

# TECHNICAL MANUAL

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## BEFORE YOU START

Gauged Porcelain tile is defined by ANSI A137.3 and A108.19 as tile between 3.5mm - 6.5mm.

### Special considerations:



### MINIMUM INDUSTRY STANDARDS

## SUBSTRATE TOLERANCES

### 10' Straight Edge Method

If there is a need to flatten the substrate before installation, to facilitate proper bedding of the tile in the mortar setting bed, especially in flooring applications.

- Concrete contractor comes back to grind down spots
- Framer or drywall contractor to repair or flatten
- Apply self leveler
- Apply patching or pre-tile repair

1/8" per 10 feet



tile & stone  
Installation Systems

SUBSTRATE PREP LINK

<https://www.ardexamericas.com/products/tsis/substrate-preparation/>

## TRAINING & EDUCATIONAL RESOURCES



[www.ardexamericas.com/](http://www.ardexamericas.com/)



[www.ceramictilefoundation.org](http://www.ceramictilefoundation.org)



<https://www.tile-assn.com/>



## TRANSPORTING AND HANDLING THE TILES

Ensure forks of forklift extend past the pallets of tile of the length and width, extensions may need to be added for stability, depending on the size of tile ordered.

Special consideration must to be given to the thickness so damage does not occur during handling.

For 32"x72" or larger, use extensions.





## SUCTION CUPS AND RIGID LIFTING FRAMES

Typical suction cups of different kinds are key for handling, a couple of installers will be needed to carry the tiles depending on the size.



## WORK TABLES

### CUTTING, DRILLING & FINISHING OFF THE TILES

A work table must always be used to cut or drill the finish off the edges. If you do not have one, pile one pallet on top of another and put a wooden board across the top. The whole tile must rest on the board.



## MANUAL TILE CUTTER, DESIGN OF THE LIFTING FRAME

The lifting frame can be designed to adapt to all tile formats, sizes, or cut sections, keeping the tiles undamaged allowing them to be handled by fewer people, and reduce risk.



1. Place the tile on top the work table so that the edge of the tile and the table are both in line.
2. Mark the point where the tile must be cut at its two ends.
3. Place the guide rail on the tile so that it coincides with both marks.
4. Fix the guide rail to the tile using the levers on the suction cups.
5. Press down on the cutting carriage and score the first two centimeters ( $1/8''$ ) by pulling the carriage back
6. Using uniform pressure at all times, scoring the rest of the tile by pushing the carriage across to the other side.
7. Release the suction cups, and remove the manual tile cutter and move the tile until the scored line is 3-4 cm (approximatley an inch) beyond the edge of the work table.
8. Using running pliers, press the jaws down, without exerting pressure, on any point of the tile and turn the screw until it touches the other jaw of the pliers. Then loosen the screw one whole turn.
9. Slip the pliers over the scored line at one end of the tile and press down until you see or hear it start to crack with tension (without it breaking completely).
10. Repeat the operation at the other end of the tile, holding the strip to be cut in your hand for stability.

## CUTTING SQUARE OR ROUND HOLES

You can find angle grinders with a tilt feature that can be used to make square or rectangular holes (for junction boxes, plumbing fixtures) in any position in the middle of tiles or panels.

1. Mark the intersections of the lines to be cut on the tile or panel.
2. Fix the guide rail in place and put the angle grinder over the cutting point.
3. Press the handle down to start cutting (slowly) and gently push the angle grinder across to the opposite.
4. Move the guide rail across to the other parallel line to be cut and repeat the operation.
5. Turn the guide rail 90°, and cut the two transversal lines in exactly the same way. The angle grinder can also be used to make slightly imperfect circular holes in normal manner. If a perfect cut is required, use an angle grinder and dry-cut diamond cutting disc (Figure 1) or drill and watercooled diamond drill bit (Figure 2).



