

GEOLUXE

DESIGN & FABRICATION MANUAL



CONTENTS

1. Introduction	01
2. Slab inspection	03
3. Material handling	05
4. Basis of design	08
5. Machining principles	11
6. Fabrication	13
6.1 Bridge saw	14
6.2 Waterjet	16
6.3 CNC machine	18
6.4 Sawjet machine	21
6.5 Instructions for handheld tools	23
7. Installation and handling of the processed slab	28
8. Care and maintenance	32
8.1 Guide for cleaning	33
8.2 Guide for repairing defects caused by chipping	35
9. Technical specifications	36
10. Disclaimer	38
11. Appendix	40



CHAPTER 1: INTRODUCTION

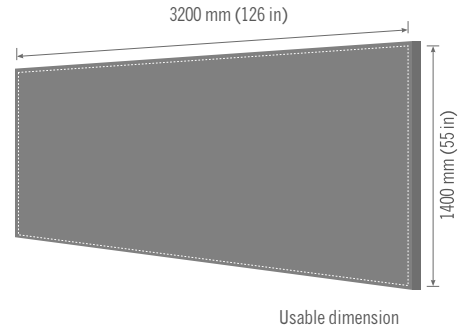
1 - INTRODUCTION

GEOLUXE® is a breakthrough Pyrolithic Stone, inspired by unparalleled nobility of natural marble with superior technical performance. It is made from mixture of mineral-based materials through the patented GeoMimicry™ forming technology, enabling realistic marble-like veins throughout slab body.

SURFACE

- Polished • Honed

To aid against accidental handling damage, slab sizes will be slightly larger than the “usable dimension” as illustrated in nominal dimension drawing. Please refer to “Usable dimension” table for the functional slab size.



USABLE DIMENSION

SIZE		THICKNESS <small>* Tolerance of thickness is ± 0.5%</small>		LENGTH		WIDTH	
mm	in	mm	in	mm	in	mm	in
1400 x 3200	55 x 126	20	¾	3200	126	1400	55

Note: **GEOLUXE®** is a surfacing product made from natural materials. It is important to remember that variations in the natural materials that make up **GEOLUXE®** are expected and are not considered defects. This includes variations in shade, shape, size and color within each design. Equally important is that these variations will have no impact on product performance.

Samples are very small select cuts from a slab. They do not represent all the attributes of a design and cannot be fully representative of any final installation. If there is any concern of difference between sample and slab, a full slab should be inspected to fully visualize a design.



CHAPTER 2: SLAB INSPECTION

2 - SLAB INSPECTION

GEOLUXE® is a surfacing product made from natural materials. It is important to remember that variations in the natural materials that make up **GEOLUXE®** are expected and are not considered defects. This includes variations in shade, shape, size and color within each design. Equally important is that these variations will have no impact on product performance.

We advise our customers to clean down and check slabs thoroughly before working. The visual inspection is recommended for:

- Blisters, cracks & fissures
- Warpage
- Tonality
- Any other anomaly that might be considered a defect

■ TONALITY

We recommend checking the tone uniformity, especially in case of slabs belonging to the different lots.

■ WARPAGE

To measure warpage accurately, the slab must be laid upon a perfectly horizontal and stable surface. Warpage is measured across the width and length of a slab using a straight edge aluminum bar and thickness gauges. Readings are taken midway between opposite sides of the slab.

