

This document is intended to cover substrate preparation requirements and installation instructions for ESD Flooring for Roppe. If there are any questions or concerns, please reach out to solutions@rhctechnical.com.

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1. APPROVED ADHESIVES

Approved Adhesives Coverage Rates, Moisture and Traffic Limits after Installation*							
Adhesive	Porous	Non-Porous	RH% Limit	MVER Limit	Light	Heavy	Maintenance
ASD-800	160 sq. ft.	N/A	90%	6 lbs.	24 Hours	48 Hours	72 Hours
USD-810	135 sq. ft.	150 sq. ft.	90%	6 lbs.	12 Hours	24 Hours	48 Hours

*Coverage rates are per gallon unless noted otherwise and approximate and subject to level of porosity as well as ambient conditions as well as angle of the trowel, actual values may vary from stated amounts

R = Roller Application, T= Trowel Application

Excelsior ASD-800 ESD Adhesive is an acrylic wet-set conductive adhesive specifically designed for the permanent installation of ESD rubber and vinyl flooring products over porous substrates in indoor applications; it is a low odor, non-flammable, solvent-free product and ready to use product

Excelsior USD-810 ESD Epoxy Adhesive is a two component urethane enhanced wet-set conductive ESD epoxy adhesive used for the permanent installation of ESD rubber and vinyl flooring products over porous and non-porous substrates. When cured it is water resistant and has high sheer strength and is the perfect choice for areas with topical moisture, heavy traffic and rolling loads both indoors and outdoors including areas with sunlight and not climate controlled; it is a low odor, non-flammable and solvent-free product

2. PRE-INSTALLATION

Prior to acceptance of this document refer to the website, www.flexcofloors.com to confirm that you have the most current revision of the installation information. Consult all associated product literature concerning adhesive installation, maintenance and warranty prior to installation of flooring.

2.1 PRODUCT LIMITATIONS

Our products are not recommended in the following areas. Please consult Technical Services for installation methods if one or more of these conditions apply.

Areas exposed to stiletto heels, cleats, spiked or other footwear that will cause damage.

Areas exposed to certain conditions that may cause staining, for example areas such as newly applied asphalt in driveways or parking lots, antioxidants in certain types of rubber used in mats, wheels, and tires. Areas which may be subjected to objects that may burn or melt vinyl flooring, for example vinyl floor covering must be protected from excessive heat, or items exceeding 140°F (60°C).

Areas where forklifts and/or pallet jacks travel at high speed, for example sudden stops, turns or other maneuvers will create friction and lead to surface damage from tire burn. Areas where the presence of sharp items, such as nails protruding from pallets or other objects, could cause severe physical damage.

Areas subjected to excessive spillage of alcohols, ketones or other solvents which may cause damage to flooring products. Areas were inappropriate, improperly designed, or inadequate floor protection devices are utilized. It is the responsibility of the equipment manufacturer to provide suitable floor contacts to prevent indentation or delamination.

Areas with excessive surface moisture, it is the responsibility of the end-user/maintenance provider to assure excessive water does not penetrate or damage the finished flooring. In areas subjected to severe surface moisture after installation, or where at least one floor drain exists, areas must be installed with USD-810 ESD Epoxy Adhesive.

DO NOT use markers (sharpies, pens, construction crayons, etc.), tapes or paints (construction or other) on the flooring or on the substrate as these items may bleed through or otherwise cause permanent staining.

Use only recommended cleaning chemicals or their equivalent in the correct dilution. Do not mix two different cleaning products together, and always follow the manufacturer's instructions. Always check the suitability of cleaners for use on vinyl floors with the chemical manufacturer. Do not use cleaners containing pine oil, phenolic sanitizer, or enzyme cleaners that will be left on the surface of the flooring. We assume no liability for damage to our flooring resulting from the misuse or improper use of markers, paints, or maintenance products. Please confirm with the manufacturer of all tape, cleaning products, chemicals and equipment for their recommendations.

2.2 STORAGE & SERVICE ENVIRONMENT

Deliver all materials to the installation location in its original packaging with labels intact. Do not stack pallets to avoid damage. Remove any plastic and strapping from packaging after delivery. Inspect all material for proper type, color and matching lot numbers if appropriate. Ensure that all adhesives intended for installation are approved for use with accessory materials if appropriate. Ensure material is adequately stored at temperatures between 65° F (19° C) and 85° F (30° C) prior to installation.

This product is designed, manufactured and tested to perform at constant temperatures, not fluctuating more than 10° from normal selected service temperatures from the allowable 65° F (19° C) - 85° F (30° C) range. This product is designed for service on substrate temperatures ranging from 65° F (19° C) - 85° F (30° C). This product is designed for service within ambient relative humidity between 40% and 60%.

