



**TEC® Gauged Porcelain Tiles and
Gauged Porcelain Tile Panel/Slabs
Installation Guide**



As one of the most trusted and respected brands in the industry, TEC® installation systems deliver innovative solutions that provide valuable advantages to our partners in quality construction.

For over a half century, we have been delivering innovative products that overcome installation challenges to help you transform visions into reality and blueprints into buildings.

At TEC®, our inspiration is you, our customers – the visionaries, the creators and the builders of great spaces. We continue to combine cutting-edge technology with real-world expertise to provide customer focused solutions that maximize efficiency, ease of use and value.

So go ahead, visualize, envision and dream.
You'll be amazed at your ability to imagine and achieve with TEC®.

Our Focus on the Environment

TEC® products, like all other H.B. Fuller Construction Products brands, are developed and manufactured with the environment in mind.

Our goal is simple: Develop products that balance sustainability, usability, performance and value.

TEC® is a proud partner of:



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GAUGED PORCELAIN TILE PANEL/SLABS INSTALLATION OVERVIEW

Gauged Porcelain Tile Panel/Slabs provide an innovative option for finished surfaces. At thicknesses that range from 3.0 mm to 6.0 mm (1/8" to 1/4") they are a lightweight alternative to traditional ceramic and natural stone tile. With facial dimensions as great as 1000 mm x 3000 mm (39.4" by 118.1") they offer increased design possibilities and a unique monolithic appearance. Some manufacturer's tile are as large as 1524 mm x 3048 mm (60" x 120"). All with the durability and ease of maintenance of a porcelain composition.

These tile panel/slabs require different handling and installation techniques. Typically the 3.0 mm (1/8") thick tile panel/slabs have a reinforcing mesh backing to minimize breakage during transportation and installation. The purpose of this guide is to inform you of what is required to ensure a successful, long lasting installation on interior walls and floors. Always consult with the tile panel/slab manufacturer prior to tile panel/slab selection and installation to confirm suitability for the specific project to ensure compliance with all governing building codes.

REQUIRED EQUIPMENT (FIG. 1)

Fiberglass residue can be very irritating to skin, eyes and lungs:

- Grip gloves for handling the gauged porcelain tile panel/slab
- Goggles
- Gauged porcelain tile panels/slabs require a three person crew minimum
- 3-M #8210 Dust and Mist Respirator

RECOMMENDED EQUIPMENT

- Trowels - use a specialty trowel, such as, Euro Notch Trowel (fig. 2a), Superior Premium Notch, or Raimondi Flow Ridge (fig. 2b)
- Pressure pliers for snapping the scored panels (fig. 3, 4, 5, 6)
- Deck/table brush
- The Euro Grip Frame with suction cups for handling gauged porcelain tile panels/slabs can be purchased from European Tile Masters (fig. 7) (www.europeantilemasters.com). The frame can also be used as a table for back buttering
- Right angle grinder
- 4" continuous rim diamond blade
- Diamond tip hole saw
- For edge smoothing and removal of excess fiberglass backing 60-100 grit diamond hand pads (fig. 8)
- The Sigma Separator provides precise pressure when breaking the score line, particularly helpful with the thicker gauged porcelain tile panel/slabs (fig. 9)
- Sigma Kera-Edge for profiling and bullnosing gauged porcelain tile panel/slabs (fig. 10)
- Edge leveling systems (fig. 11)

fig. 1



fig. 2

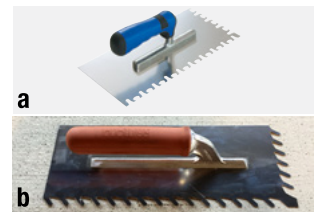


fig. 3



fig. 4

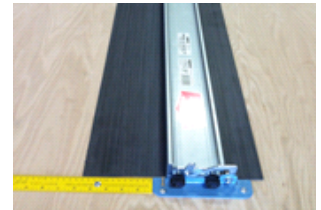


fig. 5



fig. 6



fig. 7



fig. 8



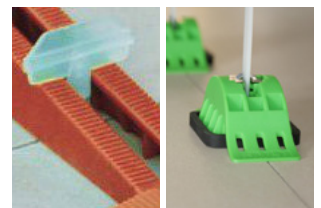
fig. 9



fig. 10



fig. 11



RECOMMENDED TEC® SETTING MATERIALS FOR INTERIOR WALLS AND FLOORS

TEC® Surface Preparation Products

Surface preparation for gauged porcelain tile panels/slabs requires a surface variation not to exceed 1/8" in 10'.

