

# CFI Wood / Laminate STUDY GUIDE

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Disclaimer: The International Certified Floorcovering Installers Association® assumes no liability for the application of the principles or techniques contained in this study guide. The information in its entirety was prepared for professionals in the industry to use as guidelines when addressing installation and difficulties that arise concerning the installation of ceramic tile. **The primary source of direction is the individual product manufacturers who reserve the right to provide specific installation instructions, which are to be strictly adhered to by installation professionals.**

## CFI

CFI represents installers and provides training and certification in all types of flooring

CFI is the organization that promotes the professional flooring installers to the industry and consumers.

CFI installers are expected to perform successful installations every time.

CFI promotes pride and professionalism,

CFI Certified Residential Wood and Laminate Installers are required to pass oral, written and hands-on tests.

CFI stresses pride, professionalism, attitude, skill and knowledge which assist when working with dealers, contractors, manufacturers and customers.

## THE CUSTOMER

1. People skills are described as the ability to satisfy the customer and communicate
2. The ultimate goal is customer satisfaction.
3. You never get a second chance to make a good first impression!

## RULES and ORGANIZATIONS

1. **EPA** - Environmental Protection Agency
2. **OSHA** - Occupational Safety and Health Administration
3. **ANSI** - American National Standards
4. **ASTM** - American Standard Test Methods.
5. **NALFA** - North American Laminate Flooring Association
6. **NWFA** - National Wood Flooring Association

## MEASURING AND ESTIMATING

1. The best installation begins at the time of the sale
2. Manufacturer's installation guidelines are **ALWAYS** to be followed.
3. Length times width = square footage of the area.
4. Round off to the next full carton – flooring is sold by the full carton.

## PRIOR TO THE INSTALLATION

5. Do NOT proceed until you check for the right product; free of manufacturing defects. If a problem, call the store.
6. Permanent, fully operational HVAC systems should be in place and working to allow for proper acclimation,
7. A consistent temperature is to be maintained between 60-75 degrees and relative humidity between 35-55%.
8. **Acclimation is required!** Upon delivery of the flooring, **acclimate** according to manufacturer recommendations.

## OSHA and EPA Guidelines

1. **OSHA** - Occupational Safety Health Administration
2. **OSHA** - Office of the Federal Government
3. **OSHA #3165** (white-blue) "Employee's Right To Know" - Employees must be trained to install ALL products handled. Note: New poster #3165 (white-blue) replaces the #2203-yellow.
4. **HAZCOM** -Hazardous Communications Plan
  - (a) Keep Safety the #1 Priority
  - (b) Plan lists training procedures for company employees
  - (c) States location of MSDS Sheets
  - (d) Identifies all products company uses and chemical inventory
5. **FINES**
  - (a) Maximum first time fine is \$7,000.00
  - (b) Maximum-next offense is \$70,000.00
6. **FINES** issued for items such as:
  - (a) No HazCom Plan
  - (b) No Kneepads
  - (c) No First-Aid Kit
  - (d) No Ventilation
  - (e) Defective tools
  - (f) Improperly labeled or unmarked containers
  - (g) Ground wire removed from electrical cords
  - (h) No MSDS sheets (Material Safety Data Sheets)

7. **MSDS-MATERIAL SAFETY DATA SHEET lists:** (Request MSDS at time of purchase)
  - a) Manufacturer and product
  - b) Physical data (volatile, boiling point, etc.)
  - c) Fire and explosion hazard data -how to extinguish fire, etc.
  - d) Hazardous Ingredients
8. **CHEMICALS** can only be transferred by ONE person to another properly labeled container.
9. **HEALTH HAZARD DATA listed on MSDS** (exposure limits, first aid) includes the following.
  - (a) Reactive data (stability - what not to mix with product)
  - (b) Special handling precautions
  - (c) Special protective equipment and procedures - gloves/ventilation
  - (d) Spill and leak procedures
10. **ASBESTOS** should always be covered or encapsulated -Testing is only way to properly identify
11. **FIRST AID KIT**- Contents of kit must be undisturbed with a letter signed by a physician and readily available
12. **EPA** – Environmental Protection Agency of the federal government

## SAFETY

1. ALWAYS be aware of the location of the **First-Aid kit**.
2. **To avoid tripping**, hoses and power cords should be placed along walls and away from traffic
3. Be aware of materials that **create silica dust**. Take precaution to avoid the intake of airborne silica and possibly lead or asbestos. Use water to wet down dust or **HEPA vacuums** to prevent airborne particles.
4. When lifting heavy objects, it is important to follow **safe lifting procedures** and use a back brace if recommended.
5. All tools and equipment are to be **properly maintained** and operated by those authorized to do so.
6. Keep the **work area clean** and free of debris
7. To avoid injury, never be under the influence of **alcohol or illegal drugs**
8. As recommended, **wear safety glasses, gloves and all protective equipment**
9. Protect hearing by **using earplugs** when exposed to loud noises or equipment
10. All materials on jobsite require material safety data sheets (**MSDS**) for product information in regard to safety and health.
11. Use power tools that are equipped with a dust collector. If high dust levels are encountered, use an appropriate designated dust mask. Avoid dust contact with eyes and skin.

## ELECTRIC TOOLS

1. **Always follow manufacturer's recommended safety precautions when using power tools!**
2. **Power equipment** should only be operated by persons authorized to use the machines.
3. Power tools and extension cords are to be grounded by 3-prong plugs and a GFCI, ground fault circuit interrupter.
5. All electrical connections meet code; ie, ground plugs, no cuts in cord, etc. Most electric tools are grounded with a third wire, which is **never cut off the plug**
6. Damaged extension cords are **NOT** to be used.
7. When working with saws, installers are to **protect their hands and wear eye protection to guard against flying chips or nail heads**.
8. Operations involving sawing, sanding or machining wood products can produce **wood dust**.
9. **Airborne wood dusts** can be an explosion hazard. Wood dust may also cause respiratory, eye and skin irritation.
10. The power tool must be equipped with a **dust collector**
11. Use the appropriate **NIOSH-designated dust mask**. Avoid dust contact with eyes or skin.
12. All **blade guards** are to be properly attached.
13. Shop vacuums are **not** to be used for removing flammable liquids.
14. To remove a person in contact with live or hot tools, **shut off the power**.

