

Antolini[®]
I T A L Y

Antolini | Tech[®]

GENERAL TECHNICAL GUIDELINES

Release C



TECHNICAL MANUAL FOR ANTOLINI TECH COLLECTION PRODUCTS

The Antolini Tech Collection Slabs in porcelain stoneware are a product obtained by compacting materials such as clays, feldspars, kaolin and quartz sands, baked in ovens at temperatures above 1,200° C.

With a size of 1,600x3,200 and 12 mm thick, the Antolini Tech Slab is suitable for the most varied applications such as kitchen tops, bathroom vanity tops, table tops and furnishing in general; façade cladding, floorings, etc...

TECHNICAL FEATURES

100% NATURAL

FROST RESISTANT

HYGIENIC

100% RECYCLABLE

SCRATCHPROOF

RESISTANT TO HIGH TEMPERATURES

EASY TO CLEAN

NON-POROUS

UV RESISTANT

- Hygienic surface suitable for food contact
- Easy to clean and maintain
- Frost and high temperatures resistant
- Thermal shocks resistant
- Mold- and mildew-resistant
- Stains and acids- resistant
- UV resistant
- Resistant to bending and shocks
- Highly resistant to scratches and abrasion

1) GENERAL GUIDELINES

What stated herein is a technical opinion that must NOT imply any responsibility and / or indisputable standards; however, these guidelines are the result of Working Tests performed by fabricators who agreed to check the operations listed hereafter.

. Slabs Storage

Indoor storage is recommended. Although the slabs are durable, problems with the materials used for packing, such as wood, may arise. For this reason, we recommend storage at least in a shed area and away from heat sources.

Both trestles and rails can be used, always providing support stakes so that they can evenly support the slabs thus avoiding any flexure point that could compromise the integrity of the slabs. It is also advisable to prepare a support consisting of a first slab of a very low flexing material, such as a 3/4 cm thick granite slab supporting the whole surface of the Antolini Tech Slabs.

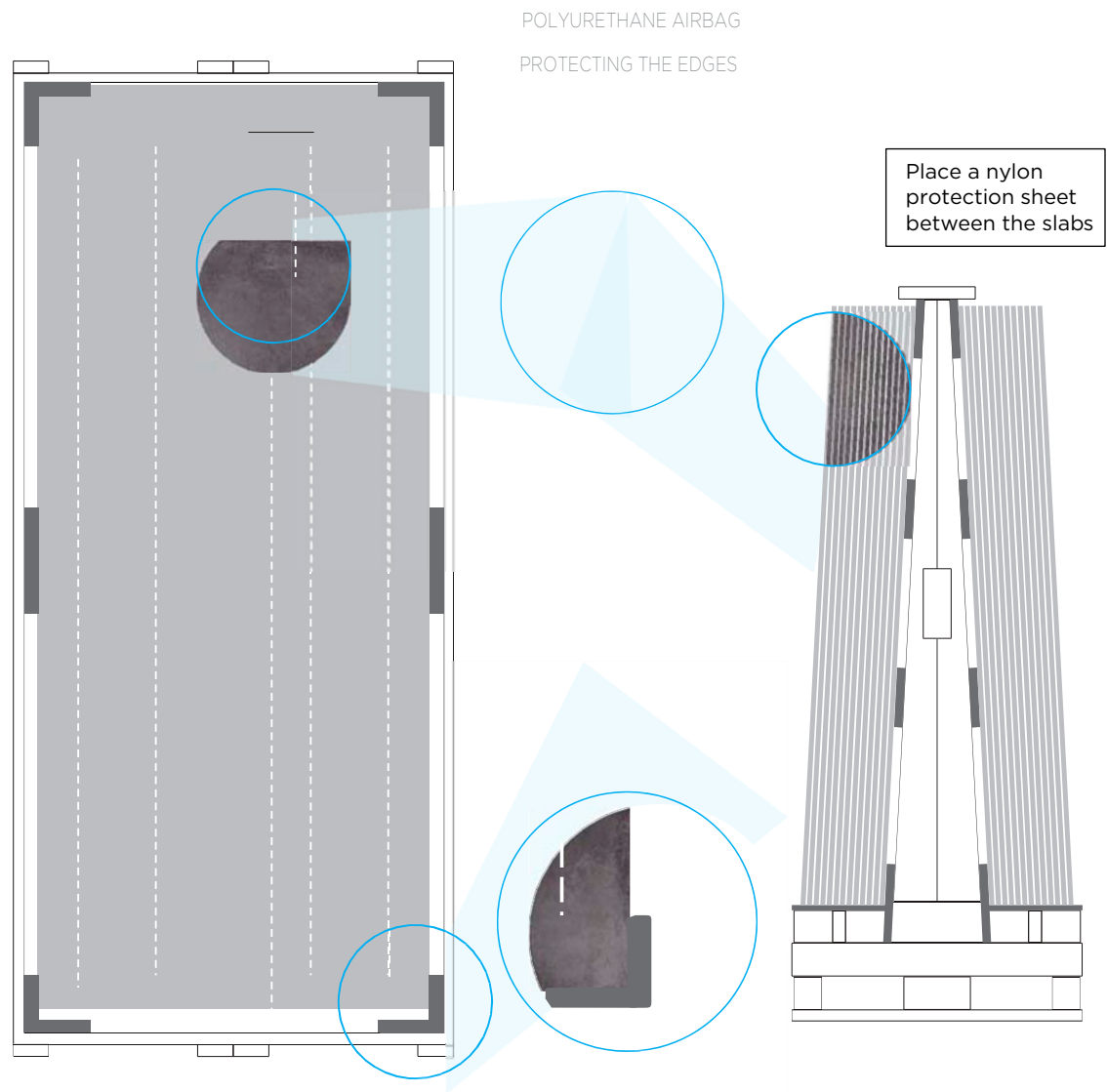
In case of storage with rails or metal trestles, the parts in contact with the material should be coated (with a wood or rubber protection) in order to prevent chipping of the material. Here are some examples of storage and bundle compositions:



Bundles Composition:



Wooden crates or trestles composition:

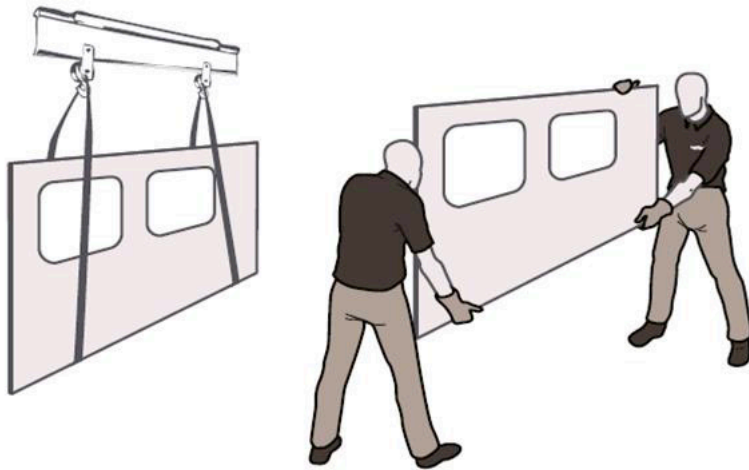


The crates (or the trestles) should be handled with forklifts from the long side with 2,5 m. forks. The slabs must be moved vertically and, in case of handling with cranes, slings must be made of hemp ropes (steel chains not recommended) in order to avoid breakage and/or chipping. In case of storage on metal trestles, these must be lined with wood or rubber.



. Handling

Always handle the slabs vertically, never horizontally.



For a proper vertical handling there are suitable tools on the market specifically meant for site or storage handling.

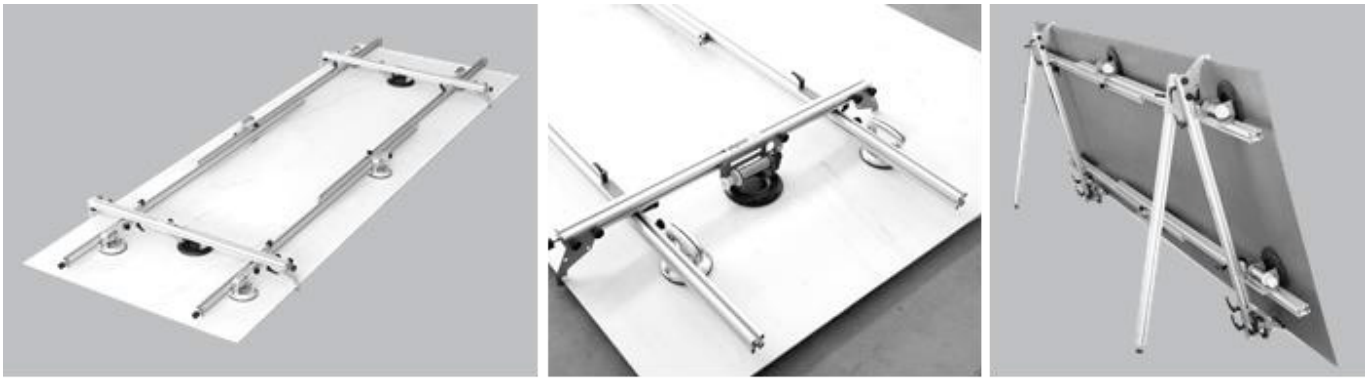
For a single slab handling, safety ropes with a special anti-cut covering as well as specifically certified grabs should be used.

In case of multiple slabs handling, safety certified spreader bars with canvas straps with anti-cut protection should be used. In some cases, it might be helpful to place spacers underneath and above the slabs, in order to avoid breakages due to the straps stress point.

For on-site handling, we recommend the use of frames equipped with suction cups sized groups allowing to work in complete safety.

The photographs show some examples.



