

TECHNICAL MANUAL

atlasPLAN

CUTTING AND INSTALLATION MANUAL

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CUTTING AND INSTALLATION MANUAL

1 PRODUCT

1.1 Finishes

- **Hammered**

A finish that produces a slightly corrugated surface, creating an appearance that resembles the natural material. Slabs have a chiselled, unpolished look, with an irregular surface characterised by pitting, dimples and bumps.

- **Matte**

The matte finish is characterised by a smooth “handle” and it is ideal for floor use that require superior technical performance.

- **Silk**

The silk finish is characterised by an extremely matt, non-reflective surface, without any mirrored reflections. It is particularly soft to the touch, while still maintaining all the technical characteristics that make it perfect for kitchen countertops and furnishing elements. Used mainly for marble looks, it features the subtle irregularities typical of natural stone.

- **Satin**

A finish with an astonishingly realistic look that enhances the depth and naturalness of the material. The colouring is softened in tone, almost as if veiled. It reveals its maximum aesthetic splendour in marble effects where it can also be defined as eggshell.

- **Polished**

A finish that highlights the chromatic hues and nuances of the material, bringing out the beauty of the pattern and giving it a refined look. Precision mechanical processing polishes the surface to a perfectly uniform finish, allowing it to reflect light.

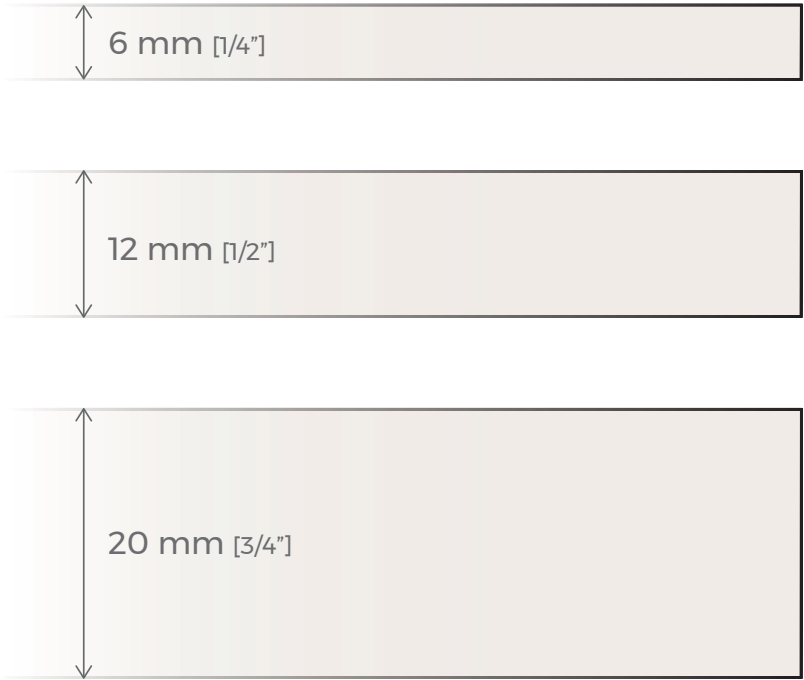
- **Leathered**

The Leathered finish of Atlas Plan slabs is characterised by a slightly wavy appearance that recalls the texture of leather. It is smooth to the touch, with a final brushing that makes the surface extremely soft and pleasant.

1.2 Sizes



1.3 Thicknesses



COLOURED BODY PORCELAIN TILES - NON RECTIFIED
GRES PORCELLANATO COLORATO IN MASSA - NON RETTIFICATO
Grès cérame coloré dans la masse - Non rectifié
Durchgefärbtes Feinsteinzeug - Nicht rektifiziert
Gres porcelánico coloreado en masa - No rectificada
Керамический гранит окрашенный в массе - Неретифицированные



				162 x 324 cm ± 6 / 12 / 20 mm				
				Requirements for nominal size N Requisiti per dimensione nominale N				
				N ≥ 15 cm		Silk	Matte Hammered Flamed	Polished Satin
(%)	(mm)							
Regularity characteristics		Thickness Spessore	ISO 10545-2	± 5 (**)	± 0,5 (**)	± 5,0% ± 0,5 mm		
		Surface flatness Planarità		c.c. ± 0,5	c.c. ± 2,0	± 0,5% ± 2,0 mm		
				e.c. ± 0,5	e.c. ± 2,0			
				w. ± 0,5	w. ± 2,0			
Structural characteristics		Water absorption Massa d'acqua assorbita	ISO 10545-3	E _v ≤ 0,5% Individual max 0,6% E _v ≤ 0,5% Valore max singolo 0,6%		≤ 0,1 %		
			ASTM C 373	Requirement ANSI A137.1 Water Absorption Max ≤ 0,5%		≤ 0,5 %		
Bulk mechanical characteristics		Breaking strength Sforzo di rottura	ISO 10545-4	S ≥ 700 N for thickness < 7,5mm per spessore < 7,5mm	S ≥ 1300 N for thickness < 7,5mm per spessore < 7,5mm	6 mm -> S ≥ 1000N		
						12 mm -> S ≥ 3500N		
		Modulus of rupture Resistenza alla flessione		R ≥ 35 N/mm²		20 mm -> S ≥ 10000N		
						R ≥ 45 N/mm²		
Surface mechanical characteristics		Mohs hardness Durezza Mohs	EN 101	-		6	6	5
		Resistance to deep abrasion of unglazed tiles (removed volume) Resistenza all'abrasione profonda delle piastrelle non smaltate (volume materiale asportato)	ISO 10545-6	≤ 175 mm³		≤ 150 mm³		
Thermal and hygrometric characteristics		Coefficient of thermal linear expansion Coefficiente di dilatazione termica lineare	ISO 10545-8	Declared value Valore dichiarato		≤ 7 MK ⁻¹		
		Thermal shock resistance Resistenza agli sbalzi termici	ISO 10545-9	Pass according to EN ISO 10545-1 Test superato in accordo con ISO 10545-1		Resistant Resiste		
		Moisture expansion (in mm/m) Dilatazione all'umidità (in mm/m)	ISO 10545-10	Declared value Valore dichiarato		≤ 0,01% (0,1mm/m)		
		Frost resistance Resistenza al gelo	ISO 10545-12	Pass according to EN ISO 10545-1 Test superato in accordo con ISO 10545-1		Resistant Resiste		
Physical properties		Bond strength/adhesion for improved cementitious adhesives Adesione a trazione con adesivi cementizi migliorati	EN 1348	Declared value Valore dichiarato		≥ 1,0 N/mm² (Class C2 - EN 12004)		
		Reaction to fire Reazione al fuoco	-	Class A1 Classe A1		A1 (without fiberglass) A2 (with fiberglass)		
Chemical characteristics		Resistance to household chemicals and swimming pool salts Resistenza ai prodotti chimici di uso domestico ed agli additivi per piscina	ISO 10545-13	Minimum Class B Classe minima B		A		
		Resistance to low concentrations of acids and alkalis Resistenza a basse concentrazioni di acidi e alcali		Declared Class Classe dichiarata		LA	LA	LA
		Resistance to high concentrations of acids and alkalis Resistenza ad alte concentrazioni di acidi e alcali		Declared Class Classe dichiarata		HA	HA	-
		Resistance to staining Resistenza alle macchie	ISO 10545-14	Declared Class Classe dichiarata		5		
		Release of dangerous substances: Cadmium (in mg/dm²) and Lead (in mg/dm²) Rilascio di sostanze pericolose: Cadmio (in mg/dm²) e Piombo (in mg/dm²)	ISO 10545-15	Declared value Valore dichiarato		≤ 0,01 mg/dm² Cd ≤ 0,1 mg/dm² Pb		

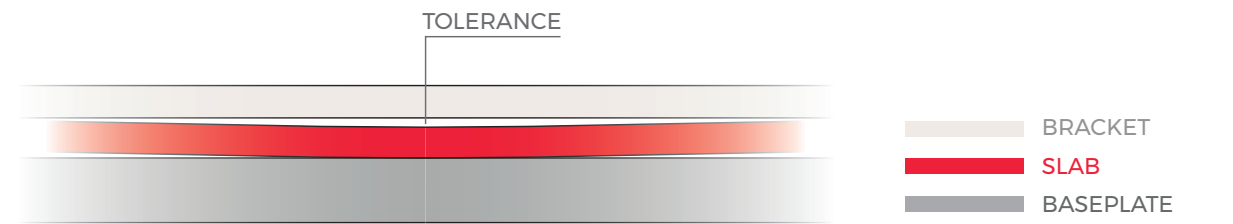
2 VISUAL INSPECTION

Before laying or processing the slabs, the operator must clean the slab and then carry out a careful visual inspection of the entire surface before it is processed or laid. Any discrepancies that emerge must be reported before processing. Atlas Plan will not accept any reports or complaints once the product has been processed and/or installed.

It should also be noted that the nominal size of the Atlas Plan slab is 160x320 cm [63"x126"]. For this reason, small chips or cracks on the edges are not to be considered as defects as long as it is still possible to obtain the before mentioned size.

2.1 Surface flatness

To evaluate the regular flatness of the slab, it is necessary to place it horizontally on a completely flat support. Place an aluminum bracket, or similar element, on the surface of the slab in order to cover its entire length and/or width. The maximum permissible tolerance is 1,8 mm.



2.2 Surface inspection

For Atlas Plan slabs, due to their large dimensions, the presence of minor surface irregularities **shall be considered acceptable and not subject to claims**, provided that they fall within the limits specified in the table below.

CHARACTERISTIC	DIAMETER
Irregularity* with a colour similar to the surrounding surface	≤ 3 mm
Irregularity* with a colour contrasting with the surrounding surface	≤ 1 mm

The Silk finish, inspired by natural stone, may exhibit a greater number of minor surface irregularities. These characteristics are inherent to the material and do not constitute defects. Any claim must be supported by **photographic documentation** complying with the inspection procedures set out in the applicable standards, including:

- geometric references suitable for identifying **the size of the defect** (e.g. a ruler),
- references allowing **the location of the defect** within the slab to be identified (e.g. a measuring tape).

With specific reference to non-rectified porcelain stoneware slabs, considering the nature of the product and its intended use, any defects, discontinuities or imperfections occurring along the perimeter edges of the Slab, within a maximum distance of 2 cm from the edge and, in any case, within the portion normally affected by trimming operations, shall be deemed technically acceptable and shall not constitute a product non-conformity.

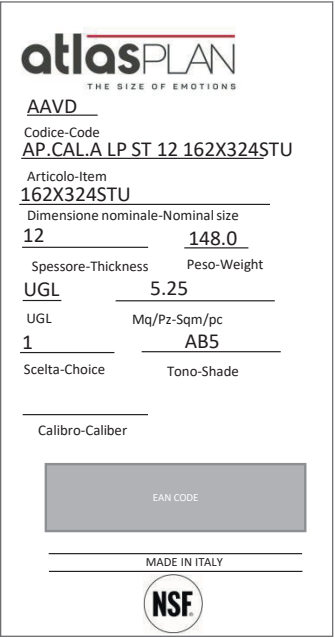
2.3 Shade

Atlas Plan porcelain stoneware is made from natural raw materials, so there may be slight variations in shade between different batches of the same product. It is therefore advisable, before cutting the slab, to make sure that the shade of the different slabs is acceptable, even when comparing different thicknesses. For a truthful result, it is advisable to carry out this inspection using a light source as similar as possible to the one that will be present on the installation site. Some Atlas Plan products have shade variations within the same slab to make it as similar as possible to the corresponding natural stone. It is therefore advisable to make sure that the two pieces which have to be coupled have the same shade before making joints. Atlas Plan does not respond in any way if pieces of the same slab with different shades are installed.

*Irregularities include: stains, speckles, rough patches, holes, dents, etc.

2.4 Slab identification

Each Atlas Plan slab carries a label containing specific technical information. Information on the item is printed on the long and the short side edges of the slab (Atlas Plan - Product Code - Item Description - Thickness - Filler, if applicable - Colour - Quality - Production Date - Made in Italy). A label is also applied on each Atlas Plan slab, containing the EAN CODE in addition to product identification information.



3 GENERAL CUTTING INSTRUCTIONS FOR SLABS WITH FURNITURE DESTINATION

Before begin: safety recommendations

Before starting any work, carefully consult the safety data sheets available at the following address: <https://www.atlasplan.com/en/safety-data-sheet/>. Alternatively, you can scan the QR code on the other label to access the Safety Data Sheet (SDS) directly.

Do not proceed until you have read, understood and implemented all necessary safety precautions, in accordance with current legislation and the specific conditions of your work.

Safety measures must be adapted to the specific conditions of each task. These recommendations are not universal and do not replace the legal health and safety obligations set out in applicable local legislation.

During the processing of the slabs, respirable crystalline silica may be released into the air. Exposure without adequate protective measures can cause serious illnesses, including silicosis and lung cancer.

To minimise the uncontrolled release of dust:

- Always use cutting tools fitted with extraction systems or assisted by a water jet.
- Wear suitable respiratory protective equipment, in accordance with current regulations and the conditions of the workplace.
- Avoid generating airborne dust, particularly in areas lacking adequate filtration and ventilation systems. The suitability of such systems must be assessed for each specific environment.
- Restrict access to the work area to only those staff necessary to ensure the safety of those not involved in the process.
- Ensure workwear is cleaned properly: use a vacuum system specifically designed for fine dust or have the garments washed by professionals in the sector.

The use and handling of products must comply with the supplier's instructions and all applicable regulations, with particular regard to safety regulations.

Careless and/or incorrect use and/or processing and/or handling, and/or failure to take the necessary precautions and/or safety measures, may cause serious harm to persons and/or property.

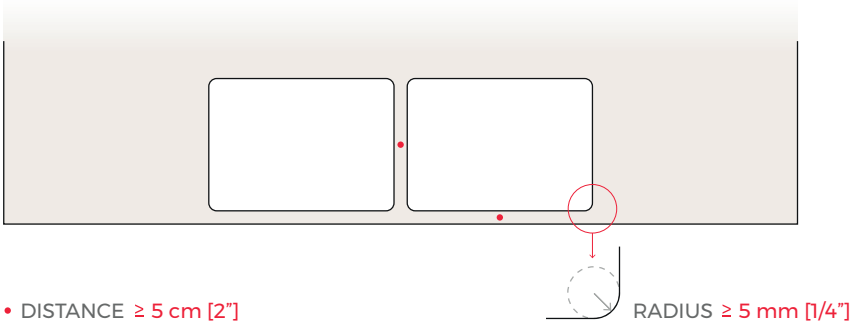
Atlas Plan slabs can be cut and manipulated on traditional cutting machines for natural stone, marble and quartz agglomerates, like bridge saws and CNC bridge saws, CNC contouring machines and waterjet machines. If using a tool, it must be suitable for cutting porcelain slabs. In this manual, information and cutting parameters will be provided for:

- Waterjet machine
- Bridge saws and CNC Bridge saws
- CNC contouring machine

For best results, it is good practice to verify the perfect flatness of the work surface on which the slab will be placed, and eliminate any scrap and debris from previous operations. The flatness of the working surface, combined with that of the slab, is important for a good quality cut because it reduces vibrations.

When making holes and internal cuts, Atlas Plan recommends leaving no less than 5 cm [2"] between two cuts/holes, as well as between a cut/hole and the edge of the slab itself.

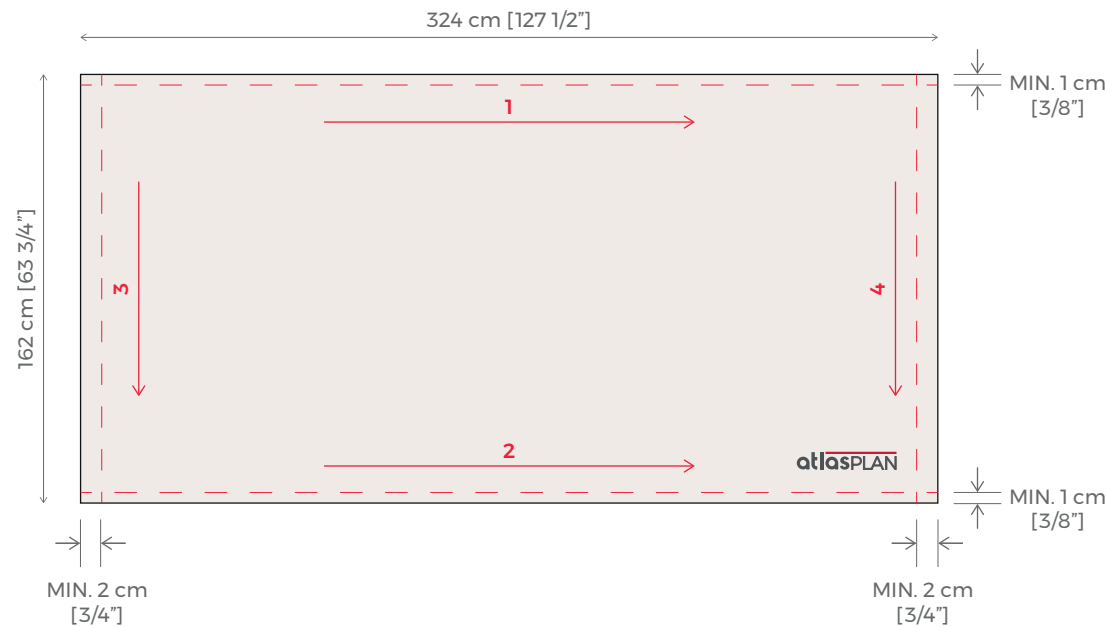
Atlas Plan strongly discourage 90° angles in all interior corners of the plan. Provide a radius greater than or equal to 5 mm [1/4"] at these corners. If the geometry of the hole allows it, use wider radius (8-10 mm) [3/8"]. In general, it is good to remember that the bigger are the radius of the curvature inside the holes and the distance between two adjacent cuts, the higher is the strength of the finished surface. Surfaces with large holes are inherently more delicate.



