HOW TO INSTALL big tiles & panels

PHOTO 1A AND B: LIGHTWEIGHT SLIM PANELS OF LAMINAM MECHANICALLY FIXED TO A FACADE (COURTESY OF CDK STONE AND LIVING TILES).
Before we discuss the best methods of installing large tiles and panels, let’s look back briefly at how and why the prevailing big tile craze developed. Prior to the early 1970s most tiles sold in Australia were 6” x 6” (152 x 152mm) or smaller. Colours were plain. Floor tile options largely consisted of quarry tiles.

Then, 200 x 200mm Italian floor tiles and large sheets of Japanese mosaic arrived, in a wide variety of interesting designs. It wasn’t long before we witnessed the arrival of limited ranges of 300 x 300mm majolica floor tiles. Importantly, most of the imported products could be used on walls or floors, and colourful floor tile designs were enhanced by the availability of a matching plain colour, which provided added flexibility in terms of design.

All of these tiles were *bicottura* products (twice fired); some of the more elaborate designs were fired three times.

Italian manufacturers launched *monocottura* or single fired tiles in 1976. These products were fired at higher temperatures, usually 1200 degrees Celsius.

From this point, manufacturers experimented with decoration and textural effects which permitted them to add decoration at the press and maintain single-fire technologies.

As building technologies developed, lightweight construction became prevalent, and fixing techniques changed. Traditional Italian *bicottura* tiles were called *cottoforte*. These products were fired once to produce the red bisque (tile body) and a second time to add the decoration. Typically, these tiles were laid in a 3:1 mix of sharp wash sand and cement. The tiles were manufactured with lugs on the back which were designed to aid the bedding process. Tiles were literally beaten into a 12mm bed of sand and cement. This technique was useful because it permitted the tile layer to lay a deeper bed, where required, to overcome discrepancies in the level of the floor.

*Monocottura*, single-fired tiles, were produced without lugs and were designed to be laid in adhesive. Consequently, floor and wall surfaces had to be prepared to a higher standard.

Ceramic tiles fixed in adhesive weigh less than a metre of tiles bedded in a minimum of 12mm of sand and cement. This development coincided perfectly with the growing move to lightweight construction techniques as specifiers developed a preference for lightweight building materials that could be used on floors, walls and building facades.

Prior to 2004 tile manufacturers principally focused on decorative and textural effects which resulted in the emergence of larger tile formats for walls and floors. Today, 500 x 500mm, 300 x 600mm and 600 x 600mm tiles are the norm, when not so long ago 300 x 300mm was considered large. Bigger tile formats provide a larger canvas to decorate and enhance with textural effects.

Large tiles have been readily accepted in most markets. Specifiers and consumers appreciate the corresponding reduction in the number and width of grout joints required with rectified porcelain tiles.

Recent advances in digital inkjet printing processes have allowed manufacturers to produce compelling new designs and replications of other surface finishes.

However, bigger tiles weigh more and fixers faced fresh difficulties in relation to cutting, adhering and handling these large tile formats.

As a result, System SpA – an Italian producer of advanced tile manufacturing machinery – launched new presses that are capable of...
Large format materials and slim products are here to stay, if only because these products require less raw materials and energy to produce. Importantly, they also weigh a lot less, and when the industry as a whole grasps how to market, handle, cut and fix these products it will be possible to install ceramic materials on virtually any vertical or horizontal surface; including doors, table tops, work surfaces, and the facades of buildings.

System's new range of presses will make it possible to produce big panels of product in a variety of finishes and designs with thicknesses that range from 3 to 20mm. All we need to do is master how to maximise the enormous potential presented by this developing technology.

**Fixing techniques**

**Large Tiles:**

At present, international standards committees are attempting to determine at what point a tile ceases to be a tile, and becomes a panel or a slab. Should this be determined by the physical size of the product, or its thickness?

Is a large thin sheet of porcelain a panel or a slab? The term slab indicates that the material is reasonably thick, at least 20mm.

In all probability, any slim ceramic product that is larger than 1000 x 1000mm will be described as a panel, rather than a tile.

In relation to the installation of big ceramic tiles, up to 1 x 1m in size, on internal walls or floors, there are several key requirements in terms of preparation and fixing techniques.

**Preparation:**

All surfaces to be tiled (wall or floor) must be flat, sound, dry and free of any contaminants that may inhibit the creation of a good bond between the back of the tile and the substrate.

Tile can be adhered to a variety of background materials, which include plywood, structural particle board, fibre cement sheet, compressed fibre cement sheets, gypsum plaster board, rendered or screeded surfaces.

Adhesives exist which will adhere tile directly to flat, sound timber surfaces. Tiling over tile can also be achieved where the existing tiles are free from cracking, drumminess, or any sign of movement.

Wet areas should be protected by the installation of an appropriate waterproof membrane. Tiles should be adhered to that membrane with a compatible ceramic tile adhesive.

Adequate movement joints, including perimeter movement joints, should be allowed, in accordance with AS 3958 Part 1 (2007) – Guide to the Installation of Ceramic Tiles.

Adhesion can often be improved by application of an appropriate primer. Wherever possible it makes sense to use compatible waterproofing membranes, primers, adhesives and grouts made by one manufacturer.

**Tools:**

The key tools of the trade required by anyone attempting to fix large tiles on walls or floors are a suitable trowel and a tile cutter of appropriate length.

