INSTALLING PORCELAIN PANELS WITH RAI-FIX MECHANICAL FASTENERS

In many instances, it is acceptable to adhere large porcelain panels to exterior walls with a suitable dry-set mortar. For details on the installation of these large porcelain panels, see CUSTOM's Technical Bulletin TB60 and relevant product Technical Data Sheets.

However, some municipalities limit the size and weight of these panels or tiles that can be simply adhered to the substrate. The 2012 building code limits the size to tile with sides less than 24 inches long and total area of less than 3 square feet. Building codes also limit the weight to less than 9 pounds per square foot. While it may be possible to get an exemption for very thin large panels, in some instances mechanical fasteners may be required.

The RAIMONDI RAI-FIX system is a suitable mechanical clip system for supporting tile in exterior installations. The following information details the requirements of installation with RAI-FIX clips. It is important to follow all industry and manufacturer's directions when installing porcelain panels and tiles to exterior walls.

Substrate
Wall surfaces must be structurally sound, with deflection less than l/360. Remove all grease, oil, dirt, curing compounds, sealers, adhesives or any other contaminant that would prevent a good bond. Glossy or painted surfaces must be sanded or abraded and stripped of all contaminants. Concrete must be cured for 28 days, free of efflorescence and accept water penetration. Smooth concrete surfaces, existing glazed tile or polished stone should be scarified. Expansion joints should never be bridged with setting material.

Surface Preparation
The surface must be flat and true. In most cases, TCNA guidelines for surface tolerance of large format tile (one side greater than 15") are acceptable. Custom Building Products agrees with the TCNA position and recommends maximum allowable variation of no more than 1/8" in 10' and 1/16" in 2', with no abrupt irregularities greater than 1/32".

CUSTOM offers cement-based products to assist in preparing the wall surface to an acceptable tolerance:

CustomFloat® Bedding Mortar allows for thick bed wall applications. After placement, screed the mortar to a smooth flat surface.

Skim Coat & Patch Cement Underlayment is a trowel-applied patching and smoothing compound that should be used to eliminate imperfections in walls. It can be used to bring the surface into an acceptable tolerance.

Once the surface is properly smoothed, it may be necessary to waterproof the substrate before the installation of the tile:

RedGard® Waterproofing and Crack Prevention Membrane can be applied at a coverage rate of one gallon per 55 square feet (equal to a dry film thickness of 15 mils) for general waterproofing.

Tile Installation
RAIMONDI RAI-FIX SAFETY CLIPS LT6AT120 (part #299 6MM)
The stainless steel LT6AT120 RAI-FIX safety clips (Diagram #1) are installed on the back of nominal 5' x 10' x 6mm thick porcelain slabs in conjunction with thin-set and used as an additional or secondary mechanical clip support system. The slab size, slab weight and building substrate type (CMU walls or 16" O/C light gauge metal studs) will determine the size and number of RAI-FIX safety clips used per slab. Each RAI-FIX-Fix safety clip supports 88 lbs. (40 kgs).
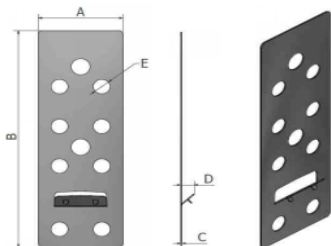
Apply the kerf cuts on the back of the porcelain slabs using the LTGT part #299 RAI-CUT Grinding Drill with a 5" Turbo Diamond Blade and cutting guide jig (Diagram #2). If necessary (prior to cutting the kerf cuts into the back of the porcelain slabs), confirm the kerf cuts on the tile align with the vertical structural 16" O/C light gauge metal studs.

Kerf cuts are **not** to be spaced more than 32" apart when installing the 5' x 10' x 6mm thick porcelain slabs horizontally on the wall. A minimum of four (4) kerf cuts are recommended per slab when installing the 5' x 10' x 6mm thick slabs horizontally. Kerf cuts are to be spaced evenly when installing the 5' x 10' x 6mm thick slabs porcelain slabs vertically. A minimum of three (3) kerf cuts spaced evenly on the short-side of the slab are recommended. Install the RAI-FIX safety clip **part #299 6mm** into the Kerf cut. Follow all recommended manufacturer instructions.

