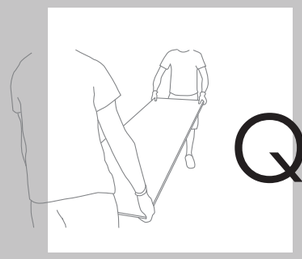
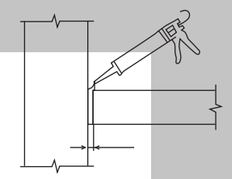
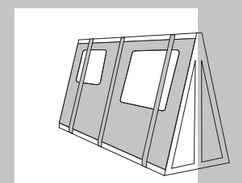
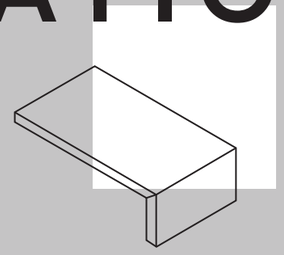
GRANICER
CERAMICA INDIANA

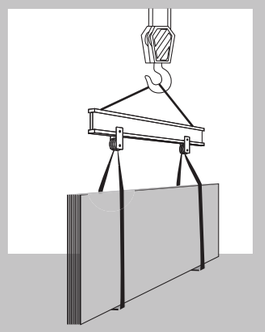


QUICK REFERENCE MANUAL FOR INSTALLATION









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TECHNICAL MANUAL

Explore the intricacies of your surfaces with the comprehensive Granicer's Technical Manual. This invaluable resource provides expert guidance on handling Granicer slabs after purchase, offering a wealth of meticulously researched suggestions.

With this manual, you can be reassured of a smooth and seamless surface experience, knowing that every suggestion is backed by thorough research.

TABLE OF CONTENT

The Granicer Manual contains thorough guidance on packaging the surfaces for safe transportation, considering various mishaps that can occur while in transit, and effectively handling and storing surfaces in a storage area or warehouse. This manual also provides clear measurements for design purposes.

Further instructions elaborate on how and where to cut the surfaces for fabrication and which tools and techniques are best for this task. They also provide clear instructions on properly installing the surfaces in a designated area and what to keep in mind during installation. Lastly, they provide a clear guide on the cleaning and maintenance process, which is nothing if not easy.

CONTENTS

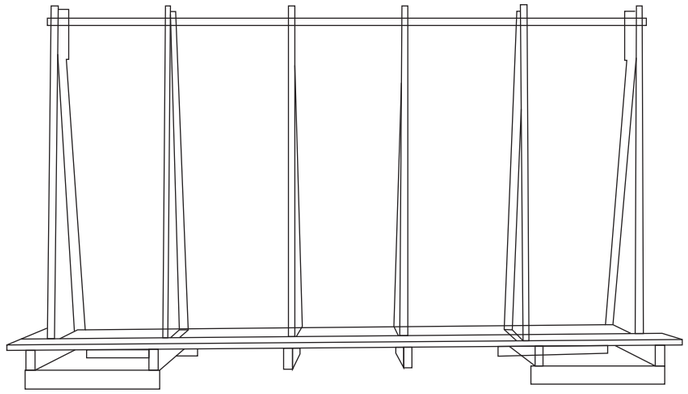
HANDLING AND STORAGE

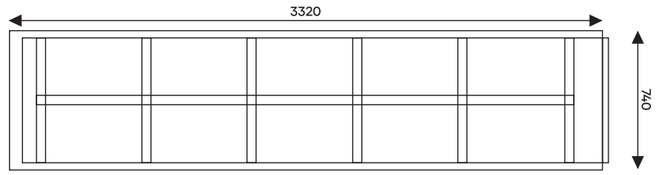
1. PACKAGING AND ROAD TRANSPORTATION

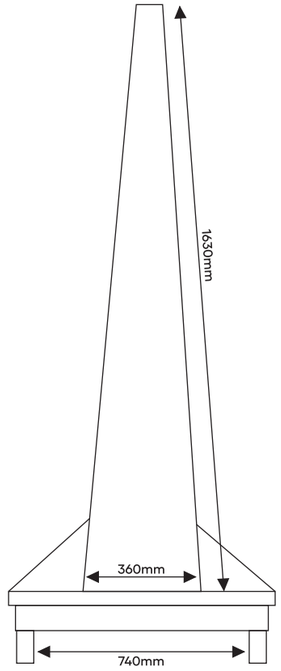
GRANICER Porcelain slabs are transported while packed upright on A-Frames as depicted below.