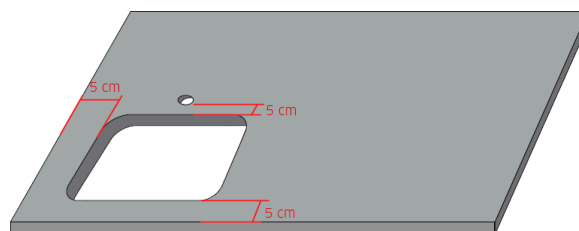


2) TECHNICAL HINTS FOR PROCESSING

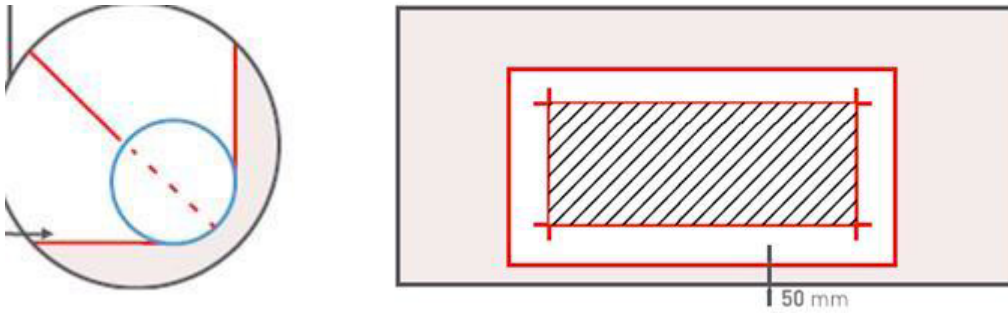
For processing Antolini Tech materials only special equipment for the processing of porcelain stoneware can be used; particularly, never use non-specific cutting disks. The use of cutting disks meant for natural stone cutting (i.e. non-continuous rim blades), for instance, may irreparably compromise the slab, by causing its uncontrolled breakage. Always contact the tools manufacturer in order to obtain the correct information about the proper tools to perform the work.

Preliminary checks

- For projects requiring several slabs, it is the customer's responsibility, when placing the purchase order, to request that all the slabs belong to the same production batch (information provided in the RFID label applied to each slab); if this is not possible, the graphics and colour tone matching between the available slabs should always be visually checked before carrying out any type of processing.
- Always make sure that the work surface is level and that there are no processing residues.
- For light colors, use a reduced cutting speed compared to the one used for natural stone processing, in order to avoid cracks and creases in the material. According to the kind of equipment used, the tools manufacturer for porcelain stoneware will provide all necessary technical instructions.
- The glass fiber mat (or net) applied to the rear part of the slab creates no problem during processing; yet, the slab should be carefully checked for any irregularities on the rear due to the application of the safety net cloth; in case of irregularities, these should be removed before processing the slab.
- The distance between the hole (for the sink or the cooker) and the edge should never be less than 5 cm; the same applies to the distance between the hole for the sink and for the tap.



Never cut holes with angles at 90 degrees.



3) GENERAL GUIDELINES FOR PROCESSING WITH AUTOMATIC MACHINES

WATERJET CUT

Water Jet	Min. pressure in bar	Forward movement in mm/min	Abrasive gr./min
Inlet hole	600	-	380 - 500
Cut	3500/3800	600/800	380 - 500

With a new 0,33 orifice and a new 1,02 mm focus, at peak performance, for a good cutting quality we recommend a forward movement between 700 and 800 per minute, with 400 gr. of Garnet abrasive grit and 3500/3600 BAR.

The quality of the abrasive used is fundamental.

TIPS: if possible, perform the inlet hole externally to the slab. Otherwise, perform the inlet hole a few inches away from the cutting edge and in any case never less than 9 mm. In the corners of closed holes paths, low pressure circular drilling and minimum radius (5 mm) are recommended.



BRIDGE SAW - CNC

Disk diameter mm	Spindle revolutions (rpm)
300	2300/2500
350	2000/2200
400	1700/1900

Cutting parameters

Slab cutting entrance from above

Straight cutting

Inclined cutting

Forward movement mm/min

100

1,000

800

It is essential to use special tools for the processing of porcelain stoneware and it is highly recommended not to use other types of tools.

For instance, with a disk for cutting 300 mm stoneware and a 2500 rpm we can get a forward movement up to 800 mm/min. Of course, each piece should be evaluated in itself, according to the colors and the geometric features of the artifact to be performed.

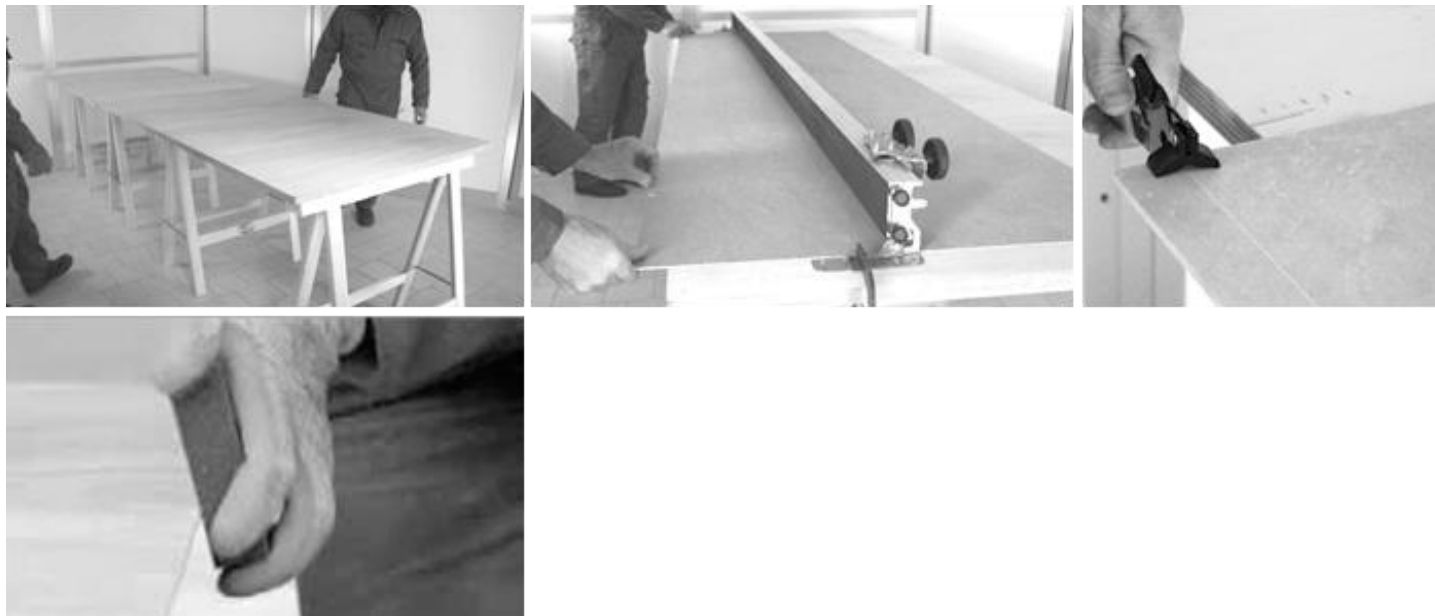
TIPS: during the cutting operation use plenty of water and direct the waterjet as close as possible to the cutting area; an insufficient water flow causes the disk to overheat, which compromises the operation as well as the disk itself.



