6273
Schonox	www.schonox.us	(855) 391-2649
Uzin	www.uzin.us	(720) 374-4810

UNSUITABLE SUBSTRATES

Substrates unsuitable for installation of Teknoflor Heterogeneous Sheet include, but are not limited to:

Asphalt Tile	Hardboard	Residual/Pre-existing Adhesive
Carpet/Carpet Pad	Hardwood	Rubber Tile
Chipboard	Lauan	Self-Stick Tile
Construction Grade Plywood	Masonite	Sleeper Substrates
Cushion-Back Sheet Vinyl	OSB	Slip-Retardant Flooring
Cutback Adhesive	Parquet	Strip Wood
Existing Resilient Floors	Particleboard	Tile Backer Boards
Floating Floors	Plywood - Fire Retardant	
Glass Mesh Tile Boards	Plywood - Preservative Treated	

Existing Resilient Floor Covering: It is not recommended to install Teknoflor Heterogeneous Sheet over an existing resilient floor covering. Considering factors such as long-term performance and indentation resistance, HMTX recommends that existing floor coverings be properly removed in order to provide the best possible substrate for the installation of Teknoflor Heterogeneous Sheet.

REMOVAL OF PRE-EXISTING MATERIALS

All existing flooring and adhesive must be mechanically removed prior to installing the new flooring material. Warning: Pre-existing floor coverings and other building materials may contain harmful substances such as: asbestos, lead, mold, mildew, and crystalline silica. Removal of any material containing harmful substances should only be performed by qualified and/or licensed individuals utilizing appropriate processes and equipment which are compliant with all pertinent codes, ordinances, and other governing or regulatory requirements including those specified by OSHA the EPA, as well as content set forth in the RFCI Recommended Work Practice for Removal of Resilient Floor Coverings.

Asbestos Warning: Do not sand, dry-sweep, dry-scrape, drill, saw, bead blast or mechanically chip or pulverize existing resilient flooring, backing, felt lining or asphaltic "cutback" adhesives. These products may contain either asbestos fibers or crystalline silica. Avoid creating dust. Inhalation of such dust containing asbestos fibers or crystalline silica may cause cancer and respiratory tract diseases. 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 assume it contains asbestos. Regulations may require that the material be tested to determine asbestos content. A brochure from the Resilient Floor Covering Institute entitled Recommended Work Practices for Removal of Resilient Floor Coverings provides a defined set of instructions for removing all resilient floor covering types.

Mold and Mildew Warning: Before removing an existing resilient floor, or installing a new floor, if there are visible indications of mold or mildew or the presence of a strong musty odor in the area, the source of the problem should be identified and corrected before proceeding with the flooring work. Visible signs of mold or mildew (such as discoloration) can indicate the presence of mold or mildew on the substrate, on the underlayment, on the back of the flooring, and sometimes even on the floor surface. If mold or mildew is discovered during the removal or installation, all work should stop until the mold/mildew problem (and any related moisture problem) has been addressed and all areas are allowed to thoroughly dry. To deal with mold and mildew issues, you should refer to the U.S. Environmental Protection Agency (EPA) guidelines that address mold and mildew. Remediation options can range from cleanup measures using gloves and biocide to hiring a professional mold and mildew remediation contractor. Structural repairs may also be needed. For more information visit the EPA website.

Crystalline Silica Warning: Before removing an existing resilient floor, or installing a new floor, identify and avoid any actions that result in the creation, dispersion, or contact with respirable crystalline silica. Crystalline silica is a common mineral found in the earth's crust. Materials like sand, stone, concrete, and mortar contain crystalline silica. These are very small particles which are at least 100 times smaller than ordinary sand that might be found on beaches and playgrounds. These particulates are typically created when cutting, sawing, grinding, drilling, and crushing stone, rock, concrete, brick, block, and mortar. Activities such as abrasive blasting with sand; sawing brick or concrete; sanding or drilling into concrete walls; grinding mortar; manufacturing brick, concrete blocks, stone countertops, or ceramic products; and cutting or crushing stone result in exposures to respirable crystalline silica dust. Industrial sand used in certain operations, is also a source of respirable crystalline silica exposure. About 2.3 million people in the U.S. are exposed to silica at work. Those who inhale these very small crystalline silica particles are at increased risk of developing serious silica-related diseases, including silicosis, an incurable lung disease that can lead to disability and death; lung cancer; chronic obstructive pulmonary disease (COPD); and kidney disease. For more information visit the OSHA and EPA websites.

TEK One

TEK One is a premium acrylate dispersion based adhesive.

Color: Off-white to beige.

Grade: Suitable for above-grade, on-grade, and below-grade applications.



Absorbent/Porous: Depending on application methodology, TEK One is recommended for use with porous and non-porous substrates. Porous substrates provide a mechanical bond and may improve performance. It may be possible to determine surface porosity by placing a 1/4" (7 mm) size drop of potable water onto a properly cleaned substrate using a dropper or pipette from a height no greater than 1/2" (13 mm). If the drop of water is absorbed within one (1) minute the surface is likely considered porous/absorbent. If the drop of water is still beaded after one (1) minute, the surface is likely considered non-porous/non-absorbent. Testing must be done in compliance with the most current version of ASTM F3191 (Standard Practice for Field Determination of Substrate Water Absorption (Porosity) for Substrates to Receive Resilient Flooring). It may be possible to prepare a non-absorbent substrate such that it becomes absorbent by sanding, grinding, shotblasting, or by the application of a self-leveling compound with a minimum depth of 3/16" (5 mm); always verify results by retesting.

Compatible: Substrates must be evaluated to determine the compatibility and performance of the system's components prior to the actual full-scale installation. Always perform a mat bond test, making certain the test area and all system components are properly conditioned before and during the testing period. Select an area with light traffic, for example next to walls or columns; avoid placement in doorways, walkways, or near windows. Protect the test area from all traffic for the duration of the test. Flooring Contractor is to determine the appropriate placement and quantity of test locations. On large projects, it is recommended that a test be performed every 50 linear feet (15.25 m), on every level, and in any area where conditions may vary. To ensure accurate results, the test must include all aspects of the project and flooring assembly including: the concrete surface profile (CSP), any surface preparation products, the proper adhesive, the specified floor covering materials, temperature, humidity, and any other ambient or relevant conditions. Install a 36" x 36" section (1 m x 1 m) and cover the perimeter edges with duct tape (or equivalent) to prevent the adhesive from drying prematurely. After allowing the adhesive to cure for a minimum of 72 hours, the adhesive should be dry (although not fully cured) and the flooring should be difficult to remove. Slowly peel the floor covering from the substrate; if the material is easy to remove, do not proceed with the installation until corrections have been made. Perform any necessary corrective actions and repeat the mat bond test. All mat bond tests must be performed in accordance with ASTM F3311.

Proper Preparation: The project and substrate must be compliant with all specifications, qualifications, and standards set forth in this document.

Moisture Limits: Substrates must be free of excess moisture. Concrete substrates must measure no more than 5 pounds MVER per 1,000 square feet in 24 hours in accordance with ASTM F1869 (Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride) or 90% RH when measured in accordance with ASTM F2170 (Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes). Wood substrates must not exceed 14% when measured with an appropriate moisture meter. Underlayment panels should be properly stored within the project space. Prior to installation, the wood panels shall be fully acclimated to occupancy-conditions and have reached equilibrium moisture content (EMC).

Installation:

Wet Set: Apply adhesive with the appropriate trowel and allow to flash off (approximately 10 to 20 minutes) before installing material. Ridges must still be wet and transfer to the finger when touched (see glossary for “flash time” - also referred to as “open time”). Install the sheet flooring into wet adhesive according to the installation instructions while achieving 100% adhesive transfer to the back of the flooring. Frequently check the back of the flooring during installation to ensure sufficient adhesive coverage. Wet set installation achieves the strongest bond strength and is the preferred installation method.

Notice: Wet Set installations require a porous substrate.

Flash times and working times may vary depending on temperature, humidity, and substrate absorbency/porosity. Installations performed over adhesive which has not properly flashed off may result in adhesive displacement or otherwise negatively affect the installation. Flooring must be installed within the working time of the adhesive or a reduction in performance or bond may occur.

To minimize material shifting, adhesive displacement, and to prevent wet adhesive from seeping or bleeding onto the surface of the material; do not work on top of freshly installed flooring. When necessary, use kneeling or walk boards.

Using a 100 pound three-section roller, roll the flooring cross-directionally as soon as conditions permit. Ensure the complete removal of trapped air and transfer of the adhesive to the back of the flooring without causing the material to slide or the adhesive to seep or bleed onto the surface. Roll the flooring a second time, cross-directionally, within one hour. It may be necessary to apply weight to the surface of the material in a manner such that the weight is properly dispersed, and the flooring material maintains contact until the adhesive has set.

Semi-Wet Set: Apply adhesive with the appropriate trowel and allow to flash off until the valleys become clear (approximately 15 to 30 minutes) before installing material. Ridges must still be semi-wet, opaque, and transfer to the finger when touched (see glossary for “flash time” - also referred to as “open time”). Install the sheet flooring according to the installation instructions within 30 to 50 minutes while achieving a minimum of 80% adhesive transfer to the back of the flooring. Frequently check the back of the flooring during installation to ensure sufficient adhesive coverage.

Notice: Semi-Wet Set installations require a porous substrate.

Flash times and working times may vary depending on temperature, humidity, and substrate absorbency/porosity. Installations performed over adhesive which has not properly flashed off may result in adhesive displacement or otherwise negatively affect the installation. Flooring

must be installed within the working time of the adhesive or a reduction in performance or bond may occur.

To minimize material shifting, adhesive displacement, and to prevent wet adhesive from seeping or bleeding onto the surface of the material; do not work on top of freshly installed flooring. When necessary, use kneeling or walk boards.

Using a 100 pound three-section roller, roll the flooring cross-directionally as soon as conditions permit. Ensure the complete removal of trapped air and transfer of the adhesive to the back of the flooring without causing the material to slide or the adhesive to seep or bleed onto the surface. Roll the flooring a second time, cross-directionally, within one hour. It may be necessary to apply weight to the surface of the material in a manner such that the weight is properly dispersed, and the flooring material maintains contact until the adhesive has set.

Trowel Size: Adhesive should be applied using a 1/16" x 1/32" x 1/32" U-Notch trowel. Coverage will vary based on site conditions but is approximately up to 240 square feet (22 square meters) per gallon.



Traffic: Premature traffic can cause indentations, gapping, movement, and other installation issues. Prevent foot traffic for a minimum of three (3) hours after installation.

Semi-Wet Set: Wait a minimum of 24 to 48 hours for full traffic.

Wet set: Wait a minimum of 48 to 72 hours for full traffic.

Wet cleaning or initial maintenance: Allow at least seven (7) days following the installation.

Clean Up: Use a clean, lint-free cloth dampened with warm potable water to clean up wet adhesive. Promptly remove any dried adhesive from the surface with a clean, lint-free cloth lightly dampened with undyed denatured alcohol. Solvents should be tested prior to use in an inconspicuous area. Do not allow excessive amounts of solvent to dwell on the surface of the material or to penetrate the joints or seams of the flooring; never apply solvent directly to the material. Perform a final rinse by wiping all affected areas with a clean cloth dampened with potable water.

Shelf Life: The shelf life of the adhesive is one (1) year from the manufacturing date when properly stored at 70°F (21°C) in an unopened container. Do not store below 40°F (5°C) and always avoid excessive heat.

Use of Non-Recommended Adhesives: HMTX's adhesive is formulated to be fully compatible with the floor coverings composition and to provide maximum performance of HMTX products. Non-recommended adhesives will void the warranty and may result in installation failures, damage to the product, reduced performance, or otherwise negatively impact the installation. The use of an adhesive not recommended by HMTX will require the completion of an Alternative Adhesive Waiver. This waiver states that HMTX will not be held responsible for any issues, warranties, performance guarantees, etc. related to the use of a non-recommended adhesive.

TEK Five v2

TEK Five v2 Adhesive is an advanced modified silane-based adhesive.

Color: White to off-white

Grade: Suitable for above-grade, on-grade, and below-grade applications.