- Multipurpose Primer (560)
- Level Set® 500 HF Self-Leveling Underlayment (500)
- Level Set® 300 Self-Leveling Underlayment (300)
- Level Set® 200 Self-Leveling Underlayment (200)
- VersaPatch® Latex Modified Floor Patch (327)
- Fast-Set Deep Patch (305)
- Feather Edge Skim Coat (330)

TEC® Waterproofing and Crack Isolation

For wet areas, use the following product:

- HydraFlex™ Waterproofing Crack Isolation Membrane (316)

TEC® Mortars

Gauged porcelain tile panels/slabs require mortar with high bond strength and non-sag characteristics.

- TotalFlex 110 (456/457)
- TotalFlex 150 (458/459)
- Ultimate 6 Plus Mortar (487)
- 3N1® Performance Mortar (384/385)
- Ultimate Large Tile Mortar (382/383)

TEC® Grouts and Caulk

Gauged porcelain tile panel/slab installations need grouts that are high strength. Also necessary is 100% Silicone for caulking and movement joints in the tile installation per EJ171.

- Power Grout® Ultimate Performance Grout (550)
- AccuColor EFX® Epoxy Special Effects Grout (440)
- AccuColor 100® 100% Silicone Sealant (155)

MATERIAL HANDLING AND STORAGE

MANUAL HANDLING AND STORAGE OF GAUGED PORCELAIN TILE PANELS/SLABS

The gauged porcelain tile panels/slabs arrive in oversized crates (fig. 12). Forklift requires fork length of 84" for handling crates to avoid damage.

fig. 12



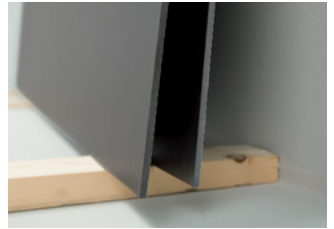
Three or four installers should handle the gauged porcelain tile panel/slab, always keeping it perpendicular to the floor while protecting the corners from impact (fig. 13). Use gloves since fiberglass back on the panel can cause irritation to hands.

Position the panel on the long side allowing the slabs to lean against a supporting wall while keeping cardboard or wooden strips suitably spaced beneath them (fig. 14).

fig. 13



fig. 14



MATERIAL HANDLING

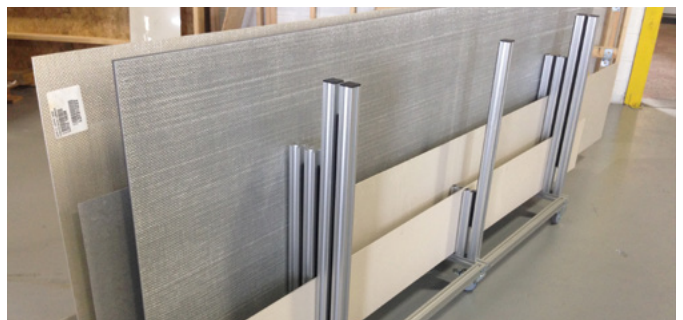
To aid handling of 39.4" x 118.1" (1000 mm x 3000 mm) slabs, especially those weakened by drill holes or openings and to aid the wall application, a suitable frame with suction cups can be used (fig. 15).

Always check the adhesion of the suction cups on the gauged porcelain tile panel/slab before lifting. For efficient moving of up to 8 panels the Euro Transporter is available through European Tile Masters (www.europeantilemasters.com) (fig. 16).

fig. 15



fig. 16



INSTALLATION PROCESS

INSTALLATION RECOMMENDATIONS

For the most efficient and consistent cutting of gauged porcelain tile panels/slabs, TEC® recommends the Kera Cutter Rail System* by Sigma (fig. 17) for usage guide, see YouTube @ KERA-CUT presentazione SIGMA.

