EMPORIO SURFACES

Installation Guide

Please ensure you have read all the information provided in this document prior to arranging delivery.

Delivery

The delivery vehicle will be a 14 or 18 tonne commercial 'curtainsider' or a 26 tonne 'Hiab' crane lorry. Due to the weight, the delivery lorry is not able to enter driveways or proceed off the public highway.

You are advised to contact our After Sales department with regards to the following:

- To request an estimated time of arrival on the day of delivery.
- To arrange a time specific (AM or PM) delivery. (Additional charges may apply.)
- To reschedule the delivery date please give at least 24 hours notice by way of email (Excluding Saturday, Sunday and public holidays).
- To change or amend the delivery address or site contact number prior to the delivery date.
- To inform us of any road restrictions or any special requirements prior to the delivery date. Note deliveries are made using a 14 or 18 tonne vehicle and that the road surface needs to be suitable for such a vehicle. In the case of EPAL Euro pallets, there needs to be a flat tarmac surface (or similar) in order for the pallet truck to function correctly. Pallet deliveries will be made to the kerbside only.
- To report a failed delivery.

Large format slabs will be delivered on an 18 tonne 'curtainsider' truck

Please inform us of any road or parking restrictions or any special requirements prior to the delivery date.

'A' frames

Deliveries of large format tiles (which includes formats with dimensions 1500 x 1500 mm and above) are made using wooden 'A frame' racks. These 'A Frames' are extremely heavy and have dimensions of 312 x 74 x 191(H) cm. A maximum of 50 slabs (25 each side) can be delivered on each frame. With the wooden frame itself weighing 220 kg and each individual porcelain slab weighing up to 60 kg, a single 'A frame' might weigh over 3000 kg.

'A frame' dimensions 312 x 74 x 191(H) cm

Supporting up to 25 slabs per side

The 'A frame' will be off-loaded from the truck and placed at the kerbside for unloading.
We highly recommend that tiles are taken directly to the area of installation and that a specialist tile handling frame is used.

Please note that typically the wooden 'A frames' are for transport only and, unless prior approval has been given, will not be left on-site.

Slabs should be removed from the 'A Frame' individually using the handling frame. Carefully wipe the surface of the tile to remove any dust or moisture. Move the handling frame into position and attach the handling frame using the suction pads to the surface of the tile. Ensure that the suction pumps are at suitable pressure and the frame is securely fixed before attempting to lift the tile.

Porcelain slabs are extremely heavy and may have sharp edges. It is therefore necessary to wear protective gloves at all times.

Handling Large Format Slabs

Large format porcelain slabs are extremely heavy and may have sharp edges. It is therefore necessary to wear protective gloves at all times. For safe handling of large format slabs on-site we highly recommend the use of a specialist tile handling frame with suction cups, such as the Raimondi Easy-Move. These frames help to maintain the integrity of the tile and ensure that operators' safety is not compromised.

Carefully wipe the surface of the tile to remove any dust or moisture, position the suction cups on the face of the tile and make sure that they adhere to the surface properly. For larger formats the full frame with four suction cups is suitable, use two double suction cups with smaller formats.

Four suction cups

Two double suction cups

Always use handling frame to manoeuvre slabs

To remove the handling frame from the tile surface, first ensure the tile is stable, then support the weight of the handling frame and press all the suction release valves in turn.

Suction cups attach to the face of tile and not the rear. Always follow the manufacturer's instructions.

Preparation

Health and Safety

We recommend that a risk assessment is undertaken prior to all works involving large format tiles. This assessment should include evaluating the number of trades-persons required to both transport and install the tiles. It should also include an asssesment of the correct equipment required to lift and carry large format tiles whilst on-site and during transportation to the site. It should also consider the correct use of Personal Protective Equipment when cutting and fixing the tiles.

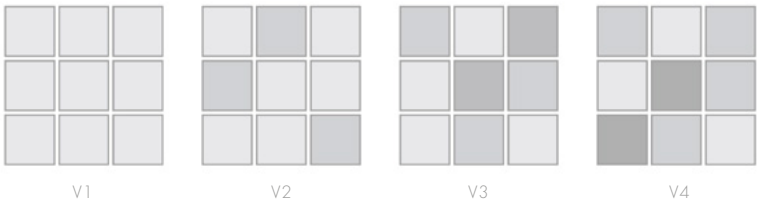
Design Considerations

The amount of cutting required and wastage caused by a particular tile layout should be considered during the planning stage. Careful planning can mitigate these issues and keep wastage and cutting to a minimum.

In addition, for projects requiring the fitting of sanitary ware or other permanent fixtures, consideration should be given to whether the tiles should be fixed first in order to reduce wastage and the requirement for cutting.

The surface flatness of the finished tiling should be true such that, when checked with a 2m straight-edge with 3mm thick feet the straight-edge should not be obstructed by the tiles and no gap should be greater than 6mm.

Take time to consider how the tiles can best be laid out to maximise aesthetic appeal and/or minimise cutting. The tiles should be well shuffled by drawing tiles from all the boxes. If possible dry-lay an area in suitable light as a final check before installation. Tiles should be arranged to obtain the best aesthetic result, especially if using a tile with a shade variation over V2.



Tile shade variance

Subfloor

Porcelain tiles are suitable for use with underfloor heating as well as floating, insulated and acoustic separating floors. Your subfloor must be level, in good condition and of appropriate thickness. It should be rigid, non-flexing and capable of supporting the expected load with minimal deflection. It must be stable, well supported, ventilated underneath and level. A level subfloor is extremely important in order to keep tiles from cracking. Use a levelling compound on low spots or sand high spots. Finally ensure your subfloor is dry and clean.