## TO AVOID SHOCK

1. Keep **hands dry**.
2. Wear non-conducting **rubber-soled shoes and rubber gloves** when working on wet or damp surfaces.
3. Use **heavy-duty extension cords**
4. Keep **electric lines** away from nails, sharp edges or corrosive chemicals or where they may be run over by vehicles.
5. Regularly **inspect** all electric cords and tools and repair/replace **frayed cords** immediately
7. **Disconnect power lines** before changing tool accessories or before adjusting or repairing tools
8. Always use a ground fault circuit interrupter (**GFCI**) when using power equipment.

## MOISTURE – ALKALINITY – POROSITY - HUMIDITY

1. It is not the responsibility of the installer to conduct moisture testing, but it is the installer's responsibility to make certain that the moisture tests were conducted and the results are documented for future reference.

2. **Calcium Chloride testing** ASTM 1869
3. **In-situ rH probe testing** ASTM 2170
4. **MAT TEST** is a qualitative test that **ONLY** checks for moisture using a plastic or rubber mat left in place for 48-hours.
5. **Efflorescence** – residue deposited on the surface of a material by the crystallization of soluble salts.
6. **pH** tests determine strength of salts, known as base or strength of acids in a substance, whether a liquid or solid state.
7. **pH of concrete neutral is 7. Strong salt (alkali) is represented by a 14 reading.**
8. **pH tests** are conducted at the same time on floors free of sealers and contaminants. 3 tests are taken for the first 1000 square feet and one additional test for every 1000 feet thereafter.
9. The **more porous the slab**, the more vapor migration occurs
10. The more porous the slab, the **less open-time** for adhesive.
11. **Dew Point** is the temperature at which condensation forms
12. **Humidity** is the amount of water vapor in the air
13. **Relative Humidity** is the amount of moisture in the air in percentage.

#### **PATCHING COMPOUNDS**

1. **GYSUM BASED:** White in color – lower psi rating – susceptible to mold and mildew. Expands during dry out and expands with moisture after it is cured.
2. **PORTLAND BASED or CEMENTITIOUS:** Usually gray in color – higher psi rating – will not promote mold and mildew may shrink during dry out period - may need to apply a second coat
3. **SELF-LEVELING COMPOUNDS:** Used for irregular substrates

#### **SEALER – PENETRANTS**

1. NOT all sealers are ready for floor coverings within 24-72 hours
2. Sealers address moisture, but not pH and can react with certain adhesives, causing a failure.

#### **GRADE LEVEL**

1. If there is more than 3” of soil against any wall, the entire level is considered to be **BELOW grade**.
2. Ground should be sloped away from the house (3” in 10’) for proper drainage
3. Three grade levels are recognized as above-grade, on-grade and below grade.
4. Prior to installing flooring, concrete slabs must cure for minimum of 90-120 days unless manufacturer states otherwise.
5. Before beginning moisture testing, slab should be cured a minimum of 30 days (check with manufacturer)
6. Tolerance should be flat to within 1/8” in 6-feet or 3/16” in 10-feet.
7. Slabs on, above, below grade, and lightweight concrete should have a vapor retarder installed.

#### **Onsite Conditions**

1. Building should be closed in and outside doors and windows must be in place.
2. All concrete, masonry, framing members, drywall, paint and other wet work should be thoroughly dry.
3. In warm months the building must be well ventilated.
4. Basements must be dry and well-ventilated.
5. Crawl space must be dry and must be a minimum of 18” from ground to underside of joists with perimeter venting.
6. Do not install in areas with a sump-pump or floor drain.

#### **Wood SUBFLOOR**

1. Subfloor must be flat, dry, free of wax, paint, oil and debris, sound, clean with no squeaks or protruding nails /staples.
2. Subfloor tolerance should be flat to within 1/8-inch in 6-feet, 3/16-inch in 10-feet.
3. **PREFERRED underlayment** - 3/4 -inch CDX grade plywood 4’x8’ sheets OR 3/4 -inch OSB, 16” o/c joist construction.

#### **SOLID BOARD SUBFLOORING should be 1” x 6” nominal dense softwood**

1. Solid board subfloors - No wider than 6” installed at 45-degree angle, all board ends full bearing on joists and fastened.
2. See Manufacturer guidelines - add moisture barrier before applying underlayment for a floating subfloor over concrete
3. Install 2 layers 1/2” CDX grade plywood 4x8 underlayment
4. Loose lay **first layer** with 1/8” gapping between sheets with staggered joints
5. Lay **second layer** perpendicular or at 45-degree angle to first and keep 3/4” gap at all vertical obstructions
6. Staple, screw or nail second layer to first layer 12” on center with fasteners not to protrude through bottom of subfloor

#### **WOOD - GLUE-DOWN Subfloor**

1. Minimum 5/8” CDX grade plywood underlayment
2. Sections of 2x8’ or 4x4’ in staggered joint pattern in adhesive, using 1/4”x1/4” notched trowel
3. Spacing - 1/8” between sheets with staggered joints and 3/4” expansion space at all vertical obstructions
4. Use 1-1/2” mechanical fasteners to install hardwood

#### **WOOD - NAIL-DOWN Subfloor**

1. Minimum - 5/8”, 3/4” preferred, CDX grade plywood underlayment preferred 4x8’ sheets
2. Spacing - 1/8” between sheets with staggered joints
3. Start at the center of the panel and work toward the edges; use a minimum of 32 nails (shots) per 4x8’ panel.
4. Expansion space - 3/4” all vertical obstructions and use 1-1/2” mechanical fasteners to install hardwood

### **WOOD Pre-Finished Mechanically Fastened Solid Strip (3/4" x less than 3" wide)**

1. Consider aesthetics, doors and fireplace area when selecting starting wall; usually the longest in the room
2. Place an approved vapor retarder before installing wood flooring
3. For the first two rows, use the longest, straightest boards available
4. Use the widest plank for the first row for random and alternate width products
5. Align tongue of first row on chalk line.
6. Top nail and blind-nail first row - Top nail every 10"-12," use 6d-8d casing or finish nails, staying 1"-3" from the ends.
7. Countersink nails and maintain the expansion area
8. **BLIND-NAIL** – 45-degree angle through tongue. If necessary, countersink nail flush to ensure proper fit of next board.
9. Use this method and continue blind nailing following rows until stapler can be used.
10. Alternatively, use pneumatic finish nailer and install nails/brads at the same intervals with a minimum length of 1-½"-2"
11. To ensure a favorable overall appearance, stagger end-joints of adjacent rows a minimum of 4-to-6," when possible

### **Installing the WOOD Floor**

1. Undercut casings and jambs
2. **Always use the recommended stapler** for the specific product being installed..
3. To determine proper pressure and alignment of fasteners, fasten at least two test boards, stapled side by side
4. **Before proceeding, CHECK** for surface damage, air pressure setting, tongue damage, edge blistering, etc.
5. "Racking" of flooring provides opportunity to inspect for problem boards and proper staggering of joints
6. The last 1-2 rows are to be face-nailed when clearance does not permit blind nailing with stapler or brad nailer.
7. Install transition molding and fill in top nailed areas and minor gaps with matching filler.