Figure 1

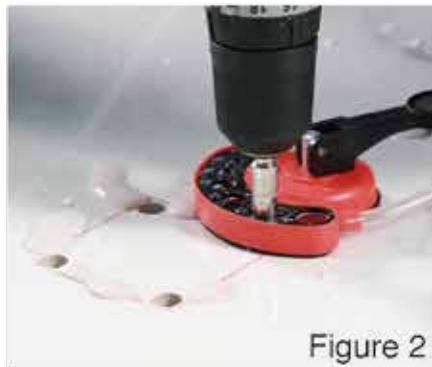
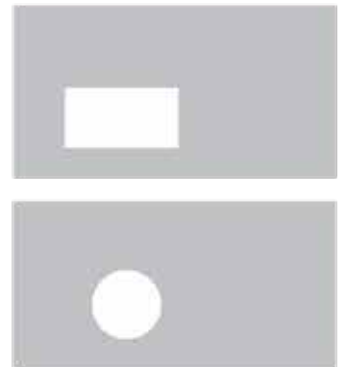


Figure 2



Variation in the height of adjoining tiles is called lippage. This is defined in the ANSI (American National Standards Institute) standard A108.02, Section 4.3.7: "Lippage refers to differences in elevation between edges of adjacent tile modules." Leveling systems are not just commonly used, they must be used with gauged porcelain tiles and slabs. They are absolutely essential. Unless a leveling system is used, it will result in lippage.

### Ultra thin tiles plate 3-6 mm

The special shape allows maximum passage of setting material which ensures maximum adhesion between the substrate and tile.

**Adjust dial (part A) to position 2, for a locking force of 61-73 lbs.**



**Adjust dial (part A) to position S, to snap for removal, after adhesive has cured.**



# APPLYING THE CEMENT-BASED ADHESIVE



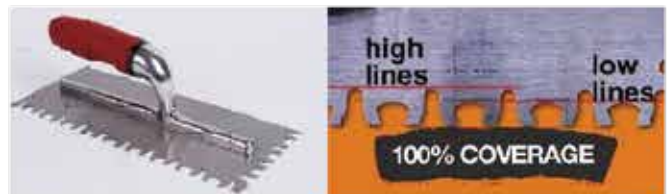
ANSI A137.3—2017 and A108.19—2017  
Release date: November 2017  
For updates: [www.TCNAtile.com](http://www.TCNAtile.com)

**American National Standard  
Specifications for Gauged Porcelain Tiles  
and Gauged Porcelain Tile Panels/Slabs**  
Material and Installation Standards

ANSI A137 states that coverage standards are 95%. Using the correct troweling and techniques is crucial to execution. A euro trowel, or zipper trowel, collapses the ridges of the mortar more effectively, and the “back butter” method states to apply coverage to both the substrate and the tile.

Check for coverage by turning over the installed tile periodically during installation to check for coverage.

Below is a photo showing 100% coverage.



## INSTALLATION VIDEO

<https://youtu.be/Way5bMh-eYg>

# A SOLID BOND AND THE REMOVAL OF AIR BUBBLES

With large format tiles, like any other, a solid bond must be guaranteed between the tile and the adhesive. A conventional rubber mallet should not be used, because the impact prior to curing of gauged (3.5-6.5mm thick) tiles might occur damaged with focused impact. Use a rubber covered wide trowel (Figure 1), or grout float, that is has a large surface area and ensure full contact with the adhesive. If the tiles are being laid on floors, better end results will be achieved using an automatic tile vibrating tool (figure 2).



Figure 1



Figure 2

<https://youtu.be/Hm6MCibZLQ0>

<https://youtu.be/b5J0IMs4GgA>



## LINK TO TOOLS NEEDED FOR INSTALLATION

[www.thintiletools.com](http://www.thintiletools.com)

<https://www.contractorsdirect.com/brand/MLT>

[http://europeantilemasters.com/gauged\\_porcelain\\_tile\\_panel\\_equipment\\_gptp/](http://europeantilemasters.com/gauged_porcelain_tile_panel_equipment_gptp/)



Using system warranties for every application, through Ardex Americas Tile & Stone (or others) is recommended by following A137.3 Standards.

Contact your local representative for a Job Site Report (JSR) from technical headquarters.

<https://www.ardexamericas.com/about-us/contact-us/>

Below are a few products and products recommended in installation. Movement joints MUST be in assemblies, and changes of plane per TCNA EJ-171.



# COUNTERTOP INSTALLATION - FOAM SUBSTRATE

 <https://youtu.be/W6x2qQzMjzE>

 <https://youtu.be/MMdH8hsbJ1Q>



Cut your 2" Nero XPS Foam board down to size to dry fit the space. Over all the spacers of your countertop, apply a polyurethane sealant in 1/2" thickness. Apply weight on the surface until the sealant has properly bonded.



Either apply cementitious coating (we recommend Ardex 8+9) or add a strip to exposed blue edges to receive your porcelain panels.



Check out Step 5. You can cut out your sink recessed before or after installation.

A utility knife, Oscillating multi-tool, or kick it old school with a handsaw.



Install your panel with full coverage with a modified thinset (Ardex X77).