Absorbent/Porous: TEK Five v2 is recommended for use with porous and non-porous substrates. Porous substrates provide a mechanical bond and may improve performance. It may be possible to determine surface porosity by placing a 1/4" (7 mm) size drop of potable water onto a properly cleaned substrate using a dropper or pipette from a height no greater than 1/2" (13 mm). If the drop of water is absorbed within one (1) minute the surface is likely considered porous/absorbent. If the drop of water is still beaded after one (1) minute, the surface is likely considered non-porous/non-absorbent. Testing must be done in compliance with the most current version of ASTM F3191 (Standard Practice for Field Determination of Substrate Water Absorption (Porosity) for Substrates to Receive Resilient Flooring). It may be possible to prepare a non-absorbent substrate such that it becomes absorbent by sanding, grinding, shotblasting, or by the application of a self-leveling compound with a minimum depth of 3/16" (5 mm); always verify results by retesting.

Compatible: Substrates must be evaluated to determine the compatibility and performance of the system's components prior to the actual full-scale installation. Always perform a mat bond test, making certain the test area and all system components are properly conditioned before and during the testing period. Select an area with light traffic, for example next to walls or columns; avoid placement in doorways, walkways, or near windows. Protect the test area from all traffic for the duration of the test. Flooring Contractor is to determine the appropriate placement and quantity of test locations. On large projects, it is recommended that a test be performed every 50 linear feet (15.25 m), on every level, and in any area where conditions may vary. To ensure accurate results, the test must include all aspects of the project and flooring assembly including: the concrete surface profile (CSP), any surface preparation products, the proper adhesive, the specified floor covering materials, temperature, humidity, and any other ambient or relevant conditions. Install a 36" x 36" section (1 m x 1 m) and cover the perimeter edges with duct tape (or equivalent) to prevent the adhesive from drying prematurely. After allowing the adhesive to cure for a minimum of 72 hours, the adhesive should be dry (although not fully cured) and the flooring should be difficult to remove. Slowly peel the floor covering from the substrate; if the material is easy to remove, do not proceed with the installation until corrections have been made. Perform any necessary corrective actions and repeat the mat bond test. All mat bond tests must be performed in accordance with ASTM F3311.

Proper Preparation: The project and substrate must be compliant with all specifications, qualifications, and standards set forth in this document.

Moisture Limits: Substrates must be free of excess moisture. Concrete substrates must measure no more than 8 pounds MVER per 1,000 square feet in 24 hours in accordance with ASTM F1869 (Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride) or 95% RH when measured in accordance with ASTM F2170 (Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes). Wood substrates must not exceed 14% when measured with an appropriate moisture meter. Underlayment panels should be properly stored within the project space. Prior to installation, the wood panels shall be fully acclimated to occupancy-conditions and have reached equilibrium moisture content (EMC).

Installation:

Flooring may be placed into the adhesive after approximately 10 to 30 minutes flash time, while the adhesive ridges are still opaque, semi-wet, and transfer to the finger when touched (see glossary for “flash time” - also referred to as “open time”). The ambient relative humidity will determine the length of flash time; the following are approximate guidelines:

AMBIENT RELATIVE HUMIDITY	FLASH TIME (OPEN TIME)
35%	30+ Minutes
50%	15 – 25 Minutes
65%	10 – 15 Minutes

Loss of adhesion can result if the flooring is not installed within the working time of the adhesive. The working time is up to 40 minutes depending on temperature, humidity, and substrate absorbency/porosity.

To minimize material shifting, adhesive displacement, and to prevent wet adhesive from seeping or bleeding onto the surface of the material; do not work on top of freshly installed flooring. When necessary, use kneeling or walk boards.

Make certain that adhesive transfer to underside of the flooring is at least 95%. Using a 100 pound three-section roller, roll the flooring cross-directionally as soon as conditions permit. Ensure the complete removal of trapped air and transfer of the adhesive to the back of the flooring without causing the material to slide or the adhesive to seep or bleed onto the surface. Roll the flooring a second time, cross-directionally, within one hour. It may be necessary to apply weight to the surface of the material in a manner such that the weight is properly dispersed, and the flooring material maintains contact until the adhesive has set.

Trowel Size: Adhesive should be applied using a 1/16” x 1/32” x 1/32” U-Notch trowel. Coverage will vary based on site conditions but is approximately up to 240 square feet (22 square meters) per gallon.



Traffic: Prevent foot traffic for a minimum of 12 hours after installation. For the first 24 to 48 hours (depending on ambient conditions), prohibit all rolling traffic, heavy loads, furniture, and equipment. Allow at least seven (7) days following the installation before any wet cleaning or initial maintenance.

Clean Up: Promptly remove excess adhesive before it dries or cures using denatured alcohol or mineral spirits applied to a clean, lint-free cloth. Solvents should be tested prior to use in an inconspicuous area. Do not allow excessive amounts of solvent to dwell on the surface of the material or to penetrate the joints or seams of the flooring; never apply solvent directly to the material. Perform a final rinse by wiping all affected areas with a clean cloth dampened with potable water.

Shelf Life: The shelf life of the adhesive is 18 months from the manufacturing date when properly stored at 65°F to 85°F (18°C to 29.4°C) in an unopened container. Always avoid excessive heat and protect the product from freezing.

Use of Non-Recommended Adhesives: HMTX's adhesive is formulated to be fully compatible with the floor coverings composition and to provide maximum performance of HMTX products. Non-recommended adhesives will void the warranty and may result in installation failures, damage to the product, reduced performance, or otherwise negatively impact the installation. The use of an adhesive not recommended by HMTX will require the completion of an Alternative Adhesive Waiver. This waiver states that HMTX will not be held responsible for any issues, warranties, performance guarantees, etc. related to the use of a non-recommended adhesive.

PREVAIL 4000

PREVAIL 4000 is a solvent free, low VOC, high performance two-part epoxy adhesive.

Color: Beige / Off White.

Grade: Suitable for above-grade, on-grade, and below-grade applications.



Absorbent/Porous: Prevail 4000 is recommended for use with porous and non-porous substrates. Porous substrates provide a mechanical bond and may improve performance. It may be possible to determine surface porosity by placing a 1/4" (7 mm) size drop of potable water onto a properly cleaned substrate using a dropper or pipette from a height no greater than 1/2" (13 mm). If the drop of water is absorbed within one (1) minute the surface is likely considered porous/absorbent. If the drop of water is still beaded after one (1) minute, the surface is likely considered non-porous/non-absorbent. Testing must be done in compliance with the most current version of ASTM F3191 (Standard Practice for Field Determination of Substrate Water Absorption (Porosity) for Substrates to Receive Resilient Flooring). It may be possible to prepare a non-absorbent substrate such that it becomes absorbent by sanding, grinding, shotblasting, or by the application of a self-leveling compound with a minimum depth of 3/16" (5 mm); always verify results by retesting.

Compatible: Substrates must be evaluated to determine the compatibility and performance of the system's components prior to the actual full-scale installation. Always perform a mat bond test, making certain the test area and all system components are properly conditioned before and during the testing period. Select an area with light traffic, for example next to walls or columns; avoid placement in doorways, walkways, or near windows. Protect the test area from all traffic for the duration of the test. Flooring Contractor is to determine the appropriate placement and quantity of test locations. On large projects, it is recommended that a test be performed every 50 linear feet (15.25 m), on every level, and in any area where conditions may vary. To ensure accurate results, the test must include all aspects of the project and flooring assembly including: the concrete surface profile (CSP), any surface preparation products, the proper adhesive, the specified floor covering materials, temperature, humidity, and any other ambient or relevant conditions. Install a 36" x 36" section (1 m x 1 m) and cover the perimeter edges with duct tape (or equivalent) to prevent the adhesive from drying prematurely. After allowing the adhesive to cure for a minimum of 72 hours, the adhesive should be dry (although not fully cured) and the flooring should be difficult to remove. Slowly peel the floor covering from the substrate; if the material is easy to remove, do not proceed with the installation until corrections have been made. Perform any necessary corrective actions and repeat the mat bond test. All mat bond tests must be performed in accordance with ASTM F3311.

Proper Preparation: The project and substrate must be compliant with all specifications, qualifications, and standards set forth in this document.

Moisture Limits: Substrates must be free of excess moisture. Concrete substrates must measure no more than 8 pounds MVER per 1,000 square feet in 24 hours in accordance with ASTM F1869 (Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride) or 90% RH when measured in accordance with ASTM F2170 (Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes). Wood substrates must not exceed 14% when measured with an appropriate moisture meter. Underlayment panels should be properly stored within the project space. Prior to installation, the wood panels shall be fully acclimated to occupancy-conditions and have reached equilibrium moisture content (EMC).

Installation:

Mixing: *Before use, always take appropriate safety precautions and utilize proper PPE including gloves and eye protection.*

- 1 Stage the area in preparation of adhesive mixing and application while ensuring the flooring and surrounding areas are protected from any adhesive spills.
- 2 Add the entire contents of Part B into the container of Part A. Always mix complete units.
- 3 Immediately mix with a low-speed electric drill equipped with a clean mixing paddle for three to five minutes, or until the adhesive is thoroughly combined and is a uniform color. Adhesive should not be mixed by hand.
- 4 After mixing, immediately apply the adhesive to the substrate and do not allow mixed product to remain in the container.
- 5 Clean tools with isopropanol or mineral spirits immediately after mixing. Once the adhesive has cured, it can only be removed by mechanical means.

Application:

- 1 Begin applying the adhesive immediately using the recommended trowel. Flooring material must be placed into the adhesive while wet. Spread only as much adhesive as can be covered within the 50 to 60 minute working time. If the adhesive has exceeded the working window, remove the affected material from the substrate and replace with new adhesive before continuing the installation.
Notice: Allowing a ten (10) minute flash time before positioning flooring may help reduce shifting and adhesive bleed through at joints or seams.
- 2 Temperature directly affects the pot life, working times, and curing times. Higher ambient temperatures will shorten working times, whereas colder temperatures will extend working times. Avoid exposure from any heat source, including intense sunlight, during installation to prevent the adhesive from curing too quickly.
- 3 Periodically check the back of the material for adhesive transfer to ensure the adhesive has not exceeded the working window.
- 4 To minimize material shifting, adhesive displacement, and to prevent wet adhesive from seeping or bleeding onto the surface of the material; do not work on top of freshly installed flooring. When necessary, use kneeling or walk boards.
- 5 Using a 100 pound three-section roller, roll the flooring cross-directionally as soon as conditions permit, ensuring the complete removal of trapped air.
- 6 Confirm full transfer of the adhesive on to the back of the flooring. Transfer must be 100% uniform with no visible ridges, and no seeping or bleeding between the joints or seams.
- 7 Roll the flooring a second time, cross-directionally, within one hour.
- 8 Due to the low initial grab of epoxy adhesives, it may be necessary to apply weight to the surface of the material in a manner such that the weight is properly dispersed, and the flooring material maintains contact until the adhesive has set.

Trowel Size: Adhesive should be applied using a 1/16" x 1/32" x 1/32" U-Notch trowel. Coverage will vary based on site conditions but is approximately up to 225 square feet (21 square meters) per gallon.



Traffic: Prevent foot traffic for a minimum of 24 hours after installation. For the first 72 hours, prohibit all rolling traffic, heavy loads, all furniture, and equipment. When necessary, use kneeling or walk boards. Allow at least seven (7) days following the installation before any wet cleaning or initial maintenance.

Clean Up: Promptly remove excess adhesive before it dries or cures using isopropanol or mineral spirits applied to a clean, lint-free cloth. Solvents should be tested prior to use in an inconspicuous area. Do not allow excessive amounts of solvent to dwell on the surface of the material or to penetrate the joints or seams of the flooring; never apply solvent directly to the material. Perform a final rinse by wiping all affected areas with a clean cloth dampened with potable water. Once cured, the adhesive may not be removable.

Shelf Life: The shelf life of the adhesive is 18 months from the manufacturing date when properly stored at 65°F to 85°F (18°C to 29.4°C) in an unopened container. Always avoid excessive heat and protect the product from freezing.

Use of Non-Recommended Adhesives: HMTX's adhesive is formulated to be fully compatible with the floor coverings composition and to provide maximum performance of HMTX products. Non-recommended adhesives will void the warranty and may result in installation failures, damage to the product, reduced performance, or otherwise negatively impact the installation. The use of an adhesive not recommended by HMTX will require the completion of an Alternative Adhesive Waiver. This waiver states that HMTX will not be held responsible for any issues, warranties, performance guarantees, etc. related to the use of a non-recommended adhesive.