3.1 Detensioning cuts

It is always required, before performing any kind of work on the slab, to make a detensioning cut. The detensioning cut consists in eliminating 1-2 cm [3/8"-3/4"] of material along all sides: in this way it is possible to release any residual tension in the slab.

It is recommended to first cut parallel to the long sides of the slab, and then parallel to the short sides. Furthermore, these detensioning cuts allow the slab to be squared for subsequent operations.

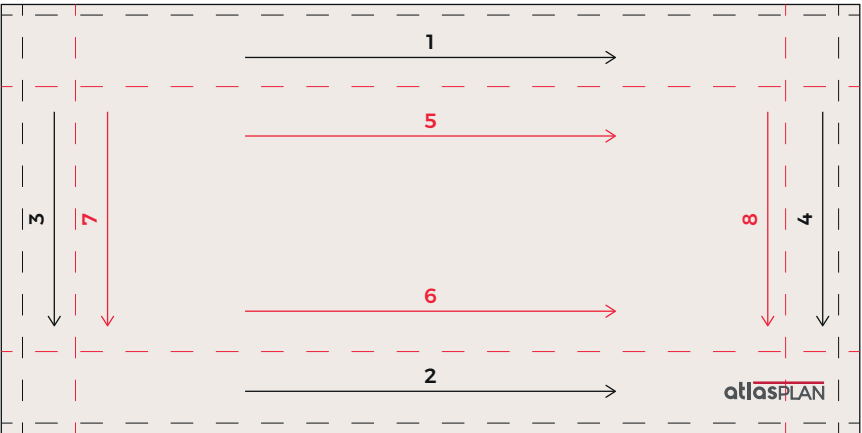


When possible, it is recommended that the perimeter cuts of the finished surface that we want to obtain do not coincide with the detensioning cuts.

3.2 Disc cutting with bridge saws

When using bridge saws, it is recommended to perform operations in the following sequence:

- Detensioning cuts
- Perimeter cuts



- - - - DETENSIONING CUTS
- - - - PERIMETER CUTS

Atlas Plan suggests the use of diamond discs specifically produced for porcelain. Diamond discs for granite (soft, hard), marble, and quartz agglomerates are not suitable for cutting Atlas Plan porcelain slabs. For this type of cut, it is advisable to use sector diamond discs.

Disk cutting with a bridge saw must be performed wet, ensuring an abundant jet of water directed precisely at the cutting area, both frontally and laterally.

The direction of rotation of the disc must be consistent with the direction of its movement.

Atlas Plan suggests the use of diamond discs with a diameter of 30-35-40-45-50 cm [11 3/4"-13 3/4"-15 3/4"-17 3/4"-19 3/4"], depending on the machine used, ideal for cutting a thickness of 12 mm [1/2"]. The rotation speed depends on the disc diameter. The ideal tangential velocity of the crown is generally about 40-45 m/s [131-147 ft/s].

Below is a summary table of the general technical parameters according to the disc diameter for thicknesses 6, 12, 20 mm:

LINEAR CUTTING				
DIAMETER (mm)	DIAMETER (inch)	RPM	FEED RATE (m/min)	FEED RATE (inch/min)
350	14	1800-2500	1,0-1,5	40-59
400	16	1500-2300	1,0-1,5	40-59
450	18	1200-2000	1,0-1,5	40-59
500	20	1000-1600	1,0-1,5	40-59

For the optimal parameters of any given disc please refer to the manufacturer's data sheet.

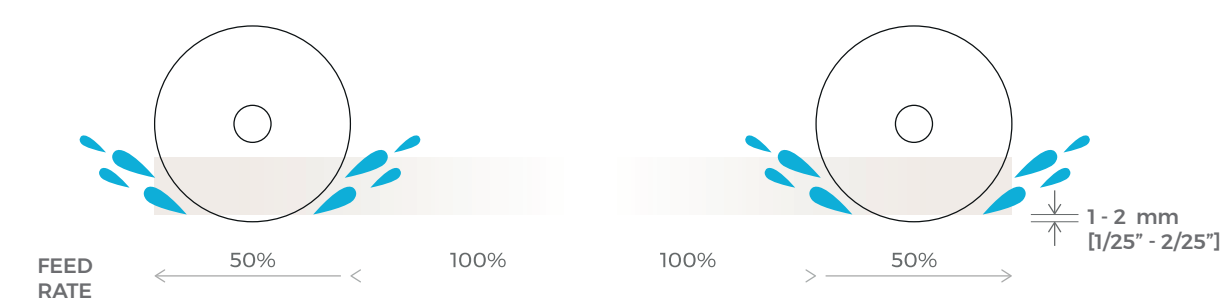
45° INCLINED CUTTING

DIAMETER (mm)	DIAMETER (inch)	RPM	FEED RATE (m/min)	FEED RATE (inch/min)
350	14	1800-2500	0,6-0,8	24-32
400	16	1500-2300	0,6-0,8	24-32
450	18	1200-2000	0,6-0,8	24-32
500	20	1000-1600	0,6-0,8	24-32

When cutting the 6 mm [1/4"] slabs, it is advisable to place a weight (quartz, marble or granite agglomerate) near the cutting line in order to locally increase the weight of the slab and consequently reduce vibrations during its processing.

In case of 45° cut, it's important to reduce the disc feed rate by 40% in order to reduce vibration during cutting (linear and inclined), it is important that the optimum feed speed is achieved when the whole disk is completely inside the material, not just when entering the slab but also, when exiting it. For this reason, if the machine allows it, Atlas Plan recommends to reduce the feed rate by 50% until the disc is completely inside the material. This distance therefore depends on the diameter of the disc.

It is important that the disc fall below the slab level by 1-2 mm [1/25" - 2/25"] so that the cooling water can also be effective from below and the fiber glass can be sliced through.



As support material for the slab during cutting, Atlas Plan recommends specially designed vulcanized rubber sheets, panels of expanded polymeric material (XPS), granite slabs or quartz agglomerates. The use of marine plywood is not recommended because it absorbs water and can become deformed.

If the diamonds on the disc are clogged, it is advisable to clean the disc by cutting sandstone slabs, agglomerated quartz, sand/cement based bricks or dressing stone sold for this specific purpose.

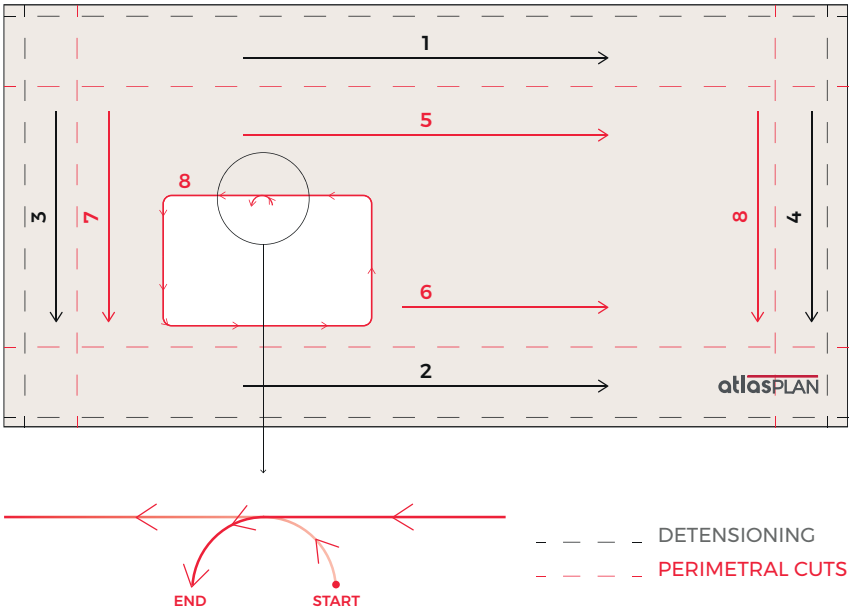
If the working surface allows it, it is possible to place a strip of abrasive material against the slab to be cut so that after the slab is cut the disc continues its stroke passing through the abrasive material, thus reviving it.

3.3 Water jet cutting

When using waterjet machines, Atlas Plan suggests performing operations in the following sequence:

- Detensioning cuts
- Perimeter cuts
- Any internal holes

When making internal holes, it is advisable to start cutting from a point inside the perimeter of the hole (at least 2 cm [3/4"], if possible), and then move outwards towards the perimeter with a curved (curled) trajectory. Once the cut is completed, it is suggested that the nozzle also exits with a curved trajectory, towards the inside of the hole.



Atlas Plan recommends a nozzle feed rate of 1000-1500 mm/min [3.3-5 ft/min] for straight perimeter cuts and a speed of 500-800 mm/min [1.6-2.6 ft/min] for internal holes. The jet pressure must be between 3000 and 3500 bar, with a consumption of abrasive of about 0.35 kg/min [0.77 lbs/min]. For internal holes, it is recommended to reduce the pressure of the jet to 600-800 bar at the start, and then increase to 3000-3500 bar when the jet has completely penetrated the thickness.

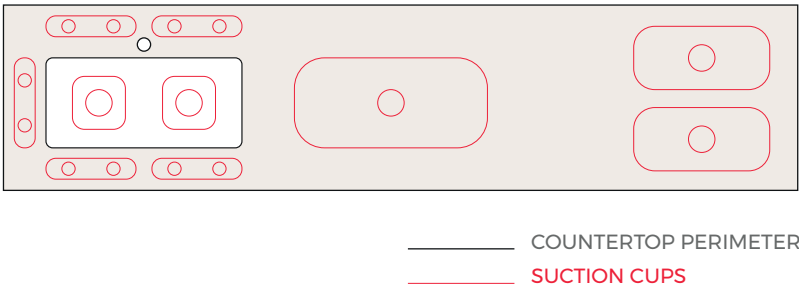
If the machine allows 45° waterjet cuts, a feed rate equal to half the feed rate used for straight cuts is recommended.

3.4 Cutting with a CNC contouring machine

When using a CNC contouring machine to make cuts and holes, the positioning of the suction cups on the lower part of the slab is crucial. The suction cups must be uniformly distributed under the slab to reduce vibrations and bending during cutting operations. When making holes and cutting portions of the material, it is mandatory to place the suction cup(s) in the area to be cut so that it is well supported and nothing falls at the end.

Make sure that the suction cups have a perfect grip on the back of slab.

Note: Atlas Plan slabs that have fiberglass mesh on the back require a higher level of compared to those that don't have it, however it's always possible to couple the suction cups with the printed surface of the slab. Before proceeding with any kind of cut it is advisable to perform the resistance test for an optimal result.



Cutting/finishing on a bridge saw must be carried out wet, ensuring an abundant jet of water directed precisely towards the cutting zone, both frontally and laterally.

Atlas Plan recommends a reduction of the tool feed rate by 45% towards the start and end of cutting. Avoid removing more than 6 mm [1/4"] for a 12 mm [1/2"] starting slab and 10 mm [2/5"] for a 20 mm [3/4"] starting slab.

3.5 Making holes

After using the bridge saw to cut the perimeter, Atlas Plan does not recommend using the bridge saw to also make rectangular internal holes. To make holes it is necessary to use a waterjet or CNC contouring machine.

3.6 Circular holes

Circular holes, both those intended for mixer taps and those in the corners of quadrangular holes, are made using wet diamond core bits. Abundant water flow is required both internally and externally to the cutting circumference.

Below there is a chart with the typical technical parameters:



CORE BIT				
DIAMETER (mm)	DIAMETER (inch)	RPM	FEED RATE (mm/min)	FEED RATE (inch/min)
10	0,4	2900-3100	25-30	1,0-1,2
20	0,8	2900-3100	25-30	1,0-1,2
30	1,2	1900-2100	27-35	1,1-1,4
35	1,4	1900-2100	27-35	1,1-1,4

Core bits of all diameters are available on the market. The recommended rotation speeds range between 2000 and 3000 RPM*, depending on the diameter of the core bit, with a feed speed through the thickness of 20-30 mm/min [¾ - 1½ inches/min]*.

If the machine allows it, during the first and last 2 mm [⅛"] the drill bit should have a lower feed rate of about 5 mm/min [¼ in/min]*. This minimizes the risk of chipping at the bottom of the slab.

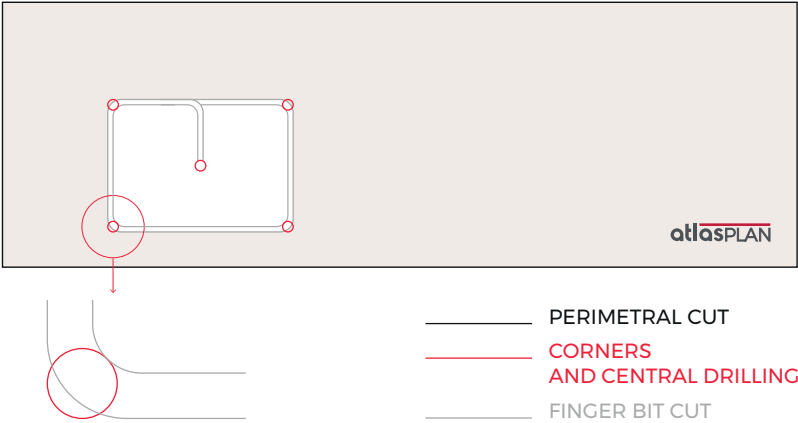
3.7 Quadrangular holes

In the CNC machine it is possible to make quadrangular holes by first drilling holes in the corners with a diamond core bit (keeping in mind the general indications of radius) and subsequent execution of the cut using a diamond finger bit. Carry out the cut under a plentiful flow of water.

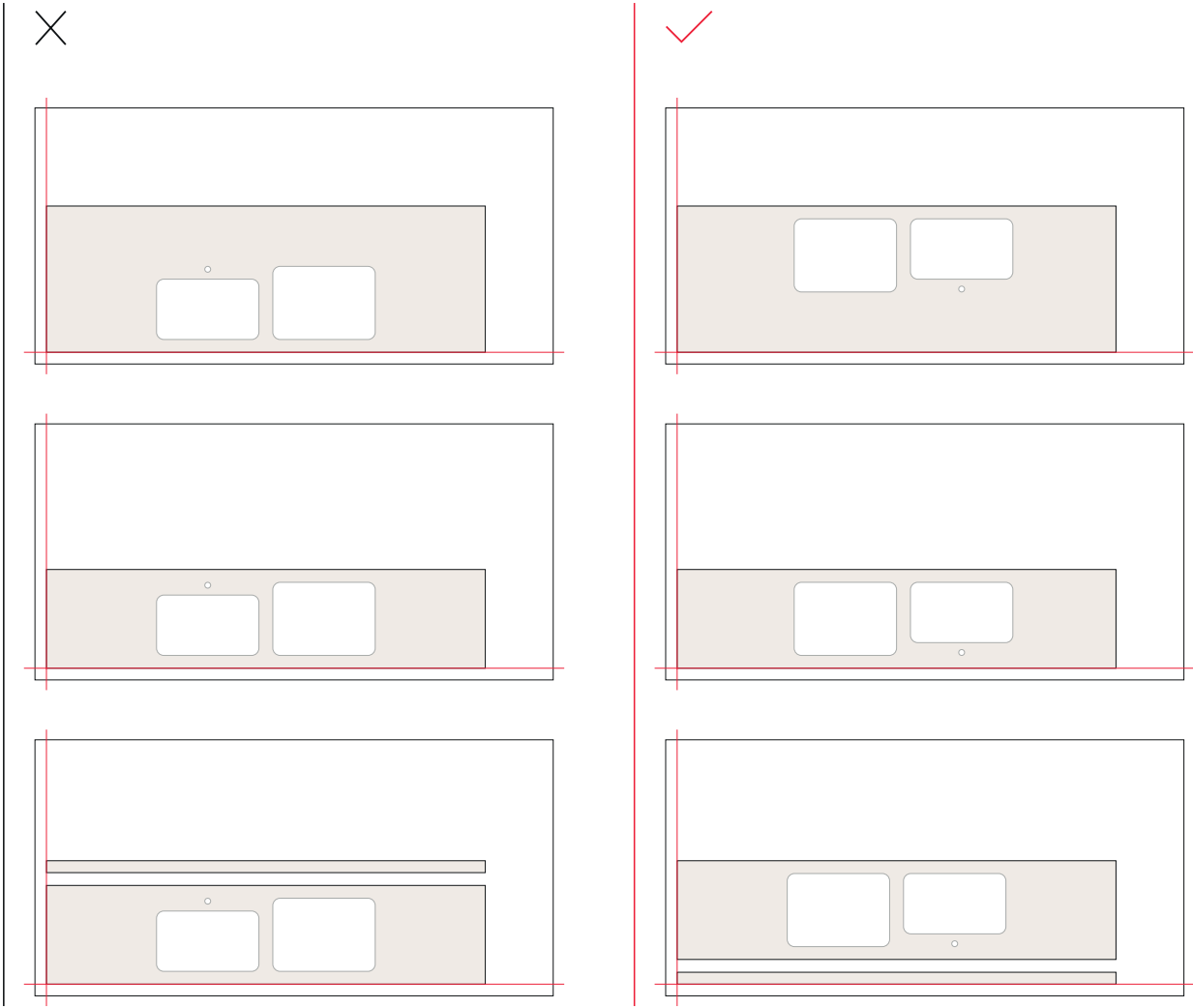
In this case, a circular hole is first made with a diamond core bit inside the perimeter of the quadrangular hole. If possible, this circular hole should be made in the center of the quadrangular hole, at the greatest possible distance from the hole's perimeter.