### **Glue-Direct Engineered Hardwood Installation Procedures**

1. Apply manufacturer moisture-reduction system, if necessary
2. Preferred - Start on longest wall; usually exterior walls are the straightest.
3. Undercut casings and jambs
4. Measure off wall 2-3 rows and strike a chalk line. Allow for expansion area.
5. Nail a sacrificial row of wood flooring with 1" concrete nails along dry side of chalk line.
6. Work away from the wood flooring. If it is necessary to work directly on the adhered flooring; use a kneeler board.
7. Chalk line grids to maintain clean work area.
8. Grid out only the area that can be installed before adhesive skins over.
9. Do not allow adhesive to skin over – If this occurs, remove adhesive and apply fresh adhesive

### **ALWAYS use manufacturer's recommended products, tools and guidelines**

1. Use manufacturer recommended trowel and adhesive for installation of wood flooring
2. Use blue tape when needed and remove it as soon as possible, preferably the same day, but no later than 24 hours.
3. Use a blue tape with minimal adhesive. DO NOT place tape over any residual adhesive remover.
4. Install wood in a random stagger application.
5. Place board to be installed close to installed board to minimize adhesive displacement and memory pull back.
6. Engage end joints first; than length of board.
7. Some manufacturers may recommend gluing the end joints on plank flooring (wider than 3 inches)
8. Clean up as you proceed with the installation, using a white cotton towel and adhesive remover.
9. Use urethane adhesive remover for urethane adhesives; paint thinner for hybrid and pressure-sensitive adhesives
10. Roll floor with appropriate roller if manufacturer recommends. Fill in minor gaps with blended filler
11. Keep traffic off of the floor for a **minimum of 24-hours**.

### **Floating Engineered Hardwood without Mechanical Fastening – Installation Procedures**

1. Start off longest wall. If wall is not straight, scribe to wall and transfer lines to boards
2. Cut boards to fit wall and install correct underlayment. Use spacers to maintain proper expansion
3. Use the correct adhesive if the manufacturer recommends gluing of tongue and groove
4. Use tapping block that is recommended by the manufacturer.
5. Random stagger the joints. Fill in minor gaps with blended filler.
6. Clean up adhesive residue with clean cotton towel and adhesive remover

### **LAMINATE FLOORING - Product – Planning - Estimating**

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1. The click system allows laminate floors to be walked on immediately.
2. Most laminate is 4 different layers; wear layer - DPL or HPL Decorative Paper or High Strength Paper - core layer and backing or stabilizing layer.

### **PLANNING, MEASURING and ESTIMATING**

1. Laminate is not fixed to subfloor – it is installed as floating floor, with sufficient space for movement around perimeter
2. Check with the manufacturer to determine the expansion distance.
3. Allow time for laminate to acclimate in unopened cartons where the installation will occur, **48 hours-minimum**
4. Before starting the installation In very dry or very humid climates, allow at least 96 hours for acclimation.
5. Relative humidity should be **30-55%** - temperature stable and within 15-degrees of normal operating temperature.
6. Laminate flooring can be installed above, on or below grade.

7. Prior to installation, ALWAYS check each panel to make sure it is not damaged.
8. Inspect the outside surroundings for improper drainage or obvious sources of moisture.
9. Yard should slope away from foundation at least ½" per foot for 10.'
10. Eaves and gutters must adequately direct rainwater away from the foundation.

#### **ALL SUBFLOORS**

1. The surface of the floor must be clean.
2. Surface must be flat, defined as maximum difference between two adjacent high points and the intermediate low point.
3. Check low spots or ridges as allowed by the manufacturer.
4. It must be structurally sound - the maximum acceptable difference in level is 3/16-inch in a 10-foot radius.
5. Fill excessive voids or low areas using a leveling compound.
6. Allow the leveling compound to thoroughly dry before beginning the laminate flooring installation.
7. High areas can be ground down or floated over with a manufacturer-approved self-leveling compound.
8. The subfloor must not slope or incline more than 1-inch in 6-feet.
9. Use laminate flooring foam or noise-reducing underlayment
10. Remove existing carpet and/or wood flooring on concrete subfloors prior to installation.

#### **WOOD SUBFLOOR REQUIREMENTS**

1. Wood subfloors must have stable moisture content between 6-10%.
2. Creaking subfloors must be repaired before installation.
3. Sand or plane high areas; low areas - patch or fill with correct leveling compound or cover with a rigid underlayment
4. Leveling compound is to dry completely before starting the laminate installation – check with manufacturer
5. Polyethylene film must **not** be used on top of wood floors or subfloors.
6. Over wood floors or subfloors, 2-in1 pads can be used.

#### **CHECK MOISTURE**

1. Record and/or document the residual moisture content and record in a reliable manner for future reference.
2. Use a wood moisture meter to check moisture content of wood subfloor is LESS than 14%.
3. Check concrete moisture by taping a 2ft x 2ft of polyethylene film in a minimum of 2-3 locations; more in large areas.
4. This is a qualitative test; meaning it only indicates presence of moisture. If moisture present, requires additional testing
5. Indications of high moisture content: darker or discolored concrete, cloudy polyethylene film or condensation on the underside of the film.
6. Moisture content cannot exceed 25% on a dry weight basis with a 6-mil polyethylene vapor barrier. Check manufacturer
7. Concrete subfloors, use 6-mil polyethylene film as vapor barrier, overlapped by 6" minimum. Check manufacturer
8. Calcium-chloride test: maximum acceptable reading is 5lbs. / 24 hours / 1,000 square feet, using a 6-mil polyethylene vapor barrier.
9. Use 3 tests per first 1,000 sq. ft. and 1 test per 1,000 sq. ft. thereafter.
10. New concrete subfloors and basements should be cured for a minimum of **90-120** days prior to the installation.
11. Existing sheet vinyl/linoleum with **welded** seams in good condition can also serve as vapor barrier, 6-mil polyethylene film is also recommended.
12. Prior to the laminate installation, remove existing wood flooring on concrete subfloors

#### **LAMINATE FLOORING - Installation Information**

##### **1. ACCLIMATE FLOORING at minimum of 48-hours PRIOR to the installation**

2. Unopened cartons of planks are placed flat on floor in area at least 3' away from outside walls, heating or air-conditioning vents
3. Maintain temperatures between **60-85 degrees F** and a **35-65%** relative humidity level.