Miter your edges (We love the Blue Ripper <https://youtu.be/qqTvbTVqyKA>) and use back-side thinset on 6mm, but do watch this 12mm edge treatment. [https://youtu.be/dcaDv\\_NGRgk](https://youtu.be/dcaDv_NGRgk)



It's better to your recess after embedding your slab in adhesive for stability purposes and to reduce the stress.

Watch some Certified Pro's at: <https://youtu.be/MMdh8hsbj1Q>

## OTHER CONSIDERATION FACTORS:

To prevent lippage in a multiple slab installation, it's important to use a leveling system.

MLT  
(mechanical lippage tuning system).

Directional troweling and an orbital hand sander (vibrating tool) is the best way to ensure full coverage.



# Tile & stone Installation Systems

## ARDEX Products Assembly

### 1. Grout Options:

- A. ARDEX FL™ Rapid Set, Flexible Sanded Grout
- B. ARDEX FG-C™ MICROTEC® Unsanded Grout
- C. ARDEX WA™ Epoxy Grout and Adhesive

### 2. Latex-Portland Cement Options:

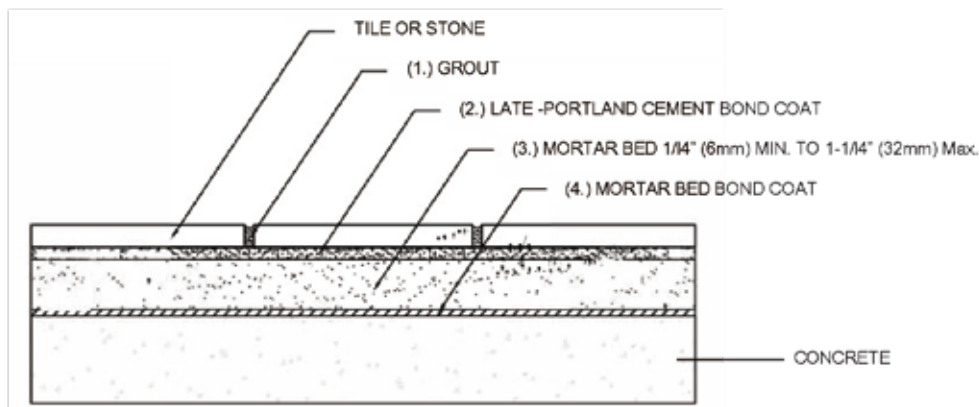
- A. ARDEX X 77™ MICROTEC® Fiber Reinforced Thin Set Mortar
- B. ARDEX X 32™ MICROTEC® Fiber Reinforced Rapid Setting Thin-to-Thick Mortar
- C. ARDEX X 5™ Flexible Thin Set Mortar
- D. ARDEX N 23™ MICROTEC® Fiber Reinforced Rapid Setting Natural Stone and Tile Mortar

### 3. Mortar Bed Options:

- A. ARDEX AM 100™ Rapid Set Pre-Tile Smoothing and Ramping Mortar
- B. ARDEX A38 Mix

### 4. Mortar Bed Bond Coat Options:

- A. ARDEX A38 Mix with ARDEX E100



Scale: N.T.S.

Drawings are developed to be compatible with Tile Council of North America 2013 TCNA Handbook for Ceramic, Glass and Stone Tile installation.

ARDEX products are listed as options and are substituted for TCA's and TTMAC's listed ANSI and ISO 13007 standards. Please refer to the Tile Council of North America 2013 TCNA Handbook for Ceramic, Glass and Stone Tile Installation for complete instructions and application limitations.

Some installation methods and component materials are not referenced. ARDEX Americas encourages the user to consult all approved resources to ensure a complete assembly.

