

RFCI IP # 2

Recommended Installation Practice for Vinyl Composition Tile (VCT)

SCOPE

- This practice covers the installation of vinyl composition tile (VCT) flooring and the preparation of the under floor over which it will be installed.
- This practice establishes basic minimum installation procedures for VCT. Specific manufacturer recommendations for their products will supersede these general guidelines regarding product installation.

APPLICABLE DOCUMENTS

- ASTM F-1066 - Standard Specification for Vinyl Composition Tile (VCT)
- ASTM F-710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
- ASTM F-1482 - Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring
- ASTM F-1869 - Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
- ASTM F-2170 - Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In Situ Probes
- ASTM F-2420 - Standard Test Method for Determining Relative Humidity on the Surface of Concrete Floor Slabs Using Relative Humidity Probe Measurement.
- ACI 302.1R - Guide for Concrete Floor and Slab Construction 117R Standard Tolerances for Concrete Construction and Materials
- Resilient Floor Covering Institute (RFCI) Recommended Work Practices for the Removal of Resilient Floor Coverings
- MASTERSPEC Guide Spec Section 03300, "Cast-In-Place Concrete"
- SPECTEXT Guide Spec Section 03346, "Concrete Floor Finishing"

HANDLING

- VCT must be stored in a protected, dry interior area. Product storage must be adequate to prevent product distortion. Do not double stack pallets.
- If the tile is chipped, cracked, indented or otherwise distorted during storage or transporting, do not attempt to install it.
- Marking pens, felt-tipped markers, or waxed crayons should not be used to write on the tile nor used to mark layout on the under floor, as they could bleed through and stain the material.
- VCT flooring products are heavy. Always use correct lifting techniques when handling these products.

SITE CONDITIONS

- The permanent HVAC system must be in operation before installing VCT.
- VCT should be installed only after other trades have finished.
- Keep all tile and accessories at the job site at room temperature (min. 65°F./18.3°C. and max. 100°F./37.8°C.) for at least 48 hours before, during, and after the installation. When using reactive adhesives, such as epoxies, the room temperature should not exceed 85°F./29.4°C. during installation. Thereafter, temperature should be maintained above a minimum of 55°F./12.8°C. Excessively high or low interior air relative humidity will influence curing of floor

patching materials and adhesive open times. Those conditions during installation should be avoided.

- VCT flooring products are intended for interior locations only.
- Underlayments utilized should be installed and prepared according to the specific underlayment manufacturer's written instructions. Use appropriate types as recommended by the flooring manufacturer.
- Good lighting is necessary for proper observation of substrate conditions and material issues, as well as for general safety reasons.

ENVIRONMENTAL CONDITIONS

- Consult appropriate Material Safety Data Sheet(s) (MSDS) for proper handling of sundry items.
- During installation, the room should be well ventilated. Maximize fresh air ventilation by utilizing exhaust fans, at point of use, and by opening windows and doors as necessary. Do not use fans to force dry adhesive.
- Because some materials used during the installation of resilient flooring may be flammable, make sure no sources of ignition or open flame exist near the use of those materials.
- Excessively high or low interior air relative humidity will influence curing of floor patching materials and adhesive open times. Those conditions during installation should be avoided.

PLANNING

- The earlier in the planning or project bidding phase that various suppliers and trades can reach agreement on key issues prior to installation, many problems and potential causes of dissatisfaction can be avoided.
- Prior to installation, material estimates should be made by taking exact measurements of all areas to be installed. To allow for tile fitting, a waste allowance must also be included in the estimate. Waste allowances are generally based on job size and area irregularity and can vary from 1-2% for very large jobs to greater than 10% for small installations. Resilient flooring manufacturers may be contacted for waste allowance estimates.
- Prior to installation, check the material for correct quantity, color, shade, size and lot number. For best shade match, use a single shade with the same manufacturing date/lot number.
- Do not install material with obvious visual defects.
- It is common practice that a minimum 2–3 % additional flooring material or "attic stock" be included to cover future repair and/or building plan adjustments.
- For areas subjected to concentrated static and/or dynamic rolling loads, it may be recommended that a hard-set adhesive be utilized under the flooring. Refer to specific manufacturer's recommendations.
- Installation directly to the under floor (concrete, wood, metals, terrazzo, etc.) is the preferred method for VCT. If installation over existing resilient flooring is necessary, check individual manufacturer's literature to see if it is permitted and what limitations may apply.
- If an underlayment is being installed or material is installed over an existing floor (check individual manufacturer's literature to verify if this is permitted), doors that may not have sufficient clearance will require trimming. Determine who will be responsible prior to the installation.
- Use of installation accessories (e.g. adhesive) matched to specific product provides performance and warranty advantage.
- Prior to installation, there should be an agreement as to who will move items such as furniture, racks, appliances, etc.
- Appliances requiring utility disconnect (water, gas, etc.) may be subject to applicable local code requirements. Disconnect/reconnect arrangements are to be determined in advance by the end user or general contractor.