TRANSVERSAL	LONGITUDINAL
width	length
± 2 mm (5/64 in)	± 2 mm (5/64 in)



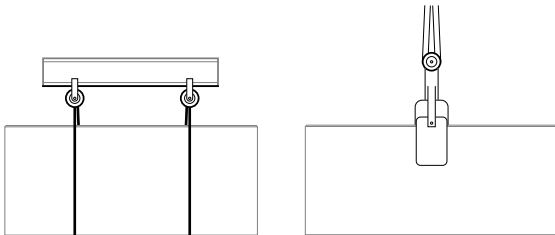
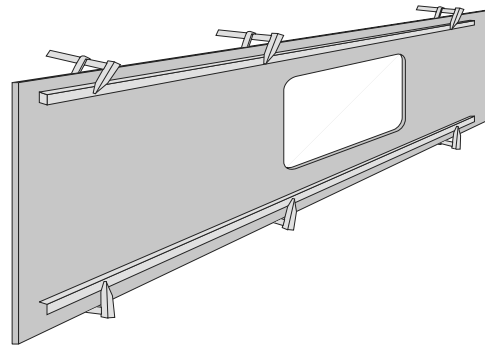
CHAPTER 3: MATERIAL HANDLING

3 - MATERIAL HANDLING



- Before handling any slab, please inspect the conditions of machine and equipment to ensure their workability and make sure that the total weight of slab does not exceed the weight limit of such machine and equipment.
- Clamps can be used for proper handling.
- The handling of multiple slabs at a time is prohibited for safety reason.
- It is highly recommended to cover the canvas slings with protective covers to prevent possible accidents or damages to slabs, given the hardness and sharpness of the material. Please consult the sling manufacturers for details of proper covers.

It is recommended to place wood or aluminum bars firmly secured with clamps along its length to prevent any undesirable breakage.



GEOLUXE® slabs must be handled, loaded, unloaded and transported by a forklift, gantry crane or professional lifting machine. In every case of handling and transportation, the slab should be balanced considering its center of gravity to prevent possible damages or slab breakages.

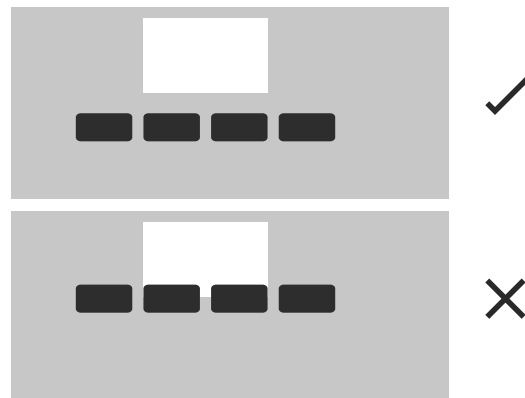
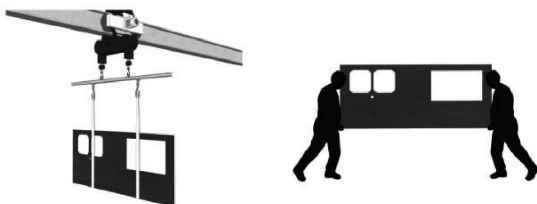
■ VACUUM LIFTING

Vacuum cups must be placed properly.



■ HANDLING THE PROCESSED SLAB

For processed workpiece, a worktop must be carried in a vertical position as shown in the diagram. If there are any openings in the worktop, they must always be kept towards the top.

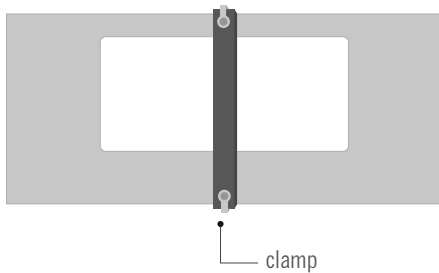


3 - MATERIAL HANDLING

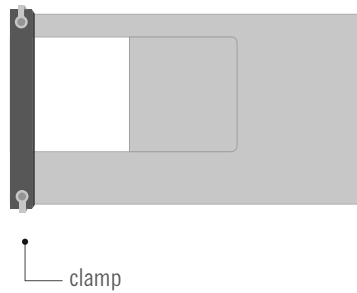
■ LARGE SIZE HOLES FOR SINK, GAS HOB OR INDUCTION HOB

If there is one or more large size holes or interrupted/open holes, it is recommended to clamp a strip of material in place. The clamp will be removed after the installation. This mitigates the potential breakage during handling and installation.