* For more detailed values, please refer to your Atlas Plan representative who will provide the technical data sheets.

The diamond finger bit, having a diameter that is smaller than the circular hole, is placed in the hole just cut and moved towards the perimeter of the quadrangular hole following a wide circular trajectory until the hole is completed. The typical feed rate for this type of operation is 200-300 mm/min [8-12 in/min]*, with a rotation speed of 5000-6500 RPM*.



The finger bit should not work the corners of the hole where the circular holes have already been made, thus avoiding any extra pressure on the corner. If it's possible, make holes as much as possible near the central part of the starting slab.



* For more detailed values, please refer to your Atlas Plan representative who will provide the technical data sheets.

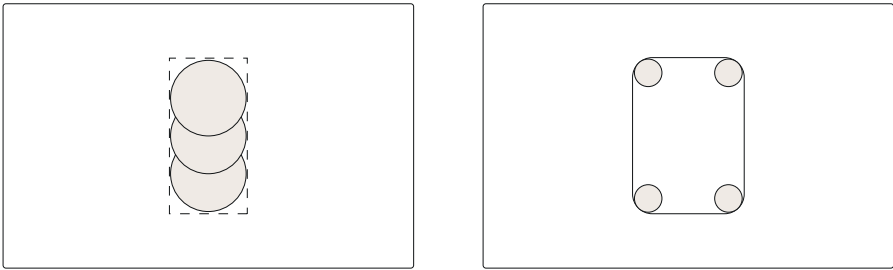
3.8 Counterbore hole

When making a counterbore hole, Atlas Plan recommends making the counterbore before the actual hole. The counterbore is made with a finger bit that removes material even from the lower surface. In general, the cutter is not able to remove all the material in a single pass. Repeat until reaching the desired depth proceeding by step of 1-1,5 mm [1/25" – 3/50"]: Atlas Plan does not recommend using counterbores greater than 6 and 10 mm [¼" – 2/5"], i.e., half the thickness (12 and 20 mm – ½" and 3/4") of the slab.



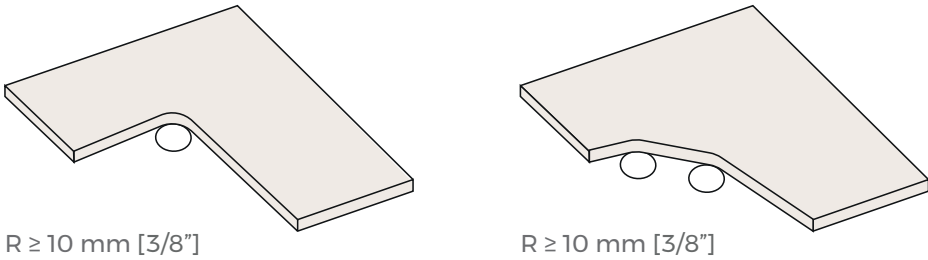
3.9 Sockets and switches hole

It is recommended to use circular holes for accessories and switches.

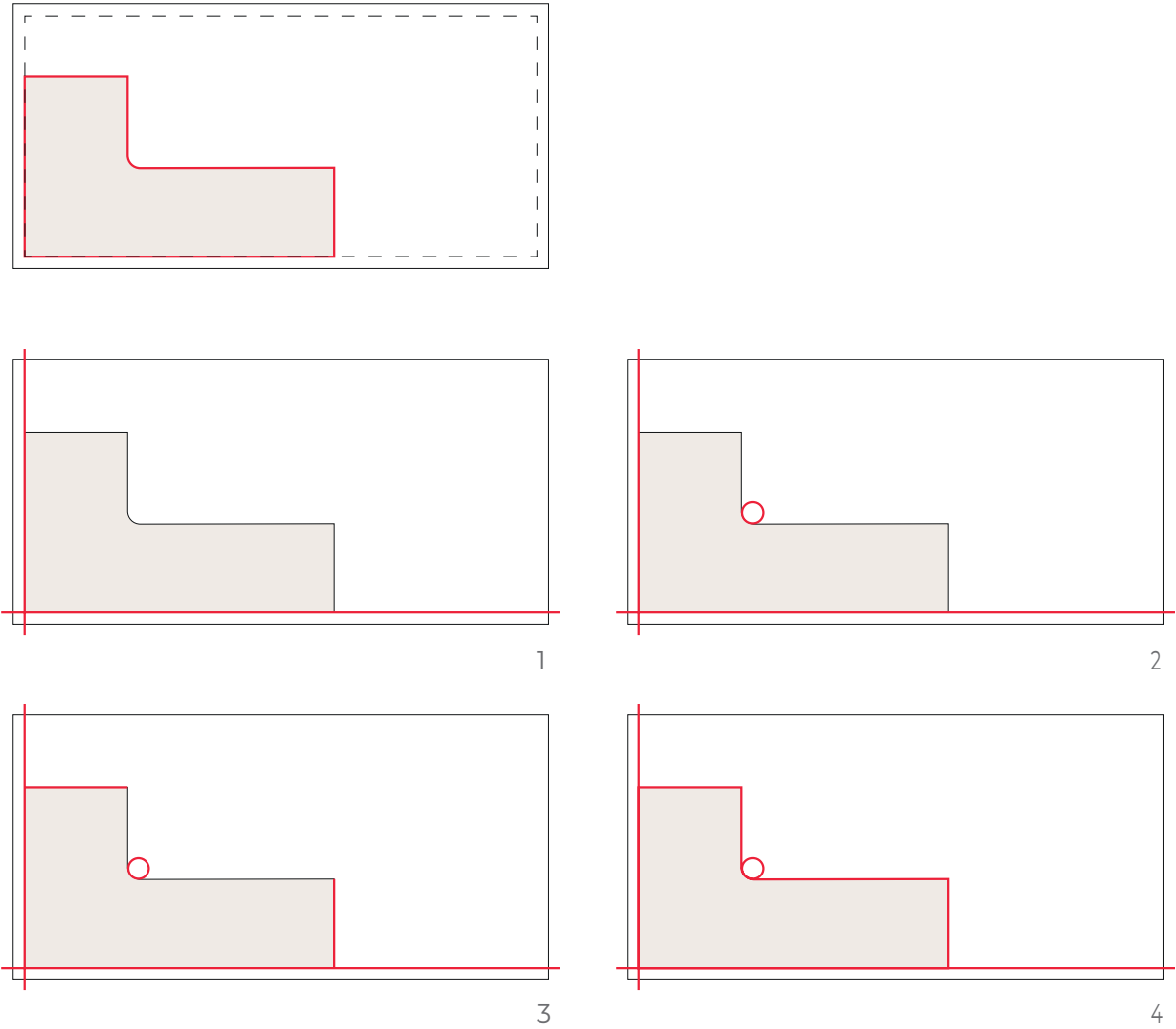


3.10 "L-shaped" cuts

In the case of L-shaped cuts, it is first necessary to make a hole at the corner and then make the straight cuts. The minimum radius of this hole must be at least 10 mm [3/8"].



Below is a diagram with the most appropriate cutting steps for the realization of an "L" shaped monobloc countertop.

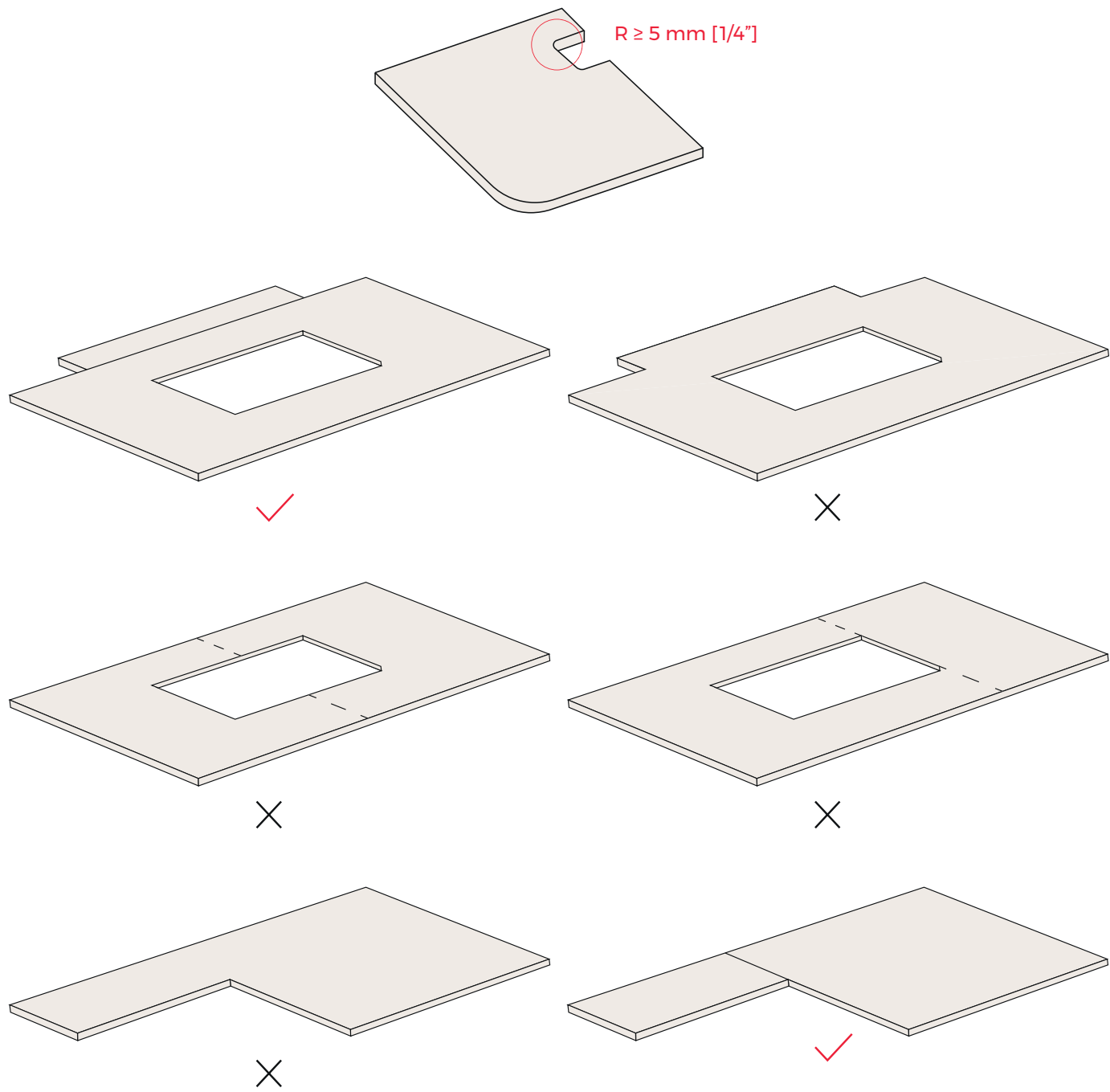


However, for greater strength of the top, it is advisable to divide the piece into two parts. In this case, It is recommended to analyze the most suitable cutting pattern for the aesthetics of the composition.



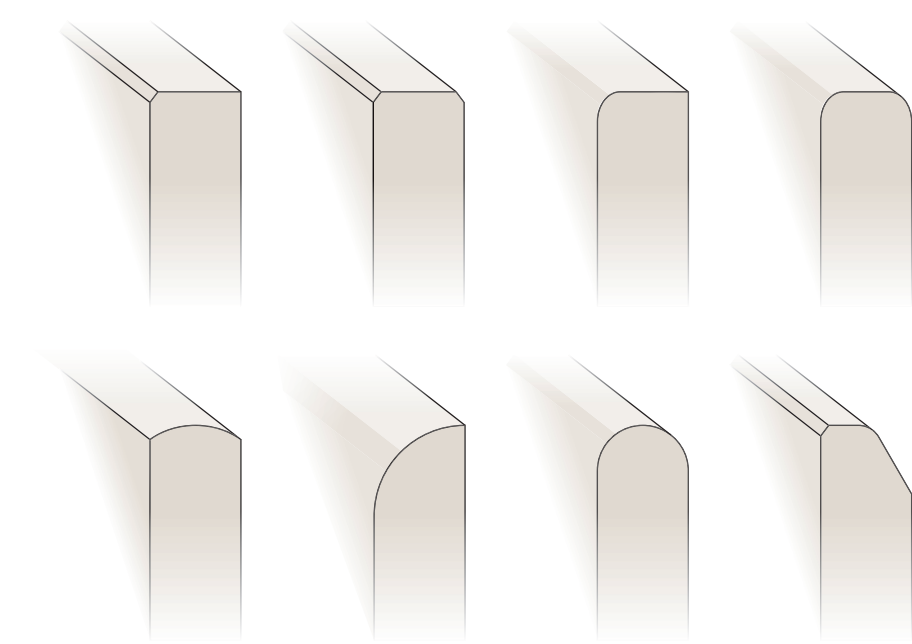
3.11 Special cases

It's always recommended to ensure a 5 mm [1/4"] radius at columns.



3.12 Edging of slabs

The edges of Atlas Plan porcelain stoneware slabs can be worked with a CNC contouring machine in order to create different profiles. Atlas Plan does not recommend leaving the edges with a sharp edge and advises to make a bevel of at least 1 mm [1/25"] or a rounded edge with a minimum curvature radius of 1 mm. The edge of the slab can be subjected to the next step of grinding, including polishing. Here are some examples that can be obtained using a CNC contouring machine.



The outer edge of the slabs, but not the internal edges of the holes, can also be shaped using an edge polisher machine. In this case, if a CNC edge-trimming machine is not available, the edge of the hole must be machined using a hand-held diamond grinding disc with a wet cutting method.

The edge polisher machine is also able to cut the slab's outer edge at 45°.

Then the slabs can be polished by specific machines for edge polishing.

* For more detailed values, please refer to your Atlas Plan representative who will provide the technical data sheets.

4 JOINTS

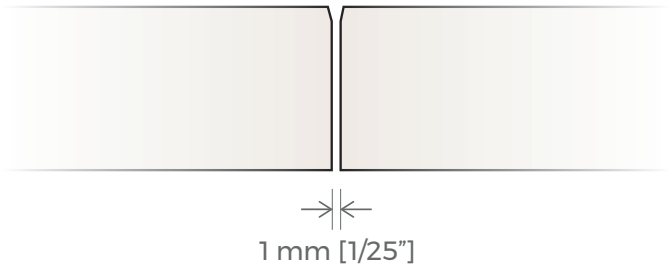
The right adhesives for gluing Atlas Plan’s slabs can be silicon or epoxy depending by particular type of the joint.

4.1 Flush joints

If the design of the kitchen counter calls for the combination of two or more flush slabs, as in the case of L or U-shaped kitchens, Atlas Plan recommends making a tiny rounded-off edge on the adjacent edges to avoid chipping during positioning.

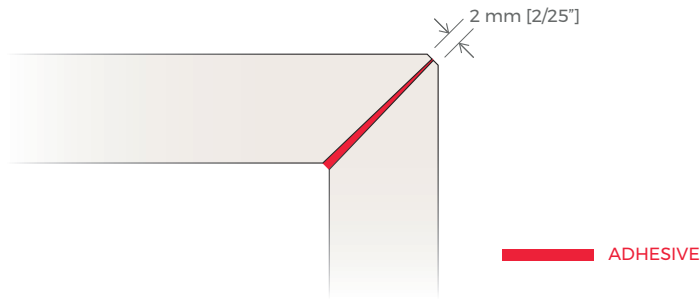
In any case, the leveling of the substrate is essential for ensuring the flatness of the top of the two slabs.