It is also recommended to reduce the rotation speed when the tool enters and exits the slab.

4) GENERAL GUIDELINES FOR ON-SITE PROCESSING

For a good cutting and drilling performance, place the slab on a stable, flat and non-flexible surface (an aluminum profiled bench). For the cutting operation, use the aluminum guide with suction cups; the cut can be performed with a simple cutting cart. Once engraving has been carried out, move the slab outward and let it protrude about 10 cm; then, with the use of cutter pliers, begin to cut starting first from the two ends and following the engraving line.



For slab internal cuts it is recommended to draw some guidelines. In addition, in order to limit the occurrence of breakage, it is recommended to perform a hole of Ø 5 mm at the corners (with the use of a non-percussive drill). While drilling holes it is necessary to damp both the slab and the drilling bit. Follow the drawn guidelines with an angular grinder equipped with a diamond disk and then finish the edges with a diamond pad. In case of 45° cuts, traction devices are available.



5) GENERAL GUIDELINES FOR LAYING

The best technical and aesthetic result can be achieved only with a proper laying methodology. The substrate must be stable and properly seasoned, free of cracking, planar (with a 2 meter screed, maximum acceptable deviation 1mm), mechanically resistant and clean. To lay the material, both for flooring and for wall cladding, glue the slabs using porcelain stoneware adhesives of C2 TE S1 or S2 type.

Traditional cement screed: thickness must be at least 4 cm in case of desolidarized screed and the composition of the dough must be assessed according to the required mechanical strength performance. The screed should be planar and any possible cracks must be sealed monolithically with an epoxy resin. The screeds must be properly seasoned and the waiting time required before laying is approximately 7-10 days per centimeter of thickness.

Screeds for radiant floor systems: it is necessary to comply with the instructions given by the plant manufacturer, and it is also essential to switch on and test the system ignition before laying, according to UNI EN 1264-4. Waiting times depend on the type of material used for the screed. The adhesive to be used on the screed must be of improved adhesion (C2) and highly deformable type (S2) according to standard 12004.

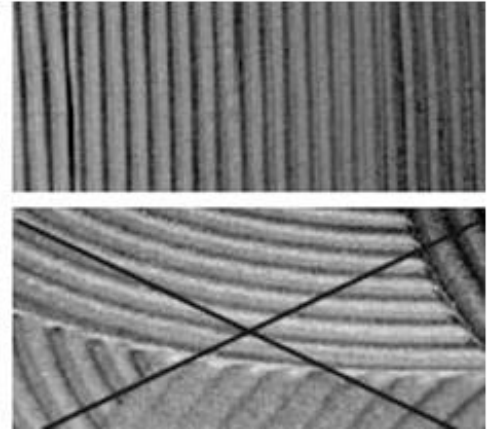
Concrete: it must have reached an adequate maturity (at least 3 months of seasoning); in addition, to ensure the cladding durability, the retaining walls must be properly insulated in order to prevent damp rising problems. The concrete on the wall must be free from treatments (anti-evaporation compounds, old paintings, etc.) which may affect its adhesion capacity.

Special binders based screeds or pre-mixed mortars: waiting times before laying can be greatly reduced by using special binders or pre-mixed mortars with standard and quick setting or quick setting and drying.

Existing floors: to lay a new floor over a ceramic, tiles or natural stone pre-existing floor, these must be well anchored to the substrate, free of cracks and thoroughly clean from oils, waxes and grease. Otherwise, some “useful” products and tools recommended by the glue manufacturers shall have to be used.

Laying tiles with joints of at least 2/3 mm. (about 5mm for exterior flooring), as provided by the different laying standards, is of paramount importance, as well as using expansion joints every 25 sq. m.. A flooring surface with joints permits to withstand the differentiated movements between the substrate and the coating, due to structure settlements, thermal expansion, etc. thus avoiding dangerous tensions and consequent detachments or breakages of the slabs.