FINAL ACCEPTANCE CHECKLIST



Prior to commencing with the installation, perform a final-acceptance inspection of the substrate, material, and the project. Claims for any losses, damages, costs, or issues arising from or related to site conditions, working conditions, workmanship, or any other circumstances other than product defect claims will not be covered. Verify the product and project have met all necessary requirements as outlined throughout the document. This includes the following:

- ☐ **Confirm HVAC:** Permanent HVAC system is in full operation and has successfully acclimatized the project space. Room temperature should be maintained between 65°F and 85°F (18°C and 29.4°C) at least 48 hours before installation, during installation, and indefinitely thereafter. Ambient relative humidity should be maintained between 40% and 65% RH.
- ☐ **Ensure Proper Acclimation:** The flooring material, ancillary products, and the project area should be acclimated for as long as necessary to reach occupancy-conditions. Acclimation should be done within climate-controlled structures between 65°F and 85°F (18°C and 29.4°C) and 40% and 65% ambient RH for a minimum of 48 hours before installation, during installation, and indefinitely thereafter. Teknoflor Heterogeneous Sheet shall be stored securely, upright, and on end.
- ☐ **Verify Substrate Suitability:** Remove any unsuitable substrates.
- ☐ **Evaluate the Substrate:** The substrate must meet the following criteria:
 - ☐ **Clean:** Substrates to receive resilient flooring must be clean, and free of contaminants.
 - ☐ **Smooth:** Substrates shall be free of irregularities or abrupt changes in elevation.
 - ☐ **Flat:** Substrates must be flat within 3/16" in a 10' radius (5 mm in a 3 m radius).
 - ☐ **Dry:** Substrates must be free of excess moisture. Concrete slabs shall not exceed the MVER or RH moisture specifications set forth by the respective adhesive when measured in accordance with the latest version of ASTM F1869 or ASTM F2170, with pH levels between 7 and 10. Wood substrates must not exceed 14% when measured with an appropriate pin moisture meter.
 - ☐ **Structurally Sound:** The structure must be free of defect and comply with all applicable building codes.
 - ☐ **Free of Excessive Deflection:** Deflection must not exceed L/360.
 - ☐ **Determine Substrate Absorbency/Porosity:** It may be possible to determine surface porosity by placing a 1/4" (7 mm) drop of potable water onto a clean substrate using a dropper from a height less than 1/2" (13 mm). If the drop of water is absorbed within one (1) minute the surface is likely absorbent. If the drop of water is still beaded after one (1) minute, the surface is likely non-absorbent. Testing must be always done in compliance with ASTM F3191.

- **Perform Substrate Preparation:** Ensure the substrate has been properly prepared and complies with all requirements set forth in this installation guide.
- **Verify Material:**
 - **Confirm Flooring:** Check materials for proper pattern, style, color, quantities, damage, and defect.
 - **Confirm Ancillary items:** Ensure the correct materials and quantities are on hand to complete the project.
 - **Confirm Lot Numbers and Roll Sequencing:** Plan the installation with consideration of lot numbers and roll sequencing to avoid any deviation in gloss, color, design, or pattern.
 - **Reporting:** Upon identifying any discrepancies, visible defects, or damage stop progress immediately. For material related concerns, contact your sales representative for guidance on how to proceed. HMTX will not pay labor charges on claims filed for materials installed with obvious visual defects.
- **Adhesive Bond Tests:** Perform a bond test to determine the compatibility of the adhesive bond to the substrate. Select an area with light traffic, such as those located next to walls or columns. Using the same flooring and adhesive as will be installed within the project area, install a 36" x 36" section (1 m x 1 m) in compliance with the installation guide. Tape the perimeter edges with duct tape to prevent the adhesive from prematurely drying. The adhesive should be dry (but not fully cured) and the flooring should be difficult to remove after 72 hours. On large projects, a test should be performed every 50 linear feet (15.25 m) and on every level. All mat bond tests must be performed in accordance with ASTM F3311.
- **Testing:** Check that all testing is complete, in compliance, and documented.

Notice: Warranty claims of labor or material costs for defective material which has been permanently installed will not be covered.

PREPARING FOR INSTALLATION

Double Check: Reconfirm materials and quantities to complete the job including adhesives, weld rod, and flooring pattern, style, color, and lot numbers.

Supplies and Tools: Ensure tools, grooving equipment, hot air welder, spatula blade, trowels, 100 pound (45.36 kg) three-section roller, and all other necessary equipment are available and in good working order. It is critical that all blades are sharp and smooth. Bring sufficient spare blades, replacement trowels, and any other consumable supplies to complete the project. Adhesive trowels have a limited service-life and should be considered consumable and disposable. Once a trowel can no longer apply the proper amount of adhesive it should be immediately replaced so as to maintain specified adhesive quantities. Trowels must be cleaned regularly and continuously throughout the adhesive application process.

Setup of Recess Scribe: Adjustment of the recess scribe, also called an underscribe, must be performed before cutting any seams. Cut a slit approximately 6" long (15 cm) in a piece of scrap material. Insert the guide portion of the tool into the opening so the guide rests against the bottom edge of the slit. For a net-fit, keep the guide tight against the bottom edge of the cut while adjusting the needle to precisely align with the top edge of the cut and tighten the adjustment screw on the recess scribe. To leave a slight gap to help guide the groover, the needle should be set 1/64" (0.4 mm) beyond the top edge of the cut. Be sure to test your set up for accuracy, making certain the scribe produces a seam which is neither gapped nor compressed.

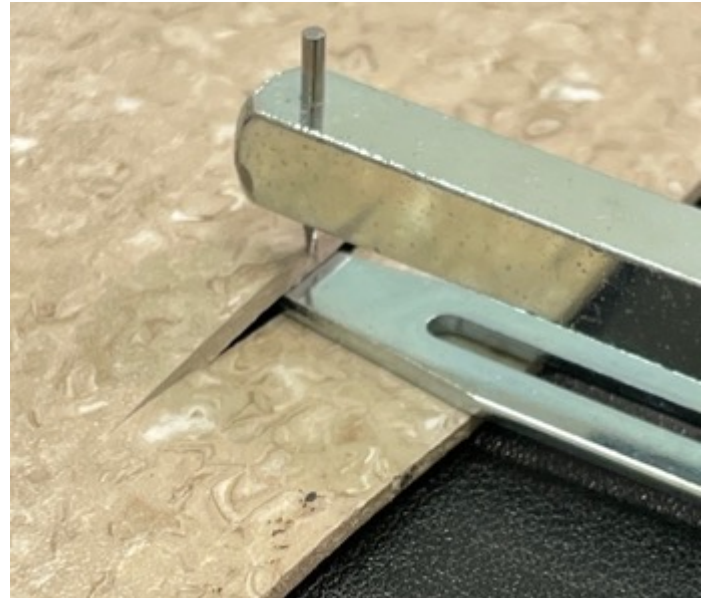


Figure 13 - Setup of a recess scribe.



There are other seam scribing tools available to the industry which may perform equally, or perhaps better, than needle-type recess scribes. It is important the Flooring Contractor utilize suitable equipment to successfully achieve proper results.

Layout: Layout and design of the project should be discussed and approved by the general contractor, architect, end user, or other appropriate party to communicate expectations and confirm details of the installation. Discussions should begin in the design phase and continue throughout the installation process. Products with wood-type aesthetics are recommended to have the seams run parallel to the planks or grain. For best appearance, balance the installation within the area to be installed.

Welding Seams: Teknoflor Heterogeneous Sheet requires seams be heat welded, regardless of the location within the installation. This includes flat seams, vertical seams, and coved areas including inside and outside corners.

Determine Proper Seam Locations: It is important to avoid improper seam placement. Seams should be at least 6" (15 cm) from any panel joints or concrete joints in the substrate. Do not install over expansion joints or other moving joints or cracks. Cross-seams should be avoided when possible as these interrupt the aesthetic.



Figure 14 - Always establish proper seam placement.

Establish Orientation: Sheets should not be laid at right angles to one another unless specified, also known as quarter-turning. Doing so may cause shade or sheen concerns. Some SKU's may require a reverse orientation. See the respective Full Spec Sheet for details.

Determine Material Placement: Material should be laid out in accordance with the flooring design, balancing the layout whenever possible. Teknoflor Heterogeneous Sheet should be installed such that roll sequencing consecutively corresponds with adjacent pieces. For an area needing more than one roll, make certain that all the rolls are from the same production date/lot. Rolls and cuts must be placed in consecutive order. Under lighting equal to occupancy-conditions, carefully check to ensure that drops match in shade. If a shading concern exists, it may be necessary to reverse sheets to obtain a side shade match. If a shade match cannot be established, do not proceed with the installation, and contact the sales representative for guidance on how to proceed.

INSTALLATION

Teknoflor Heterogeneous Sheet is intended to be installed only by trained and qualified professional installers with a proven history of successful installations with projects of similar size and scope. This guide provides the proper methods of installation of Teknoflor Heterogeneous Sheet. Before proceeding, review the Teknoflor Heterogeneous Sheet Installation Guide, Resilient Sheet Care & Maintenance Guide, and all relevant industry standards. The installer is responsible for understanding the jobsite conditions and managing the installation process to achieve the proper result. Never leave heavy objects such as rollers, adhesive buckets, toolboxes, carts, or dollies with small wheels on the finished floor during or after installation.

Preparation: Establish a clean area for cutting and staging of the floor covering material. Vacuum (or thoroughly sweep) the staging area before cutting any sheets of flooring.

Rough Cutting: When making rough cuts, measure and cut material to required lengths being sure to add a minimum of 2" (5 cm) on each end of the cut so there is enough extra material for fitting and accommodating rooms which may be out of square. Patterned goods may require additional length to accommodate pattern alignment. Material needing to be transported from the cutting location to another area should be properly rolled, face out, on cardboard cores.

Examine Material: Check material as it is unrolled for any visual concerns, side match issues, or defects before cutting. Upon identifying any discrepancies, concerns, issues, visual defects, or damage stop progress immediately. Warranty claims of labor or material costs for defective material which has been permanently installed will not be covered. For material related concerns, immediately contact the sales representative for guidance on how to proceed. HMTX will not pay labor charges on claims filed for materials installed with visual defects.

Allow Material to Relax: Allow cut lengths of material to relax unrolled and flat with the decorative side face up on the substrate for 24 hours before installation. This allows for further acclimation and provides the material an opportunity to relax, making it easier to handle, fit, and install. Carefully and loosely back roll materials that are wavy or will not lay flat, and again unroll to eliminate any stress or tension in the product. Do not damage or crease the flooring as this can cause a permanent blemish in the product.

Selvage Trimming: Factory selvages must never be butted together. Removal of the selvage is necessary since storage and handling can result in damage or distortion to the roll. For non-patterned material, trim a minimum 1/2" (13 mm) of the selvage from the sheet using an edge trimmer or a straightedge and sharp, clean utility knife. For patterned flooring it is important to maintain the design; remove the appropriate amount of selvage material using a straightedge and sharp, clean utility knife. Be sure the blade is held at a 90° angle to the substrate.



Figure 15 – Trim the factory selvage from the edge of the roll for proper seam construction.

Positioning the First Piece: Vacuum (or thoroughly sweep) the installation area before positioning and fitting the sheets of flooring. Position the first sheet in the installation area so the material is straight, lies flat upon the substrate, and is properly aligned with established references.

Trimming: Sheet fitting procedures include pattern scribing, direct scribing, and free hand knifing, which are all acceptable practices to a quality installation. Material must be properly fit with no excess material, to prevent buckling due to compression.

Positioning the Remaining Pieces: Position all subsequent sheets such that the next sheet overlays the previous sheet by 1" (2.5 cm) or as needed to align the pattern. Trim the selvage from the side that is not overlapped. Make certain the installation continues with sheets and rolls proceeding in sequence.

Before Adhering: Prior to adhering the floor, inspect the unbonded material for telegraphing of underlying substrate deficiencies, material defects, side-match or other coloration matters, material damage, or other possible issues. The installation should not progress until all concerns have been fully resolved. HMTX will not cover warranty claims of labor or material costs for defective material which has been permanently installed.

Fold Back the First Half: Fold back the sheets approximately halfway to expose the substrate. When pulling back the material, use caution to avoid sharp radius folds which may result in creases, cracks, marks, or other damage. With the material folded back, perform a final sweep, and snap a chalk line perpendicular to the material near the folded edge. This chalk line will provide a straight reference, indicating the boundary to which adhesive should be applied. Chalk should be of a non-staining variety, light in color and intensity so as to not transfer through.

Adhering the First Half: Using the correct trowel, begin applying adhesive at the chalk line near the fold of the sheets. Spread adhesive working away from the chalk line. The adhesive must be consistently spread over 100% of the exposed substrate with no voids, gaps, pools, puddles, or lumps. In order to maintain proper uniform coverage, it is critical to keep the trowel notches clean and replace trowels as they wear. In instances where telegraphing of adhesive ridges is a concern, it may be necessary to use a short-nap paint-roller, pre-moistened with adhesive, and roll out trowel marks before installation.