- Castors and/or glides utilized on furniture or equipment should distribute weight sufficiently to allow static loads to conform with manufacturer's recommendations.
- Verify in advance who will remove, recycle and/or dispose of the existing flooring, if applicable, as well as the remnant scraps.
- The end user should be shown the proposed installation layout.
- The end user should be provided a copy of the appropriate maintenance and warranty information pertaining to the product selected.

LAYOUT

The flooring dealer or contractor should provide a layout drawing for the intended installation that includes the following information:

End User:

- Name
- Address and telephone number (contact)
- Directions to job site
- Room location
- Date of drawing
- Scale of drawing
- Location, swing, and clearance of all doors
- Existing floor/under floor conditions
- Name(s) of those responsible for preparation and/or removal of existing floor/under floor
- Name of manufacturer, product style and pattern to be installed
- Product quantities required
- Pattern orientation, i.e. basket weave, same direction, on 45 degree, etc.
- Location and type of all edge moldings and base required

End User Sign-off:

- The end user should be shown or provided a copy of the layout drawing for approval prior to installation.

SUBFLOOR RECOMMENDATIONS AND PRECAUTIONS

Types of Satisfactory Under Floors:

- Typical under floors, provided they are structurally sound and properly prepared to receive resilient flooring, are considered satisfactory for use under VCT. Review the flooring manufacturer's installation manuals for specific recommendations that may provide more guidance or detail beyond the recommendations provided here.
- Clean, dry, fully cured concrete slabs on all grades
- All American Plywood Association underlayment panels rated as underlayment grade with a fully sanded face
- Sturd-I-Floor rated veneered plywood, wafer, or oriented strand board
- All veneered, etc., underlayment panels recommended and warranted by the panel manufacturer for use as resilient underlayment
- Fiber cement boards and cementitious backer boards
- Ceramic tile, terrazzo, marble
- Resilient flooring, maximum one layer thick, that has been skim coated with embossing leveler
- Polymeric poured (seamless) floors
- Steel, stainless steel, aluminum, copper, brass, bronze, lead
- Trowel-able underlayments, patches and levelers

Special Notation:

- Coatings, sealers, curing compounds present may require non-chemical removal.
- For tile-on-tile installation (refer to manufacturer recommendations), finish must be removed; loose or damaged tiles must be repaired.

ALL WOOD SUBFLOORS MUST BE A DOUBLE LAYER CONSTRUCTION, SUSPENDED AT LEAST 18" ABOVE GRADE AND HAVE ADEQUATE CROSS-VENTILATION.

DO NOT install VCT products over any of these under floors:

- Asphalt tile or asphalt-based adhesive or surfaces containing any type of residual adhesive
- On-grade or below-grade concrete under floor subject to excessive moisture or hydrostatic pressure
- Loose-laid or perimeter-fastened existing floor covering
- Self-stick tile
- Existing resilient or cushioned (containing foam layers) flooring
- Stripwood or plank under floors
- Radiant-heated floors with surface temperature greater than 85°F. (29.4°C.)
- Linoleum