The safe number of slabs on each side of the standard GRANICER A-Frame depends on the thickness of the slabs.

During HGV transportation both the slabs and the A-frames must be safely secured using sufficiently strong ratchet straps.







2. HANDLING AND STORAGE WITHIN A FACTORY OR WAREHOUSE

2.1 EQUIPMENT REQUIRED

Forklifts with forks at least 2.5 m long for loading/unloading metal palettes.

Suction cups with frame for handling the slabs or Rubber coated canvas belts or double clamp with overhead crane.

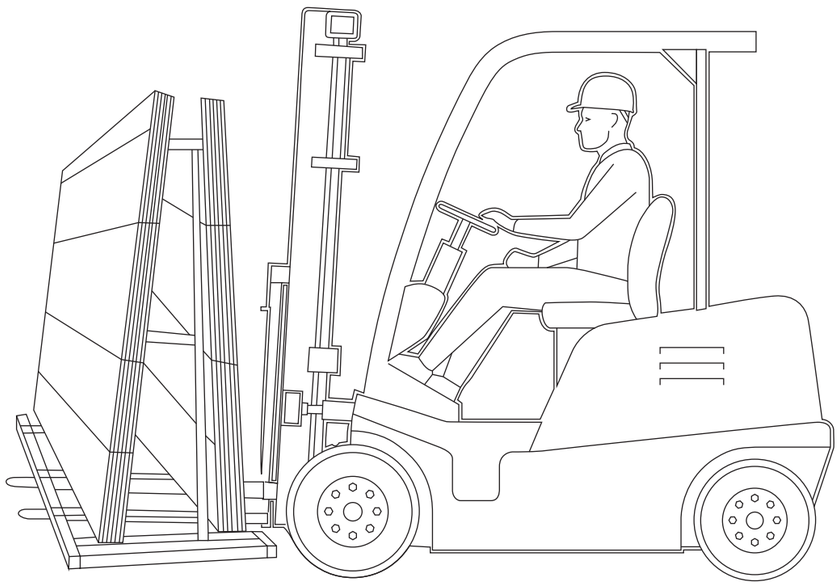
2.2 PROCESS

2.2.1 Transporting A-Frames

When handling A-Frames, use a forklift or crane to lift and place the frames at the desired location.

The forks must be inserted centrally into the base of the A-Frames at right-angles to the length of the slabs, with both forks fully inserted into the A-frame to maintain balance.

Do make sure the frame is stable before moving the forklift. It is recommended to keep the frame safely close to the ground whilst moving the frame.



2.2.2 Transporting Slabs

Remove any packaging from the slab.

The preferred means of transporting GRANICER slabs is by using a bridge crane and rubber coated canvas belts.

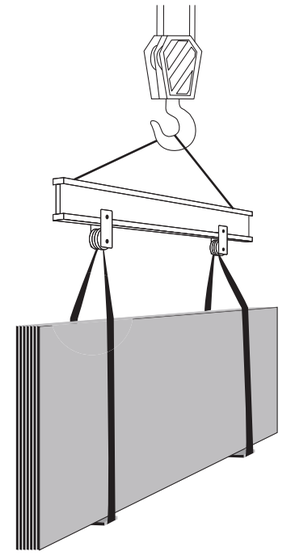
Clamps (as depicted below) can also be used. In case a double clamp is not available, it is recommended to insert a 2cm thick plank of at least 300cm length between the slab and the clamp (on the back side of the slab) to support the slab while transporting.

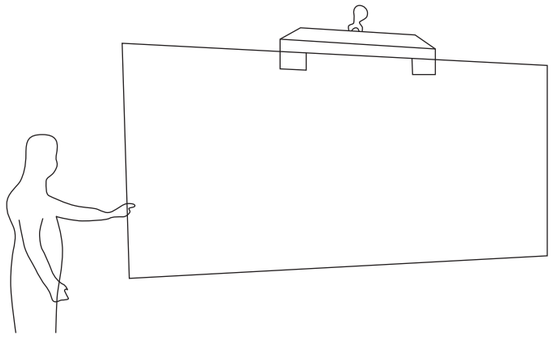
When using a clamp only move one slab at a time.