Flash Time: It is necessary to ensure the adhesive has been provided sufficient flash time. Flash and working times are influenced by ambient temperature, humidity, substrate porosity, and ventilation. These factors should be considered when determining the size of the working-area in which adhesive should be spread; do not exceed the recommended working time. The installer is to determine the proper flash and working times, based on site conditions. If the applied adhesive has exceeded the flash or working times, it must be scraped clean and new adhesive must be reapplied.



Placing Material into the Adhesive: The sheet should be carefully placed into the adhesive in a manner which avoids the creation of air bubbles caused by pockets of air being trapped under the sheet. Be careful to maintain proper alignment and pattern match. Do not drop material into the adhesive in an uncontrolled or careless manner.

Roll the First Half: Starting at the glue line, immediately roll the flooring perpendicular to the sheet direction with a 100 pound (45.36 kg) three-section roller. Progression should be gradual and methodical with overlapping passes to ensure complete contact with the adhesive, and that all air has been removed. Avoid rolling near the overlapping sheets, staying 3" (8 cm) away from the seam area. Roll in the cross-direction and check for trapped pockets of air (bubbles). Address any trapped air pockets using a 100 pound (45.36 kg) three-section roller or a cork rubbing board. Periodically peel back sections to confirm full adhesive transfer to the back of the flooring and that ridges are completely flattened to a uniform film thickness. Be sure to re-roll any sections which have been lifted out of the adhesive. Variations to rolling practices and/or utilization of kneeling boards may be necessary to prevent adhesive displacement. The flooring must be rolled within the working time of the adhesive.



Continue With the Next Half: Fold back the other halves of the sheets and proceed with the installation processes as previously outlined regarding adhesive application, placement, and rolling.

Seaming: Seams must be cut and rolled without exceeding the working time of the adhesive. All seams shall be made by adjoining two cut edges; factory edges must always be trimmed. HMTX recommends cutting seams by recess scribing to achieve a proper fit (see Recess scribing below). Completed seams must be net fit, with no fullness or compression between adjoining sheets. Seams may be gapped up to 1/64" (0.4 mm) to help guide the groover; gapping larger than 1/64" (0.4mm) may result in a weak weld and splitting of the seam. Short seams, such as doorways may be cut with a utility knife and straight edge and abutted.

Recess Scribing: Ensure the scribing tool has been properly adjusted, as described in the INSTALLATION PREPARATION section. Insert the guide portion of the scribing tool underneath the overlying sheet. Position the guide of the underscriber against the trimmed edge of the underlying sheet, with the needle above the overlying sheet. While applying light downward pressure on the needle, proceed by pulling the scribing tool along the edge of the bottom sheet so the needle scores the top sheet. Be sure to keep the tool perpendicular (90°) to the seam to maintain an accurate fit. Avoid pulling the scribing tool too tightly against the bottom sheet, doing so may cause fullness or compression in the seam.

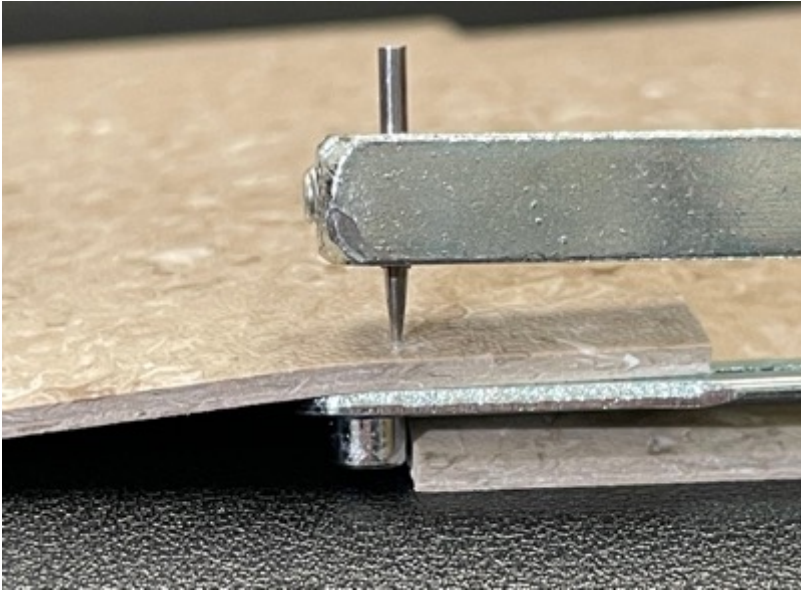


Figure 16 - The use of a recess scribe is recommended for cutting seams.



Figure 17 - Depicts the recess scribe scoring the top sheet of flooring.

Cut Along the Scribe Line: Insert a scrap piece of flooring, face-down, under the scribe line to protect the underlying piece. Using a utility knife held perpendicular to the floor, further score the material along the scribe line, being sure not to cut all the way through the material. Using a sharp hook blade, complete the cut through the material. Remove the scrap piece of flooring and any seam trimmings.

Roll the Seam: Roll the seam area with a hand roller, approximately 6" (15 cm) to each side, ensuring complete contact with the adhesive. If any adhesive gets on the surface of the flooring, be sure to remove it before it dries. Roll the length of the seam with a 100 pound (45.36 kg) three-section roller. Any areas requiring additional pressure to maintain contact should be appropriately weighted; this may include near drains or on seams.

Continue with the Next Seams: Complete the remaining seams without exceeding the working time of the adhesive, continuing until the project is finished.

FLASH COVING

Flash coving is the process of extending the flooring material up the perimeter walls and other vertical surfaces approximately 4" to 6" (10 to 15 cm), typically in commercial spaces. Due to the complexity of this practice, only highly trained and experienced installers should perform this work. All horizontal and vertical seams should be welded.

Tools and Materials Include:

- Cove stick material
- Cap strip material
- Pre-formed metal corners (if specified)
- Chalk line or laser level
- Framing square
- Heat gun
- Miter box and hacksaw
- Die Cutter
- Hand roller

Preparation: The juncture of the floor and wall needs proper preparation before beginning a coved installation. Floor surfaces, wall surfaces, and the junctures should be clean, smooth, dry, structurally sound, and free of contaminants.

Cap Strip: Ensure the cap strip accommodates the thickness of the floor covering. When installing the aluminum or vinyl cap strip, measure and mark the appropriate height. Strike a chalk line or project laser-line onto the wall at the correct elevation.

Cap Strip Corners: Inside and outside cap corners should be mitered. When making corners, use the miter box and hacksaw or a die cutter to create angles. Any sharp edges should be carefully addressed by filing smooth.

Fasten Cap Strip: Securely install the cap in compliance with the manufacturer's instruction. Using the appropriate non-staining mechanical fasteners, adhesive, or double-sided tape, fasten the cap to the surface while ensuring proper placement and elevation.

Cove Stick: The cove stick provides support to sheet goods at the floor-wall interface. It may be vinyl or plastic in composition, however, it must have a minimum radius of 1-1/8" (2.8 cm). All inside and outside corners should be mitered, and the cove stick should be tapered at door casings. Secure the cove stick with the appropriate non-staining mechanical fasteners, adhesive, or double-sided tape. Mechanical fasteners must be set flush or slightly counter-sunk.

Bonding Method: Always use the adhesive in accordance with the specified instructions. Several companies offer tape systems for flash coving. If a tape system is utilized, consult with the tape manufacturer to ensure suitability. Tape systems are to be applied in accordance with the manufacturer's instructions.

Trimming: Sheet fitting procedures include pattern scribing, direct scribing, and free hand knifing, which are all acceptable practices for a quality installation. Product must be cut net with no excess material, to prevent buckling due to compression.

Trimming – Pattern Scribing: Pattern scribing is a reliable and proven technique for flash coving. This practice is often preferred for complex layouts or instances where a precision fit is critical. Pattern

scribing utilizes a felt-type paper to create templates which are then used to accurately transfer room dimensions to the sheet flooring.

Trimming – Free Hand: Free hand knifing is another viable option for trimming and is regularly used where exacting fit is not critical, such as when a trim will cover the perimeter edge. Always ensure the flooring is making full contact with the cove stick and carefully trim away excess material.

Inside Corners: Seams must be proper and uniform; avoid large gaps at inside corners so the weld can successfully adhere.

Outside Corners: Outside corners are often considered to be the most challenging element of flash coving. Corners must be constructed utilizing boot or v-plug methodologies. All seams must be proper and uniform.

Adhering: Utilizing the adhesive or tape systems, affix the material to the wall.

Hand Roll: Ensure the floor covering is net fit into the cap strip, is fully supported by the cove stick, and roll the coved and wall surfaces with an appropriate hand roller.

Seal: Seal the top of the cap with an appropriate sealant for a clean, consistent appearance.


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HEAT WELDING

Seams shall be properly prepared, appropriately constructed, meet the conditions outlined in the HEAT WELDING section, and be evaluated and/or in compliance with the practices, methods, and specifications set forth in the most current versions of:

Industry standards can be obtained from the respective publishers.

For example, ASTM standards are available through www.astm.org

- ASTM F1516 Standard Practice for Sealing Seams of Resilient Flooring Products by the Heat Weld Method (when recommended)
- All local, state, national, or regional codes as well as any applicable regulations.

Tools and Materials Include

- Grooving equipment
- Hot Air Welder
- Welding Nozzles
- Weld Rod
- Skiving Knife with Trim Guides
- Feed roller

General: Heat welding is the act of fusing two pieces of resilient sheet together with a heated weld rod thereby sealing the seam. Prepare seams for heat welding after waiting the appropriate cure time for the adhesive used, but always a minimum of 24 hours. Due to the complexity of this method of seaming, only highly trained and experienced installers should perform this work.

Grooving: Before grooving the installed material, use a large scrap of flooring to establish the best practices to achieve a successful and proper result. Grooving must be uniform, consistent, and centered with the groove cut to two-thirds (66%) the depth of the material, and a width of 3.5mm. Using the appropriate grooving equipment, cut a groove the entire length of the seam. Again, ensure the depth of cut is equal to two-thirds (66%) of the product's thickness, and a width of 3.5mm; never go all the way through material. Groove only the seams which will be welded the same day to avoid any contamination.



Figure 18 – Depicts the grooving of a seam using a push-type groover.



Figure 19 - Grooves shall be cut to a depth equal to two-thirds (66%) of the product's total

Prepare for Heat Welding: Experience, proficiency, and practice is critical to successful heat welding. Using a large piece of excess flooring, practice welding to identify the best techniques to achieve a successful and complete result. Welds shall be strong, secure, and completely fused without scorching. Failure to achieve 100% fusion during heat welding causes a weak weld that may fail over time resulting in seam splitting and gapping.

After the practice sections of weld rod have cooled, apply force perpendicular to the weld rod using one's fingers to determine if it is well secured or releases from the groove. An identifying sign of a proper weld is referred to as "wash", which is the linear ridge of melted weld rod at the interface of the floor and the sides of the weld rod. Do not proceed unless a full and complete weld has been accomplished.

While practicing heat welding, be sure to determine the exact temperature setting and speed of application needed to achieve complete melting of the weld rod and fusion between the weld rod and sheet flooring. Proper temperature and speed are critical to the success of any heat welding. A 4 mm or 5 mm round welding tip with a narrow throat is necessary to focus the heat into the groove, promoting good melting of the weld rod, and fusion between the weld rod and the flooring.

Material that is distorted, scorched, glazed, or has sustained other heat related damages; as well as split, gapped, or otherwise unfused seams are due to improper installation practices. Such instances are not to be considered a product issue or failure but rather an installation-related condition and not covered under HMTX's warranty. Practice-welds and permanent-welds should be performed using the specified weld rod. Always confirm correct weld rod color before proceeding; installation of materials constitutes acceptance.

Make certain the grooved seam is clean and free of any contaminants, particulate, adhesive, debris, or other foreign substances.