#### **UNDERLAYMENTS**

1. Laminate floors are floating floors that are not attached to the subfloor
2. Floors rest on a resilient underlayment that reduces noise, increases impact resistance, provide walking comfort and captures the adhesive oozing from the underside of the panel joints, maintaining the floating action of the floor.

#### **POLYETHYLENE FILM**

1. Vapor barrier is required on concrete subfloors – check with manufacturer
2. Layer of polyethylene film must be installed beneath the underlay foam or noise reducing underlayment.
3. If film sheets require overlap, follow manufacturer installation guidelines.
4. Polyethylene film should not be installed on wood, carpet, particleboard or other organic materials.

#### **UNDERLAY FOAM**

1. Foam gives comfort to walking and muffles impact sound and also helps to prevent indentation.
2. Foam is unrolled side by side, taped and loose fit. Seams of foam are not overlapped.
3. Underlay foam is **not** a moisture barrier.

#### **2-in-1 PAD**

Use polyethylene film moisture barrier with closed-cell foam cushion over hard subfloors to absorb noise-increase comfort

### **NOISE-REDUCING UNDERLAYMENT**

1. Reduces drum and impact sounds, provides good walking comfort and increases impact resistance.
2. Recommended for use in multi-unit dwellings, such as apartments/condos
3. A layer of polyethylene film must be used as a vapor barrier, on concrete or radiant-heated subfloors

### **EXPANSION SPACE**

1. Because of the nature of a floating floor, leave a minimum **¼-inch expansion space** around the entire perimeter of the room and any fixed objects to allow for movement

### **FLOATING LAMINATE Installation – No Fasteners**

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1. Start by measuring the width of the room, at a right angle to the direction in which the planks will be installed.
2. Measure, mark and chalk the primary line. If installing multiple rooms, chalk a secondary line.
3. Make reference marks on walls to maintain primary line. Underlayment will cover chalk lines on substrate
4. Measurements of the last row are to be close to 1/2 the width of a plank, but no less than 2-inches wide.

### **STARTING THE INSTALLATION**

1. Undercut the door frames.
2. Lay a loose panel upside down against the door frame over a section of the correct underlayment.
3. Saw off the bottom of the doorframe so that the panel can slide underneath.
4. Always inspect each carton and panel to ensure no defective or damaged cartons or panels prior to installation.

### **UNDERLAYMENT**

1. If required, install polyethylene film first. Place 6-mil polyethylene film using the manufacturer-recommended overlap
2. Next, roll out the underlayment or lay out underlayment panels and roll only one width of underlayment at a time.
3. If noise-reducing underlayment is being installed, contact manufacturer for specific installation recommendations
4. Loose lay the underlayment edge to edge. Do not overlap.

### **RANDOM INSTALLATION**

1. Best appearance - install parallel to length of room to allow incoming light to fall along length of planks with random pattern
2. Best appearance halls – install panels lengthwise in length of hall, regardless of the light source.
3. Remove the tongue facing the wall.
4. To form a straight line, assemble the planks together in the first row
5. Begin and end each row with a plank that is at least 8-inches in length
6. If starting wall is uneven or necessary to balance plank width, scribe wall contour on panels in 1<sup>st</sup> row, disassemble/ cut
7. Work from left to right, or right to left as the manufacturer recommends.
8. Maintain manufacturer-recommended expansion area between the first row and the wall.
9. Use spacers to maintain expansion area around perimeter of installation.
10. Mark last panel in the row for cutting, by turning the panel 180-degrees
11. After cutting last plank in the first row, use the off-cut to start the second row
12. Space end joints a minimum of 12-inches apart in consecutive rows.
13. Manufacturer-recommended expansion gap should be left at walls, thresholds, pipes and other fixed objects
14. Check with manufacturer - Use expansion profile in door openings, angled rooms, corridors corners, planks no longer than 30'

### **FINISH THE INSTALLATION**

1. To calculate the correct width of the last row of planks, place the plank on top of the last installed plank.
2. Use scrap plank, plus appropriate spacer to allow for necessary expansion to trace contour of wall on full plank to fit
3. Cut according to the traced line.

### **ALWAYS check with the LAMINATE manufacturer concerning recommended installation systems!**

1. Laminate panels are installed with fully glued joints, both on short and long sides. It is very important to glue correctly.
2. Joint is not sealed if too little or no glue is used. Correctly glued joints prevent water penetration from surface of floor.
3. Groove is filled with enough adhesive so line of adhesive appears along entire length of joint when panels are together
4. Excessive adhesive is easily removed with a plastic putty knife and a damp cloth.
5. Seal groove on long and short side of the first row with the flooring adhesive. Seal all exposed edges with adhesive.
6. Begin gluing the panels by placing the first panel according to manufacturer's guidelines.
7. Adhere groove on the long and short sides of the first panel in the second row and attach it to the panel in the first row.
8. Next, glue the second panel in the first row. Tap the panels carefully together with the tapping blocks and hammer.
9. To hold the panels lightly together, use installation clamps or straps

### ***After the first 3 rows are installed, allow them to dry for 30 – 60 minutes.***

1. Work from right to left or left to right, row after row. Keep at least 10-12 inches between end joints of adjacent rows.
2. When installing the last row of panels, it is often necessary to saw them lengthwise.
3. Lay the last row of panels on top of and edge to edge with the panels in the next to the last row.
4. Use a scrap section of panel to trace wall contour on last row of panels, widthwise to the wall.
5. Saw the planks accordingly and adhere with adhesive. Press the cut panels in place.

6. Install the spacers between the wall and panels.
7. After the adhesive dries, remove the spacers and install the wallbase.
8. Remove adhesive residue or haze with damp mop, using solution of ½-cup ammonia or 1-cup vinegar per gal. of water
9. Dried drops of adhesive can be removed with a dab of acetone or ammonia on a rag.