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Diagram #1:

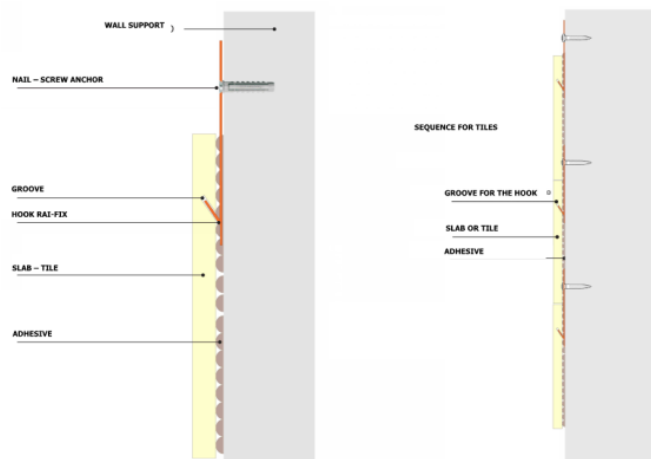| Part #	Anchor Type	Size				
		A	B	C	D	E
299	Stainless Steel 304	40mm	118mm	5/10mm	8 mm	8mm
299 6mm	Stainless Steel 305	40mm	118mm	5/10mm	6 mm	8mm

Diagram #2:

Diagram #3:

Insert the hook into the porcelain panel and make sure it is completely inserted in the groove on the back of the porcelain panel.

It is important to follow all TCNA recommendations for the installation of porcelain panels. Installation must conform to ANSI A108.5. To assure that the porcelain panels do not crack from impact, it is mandatory that the mortar coverage is greater than 95%, with no voids greater than two square inches. Ensure that all corners and edges are supported with mortar. You may want to consider a specialty notched trowel that is designed to maximize the coverage with less effort, such as **CUSTOM SuperiorBilt® Premium Notch Trowel**.

It is important to apply mortar to both the surface of the substrate and the back of the panel with clips attached. The trowel ridge lines should be applied to these surfaces so they are parallel to each other when pressed into place. This will prevent trapping air under the panel and creating a void. To achieve continuous contact between the substrate and panels, a paint roller or a rubber flooring roller may be useful and should be worked from the center outward to the tile edges. Panels should be checked regularly to assure full coverage, with particular attention to the edges and corners. Exercise caution when checking these thin porcelain panels for coverage as removing the thin panels can cause them to crack. The mortar installation instructions must be followed for cure time.

After the porcelain panel is properly bedded into the mortar, fix the hook to the wall with a screw anchor or a nail gun per manufacturer's directions.

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Recommended CUSTOM Dry-Set Mortars:

MegaLite® Ultimate Crack Prevention Large Format Tile Mortar is a high-strength bonding mortar with exceptional non-sag characteristics. MegaLite's long working time makes it the product of choice for applications in hot, dry or windy conditions.

ProLite® Premium Large Format Tile & Stone Mortar is ideal for installation on walls. Its non-sag formula supports large tiles and is ideal with mechanical fasteners.

Grouting
Prism® Color Consistent Grout is a fast-setting, high-strength grout that reduces efflorescence and grout shading for joints greater than 1/16". Grout installation must conform to ANSI A108.10. Lightly dampen tile with clean, cool water, but leave no standing water in the joints. Holding a rubber grout float at a 45° angle, completely fill the joints. Remove excess grout by scraping the float at a 90° angle.

At 70° F, do not spread more grout than can be cleaned within 30 minutes of the grout firming. Use as little water as possible for grout clean-up (high temperatures may shorten this time frame). Using a damp, small pore grout sponge in a circular motion, smooth and level joints and remove excess grout. Change the water and rinse the sponge frequently.

Movement Joints
It is important to observe all building codes and TCNA requirements for thin tile installation. It is vital that all movement joints are properly placed and filled with the appropriate soft jointing material, such as **CUSTOM Commercial 100% Silicone Sealant.**

See the TCNA EJ171 Detail for proper placement and additional information. When tiles are 10 feet long, proper soft joint placement is every grout joint. In these cases, you may want to consider grouting the entire installation with silicone sealant for a uniform appearance.

Custom Building Products offers a full line of tile installation products. Contact CUSTOM's Technical Service Department at **800.282.8786** if you have questions concerning this method or others for the installation of tile including thin porcelain panels.

The Raimondi RAI-FIX system is not manufactured or specifically endorsed by CUSTOM. Please see the Raimondi website for product and warranty details.

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TB96 12/16N