When laying, a double spreading technique must be used, i.e. the adhesive must be applied both on the slab and on the substrate. Apply the adhesive on the rear of the slab with a 3 mm toothed spatula; for the substrate, instead, use a 15 mm. round toothed or 10 mm. spatula with inclined teeth. Lay the adhesive in parallel, always in the same direction, without crossing movements, in order to avoid empty spaces. In addition, to complete the laying operations, use also the devices to join the slabs as well as the leveling wedges.



TAPPING AND TILTING

Air gaps and bubbles beneath the tile may pose a danger. To improve adhesion of the glue and facilitate the leakage of the air, use an anti-rebound plastic trowel (no rubber hammer). Perform tapping starting from the center toward the outer sides, following the channels created while laying the adhesive.



TILE LEVELING SYSTEMS

For a better floor leveling, we recommend using the leveling systems that replace the common spacer crosses. These spacers are made up of bases and leveling systems which, regardless of the type, help maintain the alignment of the slabs.



Use the special frame with suction cups to position the slab upon the adhesive bed and tap the slab with the special rubber-coated anti-rebound trowel starting from the center toward the outer sides, in order to ensure complete adhesion and the air outlet. Joints can be grouted after about 2/3 hours in case of fast setting adhesives or after about 24 hours in case of standard setting adhesives.



After the installation it is recommended to clean the slabs with acid-based detergents for cement-based plaster or with special detergents possibly suggested by the manufacturer in case of epoxy or polyurethane products.

For the installation of kitchen countertops, sinks, etc..., glue the slabs with polyurethane or epoxy adhesives, grout the joints with suitable adhesives and polish manually.

Both for flooring and wall cladding installations, the laying substrate must have the features indicated below. The warranty and control of the following features shall be the responsibility of the designer and of the installer performing the work.

6) PROCESSING LARGE SLABS WITH 6.5 MM THICKNESS

Information for handling, transport, cleaning, maintenance and storage are the same for all thicknesses (6 mm, 12 mm and 20 mm).

Size 320mm x 160mm – 6.5 thick – 15.6 kg/sq.m weight – 80kg/slab

INTRODUCTION

Antolini Tech slabs can be cut with a “traditional” cutting machine (eg. KERA CUT SIGMA) or with machines for cutting stone, marble and agglomerates, using tools suitable for porcelain stoneware processing.

INSPECTION PRIOR TO PROCESSING

- For projects requiring several slabs, it is the customer’s responsibility, when placing the purchase order, to request that all the slabs belong to the same production batch (information provided in the RFID label applied to each slab); if this is not possible, the graphics and colour tone matching between the available slabs should always be visually checked before carrying out any type of processing.
- Always inspect the surface of the slabs to be cut in good lighting conditions. Do not process slabs with any type of surface defect (such as chipping or scratches due to handling) that cannot be eliminated in the cutting layout. Slabs cannot be replaced after cutting or fabrication.
- check the maintenance status of the machine, in particular:
 - The work surface must be solid, resistant, clean
 - The work surface must be perfectly level
 - There must be no surface irregularities or debris from previous works on the surface
 - The tool used must be suitable for working with porcelain stoneware
 - The tool must be in good condition, and if necessary, it must be “re-sharpened”

The operational processing parameters are those reported by manufacturers of machinery and tools, after performing machining tests as well as tests on the material.

These parameters are to be considered purely as an indication and must be verified and adapted by the fabricator based on the machines used, their experience, and the finish to be obtained.

It is therefore recommended to carry out preliminary tests on the samples before performing cuts and processing operations, in order to test and correctly use the machine and tool available.

If the cutting finish is not satisfactory, the reasons may be attributable to the incorrect cutting feed rate, the execution pressure, the rotation speed of the tool, the non-perfect flat surface of the base, the movements or vibrations suffered by the slab during the cutting operations, or the wrong choice of the tool used.

IMPORTANT

At the end of the process, we recommend cleaning the slab with plenty of water and, if necessary, a neutral detergent, in order to eliminate any processing residues.

After completing the cleaning operations, it is essential to pay particular attention to the

handling of the processed products, especially if there are openings or internal holes. Use vacuum lifters only if equipped with a sufficient number of suction cups, in order to avoid bending of the processed surface. Alternatively, manually handle the piece vertically, taking care to avoid twisting.

CUTTING LAYOUT

The slab is “Full Size” and the external edges of the product are not squared (not trimmed). The slabs do not require perimeter squaring (trimming), but it is advisable, before starting the work, to square (to trim) two sides, in order to obtain two perfectly orthogonal sides and to be able to start fabricating the object from this area.

We suggest to approach the cutting of the slab, at a lower speed than the standard speed, and to continue the cutting throughout the surface of the slab.

DISC CUTTING (bridge saw)

In case of cutting operations performed with disc machines, discs for porcelain stoneware must be used.

The flow of the cooling water must be oriented in the same direction as the disc rotation. The cut is made by erosion with a width proportional to the width of the disc.