* Available from European Tile Masters 954-917-3599

TEC® also recommends that portable work stations be assembled to insure proper support and fabrication of the thin porcelain panels and a separate station for mortar application, as shown in the following figures.

fig. 17



PORTABLE WORK STATIONS (FIG. 18-21)

Portable work stations consist of:

- 3/4" cabinet grade plywood cut into three, 4-foot square sections each with handles
- 8 hinge plates with 4 chain mount cotter pins
- 2" flat aluminum strips screwed to each end of the center piece to reinforce and maintain table flatness
- 4 heavy duty collapsible workhorses

fig. 18



fig. 19



fig. 20



fig. 21



USE OF THE KERA RAIL CUTTER

- Use the Kera Rail Cutter (fig. 22-23) to score the gauged porcelain tile panel/slab surface from outside edge to outside edge. Begin the scoring process with backward motion then proceed forward continuously with a firm downward pressure on the scoring handle.

Note: A smaller diameter cutting wheel may be preferable for pebbled or textured finished (contact European Tile Masters)

- The rail will provide guidance and precision to the cut. Do not interrupt or restart. Maintain a smooth, firm continuous movement.
- First, clean the surface of the panel to ensure better suction to the face of the panel. Place suction cups firmly on the gauged porcelain tile panel/slab to maneuver and reposition the scored panel to the edge of the work table.
- Center the pressure pliers over the score line on each end. Gently squeeze and the panel will break (fig. 24-25).
- For the material, fold the panel 90 degrees and cut the fiberglass backing using a utility knife and remove the severed piece.
- Along the cut edge, remove the excess fiberglass backing by using a 60-100 grit diamond hand pad (fig. 26).
- For transport 6" to 8" pvc pipe w/fitted couplings for end closure (fig. 27).

fig. 22



fig. 23

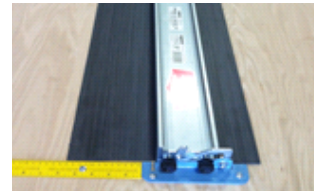


fig. 24



fig. 25



fig. 26

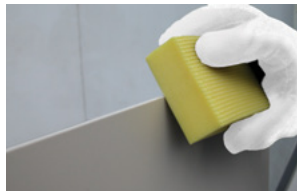


fig. 27



CUTTING AND DRILLING (FIG. 28-29)

- Diamond tipped hole saws in various diameters.
- DO NOT USE HAMMER DRILLS.
- Moderate pressure and speed are enough to minimize bit-walk and begin the hole. An occasional spray of water is helpful in cooling tile and drill bit.

fig. 28



fig. 29



DRY CUTTING ELECTRICAL BOXES

- It is recommended for electrical box cuts, before using a right angle grinder for the straight cuts (fig. 30), that four pilot holes should be drilled in each corner (fig. 31), these holes will help relieve surface tension and vibration where the straight cuts intersect.
- Cutting must be from the panel face to the back, fully supporting the underside of the panel on a flat surface while cutting will help reduce stress in the panel and avoid cracking.
- For smaller cuts and corner cuts the use of a simple high quality glass cutter such as the TOYO Pistol Grip Super Cutter* and adjustable straight edge can be a useful alternative (fig. 32). In addition, manual tile cutters and right angle grinders with a proper dry cut porcelain blade are also effective (DE-WALT DW4765 4-1/2 inch).

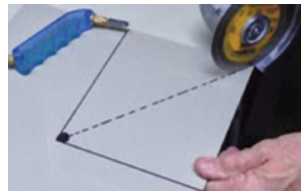
fig. 30



fig. 31



fig. 32



**Available from Wholesale Glass and Supplies 800-505-6311*

INSTALLATION

When properly prepared, suitable substrates include:

SUITABLE SUBSTRATES – WALLS

- Existing Ceramic Tile
- Cement backer board over properly prepared steel and wood framing
- Properly prepared Concrete and CMU walls
- Gypsum board/dry wall

SUITABLE SUBSTRATES – FLOORS

- Concrete in accordance with ANSI A108 and the TCNA Handbook
- Existing Ceramic Tile over concrete (well bonded and properly prepared)

Note: Gauged porcelain tile panel/slabs size will not facilitate slope to drain, therefore appropriate linear drains must be used

SUBSTRATE PREPARATION – WALLS AND FLOORS

The installation contractor should examine substrates and advise General Contractor and Architect of existing conditions and surface contamination which will require correction before the work commences. Substrates are to comply with deflection requirements called for by International Building Code (IBC), International Residential Code (IRC), or applicable local building code.