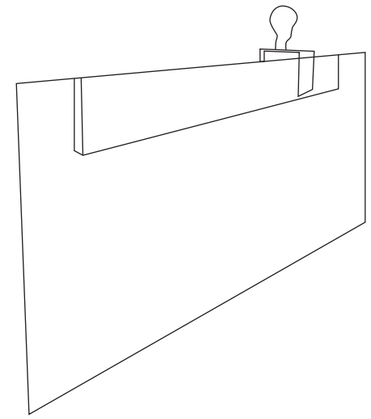
Slabs must always be moved upright.

All movement needs to be done with care and attention to avoid breakage/ splintering. Any sudden movements must be avoided.

The weight of the slab must be distributed evenly across the point of the gripped load so they remain balanced during transportation.





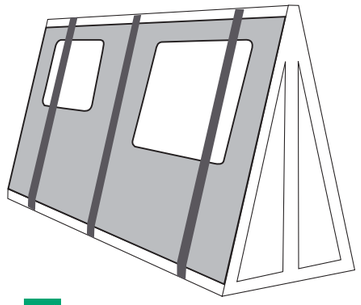


2.2.3 Storing Slabs

Slabs must always be stored upright The supports used must match the size of the slab and be strong enough to take the weight of the slabs, It is recommended that GRANICER slabs be protected with rubber padding on stands.

Avoid stacking smaller cut pieces between larger ones.

Do not stack slabs horizontally lying down.



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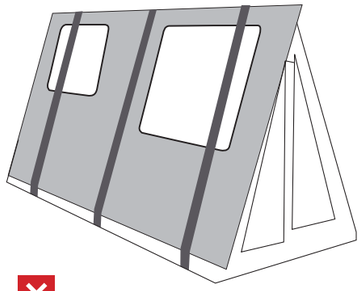

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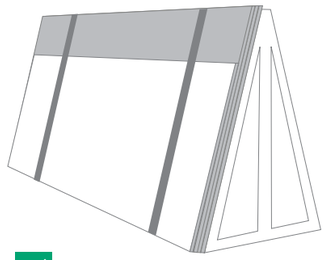

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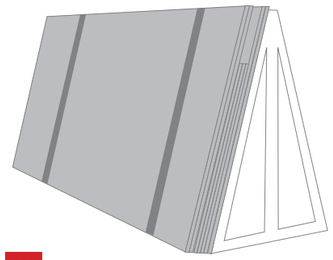
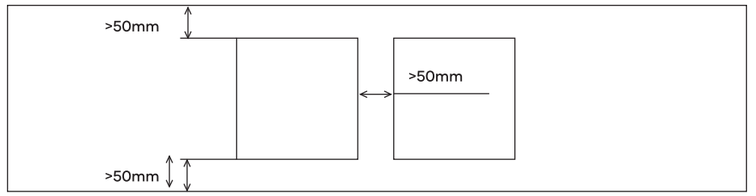


INCORRECT

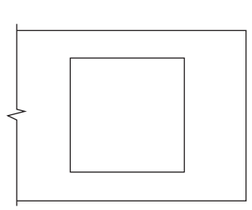
3. DESIGNING

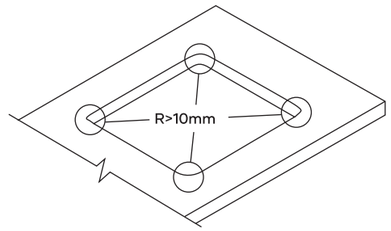
3.1 INTERNAL CUT-OUTS AND MINIMUM DISTANCES

All internal openings must be at a distance of at least 5cm from the edges of the slab and from each other.



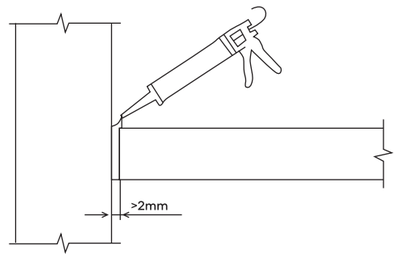
The radius of the internal corners must be greater than 10mm. Right angle internal corners must not be used as they can weaken the structural strength of the countertop, due to the right angles significantly increasing the risk of stress cracking.





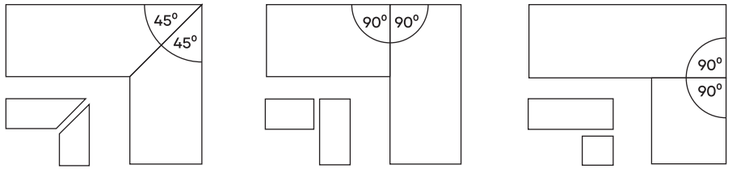
The minimum joint gap between the GRANICER slabs and any other adjoining surface (for example, walls, other GRANICER slabs, sink, hob etc) should be atleast 2mm. The 2mm joint gap can be sealed with a colour matched silicone.