Select appropriate adhesives for the intended service environment, such as wet-set acrylics or urethanes for areas that will have temperature variations or excessive windows and/or sunlight exposure from walls or ceilings such as sunrooms, window walls, skylights, etc.

NOTE: Pressure sensitive adhesives are soft setting adhesives and do not prevent effects or issues that temperature changes and direct sunlight creates in vinyl products due to thermodynamics.

If there are concerns regarding this information or the service temperature, substrate temperature or installation environment will not meet these requirements, please contact Technical Services for recommendations prior to installation at solutions@rhctechical.com.

3. JOB SITE CONDITIONS

Before starting the job and performing any preparations, testing and/or installation we recommend the following conditions be met to ensure a successful installation.

Facility must be fully enclosed, sealed and weather tight. Building HVAC must be up and running in permanent operation prior to installation. Allow all trades to complete work prior to installation whenever possible; if not possible be aware of issues that can be created by other trades during the installation process. These include but are not limited to adhesive displacement from ladders, rolling carts and job boxes.

Installation areas must have adequate lighting to allow for proper inspection of the flooring and substrates prior to installation.

Installation areas must be properly moisture tested to ensure the substrate is properly dry to receive flooring products. Review additional information below and of course, if conditions are not in agreement with the

requirements notify the General Contractor and Technical Services if needed. By covering a substrate, underlayment or existing surface, you have indicated acceptance of substrate and installation environment.

3.1 ACCLIMATION

Installation area and all materials must be maintained at desired service temperatures for a period of 48 hours prior to installation, during the installation and for the service life of the installation afterwards. If the material must be installed outside of the above acclimation and service temperature ranges contact Technical Services for more detailed installation recommendations. Do not proceed with installation until all conditions have been met.

NOTE: This product is designed, manufactured and tested to perform at constant temperatures, not fluctuating more than 4° from normal selected service temperatures from the allowable 65° F (19° C) - 85° F (30° C) range. This product is designed for service on substrate temperatures ranging from 65° F (19° C) - 85° F (30° C). This product is designed for service within ambient relative humidity between 40% and 60%.

3.2 SUBSTRATE PREPARATION

All substrates must be prepared according to the following information or ASTM F710 or ASTM F1482 at a minimum, as well as applicable ACI and RFCI guidelines. Substrates must be clean, smooth, permanently dry, flat, and structurally sound. Substrates must be free of visible water or moisture, dust, sealers, paint, sweeping compounds, curing compounds, residual adhesives and adhesive removers, concrete hardeners or densifiers, solvents, wax, oil, grease, asphalt, visible alkaline salts or excessive efflorescence, mold, mildew and any other extraneous coating, film, material or foreign matter.

It is recommended that all substrates have a floor flatness of FF32 and/or a flatness tolerance of 1/8" in 6' or 3/16" in 10'. Substrates that do not meet this requirement shall have a cementitious patch or self-leveling underlayment installed to flatten the installation area.

All substrates must have any and all existing adhesives, materials, contaminants or bond-breakers mechanically removed via scraping, sanding, grinding or buffing with a 25 grit DiamoBrush Prep Plus tool prior to adhesive installation. In extreme situations, shot-blasting may be required. Mechanical preparation must expose at least 90% of the original substrate. Following cleaning and removal, all substrates must be vacuumed with a HEPA approved vacuum and flat vacuum attachment to remove all surface dust. Sweeping without vacuuming will not be acceptable. The two most common mechanical abatement methods are shot blasting or hydro blasting. We also recommend all abatement be performed by a licensed and trained professional, familiar with local, state and federal laws.

NOTE: In regards to substrate preparation when mechanical sanding, grinding, shot blasting and vacuuming always follow the Resilient Floor Covering Institute's (RFCI) "Recommended Work Practice for Removal of Existing Floor Covering and Adhesives", and all applicable local, state, federal and OSHA requirements in regards to Asbestos and Silica containment regulations.

NOTE: Do not use solvent/citrus based or other chemical adhesive removers prior to installation.

3.2.1 CONCRETE SUBSTRATES

All concrete substrates, whether on-grade and/or below grade must have an intact and effective moisture vapor barrier which meets the current requirements of ASTM E1745.

On-grade and/or below grade slabs not containing an intact and effective moisture vapor barrier meeting the current requirements of ASTM E1745 should have a 100% solids moisture control system applied prior to application of patches, underlayments, adhesive and the installation of flooring products for the product warranty to remain in effect.

All concrete substrates must have a minimum compressive strength of 3500 PSI and be prepared in accordance with information below. When flooring is being installed directly over concrete, concrete surfaces that have an ICRI Concrete Surface Profile (CSP) over 4 shall be smoothed with a self-leveling underlayment or a patch to prevent imperfections from telegraphing through flooring materials.