ARDEX Americas  
400 Ardex Park Drive  
Aliquippa, PA 15001

Technical Services:  
1-800-512-7339  
www.ardexamericas.com

### Floors, Interior

Concrete Subfloor, Mortar Bed,  
Bonded

### AF112

TCNA: F112,  
TTMAC: 310F-A



# Tile & stone Installation Systems

## ARDEX Products Assembly

### 1. Grout Options:

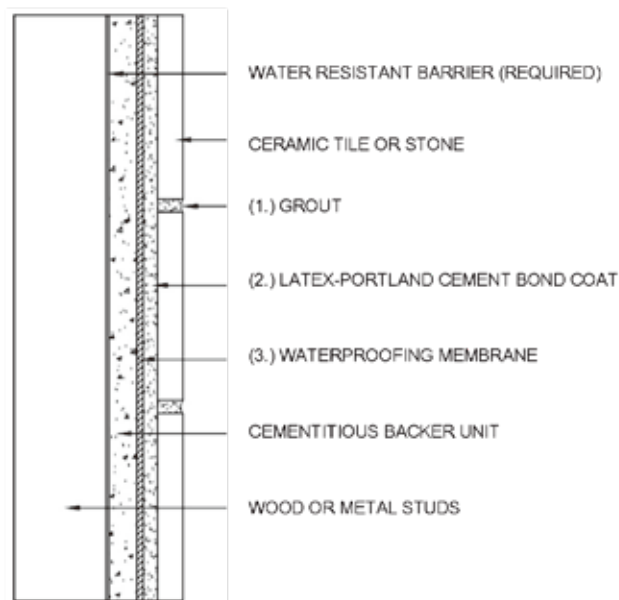
- A. ARDEX FL™ Rapid Set, Flexible Sanded Grout
- B. ARDEX FG-C™ MICROTEC® Unsanded Grout

### 2. Latex-Portland Cement Options:

- A. ARDEX X 77™ MICROTEC® Fiber Reinforced Thin Set Mortar
- B. ARDEX X 32™ MICROTEC® Fiber Reinforced Rapid Setting Thin-to-Thick Bed Mortar

### 3. Waterproofing Membrane:

- A. ARDEX 8+9™ Waterproofing and Crack Isolation Compound



Scale: N.T.S.

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Aliquippa, PA 15001

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www.ardexamericas.com



### Walls, Interior

Wood or Metal Studs, Cement Backer Board, Waterproofing Membrane

### AW244E

TCNA: W244E  
TTMAC: 305W-A



# Tile & stone Installation Systems

## ARDEX Products Assembly

### 1. Grout Options:

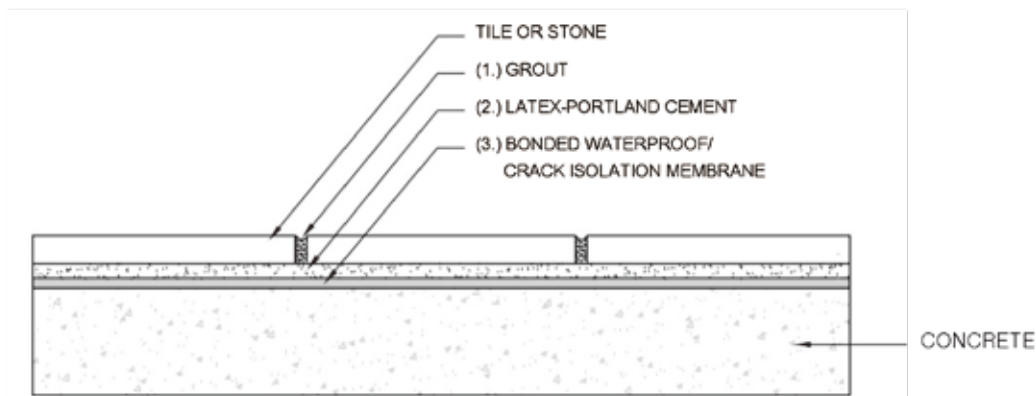
- A. ARDEX FL™ Rapid Set, Flexible Sanded Grout
- B. ARDEX FG-C™ MICROTEC® Unsanded Grout

### 2. Latex-Portland Cement Options:

- A. ARDEX X 77™ MICROTEC® Fiber Reinforced Thin Set Mortar
- B. ARDEX X 32™ MICROTEC® Fiber Reinforced Rapid Setting Thin-to-Thick Bed Mortar

### 3. Waterproofing Membrane:

- A. ARDEX 8+9™ Waterproofing and Crack Isolation Compound



Scale: N.T.S.

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Aliquippa, PA 15001

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[www.ardexamericas.com](http://www.ardexamericas.com)



### Floors, Exterior

Patios and Walkways,  
Latex-Portland Cement Mortar

### AF102

TCNA: C311  
TTMAC: 311F



# Tile & stone Installation Systems

## ARDEX Products Assembly

### 1. Grout Options:

- A. ARDEX WA™ Epoxy Grout and Adhesive
- B. ARDEX FL™ Rapid Set, Flexible Sanded Grout
- C. ARDEX FG-C™ MICROTEC® Unsanded Grout