Always include a minimum joint of 1 mm [1/25”] filled with silicone or epoxy filler of the same color of the slab. Making sure to clean the two surfaces that will be joined before applying the adhesive.



4.2 45° joint

If the project requires the creation of mitered edges (45°), the edges should be glued with a specific adhesive, after which the joint must be beveled in order to soften the sharp edge. However, it is also possible to make a slight bevel on the two edges before gluing them together.



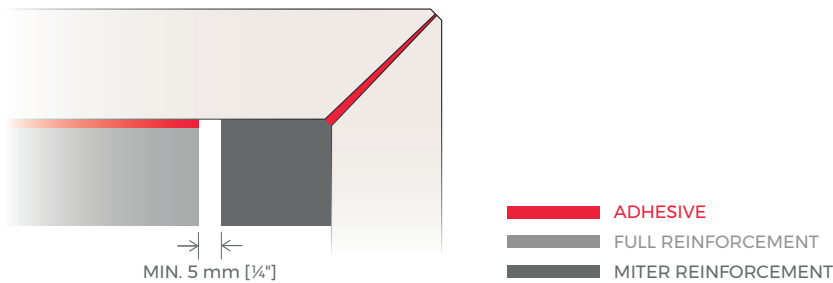
Before applying the adhesive, it is advisable to check the edges to check their cleanliness and, if necessary, treat it with acetone.

The adhesives most suitable for bonding 45° joints are dual component epoxies. The catalysis of these adhesives is chemical and requires some hardening time*. The temperature of both the room and the slabs affects the hardening time: it is recommended to glue the pieces together at a temperature above 10°C [50°F]*. In any case, Atlas Plan suggests that you carefully read the recommendations of the adhesive's manufacturer.

It is important to remove any excess adhesive before it has hardened. Please refer to the Cleaning and Maintenance Manual for cleaning suggestions.

To create invisible joints, it is best to cut each edge at an angle of just over 45° in order to leave more space for the glue at the back of the joint.

In the case of a 45° joint between slabs for outdoor use, and therefore subject to different degrees of thermal expansion between the Atlas Plan and the support, it is strongly recommended to use a support for the miter separated from the horizontal support by at least 5 mm [1/4"]. This space allows a differential expansion between the floor and the substrate. Use adhesive suitable for outdoor applications, resistant to thermal shock, water, and yellowing.

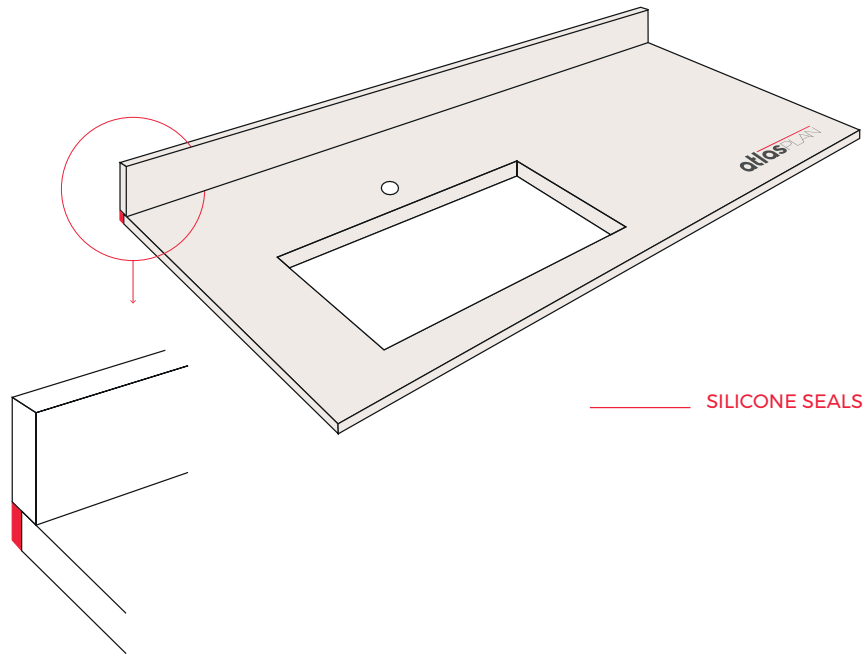


* For more detailed values, please refer to your Atlas Plan representative who will provide the technical data sheets.

4.3 Expansion joints

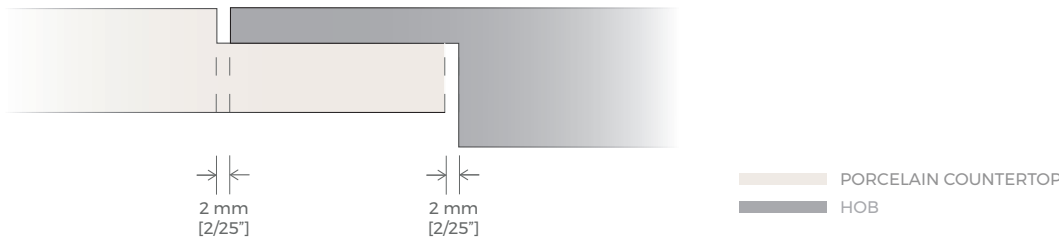
Atlas Plan always recommends leaving a margin of at least 2 mm [2/25"] between the slab and the wall, in order to avoid any problems of variation of the flatness of the wall and thermal expansions of the countertop. This margin can be covered by adding a baseboard and it has to be filled by a small application of silicone. In addition, for a flush stove top or sink, it is recommended to leave 2 mm between the stove/sink and the counterbore.

In both cases, Atlas Plan recommends filling the empty space with silicone or seals provided by the stove top or sink manufacturer.



4.4 Ceramic glass/induction hobs

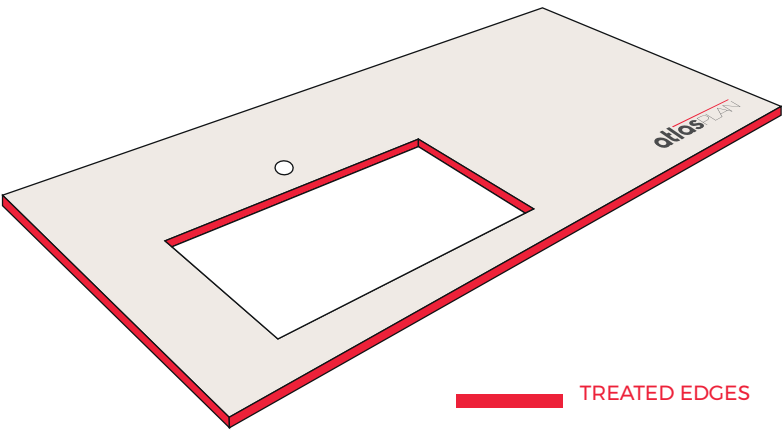
The minimum distance between kitchen countertop and hob should be 2 mm [2/25"]. Use a suitable thermal silicone or the joints provided by the cooker hob manufacturer. It is not recommended to remove more than 6 mm [1/4"] in a 12 mm [1/2"] slab, and 10 mm [3/8"] in a 20 mm [3/4"] slab. Please refer to the technical documentation provided by the cooker hob manufacturer.



5 SLAB EDGES TREATMENT

Once the Atlas Plan porcelain slab has been cut, the edges (of both the outer perimeter and any holes) may be more prone to staining.

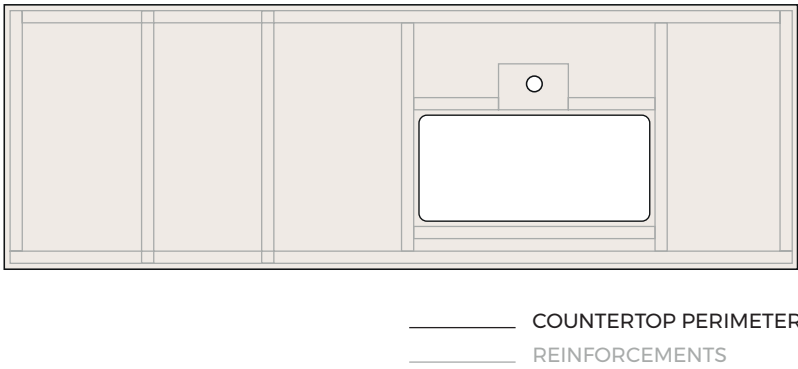
For this reason, after cutting and eventually polishing process, Atlas Plan advises to apply a specific sealant product for porcelain stoneware to the visible edges. It is best to apply this product immediately after making the cuts, where the work is being carried out. Please consult manufacturer's Technical Data Sheets for the proper application of the chosen product.



6 SUPPORTS

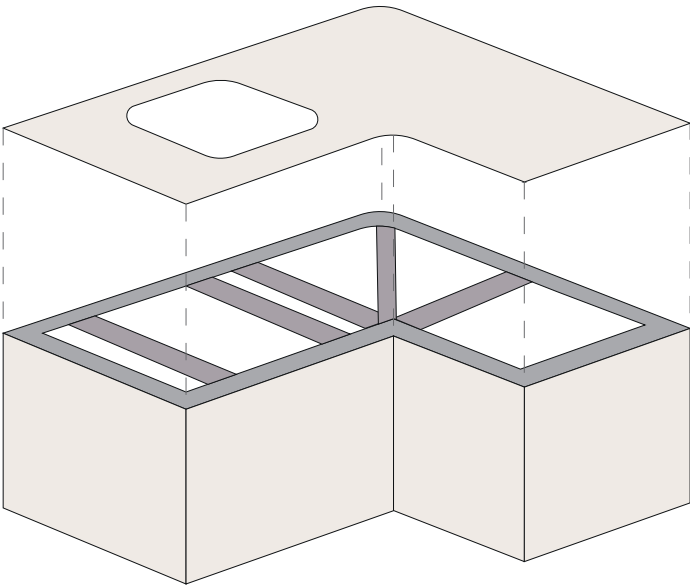
Atlas Plan slabs can be glued to a solid full support or to reinforcements. Whatever the support, it is advisable to use elastic and deformable adhesives that can compensate the different thermal expansions of the slab and the substrate. The most suitable materials with support function are all those with the thermal expansion coefficient as close as possible to porcelain stoneware. Atlas Plan suggests the use of the following materials: panels with an extruded polystyrene rigid foam core, foamed with a thermosetting rigid polyurethane polymer and granite. It is absolutely not recommended to glue the slabs on quartz agglomerate and marine or ply-wood reinforcements. There are also spreadable adhesives available that guarantee adhesion to any type of support, allowing also good deformability. It is absolutely not recommended to glue slabs to quartz agglomerate reinforcements.

In case of gluing to reinforcements, make sure that the reinforcements are positioned at the most delicate and fragile points of the slab, such as the internal perimeter of the holes (sink, hob, mixer tap, faucets holes) and even along the entire external perimeter. The adhesive must not be laid in spots, but evenly over the entire surface of the substrate.

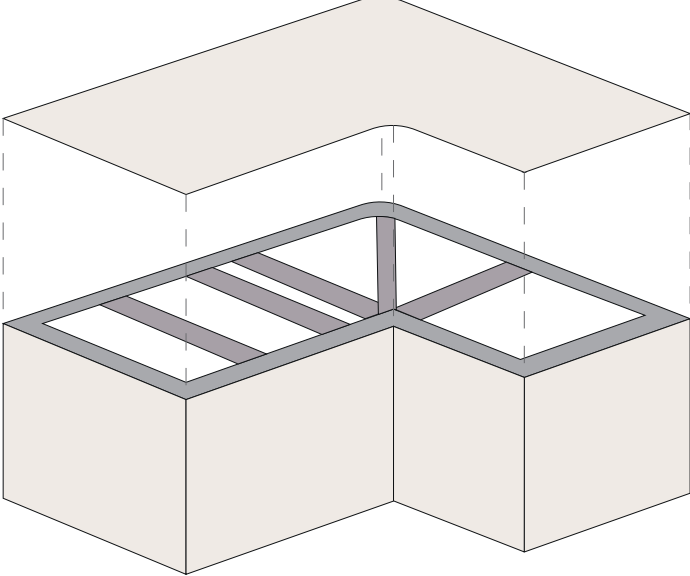


In addition to perimeter reinforcement, Atlas Plan recommends that 12 and 20 mm [1/2" and 3/4"] thick slabs should be supported transversely with crossbars placed at a maximum distance of 90 cm [35 1/2"] both longitudinally and transversely.

COUNTERTOP WITH HOLE

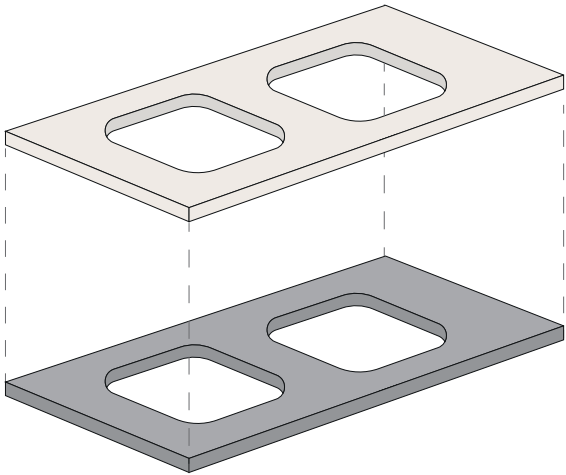


COUNTERTOP WITHOUT HOLE



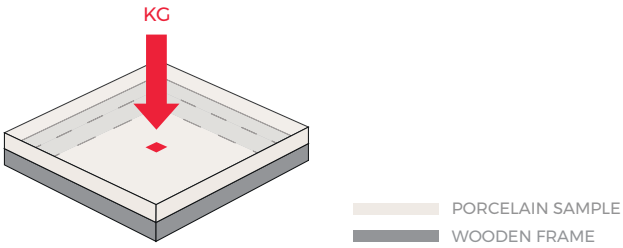
On the other hand, 6 mm [1/2"] thick slabs need to be fully supported.

FULL SUPPORT



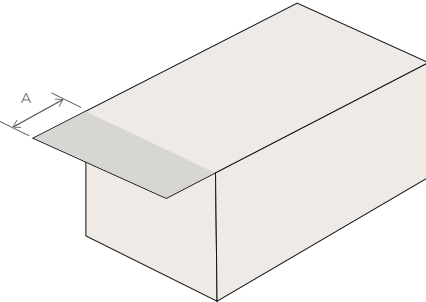
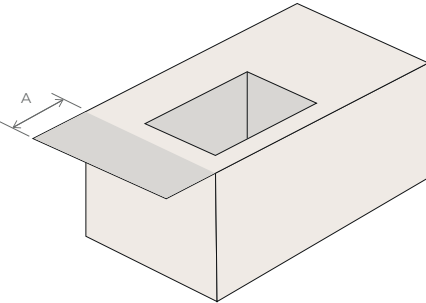
The table below shows the strength of the slab [kg] subjected to a concentrated load applied in the middle of the slab, according to thickness and size of the sample. All the samples tested were supported perimetrically with a 2 cm [3/4"] thick wooden frame in order to simulate a classic installation on cabinets.