Maximum substrate variation not to exceed 1/8" in 10' (3.0 mm in 3.0 m) and 1/16" in 24" (1.5 mm in 60 cm) from the required plane, when measured from surface high points with a straight edge, floors may require self-leveling underlayments or recessed slabs designed to accept a properly prepared mortar bed. For large non-level, interior floor surfaces use an approved TEC® Self-Leveling Underlayment to prepare the substrate for tile installation. For smaller areas on floors or walls with rough uneven substrates or large areas where a trowel applied material is better suited, TEC® offers a full line of fast setting patching materials. TEC® patches can be used to smooth and/or level areas, with a cure time of as little as 30 minutes. See specific product data sheets at tecspecialty.com for product selection criteria and installation instructions.

All substrates must be dry, structurally sound within maximum deflection criteria per industry standards and free from oil, grease, dust, paint, sealers or concrete curing compounds. All contaminants should be removed prior to installation of tile. Surface protrusions and tile glazes shall be removed by sanding, scraping or scarifying. After preparation, remove all dust by vacuuming. In lieu of removing glazes, to avoid the dust and debris associated with surface sanding or scarifying, the existing tile can be primed with TEC® Multipurpose Primer in accordance with the current data sheet posted on tecspecialty.com.

CURRENT APPLICATIONS FOR PANELS/SLABS LESS THAN 5.6 MM WALLS

- Interior Walls
- Consult with Manufacturer for specific requirements on Exterior Applications

CURRENT APPLICATIONS FOR PANELS/SLABS 5.6-6 MM FLOORS

- Interior floors: slab on grade and slab above grade- minimum cure 90 days
- Interior floors: tile over tile on slab on grade or slab above grade concrete
- Consult with Manufacturer for specific requirements on Exterior Applications

- Deflection requirements for above grade installations to be per TCNA Handbook: "Floor systems over which tile will be installed shall be in compliance with the IRC for residential applications, the IBC for commercial applications, or applicable building codes. Maximum allowable deflection under live load not to exceed L/360."
- Accepted substrates to be in accordance with Tile Council of North America (TCNA) and ANSI guidelines.
- For tile over tile applications refer to TEC® Multipurpose Primer product data sheet.
- For 5.6 - 6 mm thick floor tile installations over substrates supported by wood framing utilize TCNA handbook details F141-15 Stone or F250-15 Stone.
- Gauged porcelain tile panels/slabs when considered for heavy (shopping malls, airports) commercial applications will be considered on a case by case basis. Extra heavy (food plants, dairies) commercial applications are not recommended.

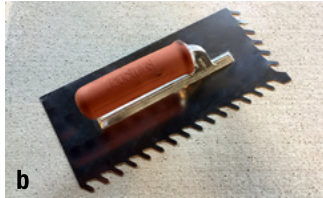
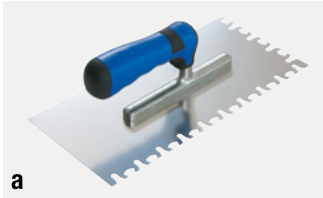
COUNTERTOPS

- Extruded foam boards (1 1/2" to 2") from manufacturers such as Schuler® and wedi® are the preferred method of countertop installation for both the 3 mm and 6 mm gauged porcelain tile panels/slabs. Their ease of installation, inherent water/vapor resistance and high density composition eliminate many of the stresses that can be created with the traditional layered approach of plywood, backer board and/or mortar beds. TEC® has found the following steps ensure full supportive coverage and precise cutting of the combined assembly:
 - Step 1** – the installation of the extruded foam board to the base cabinets.
 - Step 2** – the 3 mm or 6 mm large gauged porcelain tile panels/slabs should be installed to the extruded foam board following the mortar application method detailed in this guide.
 - Step 3** – allow the assembly to cure 24 hours.
 - Step 4** – measure and template all cutouts in the countertop, cut from the top down using right angle grinder, diamond tipped hole saw and utility knife.
- When using these materials, the instructions and detailed installation guidelines should be followed. If using a traditional installation approach, TCNA Handbook details C511, C512 or C513 should be followed.