Case1: large-size hole

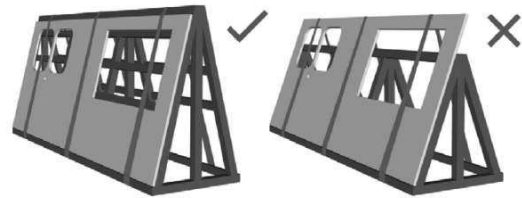


Case2 : interrupted sink hole

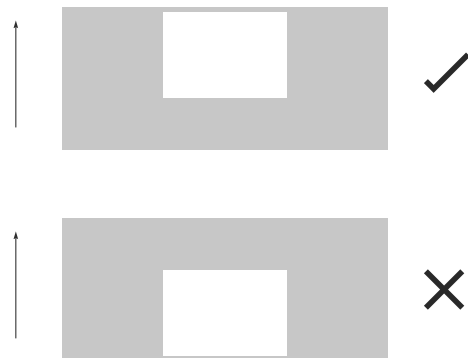


■ HANDLING OF THE PROCESSED SLAB

An A-frame, used to transport a **GEOLUXE®** workpiece, must allow the workpiece to be supported over its entire surface area. Supports that are excessively small with respect to the size of the workpiece can result in breakage of the part. The workpiece must not be bounded by excessively tight straps.



Note: Always place the processed slab in vertical position on a firm and solid A-frame with the thin side upward.



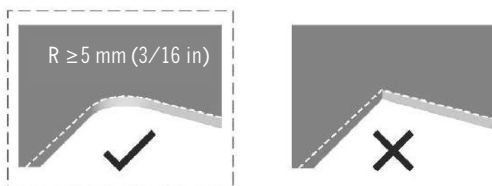


CHAPTER 4: BASIS OF DESIGN

4 - BASIS OF DESIGN

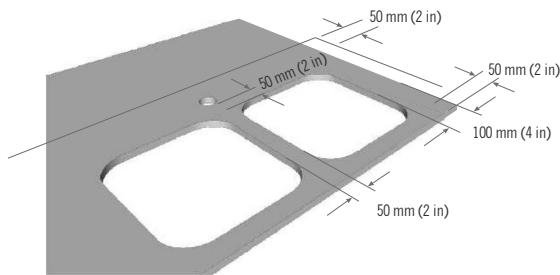
INTERNAL ANGLES AND SINK HOLE

All internal angles must have a minimum radius of 5 mm (3/16 in). A larger radius provides more structural strength to the workpiece.



MINIMUM DISTANCE BETWEEN GEOLUXE AND APPLIANCES

The minimum recommended distance between the cut-out, sink hole and the outer edge of the workpiece is 50 mm (2 in).



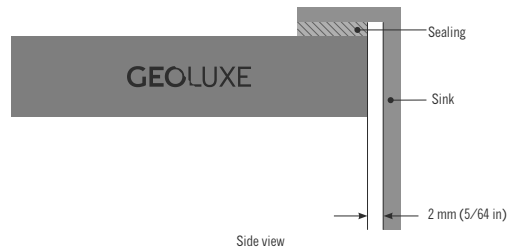
MINIMUM GAP BETWEEN GEOLUXE® WORKTOP AND APPLIANCES

The recommended minimum gap between the GEOLUXE® worktop and the appliances (sink, hob) is 2 mm (5/64 in).

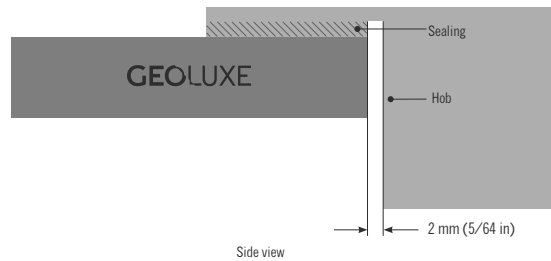


It is recommended to apply a sealant capable of compensating for the different thermal expansion, such as silicone or gaskets, between the GEOLUXE® worktop and the appliances.