#### **KITCHENS and BATHS- WET AREAS – ALWAYS CHECK manufacturer guidelines!**

1. Laminate is resistant to water, but it is **VERY important** to prevent water or moisture from getting under floor
2. Not all flooring is rated for wet areas. Check with the manufacturer.
3. When working in “wet” areas, fill the expansion gap with 100% mildew resistant silicon
4. Depending on manufacturer, planks may require adhesive applied to their tongues when installing in “wet” areas
5. **Kitchen** cabinets should **NOT** be installed on top of a laminate floor.
6. Install the floor up to the front of the cabinets and leave proper expansion where the floor meets the cabinets.
7. **Bathroom** - Do not install laminate flooring in a bathroom with a floor drain.
8. Seal the expansion space between laminate and walls or other fixed objects such as radiators, bath tubs, showers, sinks or toilets with mildew resistant silicone sealant.
9. Before wallbase, maintain space around perimeter of flooring for expansion and seal, include exposed edges of panels
10. Fill the space completely with sealant to avoid water getting underneath the floor or into the core material.
11. If required, when installing the flooring panels, make sure the grooves are entirely filled with adhesive
12. If adhesive is recommended, excess adhesive must appear on the surface when the panels are joined together.
13. **To finish the installation**, wipe away the excess adhesive with a plastic putty knife and a damp cloth.
14. Buff with a dry cloth to minimize any adhesive haze.
15. Apply acetone or manufacturer’s cleaner with white cotton cloth to remove haze. Do not apply acetone directly to floor.
16. T-molding is to be installed in the doorway between a bathroom and the adjoining hall.
17. Toilets must be removed before installation. Leave a ¼-inch expansion space around the toilet flange.
18. Fully seal the ¼-inch expansion area around the flange with a mildew resistant silicone.
19. Customer is to arrange for a plumber to reset toilet.

#### **LAMINATE MOLDINGS and TRIMS**

1. **LAMINATE T-MOLDING**- joins 2 areas of laminate floors in doorways or large areas that require movement
  - a. Use T-moldings at every doorway, regardless of size unless the manufacturer states otherwise.
  - b. Two types of T-moldings – two-part, snap system and one-piece glue-down T-molding.
2. **LAMINATE CARPET-TRANSITION STRIP** – joins laminate to carpet
  - a. Two types of transition strips - Two-part, snap-in system and one-piece glue-down T-molding.
3. **LAMINATE END MOLDING** - finishes floor at door thresholds, sliding glass doors or other vertical fixed objects
4. **LAMINATE HARD SURFACE REDUCER** – finishes where floor meets lower floor.
 

Two types: two part, snap-in system and solid glue-down T-molding.
5. When installing all molding types, do not use excessive liquid nail type adhesive, as this may reduce expansion gap.
6. Place weight on the molding until adhesive cures.

#### **INSTALLATION of T-MOLDINGS**

1. Cut ¾-inch x ¾-inch wide spacer block of wood for laminate T-molding, leave ½-inch space on either end.
2. Check the width of the leg of the T-mold before using these measurements.
3. Align the space block to be centered where the T-molding or reducer strip will be located. Screw or nail in place.
4. For easier removal later, install laminate up to spacer block(s) using thin side of one distance spacer between flooring and spacer block. Complete the floor installation.

**After the installation is complete**, carefully remove the distance spacers and the spacer blocks.

1. Cut the metal track to fit snug and in the center of the open space
2. Allow ¼-inch expansion space between the flooring and the metal track
3. Use the screws provided and attach the track to the subfloor.
4. If installing over a concrete floor, drill holes and use the plastic plugs provided.
5. Cut the laminate molding to fit snug and snap into the metal track.
6. **Make certain that the required expansion space is maintained within the molding.**
7. When using noise-reducing underlayment, install the metal track on top of the underlayment. Snap in laminate molding
8. For glued-down moldings, cut the underlayment. Glue a lath strip the thickness of the underlayment to the subfloor.

#### **STAIRS**

1. The **ONLY** time that a laminate floor should be glued to the subfloor is during a stair installation
2. Remove loose or damaged treads or risers and repair or replace.
3. Stairs must be cleaned thoroughly from any loose paint, debris or old adhesives.
4. Fasten All stair nosing with nails or screws on wood or concrete surfaces.
5. General conditions where the stair nosing is used: Step down from a floating floor; Tread is flush or even with the riser; Tread is extended and round-edge nosing or Tread is extended and square-edge nosing

**STEP DOWN FROM A FLOATING FLOOR** - Cut the stair nosing to the desired length.

Fasten nosing with nails or screws; add adhesive if desired - Keep ¼-inch expansion space between nosing and floor

**TREAD FLUSH OR EVEN WITH THE RISER** - Install the riser before the stair nosing is fit into place

1. If installing from a floating floor, follow the manufacturer's guidelines
2. If installing on a stair tread, the nosing is installed after the tread and riser are in place.

**TREAD WITH AN EXTENDED ROUND EDGE NOSING** - Square rounded portion of the extended nosing

1. Remove only radius (rounded part) and leave as much of the extending nose of the tread as possible
2. Glue a narrow strip of laminate flooring to finish exposed edge of the tread on the edge of the squared nosing.
3. The laminate nosing is installed to finish the nose of the tread after the tread and riser are installed.

**TREAD WITH EXTENDED AND SQUARE EDGE NOSING**

1. Cut a narrow strip of laminate flooring and glue it on the edge of the existing tread.
2. Install the tread and riser and finish the edge with laminate nosing

**LAMINATE FLOORING ON STAIR TREADS AND RISERS** - Dry fit the laminate planks net or snug, stringer to stringer.

1. The depth of the laminate is cut to accommodate the width of the laminate nosing.
2. This overlaps either a riser of laminate or the section of laminate which is glued on the edge of the step.
3. One plank of laminate will finish most risers.
4. Two planks are necessary for the tread since the tread depth exceeds the width of one laminate plank.
5. When gluing treads with recommended adhesive, also glue the tongue and groove of the planks for the tread
6. The joint between the tread and riser is sealed with sealant. Quarterround can also be used.

**AFTER DRY FITTING** - planks can be adhered to stair treads with full spread premium adhesive – Check manufacturer

1. Press the laminate plank into the adhesive to obtain the proper bonding
2. Check manufacturer - Apply several continuous beads of premium quality construction adhesive across full width of tread and firmly press the laminate plank into the adhesive to achieve proper bonding
3. Before using the stairs, allow the recommended time for the adhesive to fully set up

**INSTALLATION OF LAMINATE WALL BASE** – Nail with finishing nails, adhere with a premium quality construction adhesive or screw into place.

