



ARTO Concrete Floor Tile Installation Recommendations



SCOPE

Interior and exterior installations of ARTO concrete floor tiles.

NOTE TO SPECIFIER

Tiles, mortars, and grouts do not provide a completely waterproof barrier. Detail and specify LATICRETE® HYDRO BAN™ in all wet areas and over existing, non-structural, hairline cracks ($\leq 1/8"$ or 3mm) in the substrate. LATICRETE® Systems are covered by a comprehensive 25 year warranty (Reference LATICRETE DS 025.0APD).

MATERIALS

Tiles: ARTO Concrete Floor Tiles as manufactured by ARTO Manufacturing Company; www.artobrick.com

Latex Portland Cement Thick Bed Mortar: LATICRETE® 3701 Fortified Mortar Bed

Cementitious Self-Leveling Underlayment (Interior work only): LATICRETE NXT® LEVEL PLUS

Waterproofing and Crack Isolation Membrane: LATICRETE HYDRO BAN®

Latex Portland Cement Thinset Mortar: LATICRETE 254 Platinum

Large Heavy Tile Mortar: LATICRETE 255 MULTIMAX®

Latex Portland Cement Sanded Grout: LATICRETE PERMACOLOR® Grout

100% Silicone Caulk: LATICRETE LATASIL™

Tile installation materials are to be supplied by LATICRETE International, Inc.; Bethany, CT; USA Telephone: 1 (203) 393-0010; Fax: 1 (203) 393-1684; E-mail: technicalservices@laticrete.com; Website: www.laticrete.com.

PREPARATIONS

Prior to commencing the installation, the contractor must examine substrates and advise the General Contractor and Architect of any existing conditions or surface contamination which will require correction before the work commences. Before starting, substrates must be cleaned to remove curing compounds, sealers, soil, mortar, dirt, dust, etc. Curing compounds or sealers must be removed by bead-blasting, grit / sand blasting, hydro blasting, diamond wheel grinder with dustless vacuum attachment, or equivalent methods of mechanical scarifying. After removal of the curing compounds and sealers, all rough, uneven or "out-of-plumb" surfaces must be made "plumb and true" to within 1/4" in 10' (6 mm in 3 m) using LATICRETE 3701 Fortified Mortar Bed, or using LATICRETE NXT Level Plus, and related LATICRETE NXT Primer, as a self-leveling underlayment. Dry or dusty concrete or masonry surfaces must be water washed and excess water removed just prior to the application of LATICRETE membranes and mortars.

SELF LEVELING UNDERLAYMENT INSTALLATION

If replacing an existing floor, all original finish and installation materials must be removed down to fresh substrate BEFORE surface preparation stage can begin. Use LATICRETE® NXT Level Plus, and related LATICRETE NXT Primer, as a self-leveling underlayment to attain proper floor flatness.

Surface Preparation - Concrete slabs must have a minimum ICRI concrete surface profile (CSP) of 3. For more detailed ICRI CSP information refer to ICRI Guideline No. 03732. Use of chemicals to remove contaminants or to create a surface profile is not recommended. Use of a sweeping compound is not recommended as they may contain oil which will act as a bond breaker. Additionally, concrete slabs must readily absorb water, be clean, free of oil, wax, grease, sealers, curing compounds, asphalt, paint, deicing agents, dust, dirt, loose surface material and any other contaminant that will act as a bond breaker. In addition, tensile strength testing of the concrete substrate, per ASTM C1583 or ICRI Guideline No. 03739, must show a minimum of 72 psi (0.5 MPa) tensile strength prior to installation of LATICRETE self-leveling underlayment. Areas that do not meet 72 psi (0.5 MPa) tensile strength must be removed and repaired.