### 2. Latex-Portland Cement Options:

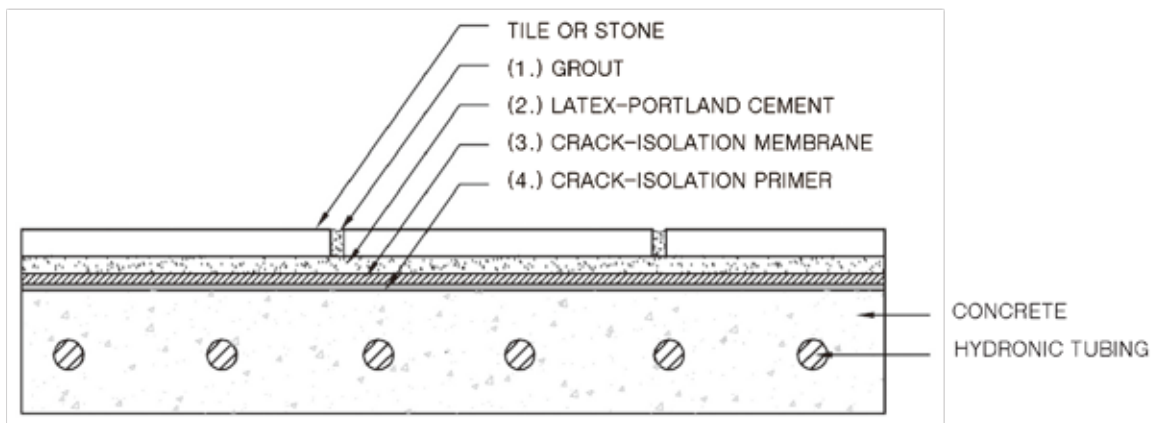
- A. ARDEX X 77™ MICROTEC® Fiber Reinforced Thin Set Mortar
- B. ARDEX X 32™ MICROTEC® Fiber Reinforced Rapid Setting Thin-to-Thick Bed Mortar
- C. ARDEX X 78™ MICROTEC® Premium Semipourable Thin Set Mortar
- D. ARDEX X 5™ Flexible Thin Set Mortar

### 3. Waterproofing Membrane:

- A. ARDEX 8+9™ Waterproofing and Crack Isolation Compound

### 4. Crack-Isolation Primer:

- A. ARDEX 8+9™ Waterproofing and Crack Isolation Compound



Scale: N.T.S.

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Aliquippa, PA 15001

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[www.ardexamericas.com](http://www.ardexamericas.com)

**Floors, Interior**  
Radiant Heat on Concrete,  
Hydronic System

**ARH110**  
TCNA: RH110  
TTMAC: NA



# Tile & stone Installation Systems

## ARDEX Products Assembly

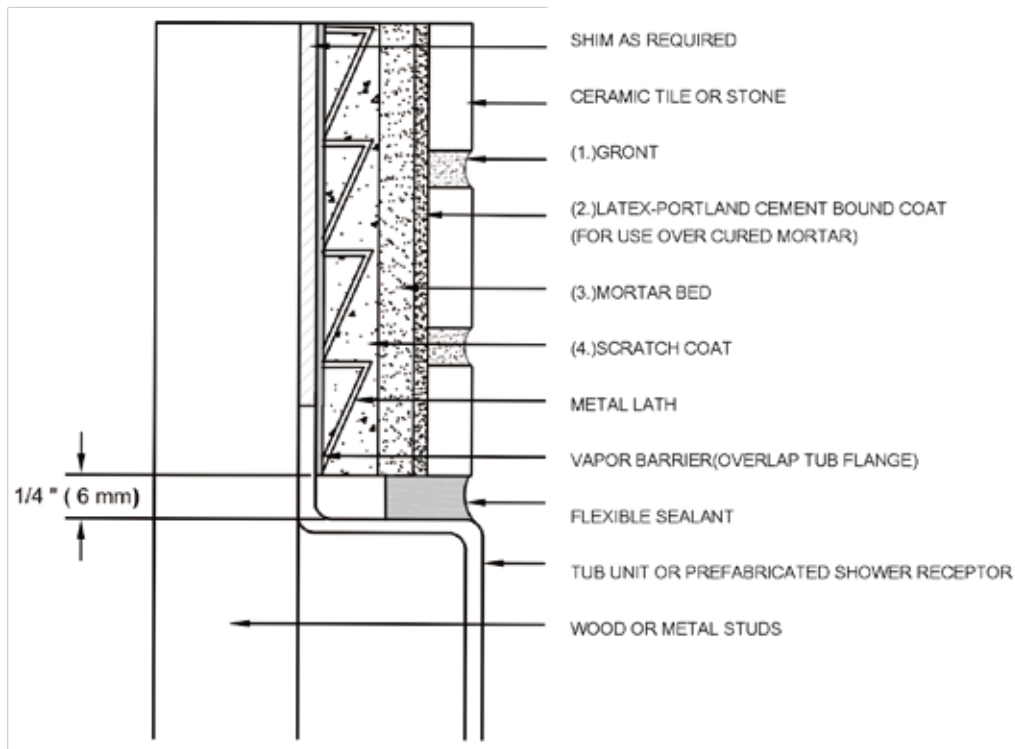
### 1. Grout Options:

- A. ARDEX WA™ Epoxy Grout and Adhesive
- B. ARDEX FL™ Rapid Set, Flexible Sanded Grout
- C. ARDEX FG-C™ MICROTEC® Unsanded Grout

### 2. Latex-Portland Cement Options:

### 3. Waterproofing Membrane:

### 4. Scratch Coat



Scale: N.T.S.

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www.ardexamericas.com



### Bathtub/Shower Walls

Wood or Metal studs, Cement Mortar

### AB411

TCNA: B411  
TTMAC:306W-A

# TILE OVER TILE/GRANITE APPLICATION

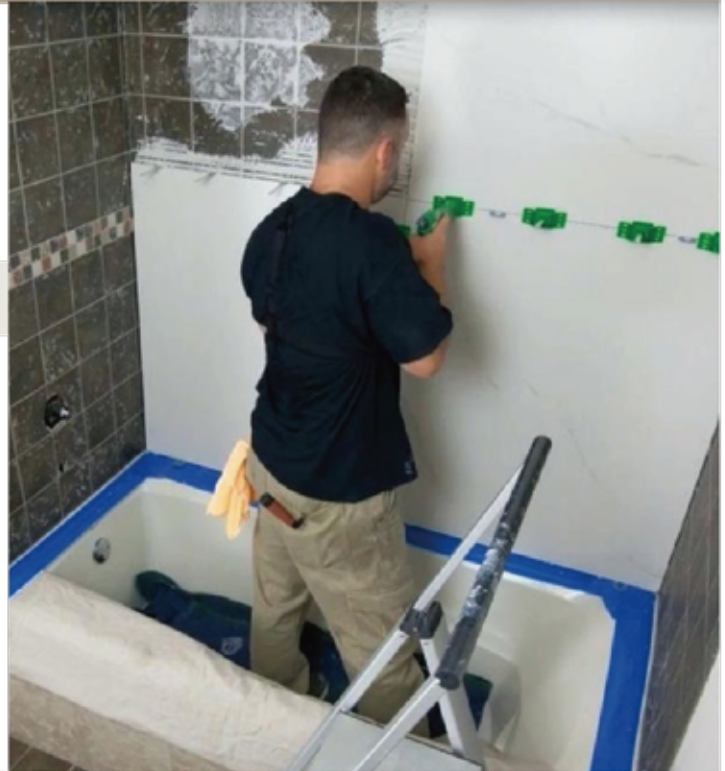


## CONTENTS

Jobsite Conditions

Recommendation

- Technical Data Sheets and Updates
- Product Link(s)
- Other Links
- Application
  - Substrate Preparation
  - Installation: ARDEX 8+9 / X 78 / E 90 / FL
  - Test Areas.
  - Warranty



## JOBSITE CONDITIONS

**Substrate(s):** Floors and walls with granite

### Conditions:

- 6mm Thin Gauged Porcelain Tile will be installed. It has been reported that the tile has no resin backing.
- The intent is to proceed directly over the granite tile installation.

## RECOMMENDATION

### Technical Data Sheets and Updates

Prior to proceeding with the installation of any ARDEX product, please read the respective technical data sheets and technical updates found at the web links below. The information herein is intended to accompany, not stand separately from, published technical documentation for each recommended product.

### Products

- ARDEX 8+9™ Rapid Waterproofing and Crack Isolation Compound
- ARDEX P 82™ Ultra Prime
- ARDEX X 78™ MICROTEC® Semi-Pourable Tile and Stone Mortar
- ARDEX E 90™ Mortar Admix Tile and Stone Mortar Enhancer
- ARDEX FL™ Rapid Set, Flexible, Sanded Grout
- ARDEX SX™ 100% Silicone Sealant for Tile and Stone Applications

### Other Items

- ANSI A 108
- TCNA EJ 171



## Application

### Substrate Preparation

1. Mechanically remove all sealers and waxes. The granite must be deemed sound, solid, well-bonded to the underlying substrate and clean to include complete mechanical removal of any contaminants that could act as a bond breaker.
2. Thoroughly sweep and vacuum to remove all loose material. The resulting granite surface must be deemed clean, sound and solid prior to proceeding with the installation.