The sealant that is used must be specified to withstand thermal variations if a hob, oven or barbecue grill is in the same vicinity.

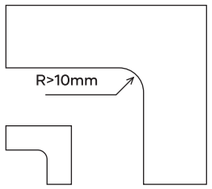


3.2 -TOPS

It is recommended that two cut to size slabs are used when making L- shaped tops to avoid the risk of stress cracking from 90° internal angles within a single slab. An L shaped-top can be created in the following three ways, whichever is preferable based on the aesthetics required of the design and the direction of the decor of the specified slab.

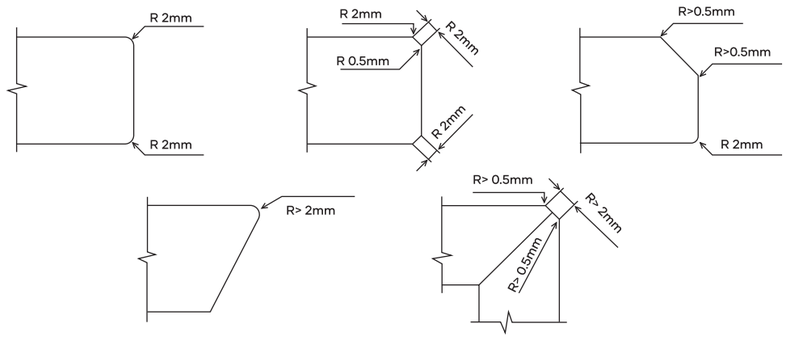


However, if you do choose to specify a single slab to create an L- shaped top, the bend radius must be at least 10mm.



3.3 EDGES

The following edges are recommended for both aesthetics and practicality.

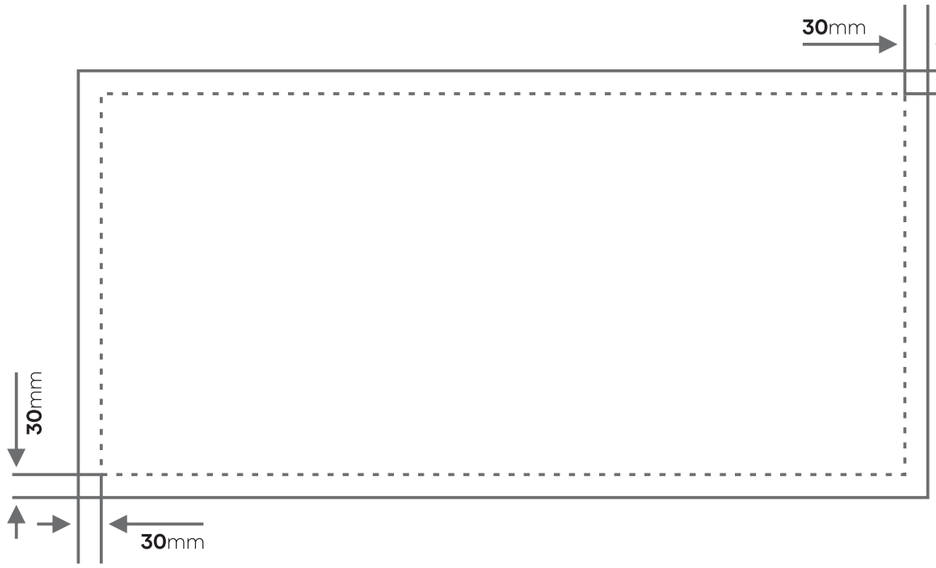


4. FABRICATION OF GRANICER PORCELAIN SLABS

It is strongly recommended that correctly calibrated porcelain wet cutting and drilling equipment is used.

If wet cutting and drilling equipment is not available, then adequate extraction on the equipment must be in place and adequate personal protective equipment (PPE) must be worn by everyone in the vicinity of the fabrication process. The PPE must be specified to enable the safe fabrication Of porcelain slabs.

The cutting and drilling equipment must be designed for porcelain fabrication and the cutting and drilling blades must be diamond-tipped and designed for cutting porcelain.