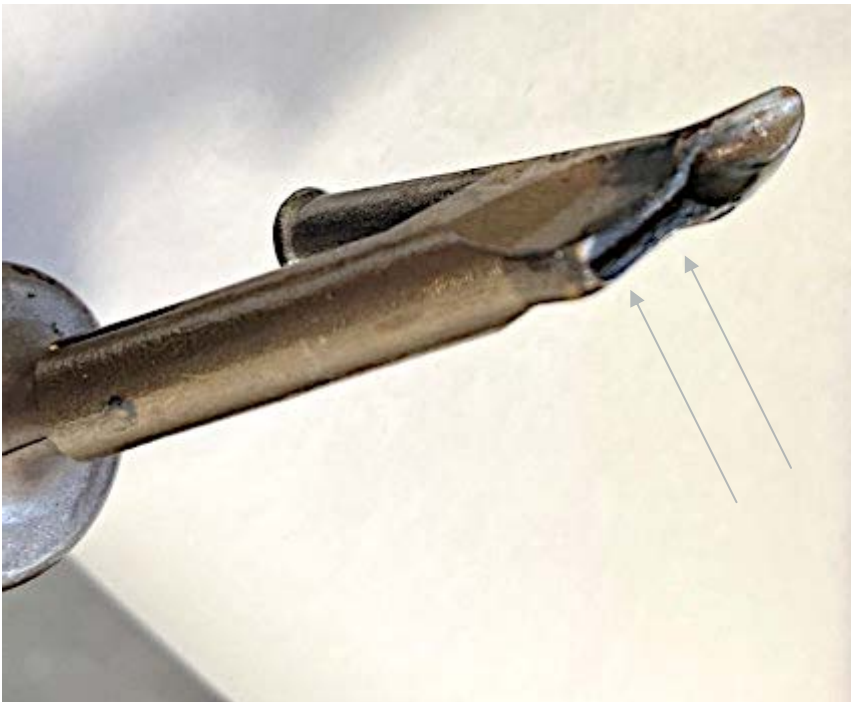


Figure 20 – Ensure proper welding tip selection, utilizing one with a narrow pre-heat.

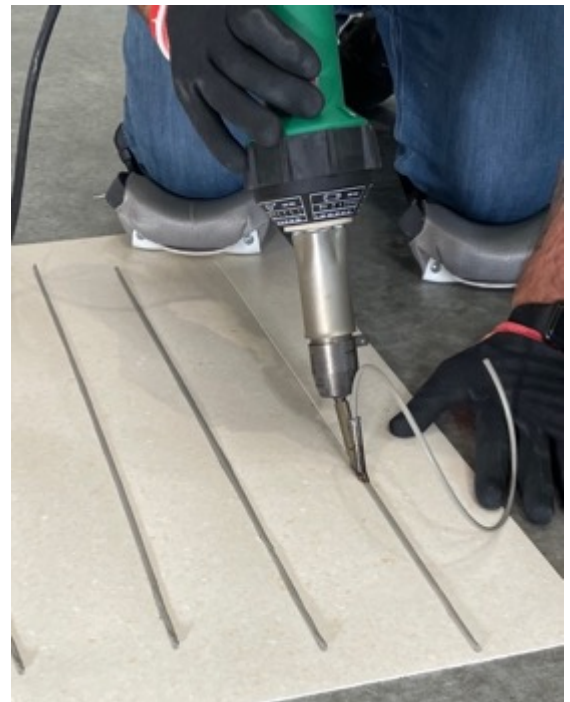


Figure 21 - Always perform practice welds.

Welding the First Portion of the Seam: Begin welding seams once successful tip selection, temperature, speed, and welding practices have been determined and verified. Preheat the welder to the temperature determined while practicing. Prior to each weld, make certain that the nozzle of the welder is free of foreign material using the correct wire brush. Cut a piece of weld rod approximately $\frac{3}{4}$ the length of the overall seam. Position the weld rod such that it is freely accessible, untangled, and neatly laid out to not interfere with continuous progress of the weld. Insert the welding rod into the clean, heated nozzle allowing approximately 2" (5 cm) to extend from tip of the nozzle. Apply the weld rod into the routed seam being careful not to tilt the tool to the right or left as this will improperly direct more heat to one side of the seam; keep the bottom of the nozzle parallel to the substrate. Continually check for wash along the base of the weld rod and do not proceed if wash is not consistently maintained. Guide the welder along the grooved seam, maintaining wash; welding should be constant and steady to avoid rough, inconsistent seams. Welding speed should be slow enough to ensure a complete fusion of the materials but not so slow as to cause burning, scorching, or distortion. Continue working until reaching the end of the weld rod.



Figure 23 - Heat welding



Figure 23 - Close up of heat welding

Welding the Second Portion of the Seam: Allow the seam to cool enough to perform an initial trim of the final 3" (8 cm) of weld rod. Using a utility knife or hand groover, cut a groove into the end of the installed rod. Beginning from the opposite end of the seam, continue welding back toward and into the grooved weld rod. The cut groove allows both pieces of weld rod to become fully integrated, achieving a monolithic and uninterrupted seam.

Initial Trim of the Weld Rod: Seams will be trimmed in a two-step process, an initial trim, and a final trim. Before performing the initial trim, wait until the weld has partially cooled and is warm to the touch. Make the initial trim using the sharp skiving knife and trim guide. Hold the knife at a low angle to the floor's surface with the beveled side of the blade face-down and against the trim plate. Carefully skive the top portion of the rod leaving a raised weld protruding above the surface of the resilient sheet. Inspect the seam and address any concerns or recessed areas which may require a re-application of the weld rod.



Final Trim of the Weld Rod: Before performing the final trim, ensure the welded seam has fully cooled to room temperature. Check the skiving knife to ensure it is sharp and smooth. Using the skiving knife without a trim guide, hold the knife at a low angle to the floor's surface with the beveled side of the blade face-down and against the surface of the flooring. Carefully make the final trim using a straight, consistent, and continuous motion to cleanly remove the excess weld rod leaving a smooth, flush weld. Use caution not to cut or gouge into the surface of the flooring material. Inspect the final seam and address any raised areas using a skiving knife; recessed areas may require re-application of the weld rod.



Vertical Trimming: Once the welds have fully cooled, corners and coved areas may be trimmed using hobby-type blades such as Xacto.

Glazing: After the final trim, smooth the trimmed weld rod using the hot air welder. Remove the nozzle from the tool and carefully apply heat along the seam.

POST-INSTALLATION PROTECTION

Appropriate precautions must be taken upon completion of the installation to avoid any damages to the newly installed floor covering. The Owner and General Contractor are responsible to protect the completed flooring after the Flooring Contractor has released the installation. Cover the flooring with a suitable protective material appropriate to prevent any damage from other construction trades until final acceptance by Owner.

Cleanup: Remove any product scraps, trash, waste, ancillary products, equipment, and tools from the jobsite. Any products or chemicals that may present safety concerns or hazards must be properly handled, stored, and disposed of. Always keep walkways, work areas, stairways, and doorways free of obstruction. Check the walls and fixtures for any adhesive, cuts, scuffs, scrapes, or other damage which may have occurred during the installation. Appropriately address any concerns and notify the owner or GC of any conditions that may require further attention.

Inspect the Installation: By thoroughly inspecting the completed project, problems can be proactively corrected thereby avoiding concerns or complaints. The installation should not be covered with protective panels or coverings until thoroughly assessed and approved.

Storing Attic Stock: Adequate balance material should be factored, ordered, and retained to accommodate future repairs. Material should be properly stored in accordance with the MATERIAL RECEIVING, STORAGE, HANDLING, AND TRANSPORTATION portion of this document.

Dirt: Vacuum or sweep the flooring to ensure all dust, dirt, and debris are removed from the surface of the finished flooring.

Control Traffic: After the installation, protect the project area from traffic.

For the first 24 hours, prohibit access and foot traffic.

For the first 72 hours, prohibit all rolling traffic, heavy loads, furniture, and equipment.

Light Rolling Loads: Flooring should not be exposed to any rolling traffic for a minimum of 72 hours after installation to allow setting and curing of the adhesive. If rolling loads cannot be avoided, protect the floor by covering with appropriate wood panels. Panels must be a suitable protective covering and breathable to allow for the unrestricted passage of moisture and will not stain, discolor, or bond to the new floor.

Heavy Rolling Loads: Improper protection from heavy objects and high point loads can result in permanent scratches, gouges, indentations, or grooves caused by the damage to the material or displacement of uncured adhesive. Heavy traffic, rolling loads, dollies, carts, pallet jacks, furniture, and appliance placement should be avoided for a minimum of 72 hours after installation. If heavy rolling loads cannot be avoided, protect the installation with appropriate wood panels sufficiently thick to effectively distribute the load. Panels should remain stationary, in a fixed location, while objects are rolled or slid across. Protective panels should not be moved or slid across the surface of the floor covering. The surface of the floor covering must be completely clean prior to placement; lightly damp mop if necessary. Remove all moisture, dirt, dust, and debris prior to the application of the floor

protection to avoid scratching, gouges, indentations, or other such damage. Do not use plastic sheeting, plastic panels, or other non-breathable materials to protect the floor covering. Panels must be a suitable protective covering and breathable to allow for the unrestricted passage of moisture and will not stain, discolor, or bond to the new floor.

Restrict Access: Newly installed flooring must be protected from damage of other trades. If other contractors are still working in the building, measures must be taken to make certain they refrain from entering the installation area.

Protective Coverings: The installation should not be covered with protective coverings until thoroughly assessed and approved. When appropriate, use a suitable protective covering which is breathable and allows for the unrestricted passage of moisture and will not stain, discolor, or bond to the new floor. The type of protection selected should factor the level of potential traffic, and the risk of damage from impact, scratching or indentation. Before applying a protective covering, check that it is suitable for the circumstances. Consider orienting the protective layer such that any logos or printing are not in contact with the finished flooring. It may be appropriate that all seams and edges of the protective covering are fully taped to one another, however, the covering should not be taped to the Teknoflor Heterogeneous Sheet. Regardless of the type of protective floor covering being used, the surface of the floor covering must be completely clean prior to placement, lightly damp mop if necessary. Remove all moisture, dirt, dust, and debris prior to the application of the floor protection to avoid scratching, gouges, indentations, or other such damage. Do not use plastic sheeting, plastic panels, or other non-breathable materials to protect the floor covering that could restrict or impair free passage of moisture.

Moving Fixtures: When moving heavy objects over the floor, a minimum thickness of 1/4" (6 mm) plywood or Masonite is required in order to protect the floor from damage. Set fixtures and furniture back in place, ensuring that objects are not slid across the surface of the new flooring. All moveable equipment and furniture should be equipped with proper floor protectors, or casters that are soft, wide, and non-staining. Casters or glides should be sufficiently sized to distribute loads and prevent indentations or damage.

Avoid Washing: Do not wash, mop, or flood the newly installed floor for seven (7) days. An appropriate maintenance program must begin following the initial cleaning. For matters of care & maintenance visit www.teknoflor.com for additional guidance and to obtain the most current care & maintenance documents.

GLOSSARY

This glossary is supplemental and shall not supersede any content set forth within the balance of this document.

Above-Grade Level: A suspended level of a structure which is located above the elevation of soil-grade on the exterior of the building. Often, above-grade levels include those over basements, crawl spaces, or the upper levels of a multi-story building. Above-grade substrates, regardless of construction or composition, have the potential to contain high levels of moisture and should be tested.

Absorbent: The ability or tendency of a substrate or material to readily soak up moisture. Checking for absorbency is necessary for proper trowel selection. It may be possible to determine absorbency by placing a drop of water onto a substrate from a height no greater than 1/2" (13 mm). If the drop of water is absorbed within one minute, the surface is likely considered absorbent. If the drop of water is still beaded after one minute, the surface is likely considered non-absorbent. Testing must be done in compliance with the most current version of ASTM F3191. (Also inadvertently referred to as "porous")

Absorption: The uptake of a liquid into another material.

Acclimation: The act of allowing flooring materials or ancillary products to achieve equilibrium with the environment in which the flooring will perform. The conditioning of the project's space, components, materials, and ambient elements to occupancy conditions. The process of adapting to environmental conditions. To change to suit appropriate conditions. (See "condition")

ACI: American Concrete Institute – A technical organization which develops standards within the concrete industry.

Acid: A chemical substance or compound with a pH value less than 7.

Adhesion: Adhesion is the tendency of dissimilar materials or surfaces to cling or bond to one another. Adhesion is affected by the condition of the surfaces, by the closeness of contact, and various molecular forces. To improve adhesion, surfaces should be suitably clean, absorbent, dry, and profiled.

Adhesive: A substance applied to the surfaces of materials that binds them together and resists separation. (Also inadvertently referred to as "glue," "mastic," and "paste")

Adhesive Bleeding: An undesired migration of adhesive to the surface of the floor between seams or joints.