### Installation: ARDEX 8+9 / X 78 / E 90 / FL

1. Prime as follows:
  - a. Floors:
    - i. Option 1: Apply a scratch coat of ARDEX X 78. Allow the scratch coat to harden and dry completely prior to proceeding with the tile installation.
    - ii. Option 2: Apply a coat of ARDEX 8+9, and allow to dry for 1 to 2 hours prior to proceeding with the tile installation.
  - b. Walls: Prime the prepared granite with ARDEX P 82.  
Allow the primer to dry thoroughly(min. 3 hours, max. 24 hours) prior to proceeding with the tile installation.
2. Install Gauged Porcelain Tile with ARDEX X 78 mixed with ARDEX E 90 in accordance with the technical data sheet and ANSI A 108.5.
  - a. Information on obtaining ANSI A 108.5 can be found at the ANSI A 108 link in the Other Links section above.
  - b. All installations must include soft joints in accordance with ANSI A 108.5 and TCNA EJ 171. Information on obtaining TCNA EJ 171 can be found at the corresponding link in the Other Links section above.
3. Allow the tiles to set 24 hours (70°F) prior to caulking soft joints with ARDEX SX and grouting with ARDEX FL in accordance with the technical data sheet and ANSI A 108.10. Information on obtaining ANSI A 108.10 can be found at the ANSI A 108 link in the Other Links section above.

### Test Areas

As always, please be advised that prior to installing any ARDEX product, we recommend installing an adequate number of properly located test areas, to include the selected floor finishes, to determine the suitability and aesthetic value of the products for their intended use.

### Warranty

ARDEX SYSTEMONE™: When installed in accordance with our written recommendations, the above application qualifies for an [Ardex SystemOne™ Limited Installation Warranty](#).

Click the link for more information online.

## EXTERIOR APPLICATION

1. All supporting surfaces shall be structurally sound, solid, stable, level, plumb and true to a tolerance in plane of 1/8" in 10' for walls and floors. (See TCNA HANDBOOK and ANSI Guidelines for details). They shall be clean and free of dust, oil, grease, paint, tar, wax, curing agent, primer, sealer, form release agent or any deleterious substance and debris which may prevent or reduce adhesion.
2. Mechanically sand, shot blast or scarify the substrate to completely remove all paint, loosely bonded topping, loose particles and construction debris. When sanding or scarifying surfaces that may contain silica sand, use an approved dust mask. Surfaces containing asbestos must be handled in accordance with current EPA regulations. Contact your local EPA office.
3. All concrete areas that are not flat, smooth and at the proper elevation shall be repaired using ARDEX AM 100™ Pre-Tile Repair Mortar, ARDEX TL 1000 or ARDEX TL 700 or equivalent.
4. All substrates shall be dry.
5. In all cases, the structural design of the floor shall not allow a deflection greater than 1/360 of the span under live and dead loads.

### A. INSTALLATION

On exterior wall installations, back butter each tile with a sufficient mortar layer, using the flat edge of the trowel immediately prior to laying, to achieve a 100% mortar contact and a void free solid support. Simultaneously apply the mortar to the substrate surface with a euro-notched trowel to achieve a continuous bed without voids or unsupported areas with beating or vibrating tools. Lay tiles while both mortar surfaces are wet. Do not allow mortar to dry or skin over on either surfaces before laying the tiles.

### B. CONCRETE

1. Concrete surfaces shall be dry, completely cured and free of hydrostatic conditions and/or moisture problems.
2. On grade or below grade concrete slabs must be installed over an effective vapor barrier. If no barrier exists, install an ARDEX MC Moisture Control System (RAPID / PLUS / ULTRA).
3. New concrete surfaces shall be wood floated or broom finished.

### C. CEMENTITIOUS BACKER UNITS (C.B.U.)

1. When installed by others, the C.B.U. shall be from a reputable manufacturer and shall conform to the quality standard requirements of ANSI A118.9. It must be installed according to the C.B.U. manufacturer's instructions and in strict accordance with ANSI A108.11 standard for INTERIOR INSTALLATION OF CEMENTITIOUS BACKER UNITS.