3.2.1.1 MOISTURE TESTING

Moisture testing is an essential part of determining the suitability of a concrete slab to receive a resilient floor covering. Moisture testing must be performed on all concrete slabs, regardless of their age or grade level, including areas where resilient flooring has already been installed.

Moisture testing shall be conducted with the area or building at service conditions, (i.e., fully enclosed, weather-tight, and with the permanent HVAC in operation). In general, moisture testing shall be conducted on concrete surfaces that exhibit the final prepared stage before the installation of the flooring material and before installation of smoothing or leveling compounds. Test results are only indicators of current moisture conditions at the time of testing and do not predict future moisture conditions.

NOTE: Moisture failures are generally a complex, cumulative, and synergistic series of events. The moisture testing information below is provided as an industry service and in an effort to help reduce the likelihood of moisture related failures within the floor covering industry.

Moisture testing determines a snap shot at the time of testing only and does not guarantee or preclude the possibility of issues in the future. In order to effectively determine moisture at the time of installation the on-grade or below grade substrates must have an effective moisture vapor barrier that meets the current requirements of ASTM E1745. If these conditions do not exist, we recommend a moisture mitigation system prior to installation of resilient flooring.

We require ASTM F2170 RH moisture testing on all concrete substrates. In addition to ASTM F2170, we strongly recommend ASTM F1869 MVER testing be performed on concrete substrates that have previously have flooring installed.

ASTM F2170 Relative Humidity testing indicates the amount of moisture in the concrete that has the potential to come out of the substrate during equilibration. ASTM F1869 Calcium Chloride testing indicates how much and how quickly the relative humidity in the concrete is evaporating from the top 1/2" to 3/4" of the concrete.

For moisture readings exceeding the RH and/or MVER limitations, a dehumidification system can be utilized until moisture readings when retested are within acceptable levels. For excessive readings, the application of a high-quality moisture mitigation system may also be employed.

We do not warrant any particular product or procedure for remediation of high moisture content. There are several companies that manufacture products suitable for moisture remediation. We suggest you refer to ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring and ASTM F3010 "Standard Practice for Two-Component Resin Based Membrane-Forming Moisture Mitigation Systems for Use Under Resilient Floor Coverings".

NOTE: Although these moisture testing information and recommendations are widely accepted within the resilient floor covering industry, there is currently no known exact amount of moisture vapor emission rate or exact % of RH to know exactly when a floor covering, adhesive, or coating system will fail.

ASTM test methods may be obtained from www.astm.org and we encourage your company to become and active and engaged member in development of these standards.

3.2.1.1.1 ASTM F2170 - RELATIVE HUMIDITY TESTING (*in-situ* PROBES)

This test method covers the quantitative determination of percent relative humidity in concrete slabs for field or laboratory test. This method is measured in percentage (%) content. Refer to recommended adhesives chart at the beginning of this document for the acceptable RH levels for installation.

Conduct one test for every 1,000 square feet (minimum 3 tests) to ensure concrete does not exceed the recommended RH for the flooring product and the adhesive being used.

NOTE: We require the use of Wagner Meters Rapid RH Probes for ASTM F2170 testing.

3.2.1.1.2 ASTM F1869 - MOISTURE VAPOR EMISSION RATE TESTING (CALCIUM CHLORIDE)

This test method covers the quantitative determination of the rate of moisture vapor emitted from below-grade, on-grade, and above-grade (suspended) bare concrete floors. This method is measured in lbs. / 24 hours / 1000 square feet. Refer to recommended adhesives chart at the beginning of this document for the acceptable RH levels for installation.

To conduct the F1869, the surface of the concrete must be porous. Hard machine troweled concrete or concrete surfaces with extraneous substances on the surface such as residual adhesive, sealers, curing compounds, etc. must be mechanically removed prior to testing.

3.2.1.1.3 ADDITIONAL METHODS

ASTM F3311 Mat Bond Evaluation and ASTM F2659 Electric Moisture Meters can be used to detect the presence of moisture, but do not satisfy the test requirement of ASTM F2170 and/or ASTM F1869. These methods provide qualitative results that may indicate targets or hot spots for further testing. Only the ASTM F2170 and/or ASTM F1869 can provide quantitative results for acceptance.

NOTE: We strongly recommend the use of Wagner Meters Concrete Moisture Meters for ASTM F2659 testing.

To conduct the Mat Bond Evaluation, double face tape 3' x 3' pieces of polyethylene to the subfloor (approximately 50' apart) for a minimum of 72 hours. After 72 hours, remove the polyethylene and if there is any evidence of moisture, allow additional time for the subfloor to dry before testing further.