Air Bubbles: A pocket of gas or air trapped under the floor covering material. The appearance of such bubbles shortly after installation is usually indicative of premature placement of flooring into the adhesive, improper placement of material into the adhesive, or improper rolling of the flooring. The appearance at a later time is often the result of moisture in the substrate. (Also referred to as "bubble" or "air pocket")

Alkali: A soluble mineral salt present in some soils and natural water. A solution or compound with a pH value greater than 7. (Also referred to as "basic")

Alkaline Salts: Diluted salts which are carried to the surface of a concrete substrate by moisture coming up from below. Moisture and alkali can cause the following problems after installation: deterioration of the adhesive, loss of bond, lumps, air bubbles, ridges, change in color, microbial growth, efflorescence, lifting of material, dimensional change of the product, and joints opening of the tile or sheet flooring. There are no guarantees a surface treatment of the concrete will keep the surface free of alkali. The washing of the surface using potable water or soda water will lower alkalinity levels. Muriatic acid has been used, however, may leave behind residue, which can adversely affect the flooring installation and should therefore be avoided.

Ancillary Manufacturer: The producer or manufacturer of an ancillary product.

Ancillary Products: Materials which provide necessary support to the preparation, installation, care, maintenance, or function of a floor covering assembly or system.

APA – The Engineered Wood Association: The APA is a nonprofit trade organization dealing with structural wood panels. Its primary function is certification, testing, research, and market-support.

Architectural Specifications: A detailed description from an architect which can outline materials, dimensions, workmanship, and practices used in the construction erecting or renovation of a building.

Asbestos: A fibrous silicate mineral that is capable of being integrated into various materials, including flooring. Proper care must be taken when working with hazardous materials. Always follow all relevant codes or regulations regarding the removal of any materials containing asbestos.

ASTM: ASTM International, which was formerly known as American Society for Testing and Materials. ASTM is an international standards organization which develops and publishes voluntary consensus technical standards for a wide range of materials, practices, products, systems, and services.

Below-Grade Level: A slab or space where the substrate assembly is partially or completely below the finished grade adjoining the building at any exterior wall or point. Below-grade substrates should be assumed to have high moisture levels and should always be tested.

Bond: The adherence of two surfaces to each other; the adhesion between two materials.

Bond Breaker: A substance which inhibits or impairs the proper bond of one material to another. (See "contaminant")

Bond Test: A 72-hour test that determines if resilient flooring can be adhered to the substrate with the recommended adhesive. A properly conducted bond test will: determine whether the adhesive is compatible with the substrate; assist in the detection of moisture; and determine the compatibility of the adhesive with sealers, curing agents, and other foreign matter, as well as the necessity of their removal.

Border: A simple or intricate decorative band or strip around the perimeter of an installation which accents, frames, and customizes a project.

Buckling: A bond failure of a floor covering occurring when the material experiences compressive forces. Causes can include shrinkage of the substrate, expansion of the floor covering, and product being fit too tight during installation. It may not be possible to repair buckles in sheet flooring; a full replacement might be necessary.

Cement: A binding substance used in construction which adheres materials and solidifies as it cures. The most common use for portland cement is in the production of concrete where it is blended with other components such as sand, gravel, and water. (Also referred to as "portland cement")

Cementitious: Having the properties of cement or being made of cement.

Chalk Line: A tool involving string which is coated with chalk dust. The string is stretched tight and snapped, often to connect two predetermined points with a straight line. The lines are typically used to provide a point of reference during the installation process.

Chemical Weld: A form of seam treatment; the edges of two pieces of material are bonded or fused through the use of chemical solvent.

Cleaning: The action of removing of dirt, dust, debris, and other extraneous or foreign materials from a surface.

Commercial Flooring: Floor covering which is engineered for use in commercial applications; this includes healthcare facilities, public buildings, educational buildings, and institutions. (Also referred to as "contract flooring")

Compressive Peaking: A bond failure of a floor covering occurring at seams or joints when the material experiences lateral compression. This is caused by the

buildup of compressive stresses amongst adjacent material. This stress is released by the product being forced out-of-plane.

Compressive Strength: The ability of a material, such as concrete, to carry or withstand a load on its surface without failure. Compressive strength is measured in pounds per square inch (PSI).

Concrete: A composite building material comprised of elements including portland cement, water, fine aggregate, and coarse aggregate. Concrete is bound together by the compound created when portland cement is blended with water, which then surrounds the aggregate and fills the spaces between particles.

Concrete Curing: Concrete curing is process of maintaining moisture and temperature conditions, in a freshly placed cementitious mixture, at a level which allow for continued hydration and crystallization to occur. The potential strength and durability of concrete is only achieved if concrete has been allowed to properly cure. It should be noted that curing is not the same as drying.

Concrete Drying: Concrete drying is defined as providing the proper conditions to allow the concrete to achieve a moisture condition appropriate for its intended use; drying occurs after curing is complete. The moisture condition of a concrete slab is important for the application of moisture sensitive floor finishes such as resilient floor covering.

Concrete Curing Compound: A concrete curing compound is a material which is applied to the surface freshly placed concrete to help reduce the loss of moisture content, which is essential during the curing process of cement. Traditionally, slabs were cured by such means as: wet straw, burlap, plastic film, etc. This kept the concrete wet for the 28-day "wet cure" period but prevented the use of the slab during that time. Prior to the installation of a new floor covering, curing compounds must be completely removed, as they are well-established surface contaminants and inhibit proper adhesion to the slab. A bond test should always be conducted to determine the compatibility of the adhesive and the substrate.

Concrete Joints: A concrete joint is an interface, separation, or weakened plane that is integrated or engineered into a concrete assembly to serve a particular purpose.

- **Construction Joint:** A construction joint is an interface between two concrete pours, resulting from concrete which has been placed at different times. This type of joints is created to allow for resuming or continuation of concrete work after intentional or unintentional interruptions. Construction joints generally conform with a predetermined joint layout and may align with, and function as, contraction or isolation joints. This type of joint can be further broken down into transverse and longitudinal construction joints which can be created using different methodologies including butt-type, keyway, doweled, and tied. Once a concrete slab has fully dried and cured, dormant construction joints may be filled with an appropriate preparation material prior to the application of a resilient floor covering. Resilient floor coverings should not be installed over non-dormant construction joints to avoid buckling, cracking, or splitting of the floor or seams. The use of a joint cover system should be incorporated into the assembly to cover and honor the joint.
- **Contraction Joint:** A contraction joint is a weakened vertical plane intentionally formed through the reduction in the slab thickness by a minimum of 25 percent. This aims to control the location of cracks, as well as avoid the formation of random cracks, caused by volumetric changes. These volumetric changes are mainly caused by a loss of moisture and temperature which thereby create a buildup of tensile stresses. Contraction joints are formed using various methods including saw cutting, forming, or tooling. They are generally between one-quarter and one-third the depth of the slab and typically spaced every 8 to 30 feet (2.4 m to 9.1 m) with thinner slabs having shorter spacing. Contraction joints are typically set at regular intervals but can also be placed at semi-random increments in particular applications. Once a concrete slab has fully dried and cured, dormant contraction joints may be filled with an appropriate preparation material prior to the application of a resilient floor covering. (Also referred to as a "control joint")
- **Expansion Joint:** An expansion joint is a separation between adjacent slabs which allows for independent in-plane movement. These joints are designed to reduce or prevent stress caused by volumetric changes by accommodating expansion and contraction. Unlike isolation joints, expansion joints are often dowelled to allow for movement and some load transfer. Expansion joints are usually filled with a flexible, compressible, or elastomeric material. Since an expansion joint is intended to accommodate movement, it should not be filled with cementitious underlayments or other

rigid materials as it may result in cracking, breaking, crumbling, or extrusion from the joint. Resilient floor coverings should not be installed over expansion joints to avoid buckling, cracking, or splitting of the floor or seams. The use of a joint cover system should be incorporated into the assembly to cover and honor the joint.

- **Isolation Joint:** Isolation Joints are separations used to confine various components of a structure; this can include walls, columns, and other structural elements. The isolation allows for independent movement of different elements. Isolation joints are typically full depth and do not permit continuity of steel reinforcement nor concrete. These joints are frequently filled with a flexible joint-filler material to prevent the infiltration of contaminants. Resilient floor coverings should not be installed over isolation joints to avoid buckling, cracking, or splitting of the floor or seams. The use of a joint cover system should be incorporated into the assembly to cover and honor the joint.

Concrete Admixture: Concrete admixtures are chemicals or additives added to concrete during mixing to enhance or alter specific properties of the concrete, as defined in ACI 116R. Concrete admixtures may interfere with an adhesives ability to bond to the surface of the concrete. A bond test should always be conducted to determine the compatibility of the adhesive and the substrate.

Concrete Sealer: A finish coating applied to concrete to protect it from traffic, damage, corrosion, and staining. Concrete sealers should not be used when the slab is intended as a substrate for resilient floor covering. Sealers are designed to inhibit water and dirt from entering the pores of the concrete's surface and may render the concrete less absorbent. Sealers may interfere with an adhesives ability to bond to the surface of the concrete. A bond test should always be conducted to determine the compatibility of the adhesive and the substrate.

Concrete Surface Profile: A concrete surface profile is a metric of the surface roughness as defined by the International Concrete Repair Institute. Values are scaled from 1 to 10, with 1 being very smooth and 10 being very rough. Values are determined by measuring the surface profile depth, or in distance between elevational peaks to valleys when viewed as a cross-section. Many manufacturers of floor covering and preparation products specify acceptable concrete surface profile values to achieve both an absorbent substrate as well as a mechanical bond

Condition: (verb) The act of putting into a proper or suitable state for use. To become acclimated to, or equilibrate with, a climate equal to that of forthcoming occupancy or service. Project sites and materials should be properly conditioned prior to installation.

Contaminant: Contaminants are considered to be any substance that would impair, diminish, interfere, prohibit, deteriorate, degrade, or otherwise negatively affect the adhesion of the resilient floor covering to the substrate. Contaminates may include, but are not limited to dust, solvents, paint, wax, oil, grease, drywall compound, residual adhesive, markers, pen, crayon, adhesive remover, curing/hardening agents, film-forming curing compound, silicate penetrating curing compound, dissipative curing compound, sealing compound, hardening compound, parting compound, alkaline salts, excessive carbonation or laitance, mold, and mildew. Contaminates should be removed mechanically, typically by means of abrasion.

Cove Base: A perimeter trim which is composed of materials such as rubber or vinyl and is produced in various sizes and profiles. It is utilized to cover trimmed edges and provide a finished treatment of the floor-wall interface. Cove base standards are set forth in the in ASTM F1861 "Standard Specification for Resilient Wall Base".

Cove Cap: A finishing trim piece mounted to the wall, to allow sheet vinyl to be extended up the wall for a complete, clean, and finished look.

Cove Stick: A transition made of materials including vinyl, wood, or plastic which is placed at the juncture of the floor and wall to define a concave radius and provide support for coved resilient sheet. Without the support of the cove stick, the flooring is more easily punctured. Cove stick should have a minimum radius of 1-1/8". (Also referred to as "cove")

Crazing: The occurrence of fine, interlacing cracks or fissures. Crazing is caused by early drying and shrinkage of the surface. (Also referred to as "map cracking")

Cross Seam: A seam that is made running across the width of the flooring or perpendicular to the length of the roll.

Cutback Adhesives: Refers to black asphaltic based adhesives which have been liquefied with petroleum solvents. Some cutback adhesives may contain asbestos, and thus proper care must be taken when removing old material. Always follow all relevant codes or regulations regarding the removal of cutback adhesive or any other asbestos containing materials.

Deflection: The movement of a substrate or structural element from its original position often due to forces or applied load. Maximum substrate deflection caused by live loads are typically specified within building codes, industry associations, or industry standards such as IBC, ACI-63, and AISC. Deflection limits are expressed as a fraction of the span, in inches, over an allowable limit, typically 360. The L/360 standard indicates that a substrate should not deflect more than the length of the span divided by 360. For example, an unsupported span of 180" would be calculated as 180 divided by 360 yielding a quotient of 0.5 and indicating a maximum deflection of 0.5" or 1/2".

Direct Scribing: The process of transferring dimensions or contours onto a piece of floor covering using a tool that establishes a uniform distance between two points. Direct scribing is often used along three different walls in a process called three-wall scribing.

Double Cut: Overlapping the edges of two pieces of flooring material, aligning the pattern (when applicable), and cutting through both pieces at the same time. It is important to keep the blade at a perfect 90-degree angle to the flooring.

Dry Fitting: A procedure where material is placed within a room while remaining unadhered. This may be done to assist with layout, balance, or to ease the process of trimming without having to contend with adhesive.

Dry-to-Touch: The point at which a material has dried sufficiently to transition from a liquid consistency to a more solidified state such that it can be lightly touched, without transfer to one's finger.