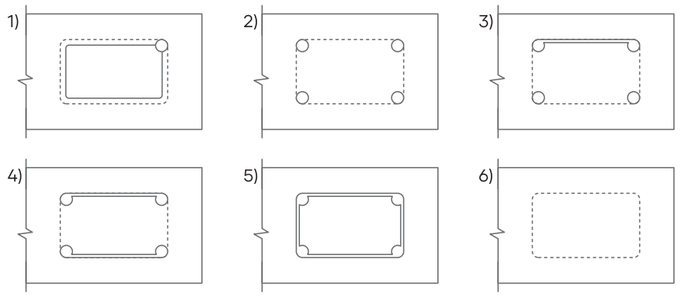
4.1 THE PROCESS

Before any cutting or drilling operation, clean the surface where the slab will be machined.

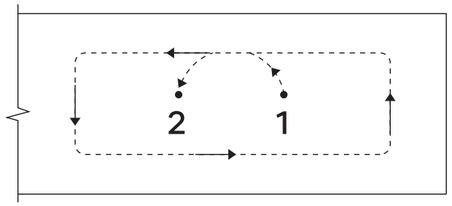
Vibrations in the slab whilst cutting or drilling must be minimised to reduce the risk of breakage. To ensure this, place a secure and perfectly flat wooden or rubber panel beneath the slab.

It is recommended to remove approximately 3cm from all sides of the slab to release the slab's internal tension. Make sure to cut the long sides before the short side. Before the fourth cut is commenced, it is advised to pre-cut part of the exit.

When making any cut-outs first drill holes on the inside of the four corners of the cut-out. The drill must have a minimum diameter of 20mm. Then cut along the perimeter of the cut-out to join the four holes. A modified version of this process should be used when creating an L-shape from a single slab.



For cut-outs using water-jet or cnc equipment, the process must have one continuous cut which starts from the inside of the cutout.



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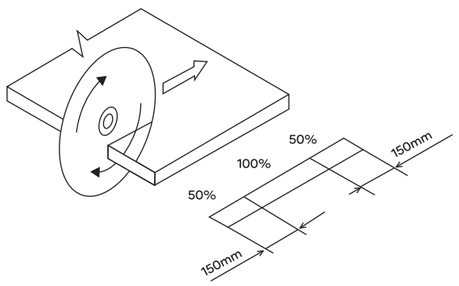


4.2 PARAMETERS

For Disc Blade Cutting
The recommended blade diameter is 400mm and the parameters below are based on that recommended diameter.

SLAB THICKNESS	RPM	STRAIGHT CUT SPEED (mm/min)	45 ANGLE CUT SPEED (mm/min)
12mm	1900 - 2150	1.0 - 1.5	0.5 - 0.7
20mm	1900 - 2150	0.7 - 1.0	0.4 - 0.5

For Water Jet Cutting

HIGH PRESSURE FOR CUTTING (BAR)	LOW PRESSURE FOR HOLES (BAR)	FEED RATE GRANICER 12mm (mm/min)	FEED RATE GRANICER 20mm (mm/min)	CUTTING ABRASIVE	DRILLING ABRASIVE
3500 - 4000	600	0.8 - 1.0	0.4 - 0.6	Mesh 80 300 g/min	Mesh 80 100 g/min

For CNC Machine Cutting

CROWN BIT FOR INITIAL HOLE		CUTTING TOOL		FLUSH TOP	
RPM	FEED RATE (mm/min)	RPM	FEED RATE (mm/min)	RPM	FEED RATE (mm/min)
1500 - 3000	15 - 20	3000 - 3500	150 - 200	4500 - 5500	150 - 200

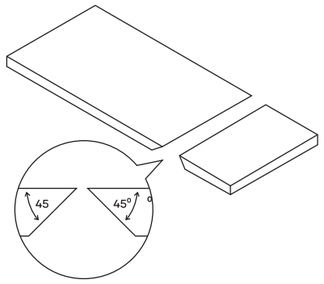
Suction pads must be positioned correctly to support all parts of the slab including the parts to be cut out.

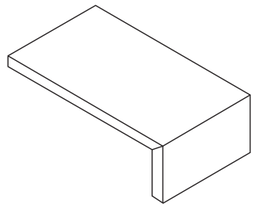
The suction pads must be placed in an evenly distributed pattern so the weight is also distributed evenly across all sections of the slab and none of them move during or after the process.