UNDER FLOOR PREPARATION

- Documented moisture testing must be conducted on ALL concrete substrates, regardless of the grade level and age. The common test methods are ASTM F-1869 and/or ASTM F-2170. Generally acceptable ranges are 5.0 lb. MVTR or below for ASTM F-1869 and/or less than 75 % RH per ASTM F-2170. Check specific manufacturer recommendations for details.
- Documented pH testing must be conducted on ALL concrete substrates, regardless of the grade level and age.
- Bond tests, as recommended by the flooring manufacturer, must be performed and documented prior to the start of the installation.
- If a moisture reducer or blocker system is utilized, verify suitability of use and warranted performance. Bond testing must be performed. A cementitious underlayment may be required with a moisture blocker system, at a specified thickness, and reduction of adhesive spread rate may be required.
- The under floor must be smooth, clean and dry.
- All dirt, dust and other debris or substances must be removed.
- Cracks should be patched with an appropriate patching/leveling compound.
- Any wood stain, solvent or oil-based spills must be completely removed.
- All fasteners must be secure and set flush with the surface of the under floor.
- All existing resilient floor coverings with surface irregularities, unevenness or deep embossing must be covered with a minimum 1/4-inch (6.4 mm) underlayment or over-layed with a cementitious latex embossing leveler. Otherwise, they must be completely removed. Check specific manufacturer recommendations.
- All ceramic tiled floors must be over-layed with a cementitious latex patching compound designed and warranted for such a purpose and allowed to fully cure prior to the installation of the vinyl composition tile products.
- **DO NOT** install VCT over expansion joints. Refer to the specific manufacturer recommendations regarding control joints and the use of polymeric filler or joint covers.

RFCI RECOMMENDED WORK PRACTICES

- Instruction for removal of existing floor covering can be obtained by contacting the manufacturer of the product being installed or by consulting the “Recommended Work Practices for the Removal of Resilient Floor Coverings” brochure that is available from the:

Resilient Floor Covering Institute
401 E. Jefferson Street, Suite 102
Rockville, Maryland 20850
Telephone: (301) 340-8580
Facsimile: (301) 340-7283
www.rfci.com

WARNING: Do not sand, dry sweep, dry scrape, drill, saw, bead-blast or mechanically chip or pulverize existing resilient flooring, backing, lining felt or asphaltic “cut back” adhesives. These products may contain either asbestos fibers or crystalline silica. Avoid creating dust. Inhalation of such dust is a cancer and respiratory tract hazard. Smoking by individuals exposed to asbestos fibers greatly increases the risk of serious bodily harm. Unless positively certain the product is a non-asbestos containing material, you must presume that it contains asbestos. Regulations may require that the material be tested to determine asbestos content.

MOLD and MILDEW

- Issues concerning mold and mildew are gaining increased attention from both residential and commercial property owners, as well as the public at large. In virtually all situations, if there is a mold issue, there is an excessive moisture issue. In order to prevent, control, or remediate mold and mildew, one must first identify, evaluate, and eliminate the source of excessive moisture.
- Prior to removing an existing resilient floor following the RFCI Recommended Work Practices for Removal of Resilient Floor Coverings (unless state or local law requires other measures) 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 where resilient flooring is to be removed or installed, 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 subfloor, 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 of resilient flooring, all flooring work should stop until the mold or mildew problem (and any related moisture problem) has been addressed. Before installing the new resilient flooring, make sure the underlayment and/or subfloor is allowed to thoroughly dry and that any residual effect of excessive moisture, mold or structural damage has been corrected.
- To deal with mold and mildew issues, you should refer to the U.S. Environmental Protection Agency (EPA) guidelines that address mold and mildew. Depending on the mold or mildew condition present, those remediation options range from cleanup measures using gloves and biocide to hiring a professional mold and mildew remediation contractor to address the condition. Resilient flooring, because it is relatively non-porous, allows any mold and mildew on the flooring surface to be easily cleaned. Remediation measures may require structural repairs such as replacing underlayment and/or subfloor contaminated with mold or mildew as a result of prolonged exposure to moisture.
- The EPA mold guidelines are contained in two publications: “A Brief Guide to Mold, Moisture and Your Home” (EPA 402-K-02-003) and “Mold Remediation in Schools and Commercial Buildings” (EPA 402-K-01-001). Appendix B of the “Mold Remediation in Schools and Commercial Buildings” publication describes potential health effects from exposure to mold, such as allergic and asthma reactions and irritation to eyes, skin, nose and throat. These publications can be located on the EPA website at www.epa.gov/iaq/molds/.

INSTALLATION OF VINYL COMPOSITION TILE (VCT) FLOORING

- Be sure that the subfloor is ready for installation of the product, including removal of all molding and checking of door clearances. Thoroughly sweep the subfloor to remove all dirt and debris.

Tile Layout:

- As with all tile formats, VCT tiles should be “balanced” in the work area. Tiles may be laid squarely in the work area or laid out diagonally in the work area. In either case, the room must be accurately measured to square off the area and to determine the center point of the area. It is critical that the intersection of the chalk lines be square at 90°. All border tiles should be of nearly equal dimensions and at least one-half of a tile wide. Careful and precise measurements must be taken during tile layout. Do not install over expansion joints.