Priming - Use LATICRETE NXT Primer with every application. LATICRETE NXT Primer is a concentrate and must be diluted with clean potable water. Dilution ratio varies depending on the substrate. For Concrete substrates with a moisture mitigation membrane, per one gallon of primer, dilute primer 1:1 (1 part primer to 1 part water). Apply a single coat of diluted primer/water mix to the point of refusal so that the substrate is completely, evenly covered and wet. While primer is still wet and white, immediately lightly scatter LATICRETE NXT Level Plus self-leveling underlayment dry powder into the wet primer. Using a push broom, work the dry powder into the wet primer/water mix forming a slurry. Continue to broom so that puddles are spread evenly over the surface and a uniform film has been applied. Coverage is approximately 285 ft² when mixed 1:1. Remove remaining puddles by brooming and spreading evenly over the surface. Allow the primer to completely dry for a minimum of 3 – 5 hours at 70^o F (21°C) and 50% Relative Humidity. Primer is considered dry when it is dry to the touch, turns from milky white to clear, there is no release of primer from the substrate and a minimum of 3 hours has elapsed. Surface may feel slightly tacky. Drying time will vary depending on surface and ambient air conditions. Substrate temperature must be a minimum 40°F (4°C) during primer application and throughout drying time. Additionally, air temperature must be maintained between 50–90°F (10–32°C) during primer application and throughout drying time. Primer must also be protected from weather and direct sunlight. Temperatures below 70°F (21°C) and/or relative humidity above 50% will increase drying time. Insufficient drying or poor film formation will result in pinholes and poor bond strength and may cause LATICRETE underlayments to de-bond. If Primer dries within 30 minutes or if a 24 hour period is exceeded after primer application, the surface must be primed again. Primed floor must not be opened to trade traffic prior to installation of LATICRETE self-leveling underlayments. If primed floor becomes contaminated by trade traffic, construction dust, debris, flooded or any other bond inhibiting substance prior to LATICRETE product installation, the contaminated primer must be completely removed by shot blasting, scarification or other mechanical means, properly re-primed and allowed to dry prior to LATICRETE installation.

Mixing – LATICRETE NXT Level Plus should be mixed with 5.0 – 5.5 quarts (4.7–5.2 ℓ) of water per 55 lb (25 kg) bag. Do not over water. For manual application, add product to water and mix for 2–3 minutes with a heavy duty drill (650 rpm) to obtain a lump free mix. LATICRETE NXT Level Plus can also be used in most pump equipment. Please consult with a LATICRETE representative to verify equipment compatibility. Perform a flow test to ensure that the mix is homogeneous and free from separation. The ideal flow range for LATICRETE NXT Level Plus is 11–12" (280 – 300 mm) using a LATICRETE Flow Test Kit. See TDS 235N –Flow Test Method - for more detailed instructions on performing flow tests.

Perimeter Isolation Strip - It is essential that all walls and building elements are isolated from the self-leveling underlayment pours to ensure proper expansion allowance against all restraining surfaces. Note: It is recommended to install a perimeter isolation strip before the installation of LATICRETE NXT Level Plus. Attach the perimeter isolation strip to the perimeter wall of the entire subfloor, as well as around the perimeter of any protrusions, in order to isolate the floor and wall/restraining surfaces. Temporarily fasten perimeter isolation strip in place with staples masking, duct, or carpet tape. The perimeter isolation strip can then be removed after the tiles have set firm. The joints can then be filled with LATICRETE LATASIL™.

Main Application - Substrate temperature should be between 40-90°F (4-32°C) during application and air temperature maintained between 50–90°F (10–32°C). Protect areas from direct sunlight. Do not use damp curing methods or curing and sealing compounds. If required to meet level tolerances, survey surface using a digital or electronic leveling device and apply level pegs as required. Adequate ventilation should be provided to ensure uniform drying. Pump or pour blended material onto substrate at an average thickness ranging between 1/8" to 1 1/4" (6–32 mm) for all surfaces. Immediately following placement lightly smooth the surface and pour lines, when not using elevation pins the use of a gauge rake will assist in controlling material depth. Do not expose LATICRETE self-leveling underlayments to rolling dynamic loads, such as forklifts or scissor lifts, for at least 72 hours after installation. Proper application is the responsibility of the user. Floor will be ready for foot traffic in 1-4 hours. Finished floor goods may be installed as soon as 16 hours after application of LATICRETE® NXT Level Plus, subject to thickness, drying conditions and type of flooring materials. Coverage will be dependent upon relative rough-ness of substrate, but the following is typical: 1/8" (3mm) thickness is approximately 49 ft² (4.41 m²); 1/4" (6mm) thickness is approx. 24 ft² (2.16 m²); 1/2" (12mm) thickness is approx. 12 ft² (1.08 m²).