Here are some general cutting tips:

- The smaller the disc diameter, the higher the spindle rotation speed.
- The lower the feed rate, the higher the quality of the cut.
- A slower feed rate allows finishing the edge with a reduced chamfer.
- The infeed and outfeed cutting rate must always be reduced by 50% compared to the standard cutting rate.
- Properly orient the water flow and assess the correct feeding rate while cutting.
- The fabrication is successful if the vibrations resulting from the cutting operations are reduced to a minimum. In order to limit these vibrations, it is recommended to place a disposable wood- or rubber-based panel (a vulcanized panel, for instance) under the slab.

Disc Diameter RPM		Feed Rate MM/MIN		Infeed/Outfeed
Straight cut	300	1800/1900	1000/1500	50%
	400	1600/1800	1000/1500	50%
	500	1300/1400	1000/1500	50%

NUMERICALLY CONTROLLED PROCESSES

Slabs can also be cut with numerical control machines. The most complex CNCs can rotate and tilt the head, making it possible to create a wide range of shapes. This machine is mostly used to perform inserts for hobs and sinks, holes, edges, curved cuts.

The tool used must be diamond-coated and suitable for working with porcelain stoneware. The tool selection depends on the specific work to be performed. Do not make any cuts or holes with the tool oscillation. During processing, it is important to use a very abundant water flow, correctly oriented both inside and outside the tool.

<i>cutting parameters</i> RPM	Feed Rate MM/MIN	Note
HOLE 2200	40	Slow down the feed rate to 10 mm/min at 1-2 mm from the bottom without water
CUTTER 1200	1000	
CHAMFERING 5500	2500	
EDGE FINISH 3400	2500	

Before starting processing, check the correct grip of the suction cups on the back of the slab. If the result is unsatisfactory, then use softer and thicker suction cups. If the slab is not perfectly fastened it may move, consequently making the piece unusable.

The correct positioning of the suction cups supporting the slab is fundamental for a successful cutting. For this reason, place the suction cups evenly in order to support the slab near the cut and below the part to be removed after cutting.

As cutting progresses, it is important to avoid any bending between the part to be removed and the machined part as this could cause cracking and / or breakage.

As an alternative to the suction cups, special clamps can be used: in this case, pls. note that the part on which the clamp is positioned cannot be processed.

WATER JET PROCESSING

The slabs can be cut with water-jet machines: this method is used for any cutting, shaping and drilling operations requiring a high degree of precision.

Check that the metal support grid is in good conditions and level, and that the piece is appropriately fastened in order to prevent any movement, which could compromise the quality of the cut.

During cutting, a disposable support (of material such as wood or polystyrene) should be used. It should be placed under the porcelain slab, preventing any damage caused by water that, by hitting the grid, could also hit the back of the slab and damage it.

If the machine allows it, it is also possible to make 45 ° cuts. By adjusting the processing parameters, straighter or more rounded edges can be obtained.

For the inserts to be cut inside the slab, it is advisable to start the cut inside an existing hole and then approach the cutting perimeter. Maintain a minimum recommended radius of 5 mm for internal corners.

When possible according to the project dimensions, perform the central cut in order to split the slab.

Always start cutting from the middle of the long side of the cut (Sink).

Maintain the water level for approx. 1.5 cm below the level of the grid.

Waterjet parameters (indicative):

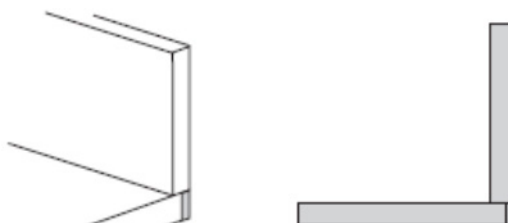
PRESSURE (MPA)	FEED SPEED (MM/MIN)	CUTTING ABRASIVE	INITIAL DRILLING PRESSURE 4S (MPA)	DRILLING ABRASIVE
420	1600/1800	Mesh 80 (500 g/Min.)	80	Mesh 80 (100 g/Min.)

EDGE BONDING

Two-component adhesives, generally epoxy or equivalent, are used to bond the edges of the slabs or their portions. For an optimal finish, we recommend the use of colored adhesives in shades as close as possible to those of the base or of the surface finish of the slab to be processed. Pre-colored adhesives or adhesives to be added with special dyes are available on the market. Bond the edges and observe the hardening times of the selected adhesive as prescribed in the manufacturer's data sheet.

Ex.: BACKSPLASH

Due to the imperfections of the wall and the structural movement of the perimeter wall, we recommend leaving a 3 mm gap between the worktop and the wall. This gap must first be filled with silicone and then the backsplash can be installed, covering the gap. The backsplash must first adhere to the wall with silicone and then be sealed to the surface with silicone.



OUTDOOR INSTALLATIONS

- When installing slabs outdoors, special attention should be paid to the supporting and the adhesive materials.
- Plywood underlays are not recommended for outdoor use; for these installations, high density foam panels should be preferred.
- The adhesive used to bond the surface must be assessed in relation to the installation environment; for example, silicone is not recommended for low temperatures - use for example a flexible polyurethane construction adhesive, which is suitable for low temperatures.

EVERYDAY CLEANING AND MAINTENANCE

Antolini Tech surfaces require very little maintenance. Routine cleaning with a sponge and soapy water is usually all that is needed.

We recommend cutting food on cutting boards rather than directly on the Antolini Tech slab.

Do not use abrasive sponges on polished finishes.