3.2.1.1.4 WATER ABSORPTION (POROSITY)

All concrete substrates must be tested per ASTM F3191 to confirm porosity, this is utilized to determine the method of adhesive application or how the adhesive will act upon the concrete.

Use a pipette or equivalent to conduct three tests by placing a .05 mL (1/4" wide) droplet of clean, potable water onto the surface. If the substrate absorbs water within 60 seconds, the substrate is considered porous. Conduct 3 tests for the first 2000 sq. ft. and one for each additional 3000 sq. ft., at least one per room. All other substrates that do not meet this requirement are considered non-porous. Ensure that all non-porous substrates are not contaminated with any aforementioned contaminants.

3.2.1.1.5 DEW POINT (SURFACE TEMPERATURE AT WHICH CONDENSATION OCCURS)

Dew point is the temperature at which the humidity in the air begins to condensate on a surface. As it relates to indoor moisture condensation, the Dew Point is an important factor for ensuring adequate and proper conditions exist during substrate testing, substrate preparation, and installation of flooring products.

Within the installation parameters regarding air temperature of 65° F - 85° F and relative humidity of 40% - 60%, the substrate temperature shall be at least 5° F above the Dew Point. Adhesives shall not be spread and flooring shall

not be installed any time the concrete surface temperature is within 5° F of dew point. See the chart below to determine Dew Point Temperature to compare to current slab temperature.

		Dew Point Reference Chart						
		Ambient Air Temperature In Degrees Fahrenheit						
		60° F	65° F	70° F	75° F	80° F	85° F	90° F
Relative Humidity Percentage	70%	50° F	55° F	60° F	64° F	68° F	74° F	78° F
	65%	47° F	53° F	57° F	62° F	66° F	72° F	76° F
	60%	45° F	50° F	55° F	60° F	64° F	69° F	73° F
	55%	43° F	48° F	53° F	58° F	61° F	67° F	70° F
	50%	40° F	45° F	50° F	55° F	59° F	64° F	67° F
	45%	37° F	42° F	47° F	52° F	56° F	61° F	64° F
	40%	35° F	40° F	43° F	49° F	52° F	58° F	61° F
	35%	31° F	36° F	40° F	45° F	48° F	54° F	57° F
	30%	28° F	32° F	36° F	41° F	44° F	50° F	52° F

To determine the dew point; read the room air temperature, read the room relative humidity and the concrete surface temperature. Locate the intersection of the air temperature and relative humidity readings and determine the dew point. If the concrete surface temperature is within 5° of each other, installation shall not occur.

3.2.2 CHEMICALLY ABATED CONCRETE SUBSTRATES

In situations where existing flooring adhesive was removed chemically, since there are known concerns with this process, one of the following conditions now exist.

- (1) Once the chemical is present in the substrate it cannot recognize the difference between the old adhesive and the new adhesive, (2) it is considered a penetrant and there is no way to know how deep into the substrate it could have penetrated into the substrate due to porosity, (3) there is no way to tell (in a short term test) if the substrate has been neutralized or rinsed (abatement chemical removed) well enough to accept new adhesive.

However, if a chemical abatement has already been performed, we recommend the Mapei process to prepare the substrate to receive a finish flooring product. The Mapei process is to scour the substrate using the Planiprep SA according to Mapei instructions, then top with the Planiprep ET according to Mapei instructions. Once the process is completed, the substrate would need to be treated as non-porous for the selection of installation adhesives and methods.

3.2.3 WOOD SUBSTRATES

Wood substrates must be prepared in accordance with ASTM F1482. Prior to installation, moisture retardant sheeting with a maximum rating of 1.0 perm must be in place beneath the wood subfloor. It shall be overlapped at a minimum of 8” and the crawl space shall be well-ventilated.

Wood substrates shall be, at a minimum double layer construction with a thickness of 1”. It shall be rigid and free of any movement. It shall be structurally sound and designed as a resilient flooring underlayment, smooth enough to prevent telegraphing through the flooring product. At a minimum the top layer directly under the flooring and adhesive should come from section 3.2.3.1 Approved Wood Substrates and have a minimum thickness of 1/4”.

It shall be free of any substance that may stain such as marking inks, paints, solvents, adhesives, asphalt, dye, etc. and be of uniform density, porosity and thickness. It shall be installed in strict accordance with the board manufacturers’ recommendations.

3.2.3.1 APPROVED WOOD SUBSTRATES

APA Certified Plywood, Poplar Underlayment, Birch Plywood Underlayment

3.2.3.2 NON-APPROVED WOOD SUBSTRATES

Lauan, OSB, Particle Board, Masonite, Chipboard, Construction Grade Plywood, Flake board, Treated Plywood, Strip Wood Flooring, Advantech Underlayments (requires a minimum of 1/4" of Approved Wood Substrates on top by Advantech Manufacturer)

3.2.3.3 WOOD SUBSTRATES MOISTURE TESTING

Wood substrates must not exceed 8% moisture content.