SAMPLE DIMENSIONS [cm - inches]	THICKNESS [mm - inches]	RESISTANCE [kg -lbs]
60 x 60 - 23 ½" x 23 ½"	6 - ¼"	100 - 220,5
60 x 90 - 23 ½" x 35 ½"	6 - ¼"	95 - 210
60 x 60 - 23 ½" x 23 ½"	12 - ½"	250 - 551
60 x 90 - 23 ½" x 35 ½"	12 - ½"	240 - 530
60 x 60 - 23 ½" x 23 ½"	20 - ¾"	950 - 2094
60 x 90 - 23 ½" x 35 ½"	20 - ¾"	900 - 1984

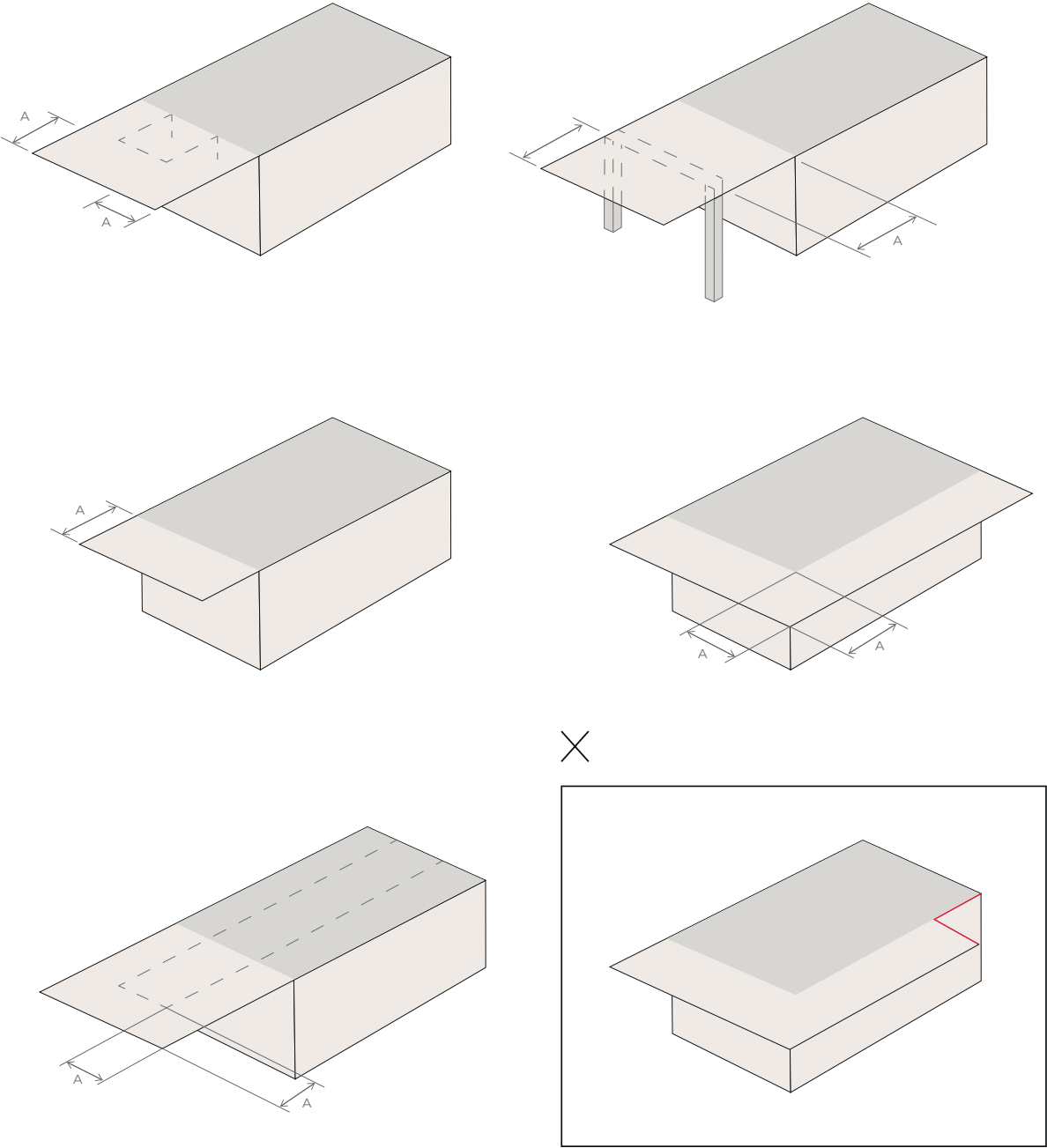


7 OVERHANGS

If you want to design an island with an overhang, it is essential to consider the information given in the following table*:

	THICKNESS		
	12 mm [1/2"]	20 mm [3/4"]	
Unsupported overhanging top	A < 200* mm [7 3/4"]	A < 400* mm [15 3/4"]	
Top with quadrangular hole and unsupported overhang	A < 100* mm [4"]	A < 220* mm [8 1/2"]	

* The reference values are calculated considering a static load of 100 kg.



8 SINKS

Atlas Plan slabs can be combined with different types of sinks, such as top-mount, bottom-mount and flush-mount sink.

We recommend that you follow the installation instructions of the sink manufacturer.

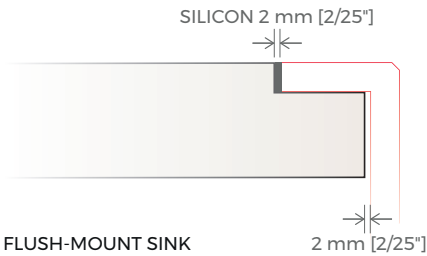
In the case of a bottom-mount sink larger than the hole in the counter top, in order to reduce the risk of chipping it is advisable to make a bevel or a rounded edge with at least a 1 mm radius even on the lower edge.

For a flush-mount sink, follow the cutting instructions and leave a margin of 2 mm between the sink and the counterbore.

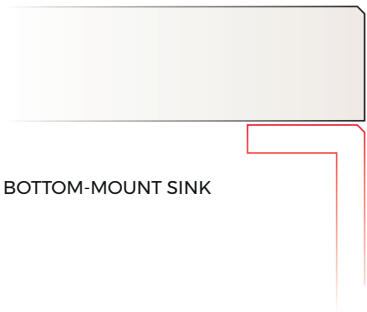
For medium and large sinks it is always a good idea to use support brackets under the sink.



TOP-MOUNT SINK



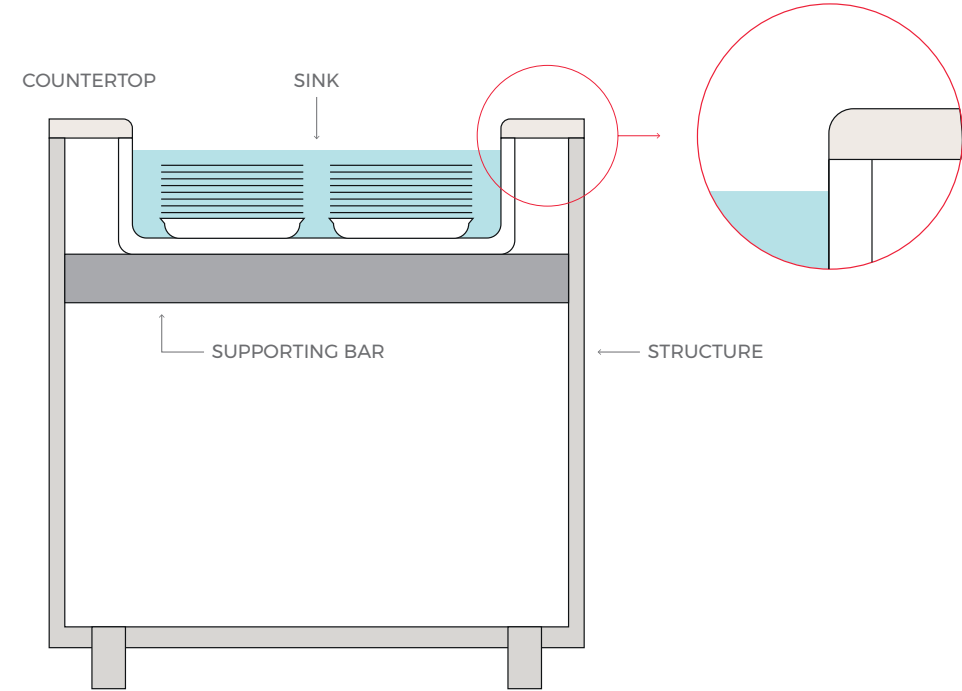
FLUSH-MOUNT SINK



BOTTOM-MOUNT SINK

8.1 Sink support

It is advisable to add a support bar for large sinks, to be fixed on the structure where the top will be installed. The weight of the water, when completely full, or the addition of the daily used material weight, could cause the detaching of the sink and/or the countertop breackage



9 TOP HANDLING AND INSTALLATION

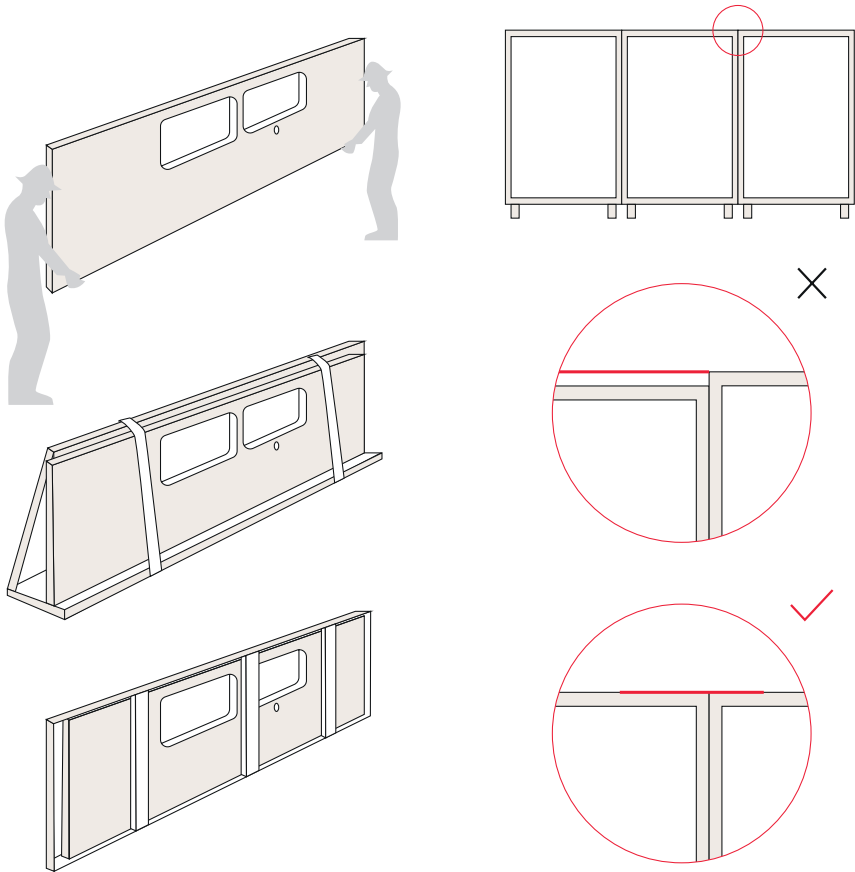
During handling, transport and installation of the finished top, care must be taken to avoid any excessive bending and twisting or collisions, particularly on the edges.

9.1 Handling

Atlas Plan suggests keeping the slabs vertical when moving them. If the holes are situated closer to one side, it is recommended to keep that side at the top.

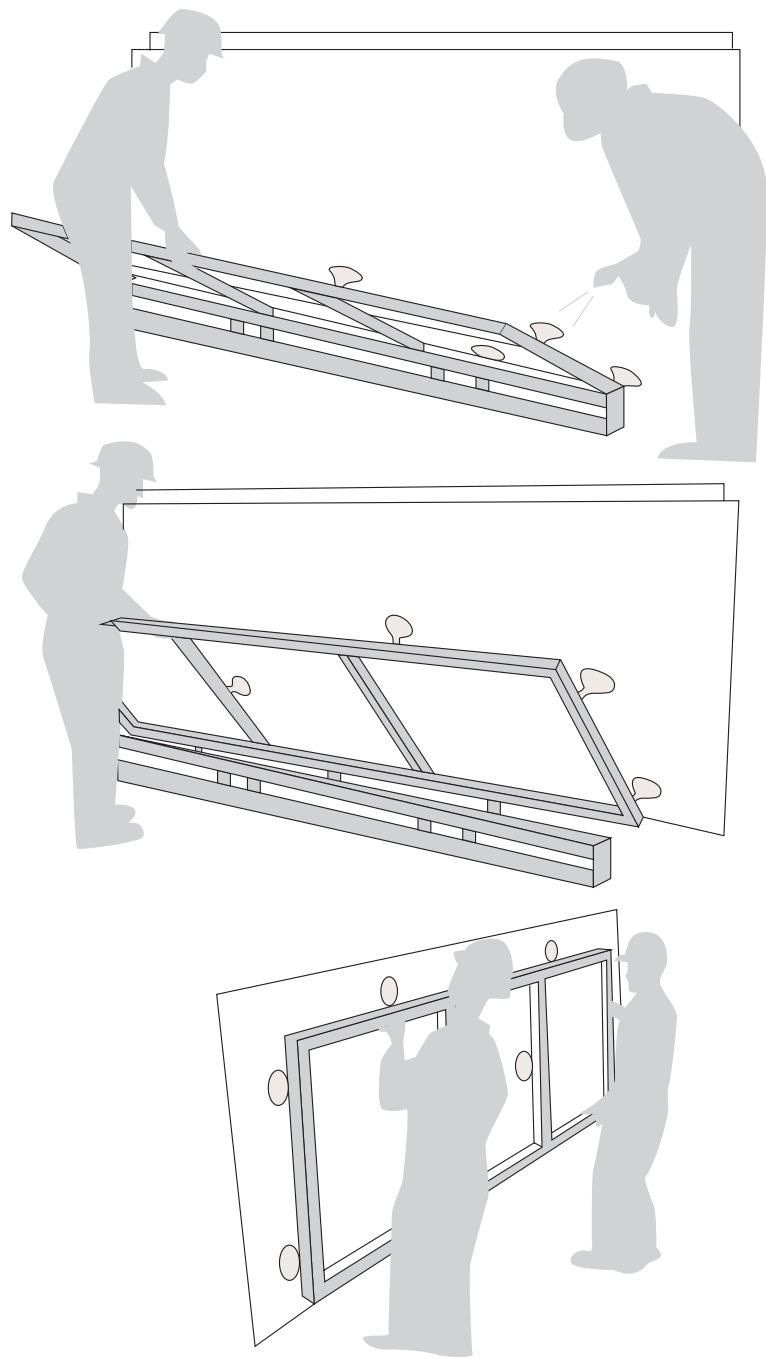
In order to facilitate transportation, it is recommended to pack the top into wooden crates or special wood frames. If the finished top is transported with trestles or A-frame, make sure that it is large enough to completely protect the top edges.

We recommend the use of foam or polystyrene edge protection profiles to protect the edges.



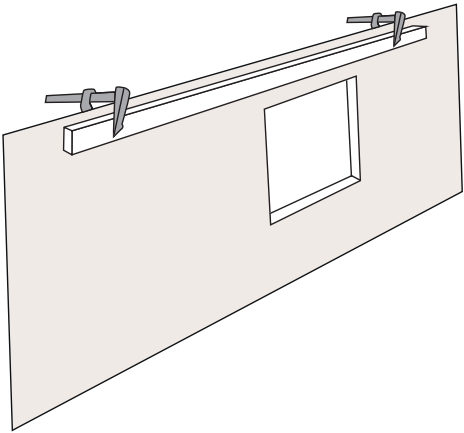
In order to facilitate slabs and processed parts handling, it is recommended to use a suction cup frame (only for 6 mm [1/4"] slabs).

The suction cups are easy to move along the frame, so you can adapt it to any necessary size.



If you do not have this type of frame, you can use an aluminum bracket or similar, fixed with various clamps. This will prevent bending during handling.

It is also recommended to fix long and thin parts (e.g. cylinders) with clamps to an aluminium bracket for transportation. This will prevent bending during handling.



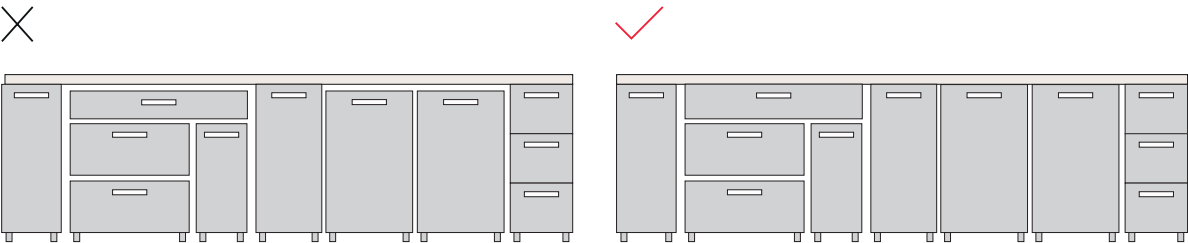
9.2 Laying - installation

It is of primary importance that the support base on which the surface has to be laid is flat, levelled and structurally stable. Most cracks during installation and post-installation might be caused by irregular or inadequate support, or by the presence of debris or work residues.

The surface of the top must be perfectly laid down on the support, any unsupported points may cause top fragility.

Therefore, it is recommended to spread the adhesive over the entire support area, so that it adheres completely to the surface. Insulated silicone points should be avoided.