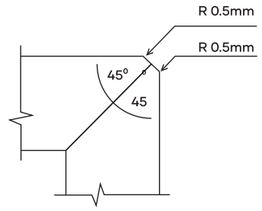
The cutting must be done 0.5mm at a time for the initial passes, then 3 mm for subsequent passes.

4.3 DROP DOWN EDGES

Seamless drop-down edges can be produced using a mitered edge joint.
The 3-step process shown here also recommends the use of a 10mm chamfer edge finish (see image no 3)





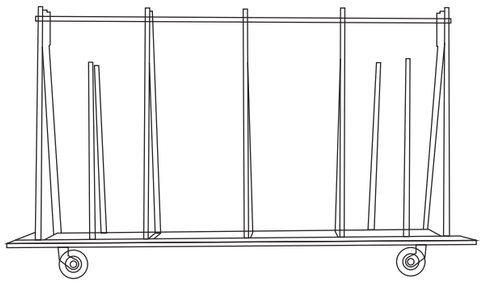


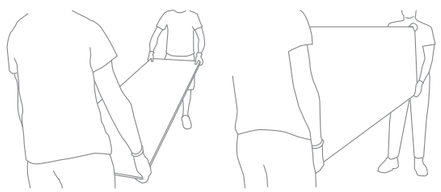
5. INSTALLATION

5.1 ON-SITE HANDLING

The full slab must be in a vertical position whilst being moved around at the installation site. While moving any cut-outs manually, They, should always be moved vertically facing cutwork upwards when the slab is being transported or is at rest.

The slab can be moved around using a slab cart or a frame with vacuum suctions which can be rearranged based on the cutting of the slab.





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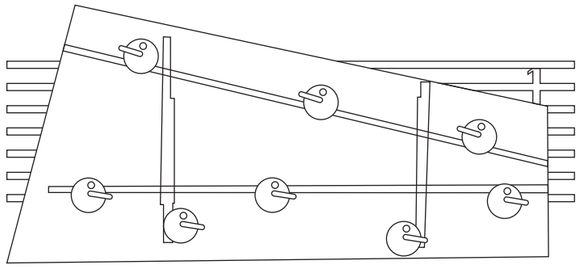
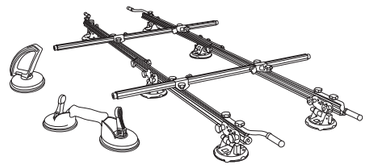


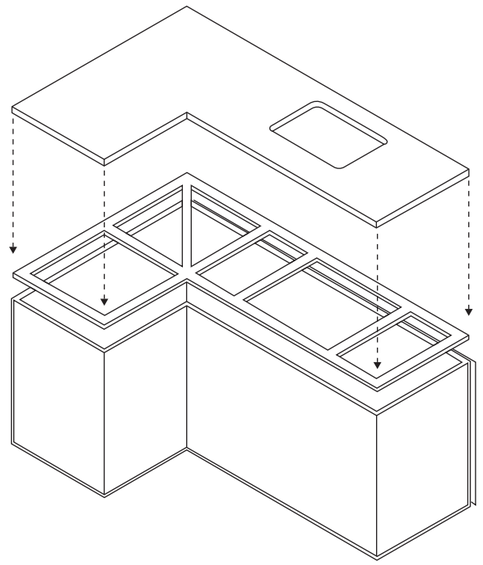


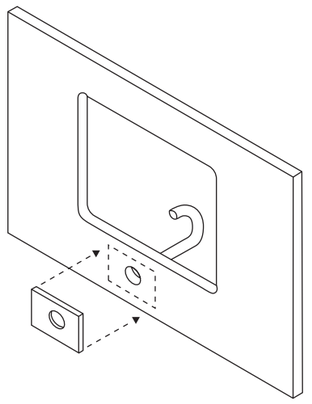
5.2 LAYING

Before laying the slabs, please ensure that the base surface is smooth without any debris. It must also be a completely even and level surface.

As noted previously, it is good practice to ensure at least a 2 mm joint gap between any two slabs, or between a slab and another surface or object. The joint gap can be filled with a suitable sealant which matches the base colour of the GRANICER design.

If there are any cut-outs on the slab, they should be supported by reinforcements near the joints and the surface. Any fittings on the slab, such as taps, must also be supported at the drilling site with a reinforcing pad.





5.3 BONDING

To bond GRANICER surfaces together it is recommended to use a 2-component epoxy adhesive or Methyl methacrylate adhesive (MMA) in a similar colour to the base colour of the slab as possible.