NOTE: We require the use of Wagner Meters Wood Moisture Meters for testing.

3.2.4 GYPSUM BASED SUBSTRATES

Gypsum-based substrates must have a minimum compressive strength of 3500 PSI. Substrate must be structurally sound and firmly bonded to the subfloor below.

Any cracked or fractured areas must be removed and repaired with a compatible patch or repair product for gypsum based substrates. Follow those products installation instructions for installation over a gypsum substrate.

Most if not all gypsum substrates require the application of a sealer on the surface to prevent dusting and promote adhesion to the substrate. New or existing gypsum substrates may require additional primer just prior to finished floor being installed. These products are available from many suppliers as standard latex primers and do not interfere with the installation of our products. Follow all manufacturers' recommendations regarding preparation for resilient flooring installation.

3.2.5 RESINOUS SUBSTRATES

When installing directly over a resinous products, such as a urethane moisture barrier or an epoxy coating, ensure that coating is dry to the touch and has cured for the prescribed length of time. Substrate must be clean, dry, sound and free of contaminates. Resinous substrates are considered **non-porous** so ensure selected adhesives can be used over non-porous substrates and follow all installation instructions and flash times for non-porous substrates.

3.2.6 METAL SUBSTRATES

Metal substrates must be thoroughly sanded/ground and cleaned of any residue, oil, rust and/or oxidation. Substrate must be smooth, flat and sound prior to installation. When installing in areas that may be subject to topical water or moisture and/or high humidity, an anti-corrosive coating must be applied to protect metal substrate. Contact a local paint or coating supplier for coating recommendations. Install flooring within 12 hours after sanding/grinding to prevent re-oxidation. Any deflection in the metal floor can cause a bond failure between the adhesive and the metal substrate. Be sure to follow installation procedures and trowel sizes for non-porous substrates. Installing over Checker plate or Diamond plate is not recommended.

3.2.7 CRACKS, JOINTS & VOIDS

All cracks, joints and voids, as well as the areas surrounding them, must be clean and free of dust, dirt, debris and contaminants. All minor cracks and voids 3/64" or less may be repaired with a suitable cementitious patch. Due to the dynamic nature of concrete slabs, manufacturer cannot warranty installations to cover expansion joints, cracks or other voids such as control cuts, saw joints, moving cracks, and/or voids. Do not install flooring directly over any expansion joints as all expansion joints shall be honored and have a suitable expansion joint covering system installed to allow expansion joint to move as it was designed. In areas where random cracks are 3/64" or greater it

is hard to tell if the slab will continue to move or has finished moving. Consult a structural engineer if there are any questions or concerns with a crack or joint, especially those that may affect structural integrity such as expansion joints or excessive random cracking in areas that are not designed to move.

3.2.8 RADIANT HEATING SUBSTRATES

When installing flooring products approved for radiant heated substrates over a substrate that contains a radiant heating system, ensure the radiant heat is turned off 48 hours prior to installation and remains off during the entire installation. The radiant heat may be turned on 48 hours after installation and the normal operating temperature shall be increased gradually over the course of 24 hours. Ensure the temperature of the radiant heating system does not exceed 85° F (29.5° C) and avoid making abrupt changes in radiant heating temperature.

3.2.9 EXISTING FLOORING SUBSTRATES

We highly recommend that ESD Flooring products be installed directly to the permanent substrate such as concrete or Wood Subfloor to ensure maximum performance of the ESD properties. However, there are situations where decisions are made to install over existing flooring. If that is the case, please follow the guidelines below for the best chance of success.

Existing carpet, rubber, hardwood, LVT, linoleum, cushioned vinyl, cork, asphaltic materials, and/or floating floors as well as the adhesives used to install them, must be completely removed from the substrate prior to installation.

Existing single layers of VCT, VAT, quartz tile, solid vinyl tile, non-cushioned sheet goods, and/or asphaltic materials and existing adhesives or adhesive residue must have a compatible cementitious patch or cementitious self-leveling underlayment installed over the substrate (existing flooring) prior to installation.

Existing hardwood flooring requires suitable underlayment grade plywood be installed over the substrate.