Dust: Fine, powdery dirt or other particulate typically found on surfaces inside a building or suspended in the air.

Dusting: The presence of loose powdery material on the surface of new concrete. It can be caused by issues including a high water-cement ratio and by allowing the concrete to dry too rapidly. (Also referred to as "chalking").

Embossing: A permanent texture integrated into the surface of flooring produced by mechanical or chemical means during manufacturing. Embossing provides a more dimensional appearance and helps conceal substrate irregularities. Embossing aids in gloss retention because only the most elevated areas of the embossing receive surface abrasion.

Epoxy Adhesive: A two-part hard-setting thermoplastic adhesive comprised of resins and hardeners. Epoxy adhesives have excellent performance properties but are widely accepted to be more challenging to work with. Being a two-component product, epoxy adhesives are not premixed but rather are mixed just before use. Environmental conditions, such as temperature, can influence the working time or pot life of the adhesive. Warmer temperatures will accelerate the setting process, with cooler temperatures delaying it. Experience, practice, and research should be relied upon, due to the various application difficulties associated with epoxies.

Equilibrium Moisture Content: The moisture level at which a hygroscopic material, such as wood, will neither gain nor lose moisture as it has already conditioned to the relative humidity and temperature of the surrounding environment. (Also referred to as "EMC")

Feature Strip: A strip of contrasting flooring used to create design elements, borders, or other aesthetics in a finished floor.

Fill: (noun) Unused portions from a piece of resilient sheet which has been strategically allocated for later use elsewhere in the installation.

Flash Time: The amount of time recommended for a dispersion adhesive to remain exposed so as to lose sufficient moisture prior to the application of a floor covering. Flash time allows moisture from within the adhesive to evaporate, allow the adhesive to develop additional tack, and prevent the entrapment of moisture. The amount of flash time will be influenced by factors such as ambient temperature, humidity, air movement, and the absorbency of the substrate. (Also referred to as "flash-off time" and inadvertently called "open time")

Flash Coving: The continuation or extension of a resilient sheet flooring up the wall by 4" to 6" (10 cm to 15 cm) to create an integral wall base.

Freehand Knifing: A trimming method involving the fitting of resilient floor covering using a knife to gradually remove excess material. This practice is best suited for installations which have perimeter trim or other means of covering the cut edge. While freehand knifing may provide adequate or passable results it is less likely to achieve a high level of accuracy.

Freeze Thaw Stable: An adhesive's capacity to be frozen and thawed significant alteration in physical properties. An adhesive affected by freeze thaw cycles exhibit poor handling characteristics usually becoming rubbery, stringy, thick, and may be unable to be troweled or applied to the substrate. Always store adhesives according to the manufacturer's recommendations; do not use affected adhesives.

Gauge: The overall thickness of a resilient floor covering product.

Gouge: A damaging cut, groove, or cavity in the floor covering which involves the loss or removal of material.

Grab: The ability of an adhesive to retain material in place which is trying to move or pull away.

Grade: The level or elevation of the substrate in relation to the surrounding ground.

Green Concrete: Recently poured concrete that has not completely dried and/or cured.

Heat-Welded Seam: The joining of two edges of resilient sheet by grooving the seam and fusing the pieces together using a heated thermal welding rod. The excess or protruding weld rod will be trimmed flush with the surface of the sheet vinyl after properly cooling.

Heat Welding: The act of fusing seams of resilient sheet together using specialized equipment and welding rod.

HEPA Vacuum: A vacuum equipped with a high-efficiency particulate air filter. HEPA filters are capable of capturing particulates of 0.3 microns with 99.97% efficiency.

Heterogeneous Sheet Vinyl Floor Covering: A resilient sheet material comprised of multiple layers of differing composition. Heterogeneous sheet flooring is generally manufactured to meet the specifications set forth in ASTM F1303, Standard Specification for Sheet Vinyl Floor Covering with Backing.

Homogeneous Sheet Vinyl Floor Covering: A resilient sheet material having a single layer and uniform composition. Homogeneous sheet flooring is generally manufactured to meet the specifications set forth in ASTM F1913, Standard Specification for Sheet Vinyl Floor Covering without Backing.

Humidity: The amount of water vapor in the air. (See "relative humidity")

HVAC: An initialism for heating, ventilation, and air conditioning.

Hydration: The process by which portland cement sets and hardens as a result of a chemical reaction between cementitious materials and water.

Hydrostatic Pressure: A pressure generated by gravity which forces water through the pores or cracks in a below-grade concrete slab. Hydrostatic pressure is a fairly rare occurrence; however, it is often inadvertently used to describe other moisture related problems. (Also referred to as "hydrostatic head")

Incompatible: Interaction between materials which are independently acceptable, but when used in conjunction yield unexpected or unacceptable performance. Products or circumstances which are unsuitable for combination due to undesirable results.

Indentation: A recess or depression on a surface; normally the consequence of concentrated point loads or an impact from a dropped object.

Inlaid Sheet Flooring: A category of floor covering having an aesthetic produced by embedding color chips or granules directly into the surface of the resilient sheet. The aesthetic design may or may not extend through to the backing of the product.

Jamb: The vertical portions of a door frame.

Joint Cover: Trim covers designed to span active joints and shift with the independent movement of the separate slabs of concrete. (Also referred to as an "expansion joint cover")

Joint Telegraphing: A condition arising as a result of structural movement or preparation deficiencies where substrate joints become visibly evident through the surface of the flooring. HMTX does not warrant against telegraphing, aesthetic concerns, or other performance issues arising from substrate movement. Such instances are not to be considered a product issue but rather an installation, structural, or site-related condition.

Telegraphing: Irregularities, imperfections, textures, and other smoothness/flatness deficiencies of the substrate which are visible through the finished floor covering. This may include joints in the substrate, adhesive ridges, cracks, substrate undulations, fasteners, debris, and other substrate preparation deficiencies.

Joints: The junction or interface between panels, modules, pieces, or sections of solid building materials. This may include tiles, underlayment-panels, and sections of concrete.

Layout Lines: Lines marked onto the substrate, often in a perpendicular manner, so as to provide a starting point, or layout guide, to assist the installer in maintaining proper positioning of the floor covering. (Also referred to as "reference lines")

Lightweight Concrete: Concrete with a notably lower density than regular concrete. It is blended utilizing a lightweight aggregate with an equilibrium density generally between 70 and 120 pounds per cubic foot (1,120 kg/m³ and 1,920 kg/m³). Lightweight concrete uses a variety of alternate aggregate materials that may include manufacturing byproducts like fly ash and slag or porous rock like pumice, clay, shale, and slate that have been treated with a heat process which expands the material and creates an interconnected series of internal pores within the aggregate. The increased porosity furthers moisture retention which means the drying process can be significantly longer.

Manufacturing Defects: A deviation from a product's design specification during production resulting in defect, deficiency, or blemish.

Mechanic: Another term used to describe a floor installer.

Mineral Spirits: A solvent used as a thinner or cleaner.

Moisture Content: Wood Moisture Content is the weight of water in a piece of wood expressed as a percentage of the dry matter of wood. (Also referred to as MC)

Moisture Test: The act of testing a substrate to determine the moisture content.

Net Seam: A seam with which both adjoining pieces interface without compressive forces or gaps. Certain trimming practices better facilitate net seams, namely recess scribing (under-scribing) and double cutting. Net seams should have edges that are at a 90-degree angle to the substrate and match one another.

Net Trimming: The act of cutting material such that it is abutting an adjacent object without any compressive forces or gaps amongst the two elements. Certain trimming practices better accommodate net trimming, namely scribing.

Neutral Cleaner: A mild detergent, having a pH value between 6 and 8. Neutral cleaners should not contain any harsh or damaging components, and are formulated to remove soil and clean resilient flooring.

Non-Absorbent: The inability of a substrate or material to readily soak up moisture. Checking for absorbency is necessary for proper trowel selection. It may be possible to determine absorbency by placing a drop of water onto a substrate from a height no greater than 1/2" (13 mm). If the drop of water is absorbed within one minute, the surface is likely considered absorbent. If the drop of water is still beaded after one minute, the surface is likely considered non-absorbent. Testing must be done in compliance with the most current version of ASTM F3191. (Also inadvertently referred to as "non-porous")

Non-Porous: Surfaces which are unable to absorb water due to a lack of pores or voids within a medium for moisture to reside. It may be possible to determine absorbency by placing a drop of water onto a substrate from a height no greater than 1/2" (13 mm). If the drop of water is absorbed within one minute, the surface is likely considered absorbent. If the drop of water is still beaded after one minute, the surface is likely considered non-absorbent. Testing must be done in compliance with the most current version of ASTM F3191. (Also referred to as "non-absorbent")

On-Grade Level: A slab or space where the substrate assembly is at ground level, in direct contact with the ground, or has less than 18" (46 cm) of well-ventilated space between the bottom of the lowest horizontal structural element and the ground. One of the most common examples of on-grade construction is a concrete slab without a basement or crawlspace. On-grade substrates, regardless of construction or composition, should be assumed to contain high levels of moisture and should always be tested.

Open Time: (See "flash time")

OSB: An initialism for Oriented Strand Board. OSB panels are constructed from rectangular flakes of wood strands arranged in cross-oriented layers. The construction methodology provides the panel with improved dimensional properties, makes it more rigid, and adds strength.

OSHA: An acronym which stands for The Occupational Safety and Health Administration. OSHA is a U.S. federal agency which regulates various aspects of worker health and safety, setting and enforcing standards and requirements that employers must follow.

Patch: A compound specifically engineered to address substrate deficiencies, often cementitious in composition. Typically, it is sold in a powder form, and later blended with a liquid in specific proportions. Patch is used to fill holes, low areas, transition different elevations, or to address non-moving cracks or joints in the substrate. Patch is also a verb, describing the process of applying the compound.

Pattern Match: The interval for which various aesthetic elements of a pattern reoccur.

Pattern Run-Out: A misalignment of a pattern caused by the stretching or compression of sheet material.

Pattern Scribing: A technique involving the creation of a template for an area, and then transferring the dimensions and contours of the template onto a piece of floor covering. Pattern Scribing is one of the most consistent, methodical, and proven practices for ensuring a precise fit.

pH Value: The quantitative measure of acidity or alkalinity of a solution. A pH value of 7 is considered neutral. Lower values are acidic; higher values are alkaline. The scale is logarithmic, which means each change of 1 in pH units is a factor of 10. For example, when comparing a solution with a pH value of 8, a solution of 9 is 10 times more alkaline, 10 is 100 times more alkaline, 11 is 1,000 times more alkaline, etc.

Plasticizer: A material utilized in the production of resilient floor covering which improves its properties, including flexibility and durability.

Plasticizer Migration: The unintended movement of plasticizer from one medium to another. One example is the migration of plasticizer from the flooring or substrate into an adhesive which can cause a detrimental softening or degradation.

Plywood: A fabricated wood panel made from thin sheets of cross-laminated veneer which are bonded using heat and pressure. Plywood is often considered to have superior dimensional stability, relative to wood panels, as well as excellent strength.

Polish: A substance applied to a floor covering which may provide an enhanced appearance and can offer protective properties.

Porosity: The quality of being porous or having open space or voids within a medium. Porosity is defined by the ratio of pore volume compared to total volume. In the floor covering industry the term porosity, or porous, is inadvertently used to describe a material's ability to absorb or be absorbent. For a material or substrate to be absorbent it must be both porous and permeable. A liquid must be able to travel throughout a medium (permeability) as well as reside within the medium (porosity). When the medium is both permeable and porous it is likely

absorbent. Checking for absorbency is necessary for proper trowel selection. It may be possible to determine absorbency by placing a drop of water onto a substrate from a height no greater than 1/2" (13 mm). If the drop of water is absorbed within one minute, the surface is likely considered absorbent. If the drop of water is still beaded after one minute, the surface is likely considered non-absorbent. Testing must be done in compliance with the most current version of ASTM F3191. (Also referred to as "absorbent")

Pot Life: The amount of time an adhesive or preparation material remains useable in the container once it has been opened or mixed. Normally used in reference to products which are blended, such as epoxy adhesives or portland-based underlayments.

PPE: An initialism for Personal Protective Equipment. Common PPE items typically includes head wear, eye protection, gloves, hearing protection, boots, pants, and high visibility vests.