**INSTALLATION OF QUARTERROUND**

1. It must be nailed to the base, **not to the floor**, using nails or screws, countersink them through the laminate
2. Fill the recessed nail hole with a matching color wax stick or finishing putty

**INSTALLATION OF LAMINATE END PIECE COVERS**

If the end of the wallbase of quarter-round is visible, use end piece covers with a durable, self-adhesive backing to cover the exposed area.

**REPAIR and REPLACEMENT of LAMINATE FLOORING - ALWAYS Check with manufacturer!**

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1. Begin the repair by cleaning up the edges of the damaged area with a small chisel
2. For the best appearance, make several straight edges for the repair.
3. After getting edges straight (not square), use clear plastic tape and tape around the edges of the damaged area.
4. Keep the tape outside the damaged area by placing it as close to and aligned with straight edges of area
5. Mix the finishing putty on a scrap plank section or similar disposable surface.
6. Use a few drops of hardener with a small amount of the finishing putty - 1/2 vial of hardener to 1/2 tube of putty.
7. Mix finishing putty and apply to damaged area with spacer or plastic putty knife.
8. Do not trap any bubbles in the putty. Smooth out the surface.
9. Normal drying time is 30-60 minutes. Use hair dryer on low-heat setting to speed up the drying process
10. Fan back and forth over the repair for 10-15 minutes.
11. Remove part of tape to check if repair putty is even with floor. If it is not, return tape to its original position.
12. Place fine (000) steel wool over eraser head of pencil. Rub back and forth gently until repair is flush with floor.
13. Do not rub the laminated surface with the steel wool.

**PROCEDURE FOR REPAIR**

1. Start by marking lines and at end of each line, place section of masking tape, where it meets end or edge of panel
2. Overlap the tape 1/8-inch from the edge of the panel onto the line.
3. Use the tape as a stop guide when sawing the panel to be replaced
4. The sawing depth should be set so that the blade scores the balance sheet, but not through it
5. Remove the pieces, starting in the center and finishing with the short end pieces.
6. Place a tapping block or other similar sized block under the adjoining panel, aligned with the joint.
7. To get the block into place, use a pry bar and pry up slightly at the center of the section to be removed.
8. With the block in place, end the section down, then up slightly above level.
9. Do not bend upward too far to avoid the risk of damaging the adjoining panel. Remove the pieces.

**Next,**

1. Do not damage laminate or core when using a chisel or utility knife - carefully clean up edges of opening
2. Cut a new groove around the entire opening by using hand router and the milling tool.

3. Adjust the router to the exact depth of the groove with a scrap section of panel.
4. Test for the proper height and fit.
5. Take a new panel and check for the same design and thickness as the existing flooring.
6. Remove the lower part of the grooves with the circular saw at a depth of 1/8-inch or 3/16-inch.
7. Test the fitting of the new panel and loose tongues in the opening
8. If router cannot cut new groove in corners, use utility knife to trim loose tongue so that it fits completely in corner
9. Remove ¼-inch of the tongue at the corners of the replacement panel
10. Dry fit until all the parts fit properly with no uneven edges or gaps.

**After everything has been fitted and checked,**

1. If required, cut a new section of 6-mil polyethylene film to cover the opening
2. Overlap the edges of the existing polyethylene by 8-inches.
3. Cut a section of underlayment foam to fit the opening without overlapping and place it into the hole.
4. Cut a section of Kraft paper to size (approximately 12" x 51") and place it in the opening with adhesive.
5. Use a small section of the loose tongue to force the adhesive into the grooves.
6. Insert the loose tongue into position
7. Place adhesive in the grooves of the replacement panel and insert it into the opening
8. Carefully place the new panel into the opening and press firmly.
9. Remove excessive adhesive on surface with clean, damp cloth. All edges are to be even on either side of joints.
10. If one side is high, apply sufficient pressure to high edge so that it becomes even with the other side of the joint.
11. For at least 24-hours, set the new panel under pressure with an evenly distributed heavy weight across the joints.

**TERMS**

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**Above Grade** Any floor that is above the level of the surrounding ground on which the structure is built

**Acclimation** The adaptation of the laminate floor to its installation environment

**Alkali** Soluble chemical substance referred to as "bases" that may cause severe skin burns. Alkali turns litmus paper blue; pH values above 7.

**Alkalinity Test** Used to determine the pH of concrete slab prior to installing flooring. A pH reading above 9 requires corrective measures. Consult manufacturer for recommended testing and corrective procedures.

**ASTM** [www.astm.org](http://www.astm.org) American Society for Testing and Materials, an organization of voluntary members representing a broad spectrum of individuals, agencies and industries who are concerned with testing standards for a variety of products, systems, services and materials. ASTM is the world's largest voluntary standards program.

**Backing** In laminate flooring, the bottom layer, or backing, is a melamine plastic layer that lends dimensional stability to the planks and also helps guard against moisture from the sub-floor.

**Balanced Construction** A panel construction that has materials of similar properties bonded to both sides of the panel.

**Below Grade** A cement slab poured below the level of the surrounding terrain.

**Calcium Chloride Test** Used to determine the quantitative measure of the concrete slab moisture by a change of weight of moisture-absorbing anhydrous calcium chloride. Represents amount of moisture that is transmitted from the area. The value is expressed as "pounds," equivalent weight of the water that is emitted from a 1,000 square foot concrete slab surface area in a 24-hour period. It is generally recognized that it is safe to install a floor if the slab emission is 3.0 pounds or less. **ALWAYS check with the product manufacturer.** Minimum of 3 tests required for the first 1,000 square feet and one test for each additional 1,000 square feet.

**Click Installation System** The "glueless" alternative; done by placing the tongue of one plank into the groove of another at an angle and pressing down. This makes it possible to create a very tight connection during the installation. The floor can be walked on immediately

**Coniferous or Softwood** Term used to describe lumber produced from needle and / or cone bearing trees (conifers)

**Core** The center of a panel (i.e. surface layer, core, backer).

**Crook** The distortion of a board in which a deviation is present, in a direction perpendicular to the edge; from a straight line to the end of a piece; a curvature from end to end.

**Cross-ply Construction** Engineered wood plies that are stacked on top of each other but in the opposite direction is called cross-ply construction. This creates a wood floor that is dimensionally stable and less affected by moisture than a 3/4" solid wood floor. Cross-ply construction allows the plies to counteract each other which will stop the plank from

growing or shrinking with the changes in humidity. The other advantage is versatility. This type of floor can be installed over concrete slabs in basements also.