TROWEL SELECTION

Notched trowel configuration can help optimize the mortar coverage between the substrate and the gauged porcelain tile panel/slab. Use one of the following trowels to minimize air pockets and increase bond strength:

Recommended Trowel: Use a specialty trowel, such as Euro Notch Trowel (a) or Raimondi Flow Ridge (b).



LEVELING SYSTEM

The use of a tile leveling system (fig. 33-34) such as the Tuscan Leveling System or Raimondi Tile Leveling System will help minimize lippage, the condition where one edge of a panel is higher than an adjacent panel that creates an uneven appearance. Consult an Edge Leveling system manufacturer for detailed instructions on use of their systems.

fig. 33

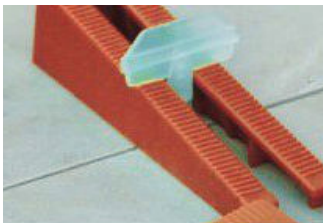
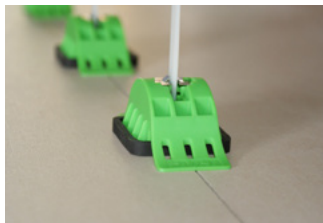


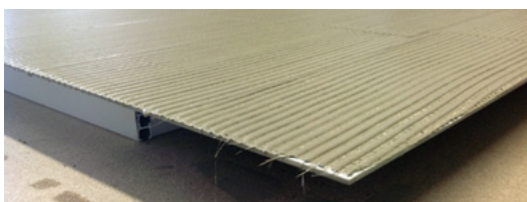
fig. 34



MORTAR APPLICATION

- Installations are to comply with current revisions of ANSI A108.02, A108.1B and ANSI A108.5.
- Be sure to key the mortar into the substrate and panel with the flat side of the trowel before combing.
- Spread only as much mortar as can be covered while the mortar surface is still wet and tacky.
- Do not allow mortar to “skin over.”

fig. 35



- Use the specialty notched trowel to apply the mortar to the wall, floor or countertop and to the back of the panel.
- Mortar ridges on both the panel back and substrate must be parallel to each other combing at right angle to the long side of the gauged porcelain tile panel/slab.
- This method will assist in achieving maximum adhesive coverage edge to edge (fig. 35).

INSTALLATION PROCESS

APPLICATION OF THE PANEL TO THE SUBSTRATE

Walls & Floors

Using the recommended frame/grip place the mortared panel onto the substrate. Edge leveling straps and caps are required to minimize lippage between panel edges. Place the straps and grout spacers uniformly along the panel's edge. DO NOT cinch down the leveling cap at this time.

Floors

Insuring maximum coverage between the panel and the substrate is critical to a successful installation. TEC® has found through its training and testing that walking on the freshly placed gauged porcelain tile panels/slabs is the most reliable and efficient way to achieve complete edge to edge coverage. Care should be taken to remove any dried mortar or other debris from footwear. Start at the center of the panel, take small shuffling steps across the width of the panel compressing the mortar ridges and forcing any entrapped air to escape along the panel's edge (fig. 36). Continue this shuffling process until the entire panel has been compressed in the mortar.

fig. 36



Following the placement of an adjoining panel, repeat the process described above. Cinch down the leveling caps tightly to bring adjoining panel edges into alignment.

Use a high-speed cordless orbital sander with pad and press along the edges of the panel and between each of the leveling straps, this will reduce lippage and increase supporting mortar coverage between panels (fig. 37) where there is more vulnerability from heavy rolling loads. Edge leveling systems that allow for removal and replacement of the cap (after bringing the panels into alignment) will allow for effective removal of excess mortar around the strap while the mortar is still fresh. After completing the removal of excess mortar, replace the caps on the straps and retighten to ensure complete alignment of the panel edges. This will reduce the possibility of damage to the panel the following day when clearing the grout joint of cured mortar.