WATERPROOFING / CRACK ISOLATION MEMBRANE INSTALLATION

Install LATICRETE® HYDRO BAN® in all applications required by Tile Council of North America (TCNA) guidelines and LATICRETE International, Inc. Installations are to comply with current revisions of ANSI A108.1 (2.7 Waterproofing), ANSI A108.13, and ANSI A108.17. Review the installation and plan the application sequence. Shake or stir before using.

Pre-Treat Cracks and Joints - Fill all substrate cracks, cold joints and control joints to a smooth finish using a LATICRETE latex Portland cement thinset mortar. Alternatively, a liberal coat* of LATICRETE HYDRO BAN applied with a paint brush or trowel may be used to fill in non-structural joints and cracks. Apply a liberal coat* of LATICRETE HYDRO BAN approximately 8" (200mm) wide over substrate cracks, cold joints, and control joints using a paint brush or heavy napped paint roller.

Pre-Treat Coves and Floor/Wall Intersections - Fill all substrate coves and floor/wall transitions to a smooth finish and changes in plane using a LATICRETE latex-fortified thin-set. Alternatively, a liberal coat* of LATICRETE HYDRO BAN applied with a paint brush

or trowel may be used to fill in cove joints and floor/wall transitions <1/8" (3mm) in width. Apply a liberal coat* of LATICRETE HYDRO BAN approximately 8" (200mm) wide over substrate cracks, cold joints, and control joints using a paint brush or heavy napped paint roller.

Pre-Treat Drains - Drains must be of the clamping ring type, with weepers as per ASME A112.6.3. Apply a liberal coat* of LATICRETE HYDRO BAN around and over the bottom half of drain clamping ring. Cover with a second liberal coat of LATICRETE membrane. When the membrane dries, apply a bead of LATICRETE LATASIL™ where the LATICRETE HYDRO BAN meets the drain throat. Install the top half of drain clamping ring.

Pre-Treat Penetrations - Allow for a minimum 1/8" (3mm) space between drains, pipes, lights, or other penetrations and surrounding ceramic tile, stone or brick. Pack any gaps around pipes, lights or other penetrations with a LATICRETE latex-fortified thin-set. Apply a liberal coat* of LATICRETE HYDRO BAN around penetration opening. Cover the first coat with a second liberal coat* of membrane. Bring LATICRETE HYDRO BAN up to level of tiles. When the membrane has dried to the touch, seal with LATICRETE LATASIL™.

Main Application - Allow pre-treated areas to dry to the touch. Apply a liberal coat* of LATICRETE HYDRO BAN with a paint brush or heavy napped roller over substrate including pre-treated areas and allow to dry to the touch. Install another liberal coat* of LATICRETE HYDRO BAN over the first coat. Let the top coat of membrane dry to the touch approximately 1 – 2 hours at 70°F (21°C) and 50% RH. When the top coat has dried to the touch inspect the surface for pinholes, voids, thin spots or other defects. LATICRETE HYDRO BAN will dry to an olive green color. Use additional LATICRETE Hydro Ban to seal defects.

Movement Joints – See LATICRETE HYDRO BAN installation instructions (DS 663.5 included in pails). Apply a liberal coat* of LATICRETE HYDRO BAN, approximately 8" (200mm) wide over the areas. Then embed and loop the 6" (150 mm) wide LATICRETE Waterproofing/Anti-Fracture Fabric and allow to bleed through; immediately followed by top coat with a second coat^^ of LATICRETE HYDRO BAN.