Floor Substrates

The installation of a suitable substrate is essential. Your substrate must be prepared in accordance with the British Standards and Codes of Practice BS 5385 Parts 1 and 3 and BS 8000 Part 11. It must be totally flat and free from contamination including wax and oils and other impurities that might prevent adhesion. Holes and leaks in the substrate should be sealed. Floor drains etc. should be protected. Sub-floors should be laid to a minimum of Surface Regularity SR1. If the surface does not meet these criteria, this must be communicated to the appropriate parties and made suitable before tiling. The installation of movement joints will generally be required according to British Standard BS 5385: Part 3. Substrates that are considered suitable for large format tiles include floor screed (sand/cement), concrete or specialist tile backer board. Timber is no longer considered a suitable substrate for large format porcelain tiles.

Wall Substrates

Substrates that are considered suitable for large format tiles and panels are listed in the table below. Existing tiling or paint should not be considered suitable for fixing large format tiles and panels. For following figures are only a guide as some boards may be capable of greater weights. You are encouraged to consult with the manufacturer for confirmation. Wall substrates should be in accordance with the requirements of British Standard BS 5385 Part 1.

WALL SUBSTRATES	MAXIMUM WEIGHT OF TILING PER M^2
Gypsum plaster	20 kg
Gypsum plasterboard (12.5mm thickness)	32 kg
Gypsum fibreboards	40 kg
Glass reinforced cement-based boards	50 kg
Lightweight foam-cored tile backer boards	60 kg
Cement/sand rendering	Typically no restriction

Please note that timber is not considered a suitable substrate for large format porcelain tiles.

Avoiding Lippage

Lippage is the difference in height between adjacent tiles. There are permissible manufacturing tolerances for porcelain tiles as defined in BS EN 14411, therefore laying tiles in a staggered pattern should be carefully considered due to any slight curvature of large format tiles, which, although within manufacturing tolerances, may result in lippage.

We recommend that any deviation between adjacent tile surfaces, should be no greater than 1 mm for joints less than 6 mm wide, and no greater than 2 mm for joints wider than 6 mm.

The contributing factors to what causes tile lippage are how much warpage the tile has, the width of the grout, how flat the substrate is, and the expertise of the tile installer. In order to ensure a uniform surface and produce a surface with acceptable lippage, make use a levelling system and frequently check that your tiles are even using a suitable box level. Levelling systems are available with 1 mm, 2 mm and 3 mm tile spacers. (It should be acknowledged that levelling systems may reduce the solidity of the tile bed.)

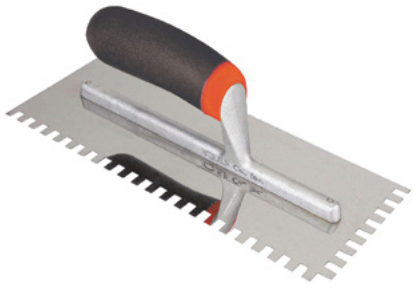
Tile levelling system

If installing over underfloor heating, ensure the heating system remains off while the tiles are fixed and until the adhesive and grout have fully cured.

Fixing

Correct preparation of the subfloor or laying surface is crucial. The laying surface should be rigid, non-flexing and capable of supporting the expected load with minimal or no deflection. A level subfloor is extremely important in order to keep tiles from cracking. Sanding high spots and the use of a levelling compound on low spots is essential. It is also important that your tiles are clean and dry, if necessary wash them with clean water and dry them thoroughly before fixing.

Whatever your specific requirements,selecting the appropriate cement-based, fibre-reinforced or ready-mixed adhesive is vital to ensuring the success of your project. Adhesive must conform to British Standards EN 12004.



10 mm square toothed trowel

Once your subfloor is clean and dry, spread the adhesive on the surface to be covered with a 10 x 10 mm square toothed trowel, covering an area 5 – 10 cm more than the size of the tile Always apply the adhesive in stripes running parallel with the short edge to remove air pockets and bubbles. By using this method, full coverage of the tile with adhesive is ensured.

Apply adhesive in stripes running parallel with the short edge

Back-buttering

Large format porcelain slabs always require back-buttering. Back-buttering describes the process of applying a layer of adhesive to the back of the tiles using a trowel.

Using a specialist wheeled transport cart, fix the large format slab in a vertical position on the handling frame with the use of suction cups. Use a 10 x 10 mm square toothed trowel for applying your adhesive to the wall or floor and when back-buttering use a 3 x 3 mm square toothed trowel for the back of the tile. The sum of the two trowels notch sizes should equal or be greater than 13 mm (3 mm + 10 mm = 13 mm).

Wheeled transport cart

Back-buttering on transport cart

Using the handling frame with suction cups, bring the slab into a vertical positional and slowly lower it to horizontal. The tile should be firmly pressed into the adhesive along a straight edge, collapsing all adhesive ridges. Use a levelling system to avoid lippage and frequently check that your tiles are even using a suitable box level. Levelling systems are available with 1 mm, 2 mm and 3 mm tile spacers.

Periodically check the tiles backs to make sure there is full contact between the adhesive and tile. If not apply additional adhesive to the tile or use a troll with larger notches in your adhesive. As you are working wipe off excess mortar with a wet sponge.

Please note that under no circumstances should the 'dot and dab' technique be used with porcelain tiles.