7) PROCESSING LARGE SLABS [20MM WIDTH]

Instruction for handling, transport, cleaning, maintenance and storage remain the same for all thicknesses (6 mm, 12 mm and 20 mm).

Size 320mm x 160mm – 20mm thick – 48 kg/sq.m weight – 245 kg/slab

The 2 cm slab does not need any **net grid** on the back (being it self-supporting), except for except for some **special request of the application**.

PROCESSING

For projects requiring several slabs, it is the customer's responsibility, when placing the purchase order, to request that all the slabs belong to the same production batch (information provided in the RFID label applied to each slab); if this is not possible, the graphics and colour tone matching between the available slabs should always be visually checked before carrying out any type of processing.

Before starting any processing operation, the slab must be cleaned and visually inspected, in order to check that it meets the quality requirements.

No claim concerning processed or installed slabs shall be accepted, when no defects had been detected on delivery. Before processing, it is recommended to perform a test on a sample plate, in order to set the optimal processing parameters and check the suitability of the tool.

The slabs are supplied FULLSIZE, not rectified (not trimmed).

Before starting the fabrication, **square the around** the perimeter of the slab (+/- 2 cm)

Usable size is 1600 x 3200mm. The slab can be processed using machines suitable for stone materials, equipped with tools (blades) in good conditions suitable for cutting porcelain. When using a diamond blade, carefully reduce the speed by 50%, both at the beginning and at the end of the cutting process.

The workbench must be clean, solid, resistant and perfectly **flat**.

In case of machining center processing, the CNC suction cups must be positioned under the entire slab, with particular attention to the areas next to the holes (sinks and hob hole); the machined slab must be handled with care, especially when there are openings

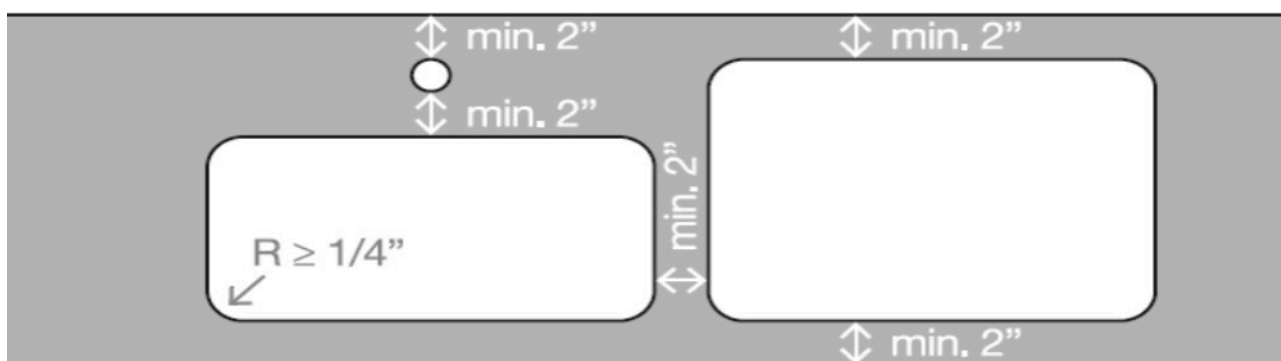
or internal holes.

The processed slab must be handled with care in order to prevent it from bending or twisting.

CUTTING LAYOUT

Maintain a minimum distance of 5 cm from the outer edge of the holes and between the tap and sink holes, the grooves as well as between the adjacent openings.

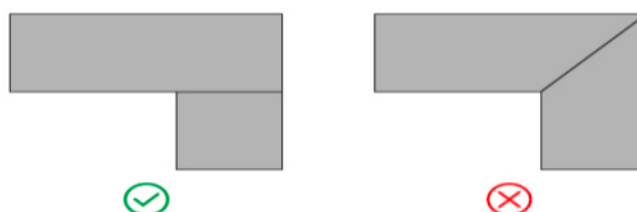
All cutting angles must have a minimum radius diameter of 5 mm.



HORIZONTAL SEAMING

L-shaped tops seaming should be performed through 2 units.

The intermediate seam must be filled with silicone or epoxy adhesive. Diagonal seams are not recommended. The minimum distance from the walls should be at least 3 mm. When fabricating an L-shaped product with a single unit, the internal angle must have a 5 mm radius.



Ex.: BACKSPLASH

For tops with no bottom panel support, the recommended overhang width should not exceed 20 cm. When installing tops with holes, overhang width shall be reduced to 10 cm. Any exceeding overhangs must be installed with a bottom additional support or fixed to a rear structure.

RECOMMENDED TECHNICAL INFORMATION

The given parameters have to be checked with the machinery and tool manufacturer and must always be verified by carrying out test operations before proceeding with the effective processing.

Cutting Parameters			
Bridge saw			
Feed rate	mt/min	0,6	
Rotation	RPM	2.400	1500/1800
Disc type		Tecnodiamant D350	Tirolit
Stress relief cut		yes	
Water Jet			
Feed rate	mt/min	0,5	
45° cut	mt/min	0,37	
Pressure	bar	3600/3800	
Sand	Kg/min	0,4	
MESH		80	
Stress relief cut		yes	

The infeed and outfeed cutting rate must always be reduced by 50%.

Another recommended option, when using a bridge saw, is to make several cutting passages at different depths, which guarantees a more precise cut and minimizes the risk of breakage.