* Dried and cured thickness of HYDRO BAN liquid membrane is 20 – 30 mil (0.02 - 0.03" or 0.5 - 0.8mm); ^^ Wet coat thickness is 15 – 22 mils (0.4 – 0.6 mm). Consumption per coat is -0.01/gal/ft² (-0.4 ℓ/m²); Use wet film gauge to check thickness. Coverage, *per coat*, is approximately 100 ft² /gal (approx. 2.5 m²/ L). LATICRETE Waterproofing/Anti-Fracture Fabric is not needed with HYDRO BAN Membrane to pre-treat cracks, joints, curves, corners, drains, and penetrations per the installations described above, but use of the Fabric with HYDRO BAN may be an option if desired – consult a LATICRETE representative for more information.

Crack Suppression – For crack suppression only, LATICRETE HYDRO BAN membranes may be used as partial or full coverage over substrates per TCNA guidelines (F125-Full; F-125Partial methods).

Protection - Provide protection for newly installed membrane, even if covered with a thin-bed tile installation against exposure to rain or other water for a minimum of 2 hours, after the final liquid coat has dried to darker "olive green" color, at 70°F (21°C) and 50% RH. For temperatures between 45°F and 69°F (7°C to 21°C) allow a minimum 24 hour cure period.

MIXING

Mix according to LATICRETE printed product instructions included with each product package.

FLOOR TILE INSTALLATIONS

Bonded Thick Bed Method: Apply LATICRETE® 254 Platinum with flat trowel as a slurry bond coat approximately 1/16" (1.5mm) thick in compliance with current revision of ANSI A108. Place LATICRETE 3701 Fortified Mortar Bed, over slurry bond coat while still wet and tacky; fully compact bed by tamping. Spread LATICRETE 254 Platinum with flat trowel over surface of "green"/fresh mortar bed as a slurry bond coat approximately 1/16" (1.5mm) thick. Apply LATICRETE 254 Platinum bond coat to back of tile and place each piece while bond coats are wet and tacky. Beat with a hardwood block or rubber mallet to level/imbed pieces before mortar bed takes initial set. Clean excess mortar/adhesive from finished surfaces. For installation of tiles over cured (pre-floated) latex-Portland cement thick bed mortars, follow **Thin Bed Method or Large Heavy Tile Mortar Method** as follows.

Thin Bed Method: Install LATICRETE® 254 Platinum thinset in compliance with current revisions of ANSI A108.02, A108.1B and ANSI A108.5. Use the appropriate trowel notch size to ensure full-bedding of the tiles. Firmly press thinset into good contact with the substrate and then comb with notched side of trowel. Spread only as much thinset as can be covered while the mortar surface is still wet and tacky. When installing large format (>8" x 8") tiles, back-butter each tile to assure 100% coverage. Beat each tile into the latex Portland cement mortar with a beating block or rubber mallet to insure full bedding and flatness. Clean excess latex Portland cement mortar from tile faces and joints between tiles. Allow installations to cure for 12 hours, at 70 F (21 C), before exposing to foot traffic; 24 hours for heavy traffic, and 7 days for vehicular traffic.

Large Heavy Tile Mortar Method: Install LATICRETE® 255 MULTIMAX® in compliance with current revisions of ANSI A108.02 (3.11), A108.1B and ANSI A108.5. Use the appropriate trowel notch size to ensure proper bedding of the tiles. Work LATICRETE® 255 MULTIMAX® into good contact with the substrate and comb with notched side of trowel. Spread only as much LATICRETE® 255 MULTIMAX® as can be covered while the mortar surface is still wet and tacky. When installing large format (>8" x 8"/200mm x 200mm) tiles, rib/button/lug back tiles, pavers or sheet mounted ceramics/mosaics, apply Large Heavy Tile Mortar onto the back of (i.e. 'back-butter') each piece/sheet in addition to troweling Large Heavy Tile Mortar over the substrate. Beat each piece/sheet into the Mortar with a beating block or rubber mallet to insure full bedding and flatness. Allow installation to set until firm. Clean excess LATICRETE® 255 MULTIMAX® from tile or stone face and joints between pieces.