New flooring may be installed over existing stone flooring substrates, such as terrazzo, porcelain or ceramic tile. Ensure existing flooring is a single layer of material and that all materials are clean, dry, sound, solid, well adhered and free of site-applied finishes, waxes and/or contaminants. Any and all loose tiles must be removed and repaired or replaced. All grout lines and irregularities must be filled and troweled flush with a suitable primer and cementitious patch to prevent telegraphing of the existing floor. All existing flooring substrates that are outside of flatness tolerances that cannot be repaired with a suitable patching compound shall be leveled with a suitable cementitious self-leveling underlayment to achieve a smooth, flat substrate.

All existing flooring substrates must have any and all site-applied finishes and/or waxes completely removed prior to flooring installation in order to ensure a proper adhesive bond. For mechanical removal, use a low-speed buffer and 40-60 grit sandpaper. Properly prepared substrates shall not have any remaining gloss or sheen. For chemical removal, ensure chemical treatments will not disrupt adhesion of the existing flooring to the substrate. Be sure to rinse the existing flooring adequately with clean, potable water to remove any and all chemicals from the surface of material.

Do not install flooring until any moisture on, between or below existing flooring has completely dried. Ensure all dust; dirt and debris are removed prior to flooring installation.

3.2.10 LOOSE LAY MOISTURE OR SOUND CONTROL PRODUCTS

It is not recommended to install over Loose Lay moisture or sound control products, please contact Technical Services with the product information you are installing over for further directions.

4. INSTALLATION INFORMATION

4.1 GENERAL INFORMATION

Prior to installation, confirm material installation pattern and direction per design specifications or work order. Inspect all tiles before installing or during installation to verify that there are no visible defects, damages or excessive shading variations. Blend materials from several cartons to ensure consistent appearance and color or shade variation. Some flooring products, colors and textures have latent and acceptable color and shade variations. If there are concerns regarding shade or color variation, do not install material and consult a sales representative and manufacturer's technical staff.

Ensure substrate is suitably prepared prior to installation, as manufacturer is not responsible for substrates that have not been properly prepared and tested for moisture. Ensure adhesive is approved for use with flooring material and the proper trowel type and size is used, as manufacturer is not responsible for any and all adhesion issues related to improper adhesive selection or usage.

Select appropriate adhesives for the intended service environment, such as wet-set acrylics or urethanes for areas that will have temperature variations or excessive windows and/or sunlight exposure from walls or ceilings such as sunrooms, window walls, skylights, etc.

NOTE: Pressure sensitive adhesives are soft setting adhesives and do not prevent effects or issues that temperature changes and direct sunlight creates in vinyl products due to thermodynamics.

Ensure substrate is clean, dry, flat, and sound prior to installation. Ensure the room is square using the 3-4-5 squaring rule or similar method to ensure acceptable installation. Determine lay out for the area if not provided by dry laying the material with the area. Cut borders and other specialty pieces to fit snugly against or around walls, thresholds, transition strips, fixtures and other protrusions or accessories. Ensure material around perimeter is 1/4" from wall or less, depending on depth of wall base or trim. Ensure all end seams are a minimum of 6" apart.

4.2 COPPER STRIP INSTALLATION

As part of the system to dissipate static electricity, the flooring must be grounded with a copper grounding strip. Prior to installation, consult project electrician or electrical engineer regarding the grounding locations for placement of the copper strips to ensure proper grounding.

We require a copper grounding strip to be placed within every 2000 square feet of installed material. We require a copper grounding strip to be placed within every room that has ESD flooring installed. This may require the extra copper grounding strips depending upon the layout of the ESD flooring being installed. For example, 2000 square feet split over 4 rooms would require 4 copper grounding strips or one in each room.

Prior to installing ESD flooring, place a minimum of 9" of the copper grounding strip into the freshly applied adhesive and trowel adhesive over the strip to ensure it is fully embedded within the adhesive. The remaining portion of the strip can be attached to the grounding point or connected to additional materials that will be attached to the grounding point.

All cracks, joints and voids must be bridged with a copper grounding strip. Center copper grounding strip over crack, joint or void and embed copper grounding strip inside the adhesive. This will require additional copper grounding strips than provided to achieve this.

Note: Electrical grounding systems should be connected and tested by a licensed and qualified electrician or electrical engineer. We have provided a few diagrams of common grounding details at the end of this document for additional information.

4.3 SELF COVED INSTALLATION

Prior to installation of the perimeter tiles measure desired self-cove height and install the appropriate Cove Cap for the area. Install the appropriate Cove Stick or Fillet strip for the desired radius from the floor to wall for the self-cove.

While bending material to desired radius, measure and cut coved area to meet the cove cap while ensuring full contact with the cove stick. The use of a heat gun or flooring torch can assist in this area of the installation but always use caution to not scorch the material.

We do recommend utilizing the Butterfly Method for creating outside corners and cutting all fill pieces and corners prior to application of the adhesive. Utilize a hand roller to ensure contact into the adhesive after placement.