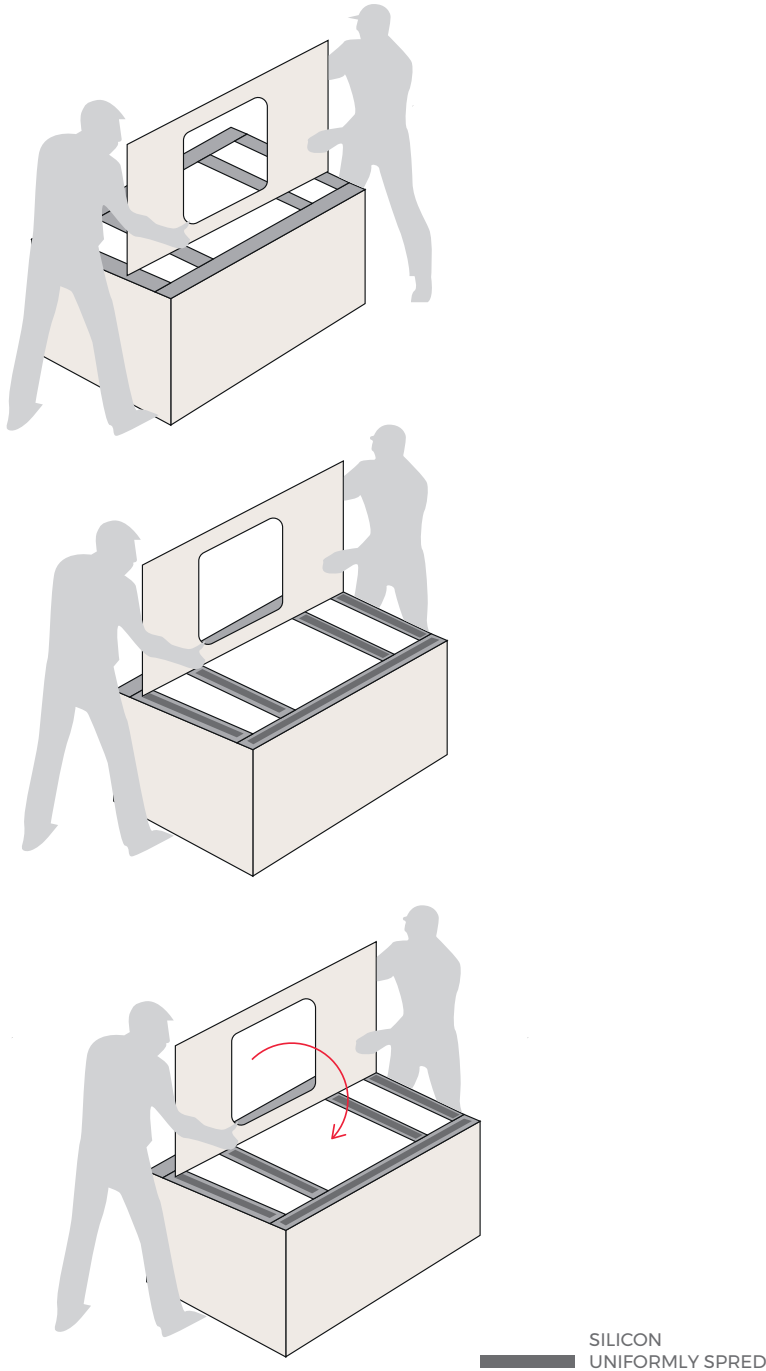
It is important that the adhesive used to fix Atlas Plan slabs is enough elastic (e.g. silicone) to compensate possible expansion differences between the slab and the support.



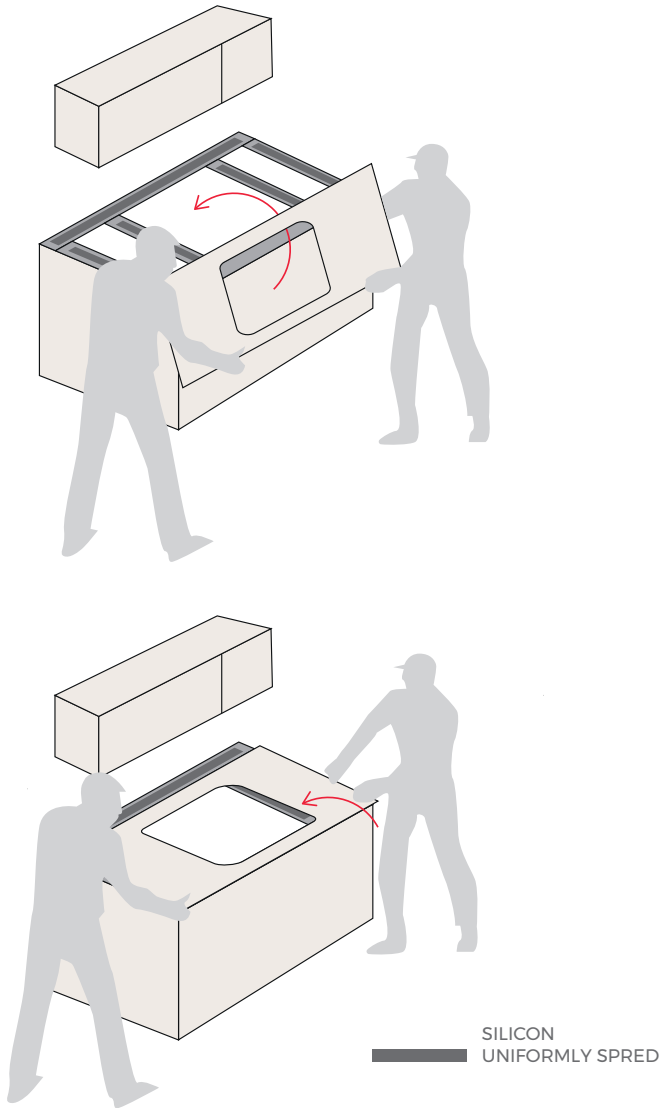
9.2.1 Top approcching

When approaching the workpiece, follow all the instructions below to ensure the best positioning.

SITUATION 1

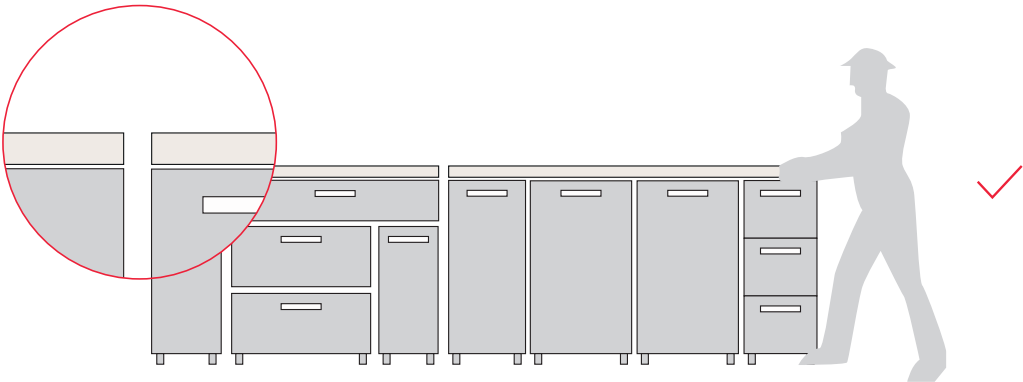
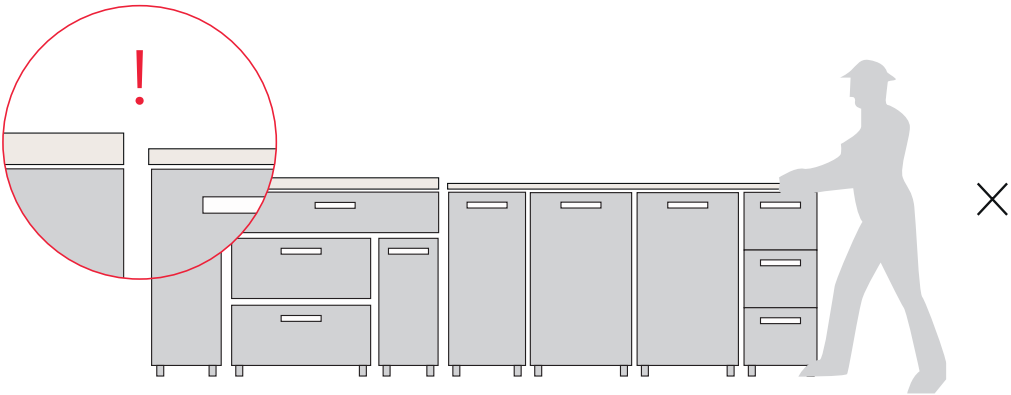


SITUATION 2



9.2.2 Planar Slabs seam

Before laying, it is necessary to make sure that the base is levelled and perfectly flat, otherwise it is essential to make adjustments or add shims. The seamed edges must match perfectly and do not have to have different angles that could lead to chipping.



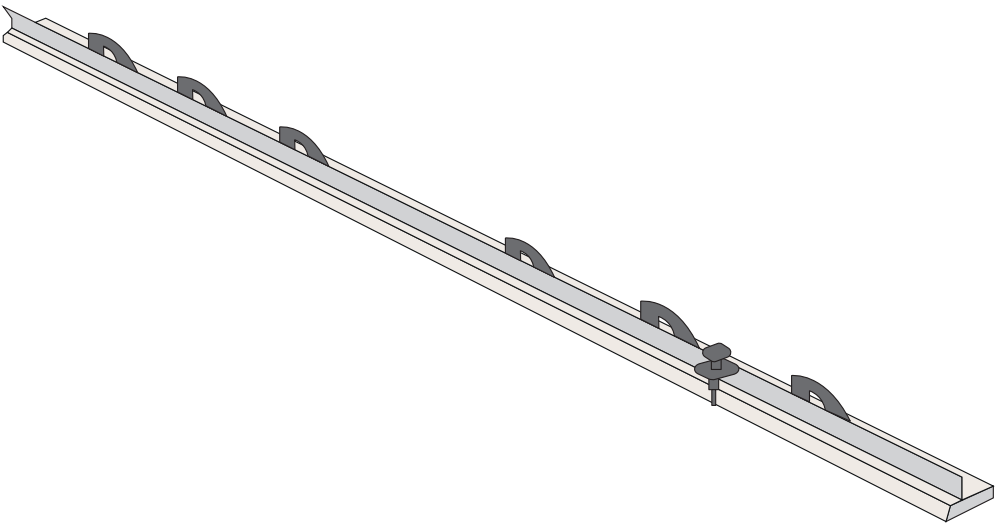
10 WORKING ON SLABS FOR FLOOR AND WALL CLADDING

The cutting table must be strong and solid, and must be adjustable according to the needs of the installer

10.1 Linear cut

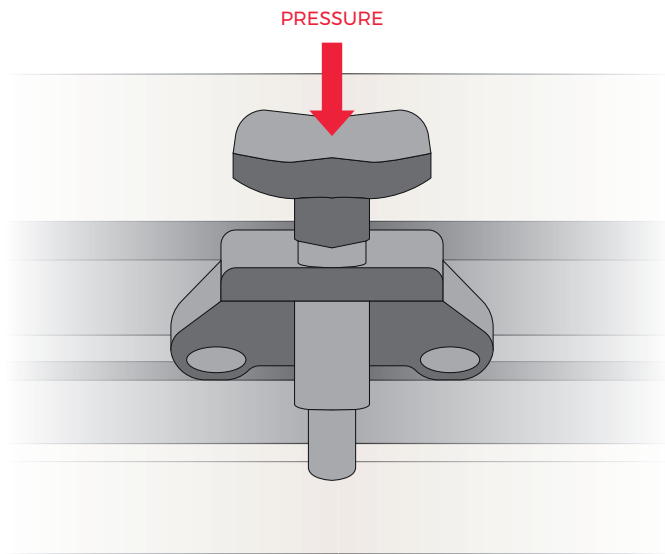
In its simplest form, a linear cut is made using a tile cutting guide with adjustable length, which is positioned on the slab and locked onto the surface using suction cups. The cutting guide is designed to seat both a scoring unit as well as a cutting unit with angle grinder

Through the scoring unit it will be possible to make only through cuts, while the cutting unit with grinder allows to make cuts of any length.



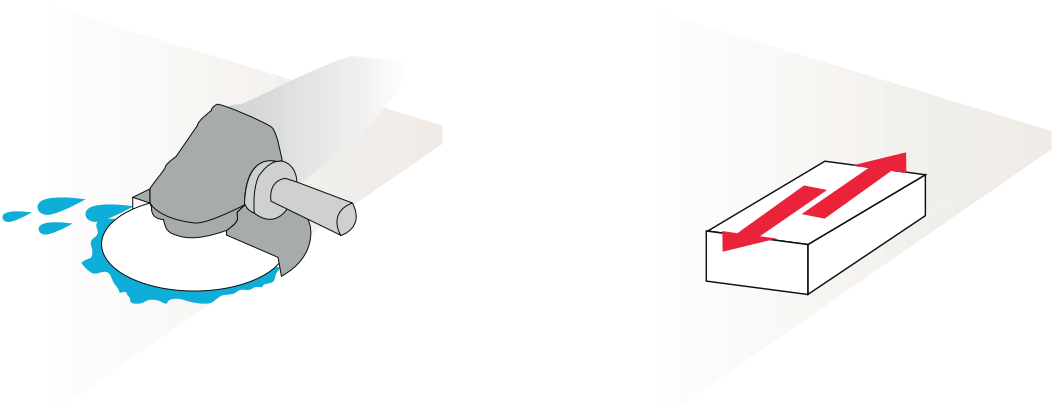
10.2 Scoring cut

To make a scoring cut, position the scoring unit at a distance of 2-3 cm from the edge and apply appropriate pressure to engrave towards the edge. Subsequently, resume from where the engraving was started and complete it up to the opposite edge of the slab.



Using a cutting-off pincer, apply a progressive pressure in correspondence of the engraving until the cut starts.

Once the cut is complete, you can use a diamond pad or disc with a steady flow of water to smooth out any slightly uneven edges that might be sharp.



10.3 Grinder cut

The cutting guide can be used also with an angle grinder cutting unit. In such cases, the cut can either be thorough or partial. It is also possible to cut the slabs in wet conditions by using appropriate tools like cutters with water cooling.



10.4 45° cut

A second cutting unit with angle grinder may also be positioned on the guide to carry out a jolly cut on the tile. Start the engraving at a distance of 1-2 mm from the corner of the tile to avoid subsequent chipping. It is possible to make inclined cuts with angles between 35° and 55°. The most common bevel angle is 45°, and the cut is made wet using a diamond blade with a device that allows water to flow over the cutting point.



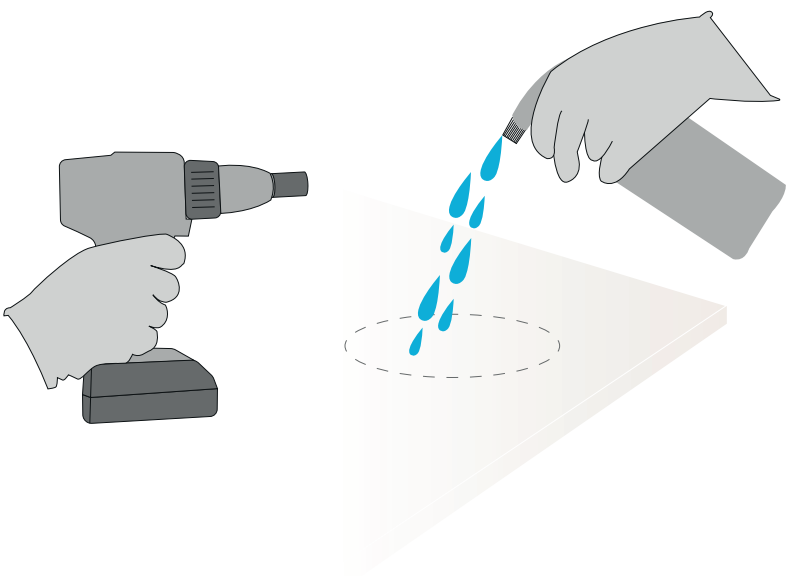
10.5 Circular holes

It is also possible to drill circular holes with a diameter between 6 and 100 mm. Be sure to use a diamond core bit. For this purpose, it is recommended to use a slower cutting rotation speed and to perform a wet operation so as not to overheat the tool. The entry position of the cutter should not be perpendicular to the plate, in order to facilitate punctual entry. Once the cutter starts drilling the slab, it is recommended to make a precession movement to allow water to reach the cutting area.

PROCESSING:

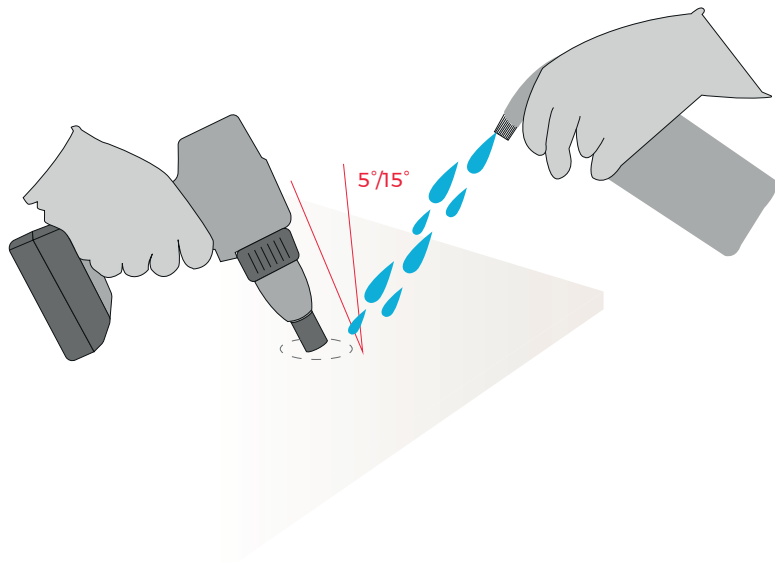
1. Cutting zone setup

Wet the drilling area to prevent the tool from overheating during the next cutting step.