**Crosspull** A condition occurring at an end-joint with the ends of flooring strips pulled in opposite directions

**Crowning** A “convex” or “crowned” condition or appearance of individual strips, with the center of the strip higher than the edges (opposite of cupping) **Crowning - Laminate** A specific type of warping when a panel assumes the shape of an inverted lengthwise or width across the face (i.e. convex).

**Cupping** A “concave” or “dishes” appearance of individual strips, with the edges raised above the center (opposite of crowning); sides are higher than the center.

**Deciduous or Hardwoods** Generally, one of the botanical groups of deciduous trees that have broad leaves in contrast to the conifers or softwoods. The term has no reference to the actual hardness of the wood.

**Deflection** The bending of a material between supports when a load is applied.

**Delamination** The separation of layers in a laminate, though failure within the adhesive or at the bond between the adhesive and the laminate.

**Depression** A dent in the surface of a panel.

**Dew Point** The temperature at which gas begins to condense as a liquid at a given pressure. In air, it is the temperature at which the air becomes saturated when cooled with no further addition of moisture or change in pressure.

**Dimensional Stability** The ability of a material to resist changes caused by environmental factors (i.e. moisture or temperature)

**Eased Edge** Each board is just slightly beveled. Some manufacturers add an eased edge to both the length of the planks as well as the end joints. Eased edges are used to help hide minor irregularities, such as uneven plank heights. Eased edge is also called micro-beveled edge.

**Efflorescence** – residue deposited on the surface of a material by the crystallization of soluble salts.

**End Joint** The place where two pieces of flooring are joined together end to end.

**End Matched** In strip and plank flooring the ends of individual pieces have a tongue milled on one end and a groove milled on the opposite end, so that when the individual strips or planks are butted together, the tongue of one piece engages the groove of the next piece.

**Engineered** One of the three common types of wood floors. (Others are Solid and Longstrip Plank) Engineered wood floors are generally manufactured with 2, 3 or 5 thin sheets or plies of wood that are laminated together to form one plank. Most engineered floors can be nailed down, stapled down, glued down or floated over a wide variety of subfloors, including some types of existing flooring.

**Equilibrium Moisture Content** The moisture content at which the material neither gains nor loses moisture at a given

**Expansion Gap** A space necessary between fixed objects, i.e. walls of a room, pipes and cabinets, and between the material itself to allow for the movement of the material.

**Filler** In woodworking, any substance used to fill the holes and irregularities in planed or sanded surfaces to decrease the porosity of the surface before applying finish coatings.

**Filler -Wood** - For cracks, knot holes, worm holes, etc. Usually, commercial wood putty, plastic wood, or other materials mixed to the consistency of putty. Wood filler may also be mixed on the job using sander dust from the final sanding, or other suitable material, mixed with sealer or finish.

**Floating Floor System – LAMINATE** Laminate floors are installed using a “floating floor system” in which a padded underlayment sits between the subfloor and the laminate planks. The planks sit directly on the underlayment and are not anchored to the subfloor on the bottom but rather are anchored on the edges.

**Floating Floor Installation – WOOD** Wood floor is not mechanically fastened to any part of subfloor with a floating installation method. Place a thin pad between wood flooring and subfloor. Apply recommended wood glue in the tongue and groove of each plank to hold planks together. Padding has its advantages: it protects against moisture, reduces noise transmission, is softer under foot and provides for some additional "R" value. Some engineered floors and all long strip floors can be floated.

**(HDF) High Density Fiberboard** - fiberboard with density greater than 50lbs. per cubic foot or 800 kg per cubic meter.

**Graining** Each wood species has its own unique graining and texture. The graining on the boards is determined by the way it has been cut. Natural variations in the color and grain are normal and to be expected.

**Hardwood** Generally, one of the botanical groups of **deciduous trees** that have broad leaves in contrast to the conifers or softwoods. The term has no reference to the actual hardness of the wood.

**Janka Hardness Test** Wood hardness rating test measures force needed to embed a .444 inch steel ball to half its diameter in piece of wood. The higher the number; the harder the wood. Although, one of the best methods to measure ability of wood species to withstand indentations. It is used as general guide to compare various species of wood flooring

**Joist** One of a series of parallel beams used to support floor or ceiling loads and supported in turn by larger beams, girders, or bearing walls.

**Laminate** A product made by bonding together two or more layers. Manufactured product that simulates the look of hardwood, hardwood tile, natural stone and many other types of flooring. Rigid floor covering with a surface layer consisting of one or more thin sheets of fibrous material (usually paper), impregnated with amino-plastic thermosetting resins, usually melamine. Sheets are either pressed as such (HPL or CPL, Compact), and in case of HPL or CPL bonded on a substrate, or with DPL, directly pressed onto substrate. The product is normally finished with a backing primarily used as a balancing material. Its performance values are set by the NALFA Standard.

**Long Strip Plank** One of three common types of wood floors (engineered, solid and long strip plank). Long strip plank floors are similar to engineered floors and have several wood plies that are glued together. The center core is generally a softer wood material and is used to make the tongue and groove. A hardwood finish layer is glued on top of the core. The top layer can be almost any hardwood species and is made up of many smaller individual pieces that are laid in three rows. This gives the effect of installing a board that is 3 rows wide and several planks long. Long strip floors come in a wide variety of domestic and exotic hardwood species and when damaged they are easy to replace.

**Mat Test** This is performed by placing a section of impervious material (sheet vinyl, rubber) no smaller than 2' x 2' and no larger than 3' x 3' on a slab in an area that is the least subject to drying out. The edges are securely sealed with a wide tape, such as duct tape, so air cannot penetrate. Remove the material after 24-hours. Check if the slab has changed appearance. If it has, this indicates the presence of moisture.

**Moisture Content** The amount of water in the material, expressed as a percentage of the dry weight.

**Moisture Meter** Tool used to measure moisture content.

**Moisture Test** All concrete floors should be tested for a moisture emission rate by utilizing an anhydrous calcium-chloride moisture test kit. Moisture emission rate is stated in pounds per 1000-square feet in 24-hours.

**Nail-down** This method is typically used with the 3/4" solid products. However, adapters are available for thinner flooring sizes. To attach the flooring to the subfloor, 2" nailing cleats are used with a wood flooring nailer and mallet.

**Nosing** A hardwood molding used to cover the outside corner of a step, milled to meet the hardwood floor in the horizontal plane, to meet the riser in the vertical plane; usually for landings.