Adhesive Application:

- Apply the recommended tile adhesive with the specifically recommended notched trowel. Begin by applying adhesive at the intersection of the chalk lines and spreading either one quadrant or one-half of the work area depending on the size of the room. Most VCT adhesives are of the pressure-sensitive type, so be sure to allow sufficient open time for all free water to flash off and the adhesive to dry to a tack, sufficient that the tile will not slide during placement. Do not use a fan to force dry the adhesive. Avoid dusty conditions that may reduce adhesive bond strength. Install tile within recommended open time for adhesive.
- If a spray adhesive system is utilized, verify suitability for use under VCT. Closely follow spray adhesive manufacturer’s installation recommendations. Under floor surface must be “extra clean” in order to make sure debris is not coated and trapped under installed tile. Make certain the spray tip is the correct one recommended for use with VCT. There should be no drips from the wand. Any drips that do occur must be wiped smooth. Proper spray pattern is important and should be applied in a thin uniform layer with slight over-lapping lines at top and bottom, with no evidence of puddling, splatters or drips. Be careful not to overspray along wall edges, etc.

Tile Installation:

- After the adhesive has had sufficient open time, begin laying the tile at the intersection of the working lines. Be certain this tile is installed squarely on the lines. After the first tile is in place, begin laying tiles outward along both guide lines. Press tiles firmly against adjoining tiles and press into the adhesive. Begin stair-stepping the tiles into the field area. Maintain the squareness of the installation by keeping tiles along guide lines.

Cutting and Fitting Border Tiles and Planks:

- Vinyl composition tile can be cut with a tile cutter or by using the "score-and-snap technique". Direct or pattern scribe the flooring to fit into complicated, irregular walls or pipes, etc.

Finishing the Job:

- Some manufacturers recommend rolling tile in both directions, with a three-section 100 lb. floor roller immediately after installation, in order to firmly seat tile into the adhesive.

REPAIRS

Chipped or damaged tiles can collect debris. To repair, follow these steps:

- If possible, the floor covering repair piece should come from the original installation.
- Heat tile to soften adhesive.
- Remove the damaged tiles and scrape the subfloor clean of any remaining adhesive.

- Re-apply adhesive on the subfloor and allow to dry to a tack before setting the repair tile.
- Roll the repair piece with a hand roller.

CLEANUP AND FINAL FINISH

- It is recommended that the end user retain some “attic stock” or, at a minimum, any remaining partial boxes of tile for repair work, should it ever be necessary.
- Check appearances of entire installation. Use proper cleaner or solvent to remove any adhesive on the surface of flooring or walls. Latex adhesive that is still wet can be removed with water; if dry, remove with mineral spirits. Follow precautions on label of mineral spirits manufacturer.
- It is recommended that all exposed edges of the flooring be covered. Use product coving, cove base molding or wood trim along the walls around the perimeter of room, and protective molding at doorways or areas where the new flooring will fit against an existing flooring.
- If it is not feasible to cover an exposed edge of the flooring with protective molding, such as around floor drains, expansion joint covers or areas where the new flooring meets an existing flooring, etc., use a two-part epoxy or polyurethane adhesive to adhere the flooring in these areas. If the exposed edge of new flooring extends above an adjacent existing flooring, a protective molding must be used. A good quality caulk must be used to seal the edge around fixtures such as tubs, toilets, etc.
- Use the floor as little as possible for at least twenty-four (24) hours after completion of the job, to minimize indentation while adhesive sets.
- If other work is to be performed in the room, protect the floor covering with a minimum of two coats of quality commercial finish suitable for the application.
- Furniture and appliances should be equipped with rests sufficiently large enough to meet the static load limit requirements recommended for the flooring material.
- To move furniture and equipment across the floor, use plywood or hardboard panels smooth side down as a runway, even when an appliance hand truck is utilized.
- It is not recommended to move heavy furniture or allow rolling load traffic on the floor for at least 72 hours after installation.
- The floor must be maintained as specified by the flooring manufacturer. This typically involves an application of at least three to five coats of polish before putting the room into service.
- Walk-off mats are recommended at all exterior entrance ways.

CUSTOMER ACCEPTANCE

- Upon completion of the job, the end user (customer) should sign a "job completion ticket".

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