The following steps ensure a proper bond :

Always clean and dry the surfaces that are to be glued thoroughly.

Attach adhesive tapes on the outer sides of both surfaces to be glued. This can be peeled off later.

Some parameters like the mix ratio, how much time the glue takes to harden after mixing varies from adhesive
manufacturer to manufacturer and must be taken note of before ending on with the glueing.

After the two surfaces have firmly glued together, mask the bonded edge with paper masking tape before grinding and polishing the edge.

When installing GRANICER slabs onto other non-porcelain surfaces, either a 2-component epoxy/Polyurethane glue can be used or a polymer-modified mortar (do check if it is specified for large format slabs).

It is recommended to do a sample test first.

6. CLEANING AND MAINTENANCE

6.1 EVERYDAY CARE

GRANICER porcelain slabs are waterproof and highly stain-resistant. Hence dirt and stains cannot penetrate the surface. This is what makes GRANICER slabs perfect for worktops in the kitchen, bathroom and everywhere else

To clean porcelain slab surfaces, GRANICER recommends using a neutral soap with warm water solution with a sponge or cloth. Do not use products containing wax or any substance which may form a film on the slabs.

6.2 SPECIFIC STAIN REMOVAL

GRANICER recommends a preliminary cleaning with warm water and mild detergent. If that does not serve the purpose, we recommend the following for removing stubborn stains. Do not use any harsh detergents or abrasive sponges.

Alkaline Solutions like Basic Cleaning Agents and Ammonia for Grease and Oil, Wine, Ice Cream and Coffee stains.

Oxidants such as Hydrogen Peroxide and diluted Bleach for Beverages and Nicotine stains.

Solvents like Universal Solvent, Acetone, Alcohol and Turpentine for Ink, Resin, Nail Varnish, Candle Wax and Asphalt stains.

Acids like Limescale Remover (lemon juice and vinegar) for residual cement, gesso, graphite stain and marks left by
metal objects.

Rinse with water and dry the surface with a clean cloth or a paper towel after application of any of the above agents.

6.3 DOs and DON'Ts

Dos

GRANICER slabs can withstand heat from everyday utensils, which can be placed directly on the slab surface, straight from the
oven or hob.

Use a soft sponge, cloth or paper towel to clean the surface, depending on the type of cleaning products you are using.

To eliminate dried food or other stubborn residues from the surface, use a wooden or plastic scraper.

DON'Ts

Avoid exposing GRANICER slabs to high-temperature heat sources like chimneys. Also avoid direct exposure to open flames.

Do not use an abrasive sponge or metal scouring pad.

Do not use any sharp metallic object on the countertop surface.