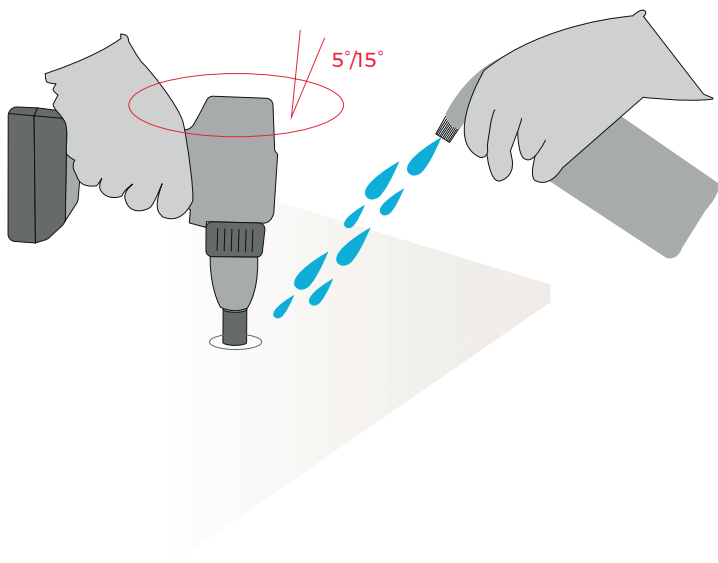
2. Start drilling

At this stage, the operator must keep the tool at an angle of approximately 5°-15° to the slab to ensure it enters precisely. This will prevent the tool from slipping and scratching the surface. A steady flow of water must be maintained both at this stage and the next.



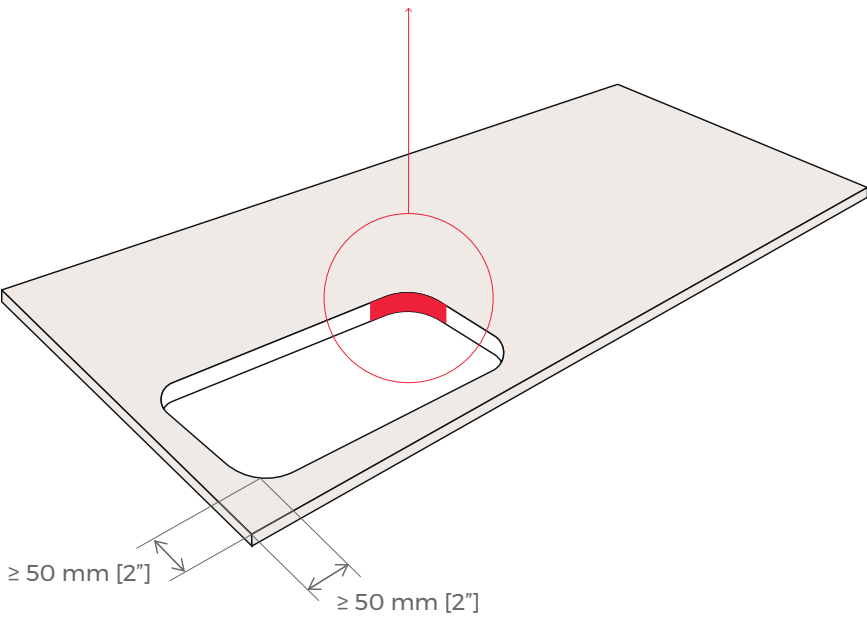
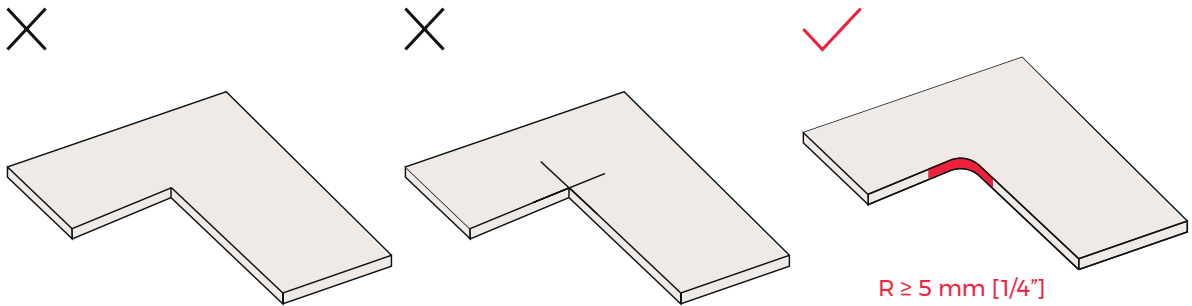
3. Drilling

The operator continues to push the tool into the cutting area while maintaining the same angle of the previous phase (5°/15°), adding a precession motion that allows the water to reach the cutting zone.



10.6 Right angles or square holes

We strongly discourage the use of a single grinder, when creating a right angle or square hole. If used, there is a risk of a fracture. It is strongly recommended to drill a circular hole close to all square angles and to connect them only afterwards, using linear cuts. This creates less tension on the vertexes. In the case of a square hole, it is recommended to perform the cuts at a minimum distance of 5 cm [2"] from the edge, as shown in the picture. Ensure a flow of water is provided both during circular drilling and during linear cuts.



11 VERTICAL AND HORIZONTAL INSTALLATION

Before installation:

Carefully check the size, colour and choice of material in order to prepare for the installation as effectively as possible. No claims will be accepted for material that has already been laid, where any defects were visible prior to installation.

During installation:

To make cleaning easier once installation is complete, avoid using tools and products that are highly likely to stain (e.g. permanent pens or markers). Use grout that matches the colour of the material, carrying out a preliminary test on a sample. It is essential to completely remove any grout residue from the laid product whilst it is still fresh, using the appropriate equipment and changing the water frequently.

After installation:

Residues of mortar, cement or sanding and polishing residue are always present on the laid surface. It is essential to dissolve and completely remove these residues using buffered acids diluted in water (read the instructions for use on the packaging of the products used), which must then be thoroughly rinsed off the laid surface as soon as possible to prevent any residues or droplets from remaining, as these could cause damage to the tiles.

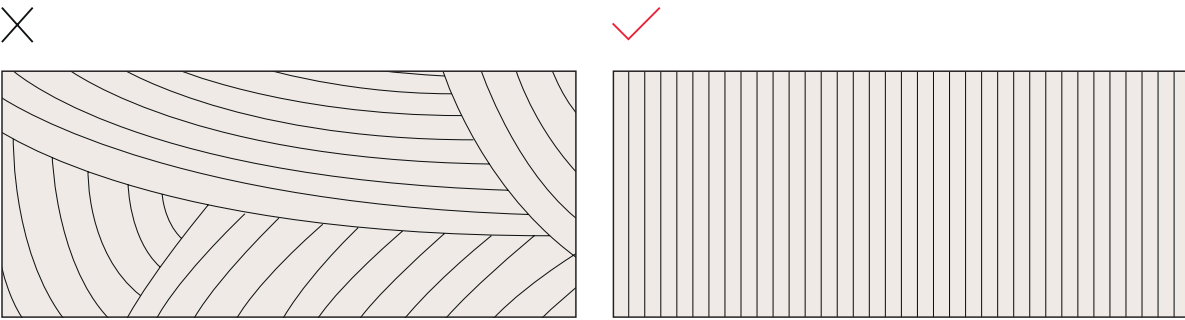
IMPORTANT NOTICE:

This product has very low microporosity. However, light colours and solid colours, in particular, require thorough and prompt cleaning of any foreign matter during and after installation.

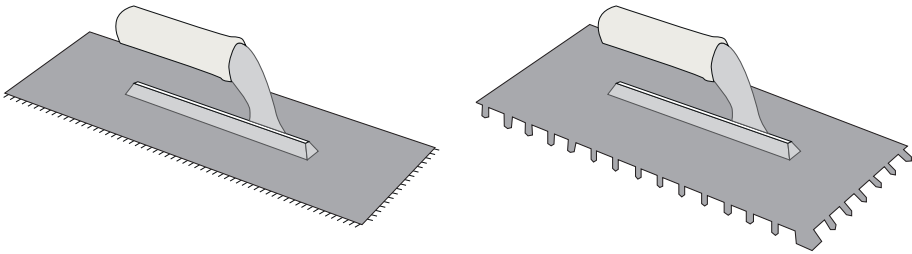
11.1 Screed laying

The screed must ensure suitable crushing strength for the final use. Rooms for civil use, for example, must possess a crushing strength of at least 200 kg/cm². the screed must have completed the normal hygrometric shrinkage. Generally, 7 - 10 seasoning days for every cm of thickness are envisaged for this type of concrete. Check for humidity prior to installation. Concrete screeds with a humidity value of below 2% are considered to be compliant.

The adhesive must be spread using the double spreading method, applying the adhesive both on the back of the slab and on the background, using a notched trowel. The spreading direction must be linear and parallel to the short edge of the tile, in order to reduce the space run by air while evacuating. It is fundamental that the direction of the spreading is the same on the tile and on the installation surface itself.

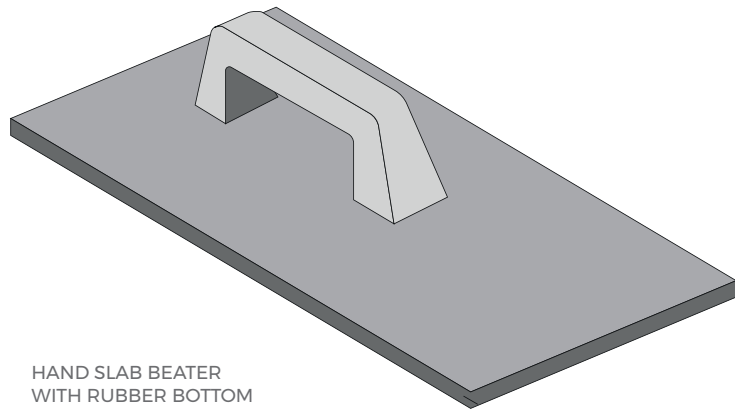


Use a 3 mm square notched trowel to spread the adhesive on the back of the slab, instead for the installation surface use a 10 mm slant-ridge trowel to spread the adhesive. In this way, it is possible to spread the glue back on itself to avoid any blank spaces.

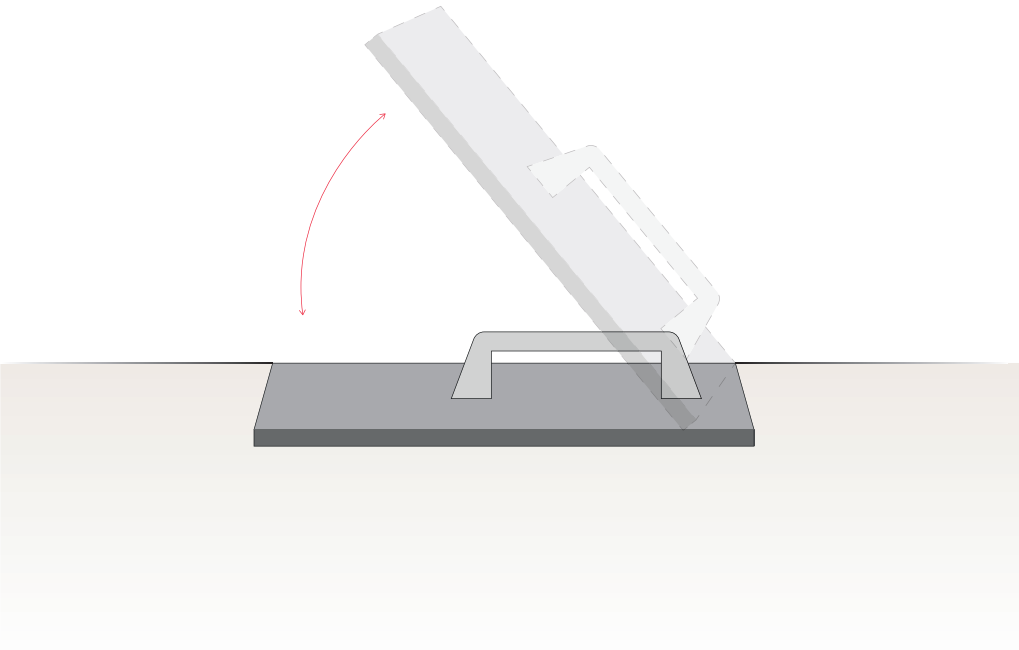


For floor and wall installation in indoor or outdoor environments of any thickness, we recommend the use of a C2ES2 adhesive (according to EN 12004) such as Mapei Ultralite S2 or equivalent. When laying in low temperature conditions or when it is necessary to use ceramic slabs quickly, it is preferable to use C2FTS2 quick-setting adhesives such as Mapei Elastorapid.

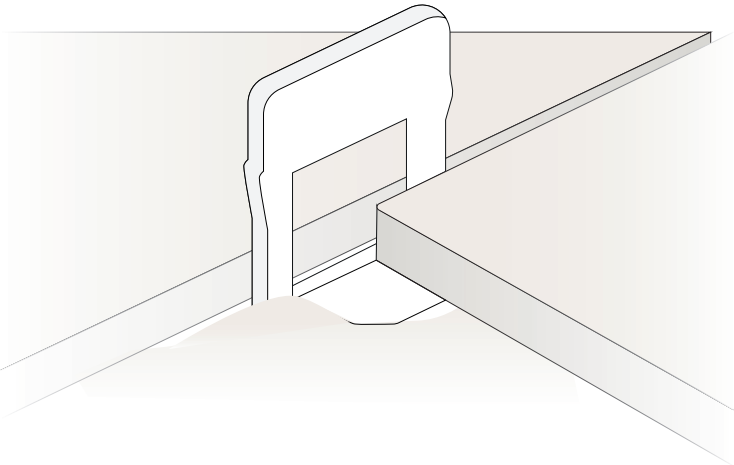
After having applied the glue on both surfaces, install the tile by using the sliding bars or the framed handling systems, while tapping firmly into place with a rubber mallet. Tapping with a rubber mallet will force the air in the channels out and therefore must be carried out from the center to the sides of the tile following the spreading direction, then in a way parallel to the short sides. It can be manual through a rubber trowel or mechanically through vibrating devices. It is essential to remove air bubbles as they are a weak point for the slab laid.



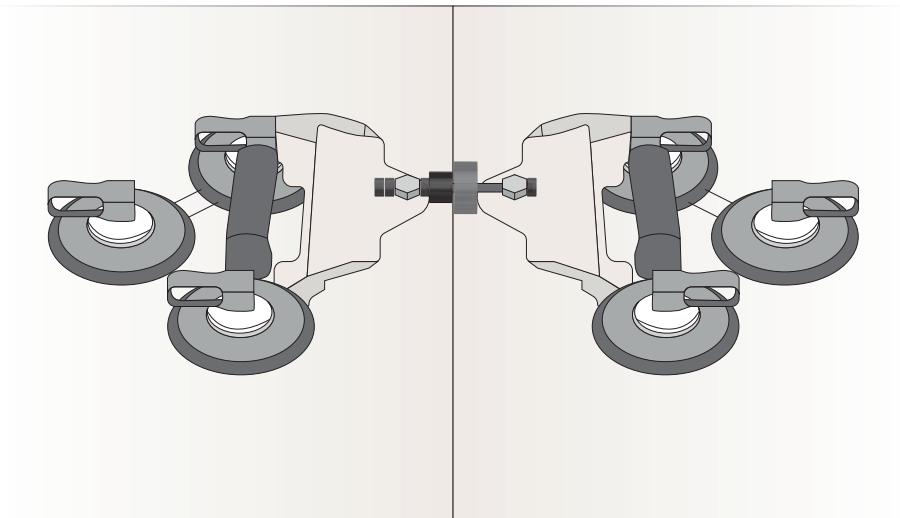
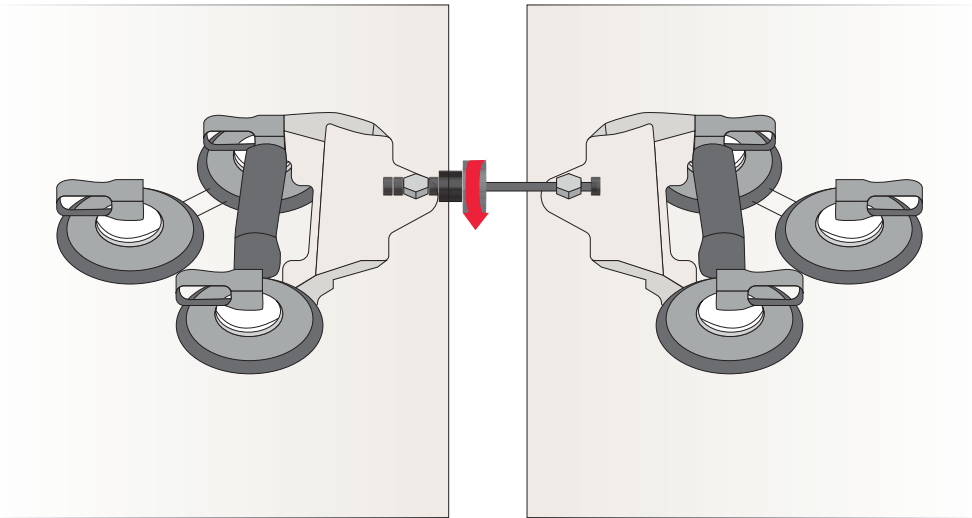
HAND SLAB BEATER
WITH RUBBER BOTTOM



The operation is repeated in order to place the adjacent tiles next to each other. The use of spacer determines the width of the joints.