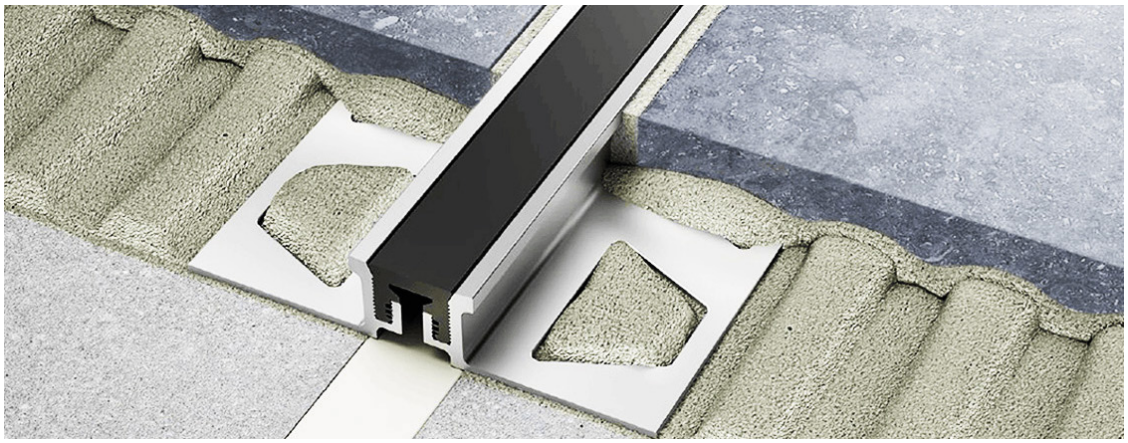
Movement Joints

All tiles will expand and contract due to changes in temperature and moisture, and almost all substrates will move differently to their coverings. Referred to as a movement joint, expansion joints are used when tiling large areas to break up the tile bed in to separate sections. Using an expansion joint allows each block or section to move independently from the others.

The provision of movement joints should be considered during the design stage of all projects involving large format tiles. Background movement due to factors such as thermal changes, moisture and drying shrinkage can cause loss of adhesion or cracking, but can be mitigated by the correct provision of movement joints.

Construction materials, bedding systems, anticipated temperature and humidity conditions should all be taken into consideration when planning movement joints. Movement joints should be installed at the perimeters of rooms, thresholds and where the tile bed meets other constructions. They should also be installed at changes in background construction and to divide up large expanses of tiles as recommended in BS 5385 Part 3. Sealants should be used for movement joints in flooring applications according to BS EN 15651 Part 4.

For wall tiling applications, movement joints should be installed where the tile bed meets other materials, or is continuous across junctions of different background materials. They should also be installed over any existing structural movement joints. Movement joints should also be installed at internal vertical corners and where stresses are likely to be concentrated. Refer to BS 5385 Part 1.



Movement, expansion or stress relieving joint

Cutting

Porcelain tiles require high quality diamond blades for cutting; if hiring cutting equipment please ensure this is provided with the appropriate blades. Always cut and fabricate with wet diamond tools and take appropriate measures to provide efficient ventilation in the work area. Always wear approved eye, boot & hand protection when fabricating porcelain.

Linear cuts

For most cuts we recommend the use of a wet saw machine. These are available for cutting lengths of 100 mm up to 2200 mm. The Raimondi Bolt range of bridge wet saw machines are available in various lengths.

Wet saw machine

For linear cuts of 1500 - 3000 mm we recommend the use of a cutting guide with cutting carriage. Always use a handling frame with suction cups where necessary. The Raimondi FREE-CUT Cutting System is available for lengths up to 4000 mm.

Cutting guide

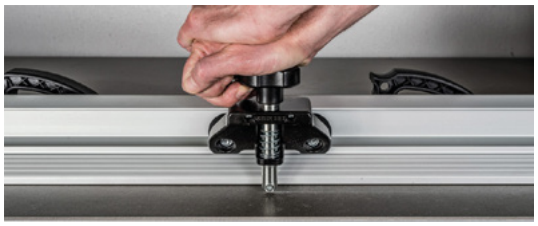
Cutting carriage

Always wear approved eye, boot & hand protection when fabricating porcelain tiles.

Using a cutting guide with cutting carriage

Mark the portion to be removed at the ends of the tile with a pencil. Position the cutting guide with cutting carriage so that the references on the guide coincide with the lines marked on the panel. Lock the cutting guide with the cutting carriage in place using the suction cups. To guarantee correct scoring, the pressure and movement of the cutting carriage must be constant along the whole length of the cut. Score one end of the panel by 15cm pushing the cutting carriage towards the edge of the panel. Complete the scoring up to the opposite end of the panel.

Cutting guide



Cutting carriage

Using the cutting guide, move the panel until scoring line protrudes 5-10 cm from work surface. Release the cutting guide from suction cups and move towards the middle of the panel. Start cutting off process by positioning cutting-off pliers in line with the line scored on the panel. Exert progressive pressure until you notice that cutting off process has begun. Go to the opposite end and position cutting-off pliers in line with line scored on the panel. Exert progressive pressure until you notice the cutting off process has begun. To complete the cutting off process, one or more operators must grip the portion to be removed and exert progressive pressure.

Sharp or rough edges should be smoothed and finished with a diamond buffer or sanding pad.

Cutting-off pliers

Diamond buffer

Always follow the manufacturers instructions of the particular cutting system you are using.