Walls

Using a high-speed cordless orbital sander with pad, work from the center of the panel outward to the edges, this pressure will expel air from behind the panel and maximize edge-to-edge coverage. Cinch down the leveling caps tightly to bring adjoining panel edges into alignment (repeat method detailed above for cleaning the joint while mortar is still fresh).

Walls & Floors

Clean excess mortar from the panel's surface and "clean-out" between the panel joints to the full depth (3.18 mm or 6.35 mm, 1/8" or 1/4") of the panel while mortar is still fresh; this will ensure an adequate amount of grout to fill the joint.

Floors

Due to room configuration or job size it may be necessary to work ON freshly installed panels. When doing so the use of a large piece of Masonite or double walled heavy cardboard work well to disperse concentrated weight and to protect the face of the panel from tool damage or ground in construction dirt. Freshly set panels should not be walked on after 2 hours. This is to ensure that the bonding mortar is not compromised as it begins to cure.

Begin grouting in as little as 24 hours for walls and 48 for floors.

MOVEMENT JOINTS

Movement joints must be provided in the tile work over all construction, control and expansion joints in the backing and where backing materials change. Refer to the Tile Council of North America (TCNA) Detail EJ-171 for industry guidelines.

GROUTING THE PANELS

Grout joints with any of the TEC® grouts listed on page 6. Grout joints must be fully packed, free of voids and leveled with the tile surface.

GROUT WALLS

- 2 mm to 3 mm (0.08" to 0.12") grout joint size is recommended
- Install and clean per manufacturer's instructions
- Install, clean and cure TEC® grout per product data sheet instructions
- TEC® has found that there are many edge leveling systems available. For timing and method/timing of removal refer to edge leveling system manufacturers requirements.

fig. 37



GROUT FLOORS

- Use a minimum of 3 mm (0.12") grout joint size due to lack of floor flatness and variable tolerances in field-cut gauged porcelain tile panel/slabs
- Install, clean and cure TEC® grout per product data sheet instructions
- TEC® has found that there are many edge leveling systems available. For timing and method/timing of removal refer to edge leveling system manufactures requirements.

EDGE TREATMENTS AND PROFILES

To complete and finish the installation, profiles for corners, deco-bands, edges, expansion joints and perimeter edges are available from quality suppliers such as Schluter® (fig. 38-42).

- 6.0-8.0 mm (0.24"-0.32") profiles recommended
- 6.0-10.0 mm (0.24"-0.39") profiles recommended

fig. 38



fig. 39



fig. 40

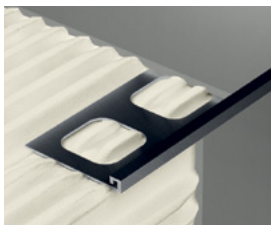


fig. 41



fig. 42



CRITICAL REVIEW POINTS

- Proper fork length (84") for handling crates
- Review list and knowledge of recommended tools
- Coverage: mortar mix ratio, directional troweling perpendicular to the long edge of the panel, embedding techniques
- Maximize edge coverage and minimize lippage: edge-leveling systems, cordless sander along the perimeter edge and between the leveling straps
- Using the tools and best practices to minimize lippage between panels to 0.4 mm (1/64") or less will greatly increase the finished installations ability to withstand the rolling loads used in most commercial applications
- Using grouting techniques that ensure the grout joint remains full and flush will also aid in the finished installation's ability to withstand edge impact. Use a new floor float with unworn sharp edges. Use steady pressure to overfill the joint and force grout into any remaining voids beneath the panel edge.

INSTALL WITH PRE-QUALIFIED CONTRACTOR

TEC® strongly recommends the use of trained professional contractors for the installation of these gauged porcelain tile panels/slabs. The following programs are well established and a good source for quality installation companies:

- CTEF – Certified Tile Installer Program
- TCAA – Trowel of Excellence
- International Masonry Institute (IMI)
- NTCA Five Star Contractor Program
- Journeyman Tile Setter Apprenticeship Programs
- Also, attend a specific training session for gauged porcelain tile panel/slabs.





H.B. Fuller Construction Products Inc.
1105 South Frontenac Street
Aurora, IL 60504-6451 U.S.A.
tecspecialty.com