TECHNICAL DETAIL

CHARACTERISTIC	STANDARD AS PER ISO13006:2018/ EN14411 Gr.BIa	STANDARD AS PER IS 15622:2017 Gr.BIa	METHOD OF TESTING	MEAN VALUE OF GRANICER
Regulatory Properties				
Deviation in Length and Width	±0.30 % (±1.00 mm)	±0.10 %	ISO 10545-2/ IS 13630-1	±0.10 %
Deviation in Thickness	±5.0 % (± 0.50 mm)	±5.0 %	ISO 10545-2/ IS 13630-1	±5.0 %
Straightness in Side	±0.30 % (± 0.80 mm)	±0.10 %	ISO 10545-2/ IS 13630-1	±0.10 %
Rectangularity	±0.30 % (±1.50 mm)	±0.10%	ISO 10545-2/ IS 13630-1	±0.10 %
Surface Flatness Central Curvature	±0.40 % (± 1.80 mm)	±0.50 %	ISO 10545-2/ IS 13630-1	±0.20 %
Surface Flatness Edge Curvature	±0.40 % (± 1.80 mm)	±0.50 %	ISO 10545-2/ IS 13630-1	±0.20 %
Surface Flatness Warpage	±0.40 % (± 1.80 mm)	±0.50 %	ISO 10545-2/ IS 13630-1	±0.10 %
Surface Quality	>95% defects free	>95% defects free	ISO 10545-2/ IS 13630-1	>95% defects free
Small Color Difference (For Plain Colour) Glazed	ΔE <0.75	N.A.	ISO 10545-16	No change
Small Color Difference (For Plain Colour) Unglazed	ΔE <1.00	N.A.	ISO 10545-16	ΔE <0.80
Glossiness (Polished)	As per Manufacturer	N.A.	Gloss Meter 60°	≥ 90
Structural Properties				
Water Absorption	≤0.50 %	≤0.080 %	ISO 10545-3/ IS 13630-2	≤0.080 %
Bulk Density	As per Manufacturer	Min 2.20 gm/cc	ISO 10545-3/ IS 13630-2	> 2.28 gm/cc
Massive Mechanical Properties				
Modulus of Rupture	Min. 35.0 N/mm^2	Min. 35.0 N/mm^2	ISO 10545-4/ IS 13630-6	Min. 37.0 N/mm^2
Modulus of Rupture (15mm)	Min. 35.0 N/mm^2	Min. 35.0 N/mm^2	ISO 10545-4/ IS 13630-6	Min. 40.0 N/mm^2
Breaking Strength Thickness ≥7.5 mm	Min 1300.0 N	Min 1300.0 N	ISO 10545-4/ IS 13630-6	Min 1500.0 N
Breaking Strength Thickness ≥7.5 mm (15mm)	Min 1300.0 N	Min 1300.0 N	ISO 10545-4/ IS 13630-6	Min 6000 N
Breaking Strength Thickness <7.5 mm	Min 700.0 N	Min 700.0 N	ISO 10545-4/ IS 13630-6	Min 1000.0 N
Surface Mechanical Properties				
MOH'S Hardness #	As per Manufacturer	Min. 5	BS EN 15771/ IS 13630-13	Polished - 4 Min Posh, CRV, Matt - 6 Min StrongX - 8 Min
Surface Abrasion Resistance #	As per Manufacturer	Min. Class II	ISO 10545-7/ IS 13630-11	Polished- Class II Min Posh, CRV, Matt - Class III Min
Deep Abrasion (Unglazed full body tile)	175 mm3	140 mm3	ISO 10545-6/ IS 13630-12	StrongX - Class IV Min 132 mm3
Thermal Hygrometric Properties				
Moisture Expansion	Max 0.06% (0.6 mm/m)	Max 0.02 mm/m	ISO 10545-10/ IS 13630-3	Max 0.02 mm/m
Thermal Expansion (COE) at 100°C	As per Manufacturer	Max. 6.0x10-6	ISO 10545-8/ IS 13630-4	Max. 6.0x10-6
Thermal Shock Resistance	Min 10 Cycle	Min 10 Cycle	ISO 10545-9/ IS 13630-5	Min 10 Cycle
Impact Resistance (COR) #	Min. 0.55	Min 0.55	ISO 10545-5/ IS 13630-14	Min 0.55
Frost Resistance	As per Manufacturer	As per Manufacturer	ISO 10545-12/ IS 13630-10	Frost Proof
Crazing Resistance at 7.5 bar	4 Cycle	4 Cycle	ISO 10545-11/ IS 13630-9	6 Cycle
Chemical Properties				
Resistance to Staining Glazed	Min. Class 3	Min Class 1	ISO 10545-14/ IS 13630-8	Min Class 4/Min Class 1
Resistance to Staining Unglazed	As per Manufacturer	Min Class 2	ISO 10545-14/ IS 13630-8	Min Class 4
Resistance to Household Chemicals & Swimming Pool Salts Glazed	Min Class GB	Min Class AA	ISO 10545-13/ IS 13630-8	Min Class GB/ Min Class AA
Resistance to Household Chemicals & Swimming Pool Salts Unglazed	Min Class UB	As per Manufacturer	ISO 10545-13/ IS 13630-7	Min Class UB
Resistance to Acid and Alkalis Glazed	As per Manufacturer	As per Manufacturer	ISO-10545-13/ IS 13630-8	Min Class GLB*** & GHB***/Min Class A***
Resistance to Acid and Alkalis Unglazed	As per Manufacturer	As per Manufacturer	ISO-10545-13/ IS 13630-8	Min Class ULB*** & UHB***/Min Class A***
Safety Properties				
Skid Resistance - (DCOF-WET PENDULUM) ##	As per Manufacturer	As per Manufacturer	ASTM E-303	Polished: < 0.2 Matt: > 0.3 StrongX: > 0.4
Slip Resistance - (Ramp test Value)	As per Manufacturer	As per Manufacturer	DIN 51130	Matt & Posh: R9 - R10 StrongX: R10 R11 Surface: R11
Lead and Cadmium release	As per Manufacturer	N.A.	ISO-10545-15	Does not yield Pb & Cd

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