GROUTING

For interior installations, either penetrating or topical sealers are to be applied to all tile faces, prior to grouting, to help facilitate grout clean-up. For exterior installations use only penetrating sealers for superior durability and slip resistance. Either grout bags or grout floats may be used to place the grout in the joints. Joints must be packed full and free of all voids and pits. Excess grout must be cleaned from the surface of the tile work while it is fresh and before it hardens. Residual cement grout film may be removed using a neutral pH detergent and clean water solution. No acid or alkaline cleaners are to be used for cleaning ARTO Concrete Tiles.

EXPANSION AND CONTROL JOINTS

Provide control or expansion joints as located in contract drawings and in full conformity, especially in width and depth, with architectural details.

1. Substrate joints must carry through, full width, to tile surface.
2. Install expansion joints in tile work over construction joints ("saw cuts") /cold joints in substrates.
3. Install expansion joints where tiles abut restraining surfaces (such as perimeter walls, curbs, columns), changes in plane and corners.
4. Joint width and spacing depends on application - follow TCNA "**Handbook for Ceramic, Glass, and Stone Tile Installation**" Detail "EJ-171 Expansion Joints" or consult sealant manufacturer for recommendation based on project parameters.
5. Joint width: $\geq \frac{1}{8}$ " (3mm) and ≤ 1 " (25mm).
6. Joint width: depth ~2:1 but joint depth must be $\geq \frac{1}{8}$ " (3mm) and $\leq \frac{1}{2}$ " (12mm).
7. Layout (field defined by joints): 1:1 length: width is optimum but must be $\leq 2:1$. Remove all contaminants and foreign material from joint spaces/surfaces, such as dirt, dust, oil, water, frost, setting/grouting materials, sealers and old sealant/backer. Use LATICRETE® LATASIL™ 9118 Primer to increase primer adhesion to tile edges. Install appropriate backing material (e.g. closed cell backer rod) based on expansion joint design and as specified in section 07 92 00. Apply masking tape to tile faces for protection during application. Use caulking gun, or other applicator, to completely fill joints with sealant. Within 5-10 minutes of filling joint, 'tool' sealant surface to a smooth finish. Remove masking tape immediately after tooling joint. Wipe smears or excess sealant off all surfaces immediately.

PROTECTION

The contractor must take precautions to protect the finished work from damage by other trades. Do not allow construction traffic on fresh grout joints. Builder must provide up to 3/4" (18 mm) thick plywood or OSB protection board, over non-staining kraft paper, to protect floors after installation, until the materials have cured. Allow the cement grout to cure for a minimum of 7 days at 70° F (21° C) before aggressive cleaning.

COLD WEATHER NOTE

The curing of installation materials is retarded by low temperatures and finished work should be protected for an extended period of time. Typically, for every 18° F below 70° F (10°C below 21°C), installation materials take twice as long to cure.

HOT WEATHER NOTE

Moisture evaporation, in Portland cement materials, is accelerated by hot, dry conditions. Apply installation materials to dampened surfaces and protect freshly installed materials and finished work from direct sunlight exposure, when installing in temperatures over 95 degrees F (35 degrees C). Typically, for every 18° F above 70° F (10°C above 21°C), installation materials cure twice as quickly. Refer to [LATICRETE TDS 176](#) for more detailed suggestions.

LATICRETE Technical Services provides review of job specifications and plans, project detail planning and review, and provides answers to questions concerning the installation of ceramic tile, brick, marble and stone. Call toll free USA +1 (203) 393-0010. Fax: USA +1 (203) 393-1684. E-mail: technicalservices@laticrete.com. Internet: www.laticrete.com. To obtain a copy of detailed product information, most recent revisions of LATICRETE data sheets, and answers to installation questions, E-mail: technicalservices@laticrete.com or call (800) 243-4788 x.235.

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