4.4 ESD VINYL TILE INSTALLATION

Delane ESD Vinyl Tiles are recommended to be installed in a point to point pattern with directional arrows on the back all in the same direction.

Caution: Material is directionally sensitive; shading will occur if directional markings are not followed.

If material is installed with the directional arrows in different directions, it can be corrected utilizing restoration maintenance procedures.

4.4.1 INSTALLATION INFORMATION

Use a nail-down guide or equivalent along starting row to expedite wet-set installation. Apply adhesive according to instructions for specific product in use and observe adhesive flash times, if applicable. Ensure all adhesive working times are observed and followed. Be sure to follow instructions based on substrate porosity (porous or non-porous).

Install material into adhesive and observe directional arrows on back of tile to ensure arrows are installed in the same direction, unless installing in a specific and pre-determined design, such as a herringbone design. For larger installations, use a pyramid layout when installing tiles to eliminate run-off.

When installing into adhesive using a wet-set method, avoid walking or working on material until adhesive has cured for light foot traffic. Working on material that is installed into wet adhesive could cause adhesive to displace. When working off of material is not possible, use a kneeling board or equivalent to disperse weight evenly and prevent adhesive displacement. Pay close attention to working time to avoid adhesion issues. This may require installing material in smaller sections. Replace trowels at recommended intervals to maintain proper trowel ridge and spread rate.

Periodically lift material to ensure proper adhesive transfer and ensure adhesive has not surpassed the open time – adhesive shall cover 90% of tile. Roll material with a 3 section, 100 lb. roller within 30 minutes of installation, crossing in a perpendicular direction after initial roll. Use a hand roller in areas that cannot be reached with larger roller.

Visually inspect installation to ensure that material has not shifted and that adhesive has not been squeezed out of joints or compressed onto surface. Clean excessive adhesive or adhesive residue from the surface of the material per adhesive recommendations. **Do not apply abrasive or solvent based cleaners directly to flooring material.**

4.5 ESD RUBBER TILE INSTALLATION

ESD Rubber Tiles are recommended to be installed in a point to point pattern. There are no directional arrows on the backs of the tiles but it is a good practice to lay the sanding lines on the back in the same direction.

4.5.1 INSTALLATION INFORMATION

Use a nail-down guide or equivalent along starting row to expedite wet-set installation. Apply adhesive according to instructions for specific product in use and observe adhesive flash times, if applicable. Ensure all adhesive working times are observed and followed. Be sure to follow instructions based on substrate porosity (porous or non-porous).

For larger installations, use a pyramid layout when installing tiles to eliminate run-off.

When installing into adhesive using a wet-set method, avoid walking or working on material until adhesive has cured for light foot traffic. Working on material that is installed into wet adhesive could cause adhesive to displace. When working off of material is not possible, use a kneeling board or equivalent to disperse weight evenly and prevent adhesive displacement. Pay close attention to working time to avoid adhesion issues. This may require installing material in smaller sections. Replace trowels at recommended intervals to maintain proper trowel ridge and spread rate.

Periodically lift material to ensure proper adhesive transfer and ensure adhesive has not surpassed the open time – adhesive shall cover 90% of tile. Roll material with a 3 section, 100 lb. roller within 30 minutes of installation, crossing in a perpendicular direction after initial roll. Use a hand roller in areas that cannot be reached with larger roller.

Visually inspect installation to ensure that material has not shifted and that adhesive has not been squeezed out of joints or compressed onto surface. Clean excessive adhesive or adhesive residue from the surface of the material per adhesive recommendations. **Do not apply abrasive or solvent based cleaners directly to flooring material.**

4.6 HEAT WELDING INFORMATION

Ensure adhesive has cured for recommended period of time prior to beginning heat welding. Ensure that you have the proper welding bead for the material you are heat welding. For example, Vinyl Welding Bead for ESD Vinyl Flooring and Rubber Welding Bead for ESD Rubber Flooring.

Prior to cutting groove for heat welding, ensure gap between seams is free of adhesive, dust, dirt, debris and contaminants. To create the groove for heat welding, set the depth of the groover (either hand or electric) to remove roughly 66% of the total thickness of the tile while ensuring the removal of material is equal between the two pieces being welded. Test the groove depth on scrap material to ensure proper depth is achieved to ensure proper bonding of the heat weld bead.

Prior to welding, test weld on scrap material to ensure temperature settings and welding speeds are correct and achieve a successful bond. Do not allow foot traffic or trim welding bead until welding bead has completely cooled. To trim seam, use a clean, sharp quarter-moon spatula knife and a clean trim plate or a Crain Mozart trimmer. After one hour, trim seam again with a quarter-moon spatula knife to create a smooth, level seam surface. If seam imperfections are observed, use a hot air gun to smooth out imperfections.