L-shaped cuts or cut-outs

It is necessary to process the tiles on a flat work surface, at least 5 cm longer than the tile from each side. For L-shaped cuts (holes for electrical boxes, internal corners) you must round off the internal angle by making a hole first with a suitable wet diamond core drill bit. Mark the portion to be removed on the panel. To limit the possibility of breaking, please ensure you drill a pilot hole in line with the point where the two lines marked on the panel meet.

Rectangular holes

Mark the area on the panel to be removed. Make 0.7 mm holes in the 4 corners using a water cooled drill with a diamond core drill bit. Using an angle grinder equipped with a diamond blade join the 4 holes. Run the diamond cutting blade along the marked surface cutting the tile. Sharp or rough edges should be smoothed and finished with a diamond buffer or sanding pad.

Drilling Holes

Due to their inherent strength drilling holes in porcelain tiles can be a difficult task without the correct equipment. It is recommended to process the slabs on a flat work surface, at least 5 cm longer than the slab from each side or double suction cup. One operator is sufficient for cutting the holes. Normal masonry or tile bits will not work.

We highly recommend the using a water-cooled drill with a diamond core drill bit. For drilling smaller holes we advise using a drill guide to prevent the drill bit from wandering. Support the tiles over the entire surface, preferably on a wooden base. Always use a support tool to help fix the drill, for example a drill support with suction pads. Small diameters must be drilled at a high speed, larger diameters at lower speeds. Do not use a rotary hammer, roto-drill, hammering drill or any other rotary drill with hammering action.

Grouting

A suitable cement based grout according to BS EN 13888 should be used in normal situations. High-performance products are available for all applications, from domestic bathrooms through to commercial swimming pools. Most cement based options come in powder form, but epoxide or acrylic resin based pre-mixed grouts are also available. Whichever option you choose follow the manufacturer's instructions on how to mix or prepare the grout. Specialist products are available for specific applications requirements including interior, exterior, floor, wall, assorted joint widths, wet areas and swimming pools and can also be specified in an assortment of complimentary and contrasting colours.

Epoxy or Epoxide based grout provides a hygienic, chemically resistant joint and offers greater bond strength than cement based grout. It does not require sealing and is easier to maintain and clean. However please note that using an epoxy based grout requires a different installation process than using regular cement based grout, from mixing to application to cleaning, and that improper application can cause serious problems. Please ensure that your tiling professional has experience with this type of product.

Prior to applying grout allow the tile adhesive to cure according to manufacturers instructions. Ensure that the grout joints are clean, dry and free from adhesive, dirt and other loose debris. It is advisable to grout and clean a small test area prior to grouting the whole floor. This will give you the opportunity to check that you are happy with your chosen grout colour.

The instructions provided by the manufacturers of grouting materials for polished or honed surfaces must be carefully followed and installation times and above all cleaning instructions must be abided by. Grout the tiles with a suitable grout in accordance with the manufacturer's instructions.

Take care to fully compress the grout into the full depth of the grout joints so that no air pockets exist and the joints are fully filled. After applying the grout, leave for approximately 20 minutes or until it has hardened, before cleaning the access grout with a wet sponge and haze remover. Work in manageable areas and clean off any residues when the grout has begun to firm up in the joints, but before it sets on the tile face. After grouting do not walk on the floor for at least 24 hours.

To allow for expansion and contraction during normal heating and cooling cycles, perimeter joints must be finished with silicone sealer, not with grout.

Sealing

Porcelain tiles are UV, scratch, stain and thermal-shock resistant and 100% non-porous and therefore do not require sealing products. But while porcelain tiles are non-absorbent and stain resistant, the grout that surrounds the tile may not be. Cement based grout is a porous product that can absorb water and stain. We therefore advise that all cement based grout joints are protected using a dedicated grout sealer.

Spray the sealer directly onto the clean and dry surface at a distance of roughly 10-15 cm away from the application point. Rub into the grouting with a sponge to improve penetration. Fully remove any residues within 5 minutes, either manually using a clean cloth or absorbent paper towel. Treat a small area at a time (1m2). The floor can be walked on after 8 hours. Any remaining residues on the surface can be removed with a mild cleaning solution.

For most grouts, sealers will not affect its appearance, but we recommend testing the sealer on an inconspicuous area 24 hours before you do the rest of the grout to check for colour fastness. Carefully apply the sealer onto the grout following the manufacturers instructions.

Take care to only saturate the grout with the sealer, not the porcelain tiles. If some sealer does get on the porcelain, wipe it away immediately with a soft cloth. If this is the first time you have sealed the grout, apply a second coat of sealer at this time. Once the second coat has penetrated, wipe away the excess grout with a lint-free cloth. Continue buffing the grout and the tiles until they feel dry and not tacky to the touch. The sealer will be fully effective after 48 hours, protect the surface against water, oil, etc. during this time.

Porcelain tiles are UV, scratch, stain and thermal-shock resistant and 100% non-porous and therefore do not require sealing products.

Cleaning

Porcelain tiles are manufactured from extremely pure clays and minerals that are fired at very high temperatures. They are harder, stronger and more durable than any natural stone and have superior chip resistance and an extremely low level of water absorption. A comprehensive cleaning routine will help to keep your tiles in tip-top condition and ensure their continued beauty for years to come.

Post-laying cleaning is critical after on-site works. Inadequate or delayed removal of the grouting used on the joints can leave marks that are difficult to remove and creates a cement film that can absorb all types of dirt, giving the impression that the tile surface has become dirty.

To remove cement based grouts, wash the floor with specialist cleaning detergent which is aimed at removing excess grout residue, post-application deposits and building grime. Always follow the manufacturers instructions. For stubborn stains or advice on specific detergents contact our After Sales department.