Sink over worktop

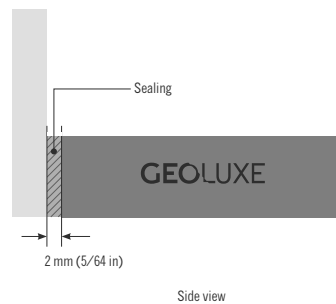


Induction hob over worktop



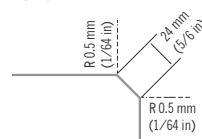
GAP BETWEEN GEOLUXE® WORKTOP AND WALL

The recommended gap between the GEOLUXE® worktop and the wall is approximately 2 mm (5/64 in).

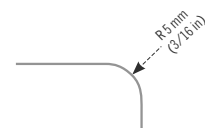


COUNTERTOP EDGE

GEOLUXE® is applicable for any edge profile option. Additionally, to reduce the edge chipping we highly recommend the following edge profiles.



- The edge is beveled minimum 2 mm (5/64 in).



- The edge is rounded between 5-15 mm (3/16-5/8 in) radius.

4 - BASIS OF DESIGN

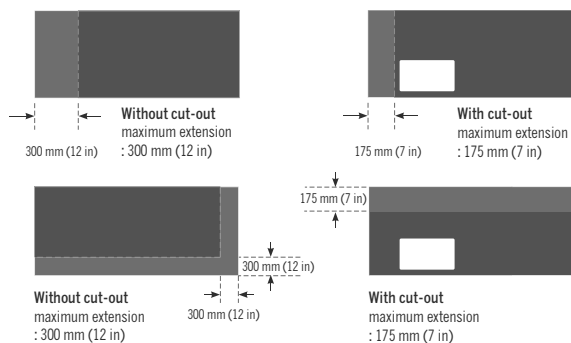
OVERHANG

Some countertops have an overhang extended from the face frame of the cabinet to create additional countertop space.

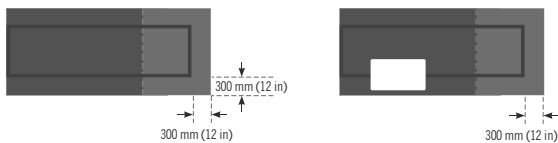
* The countertop must be reinforced on all edges and has front to back supports (G) every 600 mm (24 in).



• Unsupported overhang



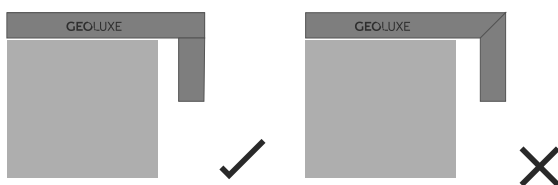
• Supported overhang



Note: The support structure must be strong and stable, not flexible or vibrable).

• Overhang edge band

Side view



* Mitering is not recommended due to lower strength.

INSTALL L-SHAPED COUNTERTOP

Check carefully the following items before processing the slab:

- Solid and firm structure of the cabinet
- Flatness of the structure of the cabinet
- Rectangularity and good level of the cabinet and the wall

Drawing 1 is highly recommended for the standard installation of the L-Shaped counter.

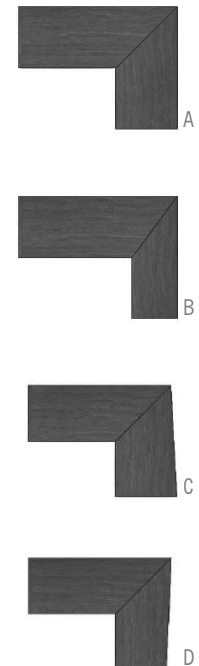
Drawing 2 the diagonal joint of two pieces is not recommended and should be avoided. Anyhow there might be few particular cases in which the diagonal joint is necessary.