CLEANING, MAINTENANCE AND CARE

Perform daily cleaning with lukewarm water and home detergent, if necessary; for more stubborn stains the following detergents are suggested:

Acid: acid detergents, descaling products, concrete removers i.e.. Viakal. **Alkaline:** basic detergent, ammonia, degreaser e.i. Chante Clair, Cif. **Solvent:** universal solvent, thinner, turpentine, alcohol.

Oxidizer: bleach, hydrogen peroxide.

After user, always rinse thoroughly with water.

KIND OF STAIN	DETERGENTS
Beer, wine, coffee	Sodium hypochlorite (bleach) solution or alkaline detergent
Ice cream	Diluted solution of sodium hypochlorite (bleach)
Tire rubber	Organic Solvent (Triethylene, thinner)
Grease and oils	Alkaline-based cleaner
Ink	Sodium hypochlorite (bleach) solution or alkaline detergent
Felt-tip pen (permanent marker)	Organic Solvent (nail polish remover, thinner)
Resins	Organic solvent organico (turpentine, thinner)
Aluminium/metal scratches	Acid detergent or cream/powder abrasive cleanser
Rust	Acid-based detergent
Fruit juices	Diluted solution of sodium hypochlorite (bleach)
Other stains	

Repair guide:

Repairing small chippings is possible. Skilled hands can restore small chippings with epoxy resins even if it is not easy to find the right tones and restore the original surface. Once the chipping is fixed, remove the excess resin with a cloth soaked with acetone [nail polish remover] before it hardens. Once hardened, work the resin manually to homogenize the surface.

COMPARATIVE TABLE OF FURNISHING MATERIAL PROPERTIES

	Antolini Tech Satin	Antolini Tech Lux	AGGLOQUARTZ	LAMINATES AND WOODS		STEEL
HYGIENIC	● ● ●	● ● ●	● ● ●	●		● ● ●
NON POROUS	● ● ●	● ● ●	● ● ●	●		● ● ●
SUITABLE FOR OUTDOOR INSTALLATIONS	● ● ●	● ● ●	●	●		● ●
HEAT AND HIGH TEMPERATURE RESISTANCE	● ● ●	● ● ●	● ●	●		● ● ●
MOULD AND MILDEW RESISTANCE	● ● ●	● ● ●	● ● ●	● ●		● ● ●
STAIN RESISTANCE	● ● ●	● ●	● ●	● ●		● ● ●
DETERGENT RESISTANCE	● ● ●	● ●	● ●	● ●		●
CHEMICAL RESISTANCE	● ● ●	● ●	● ●	●		● ●
THERMAL SHOCK RESISTANCE	● ● ●	● ●	● ●	●		● ● ●
FREEZE/THAW RESISTANCE	● ● ●	● ● ●	● ● ●	●		● ● ●
RESISTANCE TO HUMIDITY	● ● ●	● ● ●	● ● ●	●		● ● ●
UV RAYS RESISTANCE	● ● ●	● ●	● ●	●		● ● ●
RESISTANCE TO SCRATCHES AND ABRASIONS	● ● ●	● ●	● ●	●		●
EASY CLEANING AND MAINTENANCE	● ● ●	● ● ●	● ● ●	● ●		●

TECHNICAL SPECIFICATIONS

PORCELAIN STONEWARE				
CHARACTERISTICS	UNIT OF MEASURE	AVERAGE VALUE	PRESCRIBED VALUE	TEST METHOD
SIDES DIMENSION	%	COMPLIANT	+/- 0,6 MAX	UNI EN ISO 10545-2
SIDES STRAIGHTNESS	%	COMPLIANT	+/- 0,5 MAX	UNI EN ISO 10545-2
SIDES STRAIGHTNESS	%	COMPLIANT	+/- 0,6 MAX	UNI EN ISO 10545-2
PLANARITY [FLATNESS]	%	COMPLIANT	+/- 1 MAX	UNI EN ISO 10545-2
THICKNESS	%	COMPLIANT	+/- 0,5 MAX	UNI EN ISO 10545-2
WATER ABSORPTION	%	COMPLIANT	≤ 0,5	UNI EN ISO 10545-3
BREAKING RESISTANCE	N	COMPLIANT	≥ 700	UNI EN ISO 10545-4
BREAKING MODULE	N/mm2	COMPLIANT	≥ 28	UNI EN ISO 10545-4
LINEAR THERMAL EXPANSION COEFFICIENT	MK [- 1]	a7,00	DECLARED VALUE	UNI EN ISO 10545-8
THERMAL SHOCK RESISTANCE		RESISTANT	PASS. ACC. TO 10545-1	UNI EN ISO 10545-9
CHEMICAL RESISTANCE		COMPLIANT	MINGB	UNI EN ISO 10545-13
RESISTANCE TO ACIDS AND LOW CONCENTRATED BASES		ULA	METHOD AVAILABLE	UNI EN ISO 10545-13
FREEZE RESISTANCE		RESISTANT	PASS. ACC. TO 10545-1	UNI EN ISO 10545-12
STAIN RESISTANCE		COMPLIANT	MINIMUM CLASS	UNI EN ISO 10545-14
MOHS HARDNESS SCALE		5-8	≥ 5	[EN 101]





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