General cleaning of porcelain tiles is a relatively simple process. Regular cleaning (once or twice weekly) is the best way of preventing a build-up of dirt and unsightly stains. This can be accomplished with a simple sweep and vacuum to remove debris, followed by mopping sparingly with warm water. Dry with a microfibre cloth and if your surface is polished, buff to restore the brilliant finish.

Before using any new cleaning product or method, make sure to test it on a small, inconspicuous area of tiling first. Avoid using excessively acidic or basic products, and do not use abrasive sponges. We do not recommend the use of polishing machines or waxes.

Although porcelain tiles are stain resistant, care must be taken to immediately clean any stain, especially on polished bench tops. The best way to ensure stubborn marks do not occur is to wash away stains such as red wine, food and drinks, using warm water and a soft cloth. For stubborn stains use a non-abrasive cleaning product, sugar soap or normal house cleaning products. Do not use cleaners that have strong alkaline pH levels and thoroughly rinse the surface with clean water to remove residue. It is also important to note that hydrofluoric acid (HF) and its derivatives can irreparably damage porcelain stoneware.

We strongly advise against the use of waxes, oily soaps and impregnating products as their application is unnecessary. Please note that some off-the-shelf detergents contain waxes and additives which can deposit a shiny coating on the surface, affecting the slip resistance properties of the tile.

Fabrication

The latest technology has meant that 6 millimetre thickness porcelain can be cut, shaped, mitred or drilled to almost any size or pattern. This has empowered designers to specify this innovative material for additional object-based surfaces and form entirely bespoke fabrications. From hidden doors and sliding walls, kitchen worktops with integrated basins, vanity units, stand-alone objects, desks and furnishing accessories, every design can now benefit from the stunning beauty, flexibility and superior technical performance of porcelain.

Cutting curved corners

Custom made counter tops featuring curved cut-outs are also possible and can be use with under mounted basins. When planning the shape of the curved cut-out, consideration should be given for the availability of suitable cutting equipment. We recommend the use of a water-cooled diamond core drill, with a diameter that suits the radius of the required curve. Finalise the cut on a CNC (Computer Numerical Control) tile cutting machine or bridge saw. Finish by honing the top edge with a small Aris profile.

We recommend that all drilled holes or cut-outs be located through application and careful marking. It is always best to use a template for any drilled hole to ensure correct location is achieved. To avoid hairline cracks when adhering sinks to the underside of porcelain benchtops (especially once sinks are full of water) it is recommended to reinforce the underside of the edges or ensure that sink weight is physically supported from underneath.

Joint treatment

We recommend all joints be taped prior to application of any joint slant such as silicon or colour matched resin. No joint sealant should be allowed to touch the finished surface of the tile. We also recommend epoxy based adhesive for adhesion to substrates, but consult your fabricator for the best adhesives to use for joints.

Edge Profiles

There are many options for edge profiles of worktops and benchtops that will result in a high quality finish. Porcelain tiles are suitable for various profiles including Aris Edge, Pencil Round, Half Bullnose and Bullnose. A slim natural profile, using a straight edge also provides a contemporary look and does not require polishing. Exposed edges are best finished to minimise the potential for chipping and can easily be polished if required.

Mitred edges

A mitred edge can be achieved to give the illusion of one thick solid slab of stone or concrete. It is important that when setting up the mitre machine, sharp edge mitres are avoided. The junction between the mitre needs to be suitably worked so as to minimise sharp edges. Generally a 1 mm Aris Edge or Pencil Round is effective. Other mitred edges that can be achieved include Butt and Birds Mouth joints.

Substrates for fabricated surfaces

Always use a rigid base substrate and ensure that the substrate has no flex. Do not install the tile over timber support bench battens without a suitable substrate.

NOTE: When gluing panels to an existing substrate you must ensure that the adhesive spread has 100% coverage of at least 2-3 mm thick. Use a PU based adhesive or silicone.

Overhangs

We recommend a flush finish to benchtops and worktops, but a maximum 20 mm overhang is possible. If larger overhangs are required, use a support substrate to minimise any potential damage to the material due to heavy impact or flex.

Do not leave air gaps under bench tops.

Mosaic

Porcelain and glass mosaic tiles are available in a number of different chip sizes, from 16 mm to 60 mm, and typically come mounted on 300 x 300 x 9.5 mm fibreglass mesh-bound sheets. Part of the beauty of mosaic tiles is the fact that there is less cutting involved in comparison to using larger tiles. Cuts to the mosaic tile sheets may still need to be made and we recommend that you either cut from the back through the mesh with a utility knife or from the top with scissors.

Try to limit cutting the actual tiles where possible, but if you do need to cut porcelain or glass mosaic, use a manual rail cutter or high quality tile nibbler. Sharp or rough edges should be smoothed and finished with a diamond buffer or sanding pad.

Carefully clean the surface to be tiled. It must be totally flat and free from contamination including wax and oils and other impurities that might prevent adhesion. Holes and leaks in the substrate should be sealed. Floor drains etc. should be protected. If you are tiling over an existing concrete base, seal the base with an acrylic primer, to ensure a good bond between the thinset and the subfloor.

If you are tiling a shower tray or wet room ensure that your subfloor is primed with a waterproof membrane. This is usually painted on, but can also be installed using a lightweight tile backer board. Also do not forget to allow for adequate drainage. This will prevent problems with standing water while the shower is in use and reduce moisture levels when the shower is off. This will also help to prevent mould and mildew. The recommended minimum slope for a shower floor is about 4 percent, or a 12 mm drop every 30 cm, from the shower walls to the drain.