**On-Grade** A cement slab that exists on the same plane as the surrounding terrain.

**Overlapping Stair Nosing** Similar to a flush stair nosing except the nosing overlaps the exposed edge of the floor. The overlapping stair nosing is secured to the sub floor and not to the laminate floor so the floor is free to move

**Overlay** A product of paper, plastic, film, metal foil, or other material incorporated into laminate flooring that provides the wear resistance and protection.

**Particleboard** A core material primarily composed of cellulosic materials (usually wood), generally in the form of discrete pieces or particles, as distinguished from fibers. The cellulosic material is combined with a synthetic resin or other suitable bonding system by a process in which the inter-particle bond is created by the bonding system under heat and pressure.

- **Flakeboard** - A particle panel product composed of flakes.
- **Oriented Strand Board** – A type of particle panel product composed of strand-type flakes which are purposefully aligned in directions which make a panel stronger, stiffer, and with improved dimensional properties in the alignment directions than a panel with random flake orientation.
- **Waferboard** - A particle panel product made of wafer-type flakes. Usually manufactured to possess equal properties in all directions parallel to the plane of the panel.

**Pattern End Matched** Ends of flooring panels, typically similar patterns, matched end to end for continuous linear effect

**Peaking** Areas of the laminate flooring at adjoining panel seams that have raised above the intended horizontal plane of the flooring surface. Seams that raise where the laminate planks or tiles join.

**pH Test** Determines strength of salts, known as base or strength of acids in substance, whether in a liquid or solid state.

**pH Value** Concentration of hydrogen ions in gram equivalents per liter used to indicate acidity or alkalinity of a substance on a scale from 0-14, with 7 representing neutrality or distilled water. Numbers less than 7 indicate increased acidity. Numbers above 7-14 indicate increased alkalinity. Lab and field testing for pH is done with distilled water

**Polyurethane** A clear, tough and durable finish that is applied as a wear layer.

**Porosity Test** Method to determine degree of porosity of concrete substrates prior to installation of flooring, by pouring water in several areas of substrate and observing time and amount of absorption. If water remains on surface or beads up, this indicates a non-porous substrate. Serious problems with porous slabs come from extra water added in order to make a concrete batch a workable material. Water/cement ratio is to be carefully considered if flooring problems arise

**Qualitative Test** The test indicates only the presence of moisture; additional testing is required if moisture is pre

**Radiant-Heated Floor System** Floor system that transfers heat directly from its source to another conductive material without passing through airspace. Heat is derived from heated water running through pipes or tubes buried just below the surface of a floor. Caution is used to avoid puncturing the tubing during the flooring installation.

**rh – Relative Humidity** Measured in percentage, relationship between air volume and amount of moisture the air holds of the total moisture-holding capacity of that volume of air, at a stated temperature. The water vapor holding capacity of a solvent, decreases as the temperature of the solvent increases.

**Resins** A polymeric material used for impregnating and bonding layers of laminate flooring.

**Screeds** Usually a 2" X 4" laid flat side down and attached to a concrete subfloor to provide a nailing surface for tongued and grooved strip flooring or a wood subfloor. **Sleeper** – another name for screeds.

**Screens – LAMINATE** The quality of the laminate partially has to do with the photography and the number of photographs per style, which is known as "screens". The more screens a product has, the more variation it can offer and the more "authentic" the laminate appears.

**Shake** A separation along the grain

**Slip-Tongue** A spline or small strip of wood or metal used to reverse or change direction in installing standard tongue and groove strip flooring. Sometimes used in laying 3/4" solid tongue and groove parquet.

**Softwoods / Conifers** General term used to describe lumber produced from needle and/or cone bearing trees; conifers

**Solid** One of the three common types of wood floors – engineered and long strip plank. Solid wood floors are one solid section of wood that have tongue and groove sides. Solid wood floors can be unfinished or pre-finished 3/4" solid wood floors. Solid wood floors are sensitive to moisture. Because of this, they are used in nail-down installations and are not recommended for installation below ground level or directly over a concrete slab.

**Stapled Down** 1-1/2 to 2-inch staples are used versus nailing cleats to attach the wood flooring to the subfloor. A pneumatic gun is used to drive the staple into the wood flooring and subfloor.

**Subfloor** A pre-existing supporting surface in a structure.

**Tongue and Groove** The joining of two boards. One board has a tongue on its edge that fits into a groove in the edge of the other board..

**Tongue and Groove Wood (T&G)** In strip, plank, and parquet flooring made from strip, and some mosaic parquet; a tongue is milled one edge and a groove on the opposite edge. As the flooring is installed, the tongue of each strip, slat, or unit, is engaged with the groove of the adjacent strip or unit.

**Vapor Barrier** A material with a high resistance to vapor movement, such as foil, plastic film, or specially coated paper, that is used to control condensation or prevent migration of moisture.

**Warping** Crowning, cupping or crook or any distortion of a piece of flooring from its true plane that may occur in seasoning.

**WHITE PAPER on Moisture Emission Testing** [www.wfca.org](http://www.wfca.org) Position statement on moisture emission testing and accompanying document, "Moisture Emission Testing – Responsibility and Qualifications for Testing" adopted by the World Floor Covering Association (WFCA) Board of Directors to begin the process of soliciting industry-wide support for the measure. The focus of the position statement is that concrete moisture vapor testing needs to be performed by qualified independent agencies, and not by floor covering personnel. This recommendation, if adopted, will require that architects move such testing away from Division 9 of Construction Specifications and place it with other construction-related test requirements. Building industry practice historically has been that floor-covering installers, dealers and contractors have been held accountable for testing of moisture emissions in concrete and the satisfactory installation of floor covering on this material.

Horror stories abound about floor covering professionals being held liable for non-performance, often in extenuating circumstances beyond their control. Compounding complexity of the situation are technological advancements in concrete formulations, as well as new, "fast track" construction techniques. It was in this environment that the Ad Hoc Task Force of interested professionals was brought together by WFCA to attempt to rectify what has proven to be a serious problem. That led to the development of the "Position Statement on Moisture Emission Testing" that was finalized in 2001. Document is available online at [www.WFCA.org](http://www.WFCA.org) and at [www.CFInstallers.com](http://www.CFInstallers.com).

*\*\*Information from manufacturer printed materials, the North American Laminate Flooring Association, the National Wood Flooring Association and the CFI-RITE training manuals developed by the World Floor Covering Association.*