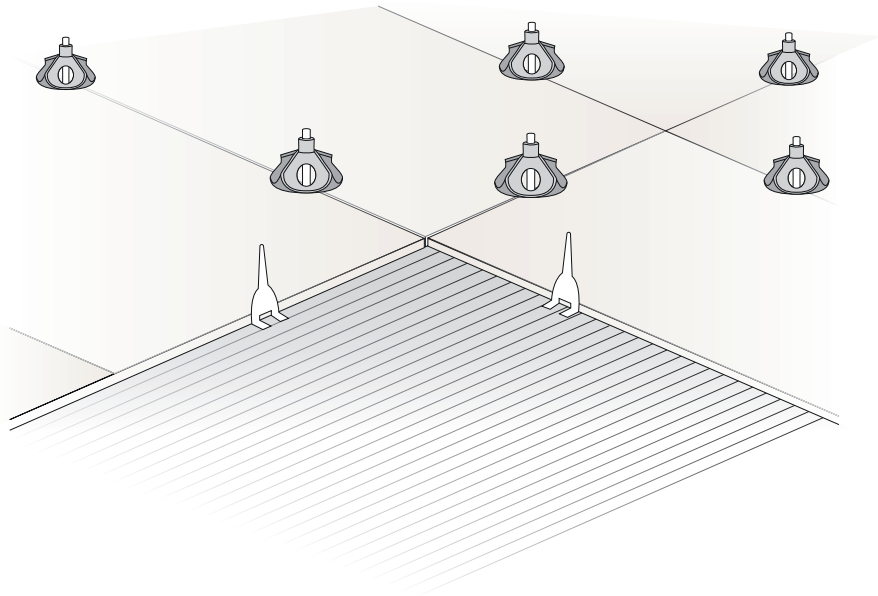
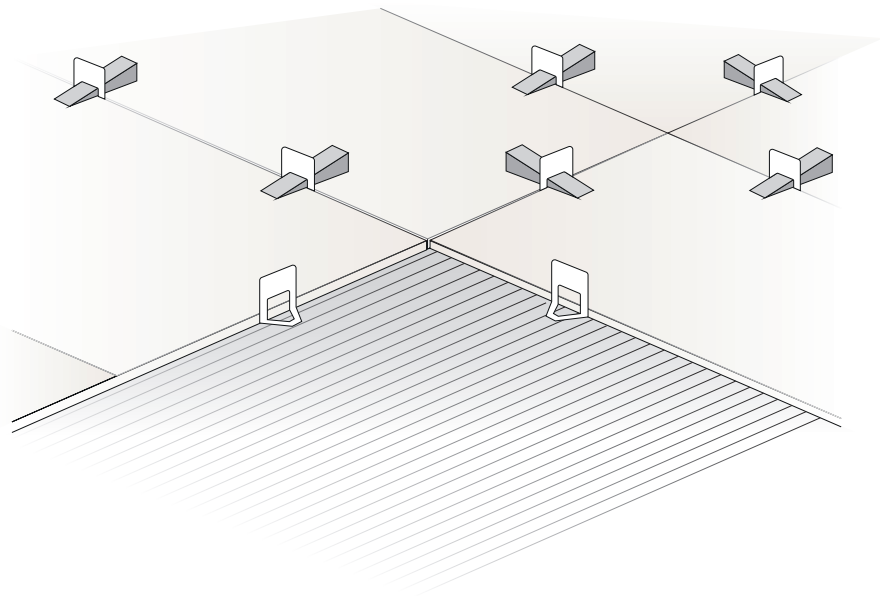


In the specific case of large sizes, it is possible to pull two contiguous slabs together using two systems of suction cups (one per slab), which distance is determined by a central screw.

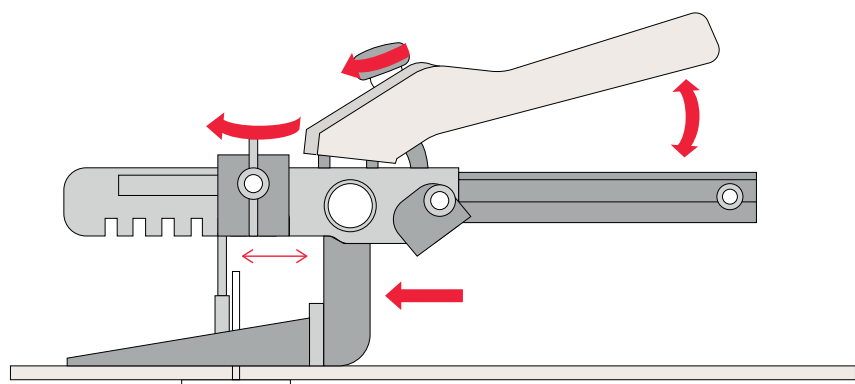
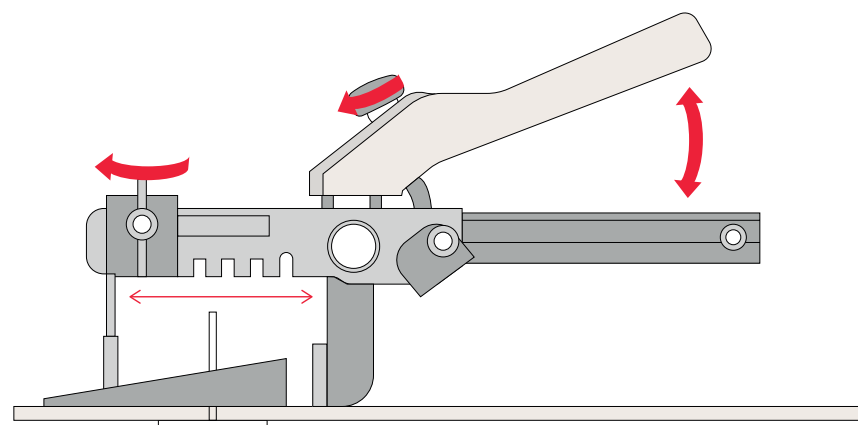


It is good to remove the excess adhesive from the joint, both to reduce the risk of scratches during the next pulling phase and to sufficiently fill the joint with the filler.

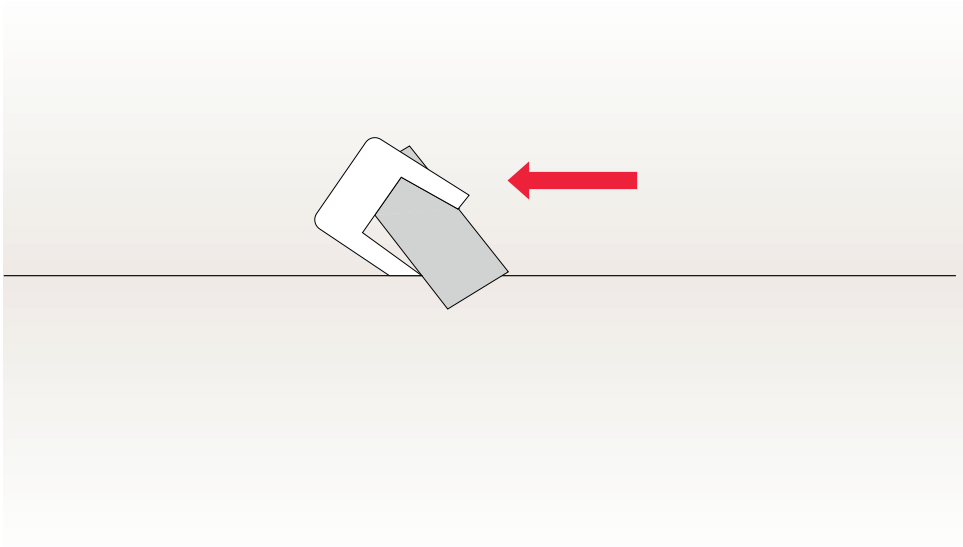
A wedge & clip or screw levelling system is recommended to avoid any difference in height of the slabs. A wedge leveler is inserted into the gap between the spacer and tile and forced in with a pincer. Once the glue has dried, the system can be removed mechanically.



FLOOR PILERS



WEDGE REMOVAL



11.2 Installation on existing floor

Sometimes it may be necessary to install materials on top of an existing floor. The advantages of 6 mm thick products for this type of application are as follows:

- Reduced weight handling
- Low increase in floor height
- Reduction of disposal costs

First of all, check that the existing floors is perfectly adherent to the substrate and free of cracks. If these conditions are not checked, it is essential to remove tiles that are detached or cracked by filling in the gaps created with fast-hardening cementitious skimming and restore their integrity with pourable epoxy mortars.

In addition to the integrity, the flatness must be checked, and to restore it, a self-levelling mortar must be applied after applying a suitable primer such as Mapei ECO PRIM GRIP.

Once the above conditions have been verified, proceed with a degreasing washing of the pre-existing floor with water and caustic soda or special alkaline detergents for the removal of film and wax coatings on the surface.

We recommend the application of class C2ES2 adhesive with the double spreading technique, following all the steps reported for the installation on the screed.

If you decide to lay Atlas Plan slabs on a cladding other than screed or ceramic, contact your Atlas Plan reference to evaluate the actual possibility.

11.3 Grouts and joints

The joints must be designed in compliance with the laws or regulations in force in the country where the ceramic material will be installed. In any case, the width of the joint between slabs must be at least 2 mm and will be conveniently increased taking into account the size and type of the slab, the intended use of the material (floor or wall, internal or external) and the operating stresses.

The following minimum grouts are recommended:

- ≥ 2 mm for internal floors and walls
- ≥ 3 mm for laying on pre-existing floors and/or heating screeds
- ≥ 5 mm for external wall installation

For the running installation of planks or rectangular formats, a maximum offset of $\frac{1}{3}$ of the length of the longest side is recommended.

Joints must always be provided along the perimeter of the room (perimeter joints) and near the structural joints in the subfloor.

There must also be splitting and/or expansion joints to divide the flooring into smaller, approximately square-shaped areas, as follows:

- 5m x 5m o 6m x 4m 4m for INTERIOR floor and wall coverings
- 3m x 3m o 4m x 2,5m 5m for EXTERNAL facades

Their size depends on the thickness and size of the slab, the characteristics of the substrate, the intended use and the loads acting on the slabs and, in any case, they must be generally between 5 and 12 mm wide.

11.4 Post-installation procedures

Once the slab has been laid, to completely remove any excess air, it is necessary to tamp it down – either manually or mechanically – using the appropriate anti-bounce trowel, working from the centre outwards.

CLEANING AND MANTEINENCE

1 ORDINARY CLEANING

For the ordinary cleaning of Atlas Plan slabs, it is advisable to remove the dust with a dry and clean cloth. Afterwards, we recommend using the product CLEAN&SHINE (FILA) or FLOOR CLENAER (FABER). We suggest using the doses recommended by the manufacturer and a microfiber cloth.

In any case, to avoid extraordinary cleaning, it is advisable to immediately remove any stain before it dries.

2 EXTRAORDINARY CLEANING

In the case of dirt resistant to ordinary cleaning. It is recommended to use a detergent specific to the type of dirt.

Prompt action remains an important factor for the success of the cleaning operation.

It is suggested to perform a preliminary test on a small stained portion, verifying the effectiveness of the detergent before using it on the whole surface.

Never use concentrated hydrochloric acid and/or caustic soda or detergents that contain hydrofluoric acid and/or its derivates.

Below is a table showing detergents suitable for various types of dirt:

TYPE OF DIRT		DETERGENT/SOLVENT	APPLICATION
		FILA	FILA
		FABER	FABER
GREASE	Degreasing detergent	PS87 PRO	Damp cloth
		Deep Degreser	White pad
COFFEE	Degreasing detergent	PS87 PRO	Damp cloth
		Coloured Stain Remover	Direct application
WINE	Degreasing detergent	PS87 PRO o SR95	Damp cloth
		Coloured Stain Remover	Direct application
BEER	Degreasing detergent	PS87 PRO	Damp cloth
		Tile Cleaner	White pad
FRUIT JUICE	Degreasing detergent	PS87 PRO	Damp cloth
		Tile Cleaner	White pad
COCA COLA	Degreasing detergent	PS87 PRO	Damp cloth
		Tile Cleaner	White pad
INK	Degreasing detergent	PS87 PRO o SR95	Damp cloth
		Coloured Stain Remover	Direct application
VOMIT AND URINE	Degreasing detergent	PS87 PRO	Damp cloth
		Tile Cleaner	White pad
ICE CREAM	Degreasing detergent	PS87 PRO	Damp cloth
		Deep Degreser	White pad
FELT TIP PEN	Degreasing detergent	PS87 PRO	Damp cloth
		Coloured Stain Remover	Direct application
BLOOD	Degreasing detergent	PS87 PRO	Damp cloth
		Coloured Stain Remover	Direct application
RUBBER	Degreasing detergent	PS87 PRO	Damp anti-scratch Scotch Brite
		Solvent Stripper	White pad

TYPE OF DIRT		DETERGENT/SOLVENT	APPLICATION
		FILA	FILA
		FABER	FABER
SUCTION CUPS	Degreasing detergent	PS87 PRO	Melamine Sponge
		Epoxy Cleaner	Melamine Sponge
RUST	Detergent for rust removal	NORUST	Damp anti-scratch Scotch Brite
		Cement Remover	White pad
SILICONE	Detergent for silicone removal	ZEROSIL	Damp anti-scratch Scotch Brite
		Epoxy Cleaner	White pad
WAXES AND RESINS	Solvent	SOLV o ZEROSIL	Damp anti-scratch Scotch Brite
		Wax Remover	White pad
ALUMINUM MARKS	Descaling detergent	DETERDEK PRO	Damp anti-scratch Scotch Brite
		Tile Cleaner	White pad
PENCIL MARKS	Descaling detergent	DETERDEK PRO	Damp anti-scratch Scotch Brite
		Tile Cleaner	White pad
LIMESCALE	Descaling detergent	DETERDEK PRO	Damp anti-scratch Scotch Brite
		Cement Remover	White pad

2.1 Application

DAMP CLOTH - WHITE PAD

Apply the detergent to the stain and let it act for the time indicated by the detergent’s manufacturer. Rinse carefully and dry with a cloth.

DAMP ANTI-SCRATCH SCOTCH-BRITE

Apply the detergent to the stain and let it act for the time indicated by the detergent’s manufacturer. Use a white, damp scratch-resistant Scotch-Brite sponge and scrub the area to be cleaned with a circular movement. Rinse thoroughly with clean water and dry with a cloth.

3 PRECAUTIONS

Atlas Plan is not responsible in any way for the improper use of the material, which is why it recommends to:

- Prevent collisions with the most exposed points like corners and edges, both with and without a miter.
- Avoid using metal or abrasive pads.
- Do not use knives with a ceramic blade because the hardness of the two materials is very similar.
- For dark colors and/or Polished and Satin surfaces use wood or plastic cutting boards for cutting food.
- Precautionary protect the surface from the direct contact with hot objects (such as frying pans, pots, coffeepots, etc.) by using trivets.

Note: to repair scratched surfaces, in different finishes, contact Atlas Plan referent.

It is understood that Atlas Plan cannot be held responsible for events, damage or defects due to negligent cleaning and maintenance.

This technical manual was drawn up by Atlas Plan technicians based on laboratory testing, therefore it may be updated as new technologies are developed.

The sole purpose of this manual is to inform slab installers of the state of the art in cutting and handling techniques.

Atlas Plan is not in any way responsible for any breakage occurring while working with the material nor is it responsible for visible defects in materials that have been cut or installed.

With regard to optimal working parameters, always refer to the technical sheets of the tool/machine manufacturers. In any case, Atlas Plan can provide the technical sheets of the tools of the technical partners that collaborated in the development of this technical manual.



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