For tiling on more complex structures we recommend a universal substrate specifically for waterproof assemblies. Schlüter KERDI-BOARD can be used to tile on walls of any kind and has a grooved version (KERDI-BOARD-V) for creating rounded and curved structures and surfaces.

Installing mosaic tiles

If installing over a large surface, plan how you will lay the mosaic tile sheets. Try to stagger the join of the sheets, avoiding continuous lines, so that the tiles appear to be individual mosaic, rather than part of a clearly discernible square backing sheet.

Use a thinset mortar to attach mosaic tiles. Take care to use the correct thickness of thinset as spreading it too thickly will risk it ooze through between the tiles. Build up and then use as little as will adhere the mosaic to the surface. You can test on a sample area to be sure. Use a 6 mm square notched trowel to apply the thinset mortar. Lay the mosaic sheet carefully into the desired position and with the thick rubber surface of a grout applicator or similar, apply even but gentle pressure across the surface of the tiles. Be careful not to allow the thinset to ooze above the surface of the tile. If you see areas where excess thinset has oozed through, clean this off with a thin pointed object while still wet.

Use tile spacers to ensure equal distance between tile chips and each tile sheet. Check your levels and ensure the tile surface is smooth and the sheets are embedded evenly in the thinset. Allow to dry for 24 hours.

Once the thinset is dry, you can begin to grout the tiled surface. Choose your grout colour carefully as this can have a dramatic impact on the overall look of the area.

Grout a small area at a time and apply sparingly. Clean the surface thoroughly with a lightly damp sponge to remove the excess grout. Do not saturate the tile surface as additional water will weaken the grout. After grouting do not walk on the floor for at least 24 hours.

Never use mastic to fix mosaic tiles for shower or wet room projects.

Underfloor Heating

Porcelain tiles are suitable for use with underfloor heating. If installing on top of underfloor heating it is important that the heating system is off while the tiles are fixed and remains off until the adhesive and grout have fully cured. If laying the tiles on a freshly installed underfloor heating system, they should only be applied once the drying conditions are suitable. Air dehumidifiers, draughts and too high temperatures must be avoided.

Use a suitable substrate

One of the most common reasons for problems with the laying of tiles on an underfloor heating system is damage to the heating system during fitting. Without the use of a suitable substrate, it is easy to accidentally tear a pipe with the trowel when adhesive is applied. With a suitable substrate in place, the heating pipes are completely below the screed or substrate slab, and therefore the risk of damage when laying tiles is removed.

Movement due to thermal expansion

Underfloor heating systems create thermally-induced movement. The substrate and adhesive expand at a similar rate to each other, whereas the tiles (with a lower coefficient of thermal expansion) will expand proportionately less. The result is that stresses build up at the bond between the tile and the adhesive. This can result in a fracture between the tile and the adhesive, or stretching at the grout joints.

We highly recommend the use adhesives and grouts that have enough flexibility when set, to accommodate the thermally-induced movement associated with underfloor heating systems.

20 mm tiles

With their practical, non-slip surface and incredible strength, 20 mm porcelain slabs have become the ideal laying solution for heavy traffic commercial areas and external applications. 100% frost-resistant and suitable for sub-zero temperatures means that these tiles can be used for driveways and walkways, as well as for swimming pools surrounds and hard landscaping. They are also entirely resistant to stains, mould and moss, meaning their finish will remain as beautiful as the day it was laid.

20 mm porcelain slabs also provide tremendous versatility, as they can be laid on virtually any outdoor surface and be fixed with a variety of different methods to suit the application. Adhesive free installation techniques allow for dismantling, maintenance and repositioning of porcelain slabs. The following pages document the various laying options for grass, sand, gravel and screed as well as for using a raised pedestal system.

Grass

Gravel / Sand

Screed

Raised Flooring

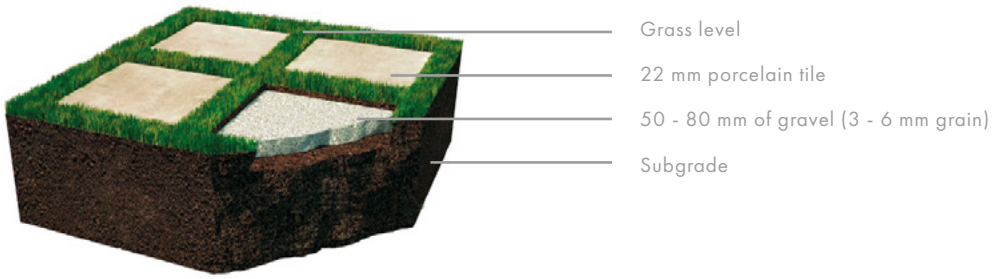
Porcelain tiles are 100% frost, stain, mould and moss resistant.

Laying on grass

The following the method ensures that your tiles are reusable if you decide to move the pathway at a later date.

Position the slabs on top of the grass area according to your desired installation layout.
Mark around the perimeter edge of each slab using a flat spade or lawn edging cutter. Carefully lay the slab to one side. Across the entire area you have marked, remove the top surface of the lawn and soil down to a depth of 70 - 100 mm.