### D. EXTERIOR WALL SURFACES

1. Apply a coat of waterproof membrane or, when surface waterproofing is not required, a thin smoothing coat of the setting mortar approximately 1/16"(1.5mm) to 1/8" (3mm) thick to cover the entire concrete, masonry or C.B.U. substrate. Allow to dry and cure for at least 24 hours prior to installing tiles.

## CLEANING AFTER LAYING

1. Once the tiles have been grouted and any excess grout cleaned off, it is important to wait the stipulated time before using the tiled surface; in other words, any cleaning should wait until the tiled surface is completely dry. It is recommended to wait 5 days before cleaning for full use.
2. The newly tiled surface must be protected from water and moisture while the adhesive and grouting materials are curing and hardening. This is particularly important in outside spaces, and areas where there is a risk of freezing.
3. Measures should also be taken to protect the newly tiled surface against mechanical or chemical damage resulting from subsequent work by other professionals or later installations. Damage can be prevented by covering the floor tiles with thick cardboard or similar material.
4. For the final cleaning of the tiled surface, the products used should be compatible with the chemical resistance of the tiles. Avoid solid detergents with abrasive particles and solutions containing hydrofluoric acid, which attacks the glaze and causes irreversible damage to the tile.
5. For stains that cannot be completely removed with a conventional detergent, and require the use of specific solvents or cleaners, we recommend that you first check the chemical resistance class of the slab.
6. We advise against using waxes, oils or similar products.

### PROTECTION

The material's stain-resistant and atmospheric agent-resistant properties can be improved to make it easier to maintain.

TYPE	PRODUCT
<b>Greasy- food, tire marks, marker</b>	FILACLEANER
<b>Stains, Epoxy residual</b>	FILA PS87
<b>Rust</b>	FILA Filanorust
<b>Graffiti</b>	FILA Antigraffiti Star



<https://www.filasolutions.com/usa/>

# CLEANING AND MAINTENANCE



1

## Post Installation Cleaning

After floor renovations, or new installations it is essential to properly wash the surfaces to remove any cement, concrete and glue residue leftover from installation.

Unfortunately, post installation cleaning is often ignored or carried out using products not specifically designed for this purpose. Over time, this can lead to staining and surface discoloration.

## Protection

Protecting surfaces against stains and humidity is imperative for maintaining their technical properties and aesthetic appearance. It is important to choose the product based on material, location (inside or outside), type of protection (water repellent or stain proofing).

2



3

## Surface Finishing

Interior floors may require a finishing treatment to protect them against surface wear caused by frequent foot traffic, or moving chairs and furniture.

## Maintenance

Ordinary maintenance is nothing more than everyday cleaning. It removes dirt and reinforces the protective layer. Every once in a while, extraordinary maintenance is required. A microfiber dust mop, and clean hot water is all that is needed for everyday cleaning. A dilution of Fila Deterek as directed can also be applied.

4



# TECHNICAL DATA

Physical-Visual Properties	ASTM TEST	Industry Standard	LA' BOBO Results
Water Absorption	C373	Impervious <0.5%	≤0.08%
Thickness Dimension	C499	Range ±0.04Inc, Max.	≤±0.012 Inc.
Facial Dimension	C499	±0.25%	≤±0.25%
Warpage Average Diagonal	C485	±0.40%	≤±0.40%
Warpage Average Edge	C485	±0.40%	≤±0.40%
Wedging	C502	±0.25%	≤±0.25%
Bond Strength	C482	≥50psi	≥200psi
Breaking Strength	C648	≥0.25lb.	1575N
Hardness (Mohs)	Scratch Test (Not regulated)	Range 0 - 10	≥ 7
Visible Abrasion Resistance	C1027	No Requirement, Range 0-5	Class IV(4)
Deep Abrasion Resistance for Unglazed Tiles	C1243	Impervious(Porcelain) Class P1: ≥ 175mm	≥175mm
Frost Resistance	C1026	No Sample must show alterations to surface	No Evidence of Damage
Chemical Resistance	C650	No Requirement, Range E - A	Class A
Stain Resistance	C1378	No Requirement, Range E - A	Class A
DCOF	BOT 3000	≥ 0.42 <sup>0</sup>	0.61/0.7/0.53/0.84(matte)
Aesthetic Classification	Visual Evaluation Shade & Texture	No Requirement, Range V0-V4	V2 - V3
Light Reflectance Value (L.R.V)	C609	No Requirement, Range 0-100	10 to 80 Depending on Style/ Color Selection

# TECHNICAL MANUAL

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