Radiant-Heated Substrates: A substrate with an integrated heating system. Radiant heating systems use an embedded electric or hydronic means to supply heating to an area. The heat then transfers from the flooring to other objects within the space. Hydronic systems utilize boiler heated water which is circulated through tubing. Electric heating systems use specialized electric heating wires or cables to transmit heat. Resilient flooring can generally be installed over radiant-heated substrates contingent the surface temperature does not exceed 85°F (29.4°C).

Ramp: A slope or incline which is employed to interconnect two different elevations, often used in lieu of steps.

Recess Scribing: A technique which utilizes a specialized pointed or sharp tool to score or cut an overlapping material guided by the edge of an underlying material. Recess scribing is able to achieve a high level of accuracy. (Also referred to as "under scribing")

Relative Humidity: A measure of the amount of water vapor in the air as a percentage of the amount needed to reach saturation at the same temperature. For example, if the relative humidity is 50%, then the air is half saturated with moisture. Warmer air is capable of holding more moisture than colder air. (Also referred to as "RH" or "humidity")

Release Agent: A compound which is applied to some concrete substrates during particular construction processes. Release agents are formulated specifically to inhibit bonding to a concrete slab. While these compounds may be necessary during the initial construction of the building's structure, they may later impair the floor covering's ability to properly bond to the concrete substrate. Surface contaminants, such as release agents, must be completely removed from a concrete substrate prior to installation of a resilient floor covering. (Also referred to as "parting agent")

Residual Adhesive: The remaining adhesive from a prior installation.

Resilience: A measure of floor covering ability to recover to its original condition or thickness after use, stress, or load.

Resilient Floor: A non-textile floor covering material made in sheet, tile, and plank formats or otherwise formed in place. Materials include products such as cork, linoleum, rubber, luxury vinyl, non-vinyl bio-based flooring, vinyl composition tile, and poured polymeric or resinous flooring.

Reverse Method: The practice of alternating the direction of adjacent pieces or sheets of resilient floor covering by 180 degrees.

Rolling Loads: Floor traffic involving the use of wheels or casters moving across the surface of a floor. The contact area between a wheel and the floor covering is deceptively small. The small point of contact coupled with rolling forces result in higher stresses than may be anticipated. Factors which may influence the amount of stress a floor covering sustains may include the caster's width, diameter, hardness, profile, composition, condition, the number of casters, the weight imparted onto the caster, and the frequency or intensity of the wheeled traffic. New flooring should not be exposed to any rolling traffic for a minimum of 72 hours after installation to allow setting and curing of the adhesive. If rolling loads cannot be avoided, protect the floor by covering with appropriate wood panels.

Rolling: A process which utilizes a roller tool to press material into a bed of adhesive, flatten the adhesives ridges, and remove trapped air pockets under a

recently adhered floor covering. Rolling should be done immediately after placing the flooring into the adhesive. Perform all rolling cross-directionally by rolling in one direction and then in the perpendicular direction. It is often best to begin toward the center of a sheet and work outward toward the perimeter. Rolling of larger areas is typically done with a 100 pound (45.36 kg) 3-section roller. Rolling of smaller areas is done with one of several rollers, each tailored to specific tasks.

Scarify: A mechanical means of sanding, grinding, or otherwise abrading a surface to remove contaminants or alter a surface's profile so as to enhance bondability.

Scratch: (verb) An action causing a shallow cut, mark, abrasion, or other imperfection on a flooring's surface. (noun) A score or mark on the surface of a floor covering caused by contact from an abrasive material or a sharp object.

Scribe: A technique which utilizes various tools or practices to score, mark, or cut one material by transferring or following the edge of another. Scribing can be used on straight or contoured surfaces and is able to achieve a high level of accuracy. Examples include direct scribing, recess scribing, under scribing, pattern scribing, and 3-wall scribing.

Scuff: A blemishing mark on the surface of a floor covering. A mar, scrape, or wearing away of the surface by means of abrasion or friction. An undesired depositing of foreign material onto a surface by way of thermo-mechanical displacement resulting from friction between the floor covering and a foreign object.

Sealer: A compound which is applied to the surface of another material with the primary purpose of preventing foreign materials from entering or to contain elements from leaving or migrating. Sealers may be a surface contaminate or bond breaker.

Seam: The line along which two edges of flooring are joined.

Seam Cutting: The process of trimming two pieces of flooring material to create a seam.

Seam Treatment: A process used to finish, fuse, weld or otherwise treat a floor covering seam. Different seam treatments include seam sealers, seam coaters, cold welding, and heat welding. (Also referred to as "seam sealing")

Selvedge: The excess material added to the edge of flooring during the manufacturing process. These edges should be removed prior to material being seamed. (Also referred to as "selvage")

Skiving: The process of trimming the heat welding rod flush with the surface of the finished material. It is generally recommended that skiving is performed using a two-pass process.

Shelf-Life: The duration a manufacturer will guarantee a properly stored and unopened unit of adhesive, without becoming unfit for use. It is possible, although not recommended, that an adhesive may continue to be used following the shelf-life terms. One indication of expiration is a change in the physical and application characteristics of the adhesive.

Sleeper Floor: A wood framed assembly installed over a concrete slab without 18" (46 cm) of well-ventilated air space. There are instances when these types of assemblies have encountered success, however, there is a propensity for moisture build up to occur within the assembly. The moisture results in decay of the wood framing, failure of the assembly, and consequential issues including Indoor Air Quality concerns. Unhealthy and unsafe moisture issues can occur regardless of grade-level or whether a vapor barrier (retarder) is used between the slab and the wood framing.

Solvent Based Adhesive: Adhesives with binding agents dispersed in suitable solvents to create an adhesive polymer solution. Once an adhesive has been applied to a substrate, the solvents evaporate, and the adhesive changes from a liquid to a final solid state. While solvent based adhesives have traditionally outperformed current generation adhesives, there are significant environmental and health concerns to consider. Solvent based adhesive cannot be removed with water.

Spread Rate: The approximate coverage which can be expected from a given volume of adhesive when applied using a specified trowel.

Static Load Indentation: An indentation in a floor covering caused by a point load having been imparted over a period of time.

Static Load Indentation Resistance: Is the ability of a flooring product to withstand or recover from exposure to a heavy load, i.e., desks, tables, chairs, cabinets, stiletto heels, hospital beds, etc. The indentation to a floor can be influenced by factors including product construction, thickness, backing, and embossing.

Straightedge and Butt: A seam cutting method involving the use of a straightedge as a guide and trimming off the edges of the material using a sharp, clean utility knife. The two trimmed edges of material are then butted together to form a seam.

Subfloor: Subfloor is the initial, structural layer of solid material and is directly supported by joists or other structural members. The subfloor acts as a contiguous and foundational base-layer providing support and rigidity to overlying underlayments. The subfloor itself is often not robust enough to singularly provide sufficient rigidity for the floor covering and is typically augmented with additional layers of underlayment. The term subfloor is often inadvertently used to describe underlayment or other substrates.

Substrate: The surface over which a flooring material is installed. Common floor covering substrates are concrete, wood panels, cementitious based underlayments and patches, synthetic gypsum based underlayments and patches, and pre-existing floor coverings. Prior to the installation of a new floor covering, a substrate will require assessment and qualification to ensure it will be suitable to accommodate its intended purpose. Qualification often includes factors such as clean, smooth, flat, dry, structurally sound, and compatible.

Suspended Concrete Slabs: A floor slab having two or more edges supported on walls, beams, or columns which carries its own weight and any imparted loads. The assembly spans between supports and will typically deflect under load.

Suspend Wood Floors: A wood substrate supported by structural framing; positioned over an air space with a minimum height of 18" (46 cm).

Telegraphing: A condition in which irregularities, imperfections, textures, and other smoothness or flatness deficiencies of the substrate are visible through the finished floor covering. This may include joints in the substrate, adhesive ridges, cracks, substrate undulations, fasteners, debris, or other substrate preparation deficiencies.

Template: A piece of material used as a pattern or guide to transfer the shape or dimensions of an area onto the flooring material to achieve an accurate fit.

Terrazzo: A poured cementitious flooring which may be comprised of various materials including marble, granite, glass, or onyx which may be embedded within freshly placed mortar. The surface is usually hardened, ground smooth, and polished.

Trowel: An often rectangular or trapezoidal shaped hand tool having a flat edge with notches of particular dimensions which are spaced at specific intervals. Trowels are used to apply adhesives onto a substrate and act as a metering device ensuring the correct amount and appropriate placement of an adhesive. Adhesive trowels have a limited service-life and should be considered both consumable and disposable. Once a trowel can no longer apply the proper amount of adhesive it should be replaced immediately. Trowels must be cleaned regularly and continuously as they are used.

Under Scribing: A technique which utilizes a specialized pointed or sharp tool to score or cut an overlapping material guided by the edge of an underlying material. Under scribing is able to achieve a high level of accuracy. (Also referred to as "recess scribing")

Underlayment: A material applied under a resilient flooring to provide a suitable installation surface. This can include wood panels, smoothing compound, leveling compound, and other materials.

Vapor Barrier: A vapor barrier is a material that reduces the rate at which moisture moves through floors, walls, and ceilings. These materials are designed to have a high resistance to vapor movement and are used to control condensation or resist the migration of moisture. The ability of a material to resist the diffusion of water vapor is measured in units, known as perms. Vapor barriers are often found in such forms as foil, plastic film, film forming compounds, or specially coated paper. The term "vapor barrier" is still widely used, however, it is a misnomer; "vapor retarder" is more accurate. (Also referred to as a "vapor retarder" or "vapor diffusion retarder")

Vinyl Asbestos Tile: A commonly encountered, albeit obsolete, form of resilient tile composed of vinyl plastic binders, chrysotile asbestos fibers, mineral fillers, and pigments. These tiles were regularly used in buildings constructed or renovated between the 1940's and 1980's, however, its use may extend beyond this timeframe. A visual inspection cannot establish the presence or absence of asbestos. Licensed professionals and laboratories should be commissioned to test materials which have any chance of containing asbestos. (Also referred to as "VAT")

Vinyl Composition Tile: A finished flooring material which has been primarily used in commercial and institutional applications. Flooring composed of elements such as colored chips of polyvinyl chloride (PVC), binders, fillers, and pigments compounded with suitable stabilizers and processing aides, which are formed into solid sheets of varying thicknesses (1/8" is most common) by heat and pressure. Vinyl Composition Tile is manufactured to meet the requirements of ASTM F1066, "Standard Specification for Vinyl Composition Floor Tile". (Also referred to as "VCT")

Walk-Off Mat: A type of commercial floor covering that is mainly used near the entryway of a commercial facility. Walk-off mats are utilized to capture and retain dirt, debris, and other surface contaminants from the shoes of those entering the building. Mats should be appropriately sized to perform as needed. The Carpet and Rug Institute specifies that entrance matting should be between 12' and 25' long (3.6 m and 7.6 m) depending on the application.

Water-Cement Ratio: The ratio of the weight of water used for a given weight of cement in a concrete mix. Sufficient water must be added to concrete to properly facilitate hydration; however, excess water greatly reduces the final compressive strength. Proper ratios are critical in ensuring quality concrete construction. (Also referred to as "w/c" or "w/cm")

Wax: A coating that is similar to polish and offers a temporary protective film. Wax often requires regular buffing to maintain a desired gloss.

Wear: The gradual damage, deterioration, degradation, or erosion of a floor covering over time. The loss is caused by use, friction, and the collective accumulation of abrasions, gouging, and other damage to the flooring.

Wear Layer: An integrated top layer of a resilient floor covering that is engineered to resist against wear and protect the pattern and design. Temporary finishes or maintenance coatings are not considered a wear layer.

Working Time: The limited period of time to install a floor covering into an applied adhesive. The duration will be dependent upon factors including the chemistry of the adhesive, the application methodology, temperature, humidity, and the absorbency of the substrate. Always follow the respective adhesive instructions. Generally, the following practices are used relative to working time:

- Pressure Sensitive Adhesives – Working time begins from the time the adhesive is dry-to-touch but not to exceed the specified working time.
- Wet Set and Epoxy Adhesives – Working time begins occurs as soon as the adhesive is applied to the substrate or after the appropriate amount of flash time (i.e. while the adhesive is wet, with full transfer to the backing of the floor covering).

Exceeding the working time of an adhesive will result in a loss in bond strength.

NOTICES AND DISCLOSURES

This document supersedes, in its entirety, any and all prior printed and electronic versions relating to the subject matter hereof including Installation and Technical Guides previously distributed for Teknoflor Heterogeneous Sheet. HMTX's written installation instructions shall have precedence over any agent, affiliate, representative, or referenced industry standard guideline unless set forth in writing by an authorized member of HMTX's Technical Services team.

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