To ensure perfect stability, fill the excavated hole with fine gravel (3 - 6 mm grain sized) to a depth of 50 - 80 mm and compact down to ensure a level surface. Carefully lower the slab into position and gently tap the slab with a rubber mallet to level. Ensure the surface of the slab is approximately 5 - 8 mm beneath the surface of the surrounding soil in order not to damage the lawnmower when cutting the grass. You may be left with a slight gap around the tile which you can fill with some of the previously excavated soil. Slabs installed in this way can be walked on immediately.



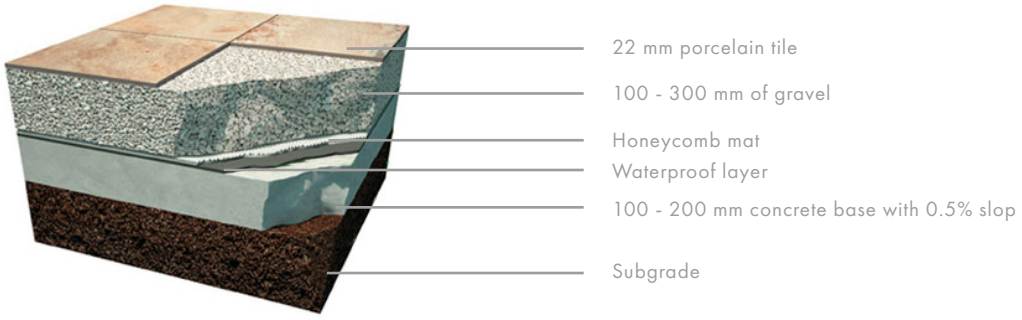
Take care to ensure that the porcelain slabs do not protrude above the level of the soil in order not to damage the lawnmower when cutting the grass.

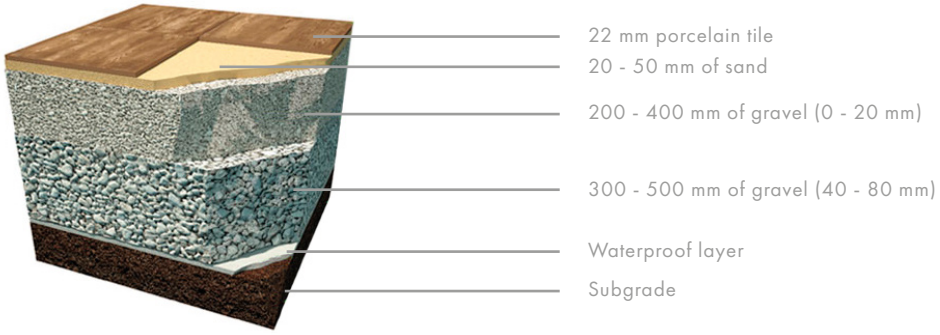
Stepping stone layout on grass

Laying on gravel or sand

Laying on gravel ensures correct soil drainage, through the gaps between the slabs, allowing the water to drain off into the ground. This laying solution is ideal for projects where permanent floor laying is not possible.

For installation on gravel we recommend the use of spacers as they provide the slabs with support and allow for planar surfaces. The transparency of the material makes them scarcely visible and they can be cut in order to create T-shaped spacers for straightforward installation patterns.





Porcelain slabs do not require sealing or seasonal treatment and can be washed using a pressure washer.

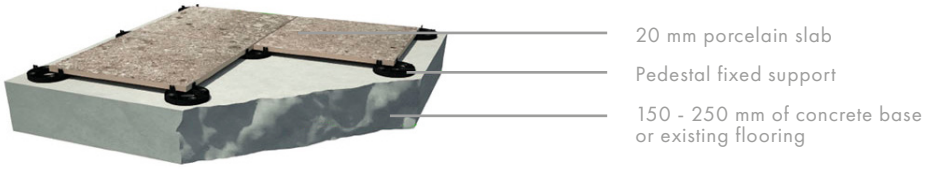
Using a raised pedestal system

Fixing tiles in outdoor environments can be extremely tricky. Surfaces are often uneven and require significant preparation work. In the right situation a raised pedestal system can make this process relatively simple. Pedestals are small plastic bases that are placed below the tiles to hold them in place. The height can be adjusted on each pedestal allowing the creation of a flat even surface. No adhesives or grouts are needed, and the pedestals are so easy to use they can be fitted without previous paving or tiling experience.

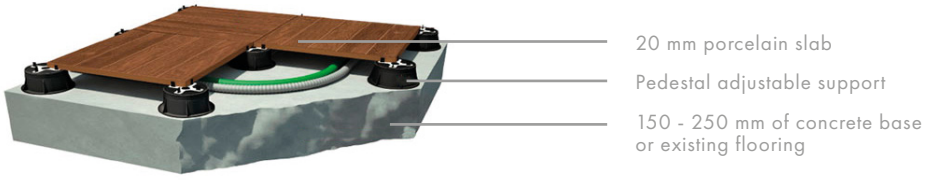
Our 20 mm porcelain tiles are suitable for fixing on a raised pedestal system. Installation on a raised pedestal system is typically used on large, regular surfaces or above previous installed floors. The open gaps between the slabs allow the rain water to drain off into the cavity created under the panels. Therefore a flat, even floor can be obtained, while the underlying waterproof layer will have the gradient required to drain off the rain water.

Laying on a raised pedestal system

Using a Fixed or Adjustable pedestal is possible.