After heat welded seam has completed cooled it may be necessary to utilize the heat gun to glaze the welding bead to bring out the desired color. Once the seam is glazed and cools again, the color will remain.

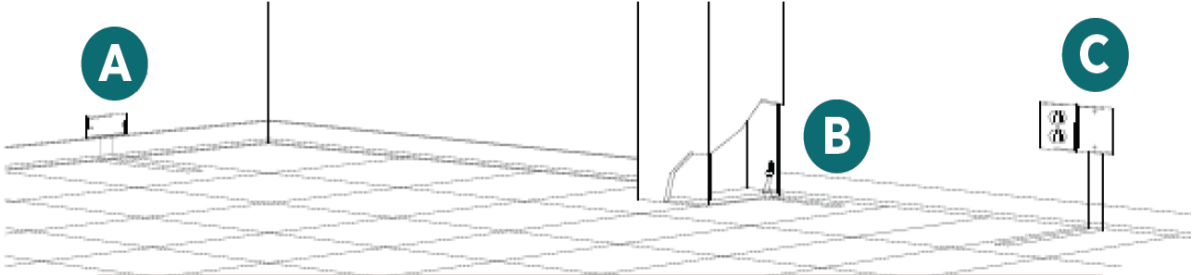
4.7 ESD PERFORMANCE TESTING

We offer testing to ensure the flooring is working properly after installation. If service is desired, that can be scheduled through the regional representative.

There are a couple of requirements for this testing. The installation must be a minimum of 14 days old, have undergone the correct prescribed initial maintenance process, and be free of additional finishes whether ESD finishes or any other standard finishes.

4.8 ESD GROUNDING DIAGRAMS

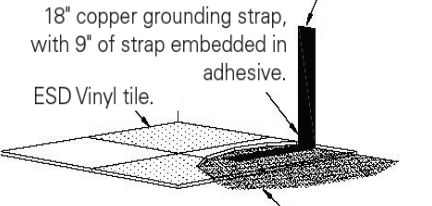
Acceptable ESD Grounding Systems & Methods



- A. Specific and/or customized ESD grounding system, such as a grounding bar, typically built into facility. Contact electrical or facility representative for detail.
- B. Steel building column or grounded building framing system. Grounding lug fastened to steel framing per NEC requirements (see Method B Detail below).
- C. Standard copper connection, typically routed to an electrical system ground connection from a receptacle box (see Method C Detail below).

Copper Grounding Strap Installation

Connect remaining copper grounding strap to acceptable grounding system.

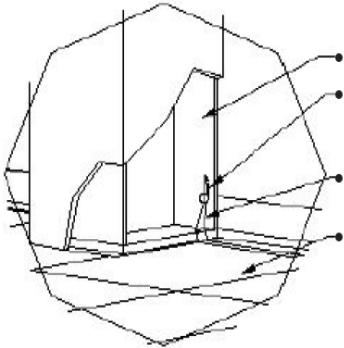


18" copper grounding strap, with 9" of strap embedded in adhesive.

ESD Vinyl tile.

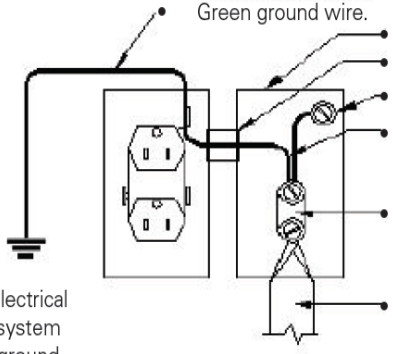
ASD-800 or USD-810, installed above and below grounding strap.

Method B Detail



- Steel building frame
- Electrical lug, mechanically fastened to steel frame for connection to copper grounding strap.
- 18" copper grounding strap, with 9" of strap embedded in adhesive.
- ESD Vinyl tile.

Method C Detail



- Green ground wire.
- Receptacle box.
- Conduit coupling.
- Receptacle box grounding connection.
- #12 awg copper wire, routed from receptacle box grounding connection, to electrical lug and then to electrical system ground.
- Electrical lug, mechanically fastened to receptacle box for connection to copper grounding strap.
- 18" copper grounding strap.
- Electrical system ground

5. FLOORING PROTECTION AFTER INSTALL

Protect newly installed flooring and accessories with construction grade paper or protective boards, such as Ram Board, ThermoPLY, Masonite or other materials to prevent damage by other trades. Do not slide or drag pallets or heavy equipment across the installed flooring and accessories. Limit usage and foot traffic according to the adhesive's requirements.

When moving in appliances or heavy furniture, protect flooring and accessories from scuffing or tearing using temporary floor protection.