The most popular tile size in residential and commercial environments is 600 x 600mm. To install any tile larger than 400 x 400mm, a 12mm notch trowel is required (Photo 3).

A variety of manual, scribe and snap tile cutters are available, including Sigma’s massive 3F machine which has a cutting length of 1510mm. The best Sigma machine for 600 x 600mm tiles is the 3D which has a cutting length of 930mm and allows point to point, diagonal cutting of 600 x 600mm tiles (Photo 4).

If larger, conventional ceramic or natural stone products are being installed it pays to use an electric wet saw like the Raimondi 3 HP Zoe which has an overall cutting length of 1550mm (Photo 5).
Cutting wheels used on manual cutters and diamond blades used on wet saws should be carefully chosen to match the hardness and nature of the material being cut.

The Technique:
The best method of adhering big units of tile or stone to flat, well prepared surfaces calls for application of double-stick techniques which basically involves application of adhesive to the wall or floor substrate using the 12mm notch trowel. Never apply more adhesive than the manufacturer recommends.

You can then use the flat side of the trowel to apply a thin veneer of adhesive to the rear of the tile (Photo 6), taking care to completely cover the back. Then bed the tile carefully into the adhesive you have spread. The overall objective is to achieve contact coverage of at least 80 per cent for residential floors, or the 90 per cent required in accordance with AS 3958.1.
Commercial and industrial floors
- Wet areas
- Swimming pools
- External walls
- Exterior floors, decks and roofs

Optimum coverage is obtained by pressing tiles into the bed and moving them perpendicular to the direction of the adhesive notches.

Most of our local adhesive manufacturers produce a non-slump adhesive that is designed to withstand the weight of a heavy tile. Use of a non-slump adhesive will assist in avoiding lipping tiles. This term describes the situation where the edge of one tile protrudes above the other. This can be unsightly on walls; it can cause accidents on floors.

To guard against uneven surface finishes, use levelling system product which is designed to ensure that adjacent tiles are completely flush (Photo 7).

The bigger the tile, the harder it will be to physically handle and manoeuvre. Really large, conventional tiles that are bigger than 600 x 600mm and are 8mm thick (or greater) may require the efforts of two tile fixers.

Installing Slim Tiles & Panels:

If the fixer is using slim tiles (6mm or less) in conventional sizes the weight of the tile is not a major concern, but the flatness of the substrate is key. When thin tiles and panels were first introduced the aim was to provide a lightweight renovation product that could be adhered to existing tiled wall or floor surfaces, thereby reducing the mess, the time and the cost associated with removing the existing tiles and repairing the substrates. This is still a significant benefit associated with the use of slim products. These lightweight products, especially the big thin 3mm panels, were also designed for use on internal and external walls.
Today, the technology has advanced to a point where products like Cotto D’Este’s Forest 5.5mm slim tiles and panels can be adhered directly to correctly prepared, flat walls and floor surfaces, even in light commercial environments.

Thin porcelain tiles of fairly regular dimensions are surprisingly strong, and 3 to 6mm products can often be cut on a wet saw using a suitable blade. Some slim tiles have a PVC reinforcing mesh on the back that adds strength. These products should be cut with a wet saw. If mesh is not present, they can often be cut with a glass cutter.

Given the slim thickness of the product it is essential to ensure that edges do not lip. Ideally, the double-stick method should be employed using a trowel with an appropriate slanted notch, much smaller than 12mm. This should ensure that the edges are well supported, and that 90 per cent plus adhesive coverage is achieved.

Care must be taken to avoid excess adhesive squeezing up through the joints.

Tile over tile on walls, or thin tile application on new wall surfaces will provide a real benefit to fixers as they cut, handle and rapidly install the tiles.

Floor tiling projects can be equally successful providing one appreciates that the background must be very flat, and that thin products will not slide like conventional tiles do, which makes accurate placement vitally important.

Eric Astrachan, Executive Director of the Tile Council of America, told Tile Letter magazine in 2011 that these materials could benefit from being walked on immediately, to embed them in the mortar. Astrachan stated, “This tile is flexible....stepping on it pushes it into place.”

A similar benefit could be achieved with a roller of some description. One way or another, demand and installation of these products will increase as more people recognise that these products are strong, especially when fixed correctly. They are also increasingly available in a range of attractive designs, which are often made in regular thicknesses, which could allow users to install a slim product on walls (3 or 4.8 mm) and 5.5 to 6mm or thicker on the floor.

Cutting and Moving – Big Panels on Walls:

Two installers can easily lift 1000 x 3000mm panels of porcelain. Handling and manipulation can be made easier by the use of suction cups and a suitable frame or table. This is not a DIY activity.

The best and most efficient cutting and movement of large slim panels is achieved on the Raimondi Free-Cut System (Photo 8) which is designed to cut panels of up to 1500 x 3000mm.

Panels can be installed internally or externally. Use of the 3mm product is normally restricted to walls. Large panels on floors should be at least 5.5mm thick.

On walls the 3 mm panels can be used to line internal surfaces using conventional adhesives, where heights do not exceed 3 metres.

External cladding projects can be completed using mechanical fixing systems like the one designed by Laminam, the original slim panels (Photo 9).

However, a number of systems have been developed that will successfully install panels and tiles to building facades that range from 6mm in thickness. The Rai-Fix system by Raimondi will be exclusively available from B.A.T. Trims in Australia (Photo 10).

Standards for the application of mortar to big panels should comply with revisions to ANSI A108.2, A108.1B and ANSI108.5.