Fixed Support

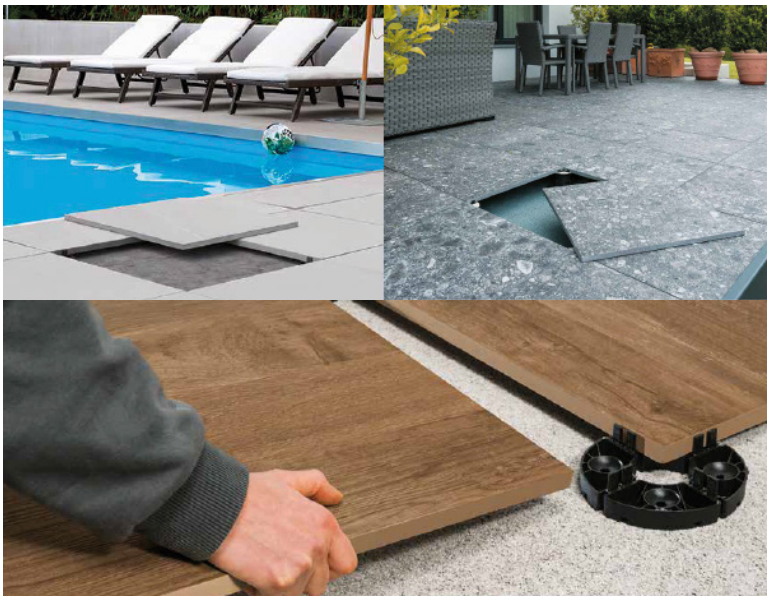


Adjustable Support

Installing a raised pedestal system

The load-bearing structure of the pedestal system is made of polypropylene feet with a large base and rounded edges, to prevent damage to the insulating layer. This solution allows for any underlying elements to be inspected and offers a practical passage for pipes and wiring, meaning that all pipes and wiring systems laid beneath the tiled surface can be inspected at any time, simply by lifting and removing the slabs.

Step 1: Ensure that the underlying base is fully waterproofed.
Step 2: Clean the underlying base carefully.
Step 3: It is advisable to start laying from a corner if there is one.
Step 4: It is advisable to use a fifth foot in the centre of the slab to distribute the load evenly.
Step 5: The maximum recommended laying height of the pedestals is 200 mm.
Step 6: When laying regularly check that the laid slabs are level.
Step 7: To ensure a level surface, adjust the feet with the special spanner provided.
Step 8: When laying, check that the gaps between the tiles run flush and even.



Laying on a raised pedestal system

It is important to ensure that the underlying base is fully waterproofed and has sufficient gradient and drainage to deal with rain water.

Laying on screed

20 mm porcelain slabs are extremely resistant to both dynamic and concentrated loads, which makes them the ideal laying solution for vehicular driveways, car parks and garage ramps. High precision, rectified slabs, mean that grout lines can be kept to a minimum, while large formats make them ideal for sizeable areas such as street furnishing projects.

Laying screed

Prepare the subfloor

Porcelain slabs are suitable for fixing on screed both for internal and external projects. If you are laying screed on top of an existing smooth or shiny floor, you may need to key the surface to ensure stability. Once keyed, apply a cement slurry across the pitted surface to ensure a good bond between the keyed surface and the screed. Use an uncoupling membrane across expansion joints.

Use a uncoupling membrane across expansion joints.

Preparing the screed layer

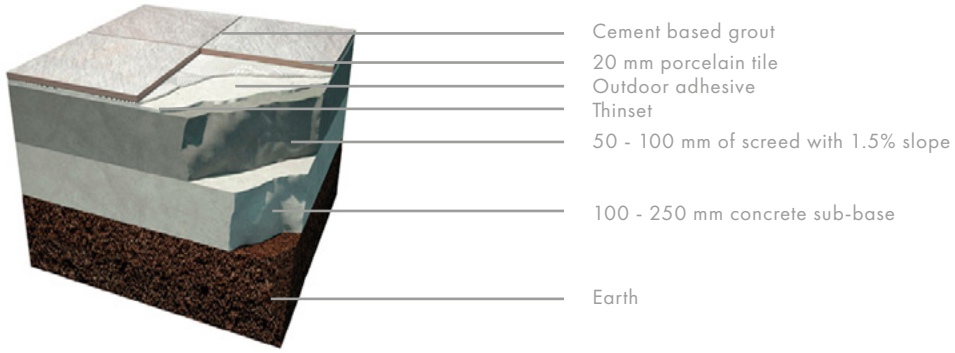
Prepare your screed with 1 part cement with 4 parts sand. Shovel in the mix to a depth of 50 - 80 mm. Compact it down evenly with a steel float. Using a straight edge remove the excess mix from the surface of the screed, and check for level until you reach the desired height and level. For driveways and external projects, ensure a 1.5% slope for adequate drainage. Finish by using a wooden or plastic float to achieve a perfectly smooth surface.

Systematically continue the compacting, levelling and floating process across the surface to be tiled, checking regularly with a spirit level to ensure the correct levels. Clean off any access.

Cement-based materials need to retain moisture until the hydration process is complete. Screed should therefore be left for at least 3 weeks to dry prior to tiling. The recommendation is for 1 day of drying per mm, for thicknesses up to 50 mm. Thicker substrates will require 2 days per mm.

A cement based waterproof coating is recommended that cures to form a durable, waterproof coating which acts as a sealer and protects the screed from water penetration.

Once dry, fix your slabs as outlined previously using an appropriate outdoor adhesive. Ensure to back-butter all porcelain slabs to fill any voids and ensure full coverage between the surface of the tile and the adhesive. Use an appropriate levelling system. Leave at least 24 hours for adhesive to dry then grout as required. After grouting do not walk on the floor for at least 24 hours.



Apply the adhesive in stripes running parallel with the short edge of the slab.

CONTACT

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