- To match precisely the veins of two pieces.
- To join two pieces of different width.
- When the slab is installed against a non-perpendicular wall.
- To join the pieces with non-parallel sides (acute/obtuse angle)

Drawing 1



Drawing 2





CHAPTER 5: MACHINING PRINCIPLES

5 - MACHINING PRINCIPLES



To prevent against exposure to silica dust, in accordance with CCOHS, NIOSH and OHSA, safety goggles and approved particulate respirators (N99, R99, P99, R100, P100) must be worn at all times. Always cut and polish **GEOLUXE®** using wet process and take appropriate measures to provide sufficient ventilation in the work area.





CHAPTER 6: FABRICATION

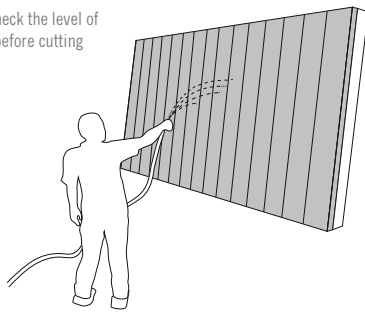
6 - FABRICATION

6.1 - BRIDGE SAW

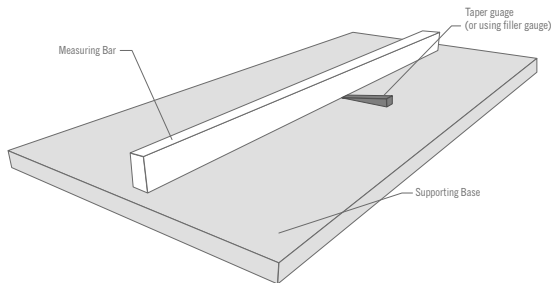
General suggestions:

Please inspect that the cutting table is flat, rigid, levelled and free of any debris and there is sufficient support for the entire slab.

- Always clean and check the level of the supporting base before cutting the slab.



The platform and supporting base must be uniformly levelled. The cutting line must be on a full supporting base (thus the blade won't cut over a previously consumed-cut line). In case of such consumed worktable, it is advisable to calibrate the level of the platform and the supporting base. The acceptable maximum gap between the supporting base and the measuring bar is not more than 2 mm (5/64 in).



- Use the appropriate type of blade for porcelain and make sure the blade is in good condition, ready for use.

- It is advisable not to use the blade for porcelain to cut other types of material to avoid the contamination that may affect the cutting performance of the blade.

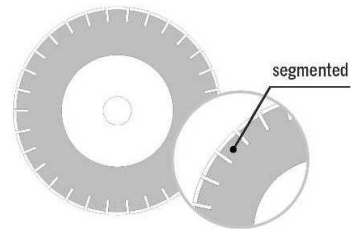
- It is always recommended to dress the blade properly to ensure its cutting power before starting any job.

- Use the maximum flow of water (minimum flow rate required is > 50 liters/min or 13.2 gallons/min) and it must be accurately directed to the contact point where the blade cuts as shown.



BLADE

We recommend the use of blades designed for porcelain, some of which were already tested and approved for use with GEOLUXE® slabs. (See appendix)



Picture refers to segmented blade for porcelain.

* It is very important to respect the standard parameters as recommended by the blade company of your choice.

SAW BLADE ROTATION PARAMETERS

RPM	BLADE DIAMETER				
	300 mm (12 in)	350 mm (14 in)	400 mm (16 in)	450 mm (18 in)	500 mm (20 in)
1200			300-400 mm/min (12-16 in/min)	300-400 mm/min (12-16 in/min)	500-800 mm/min (20-32 in/min)
1500			300-400 mm/min (12-16 in/min)	500-800 mm/min (20-32 in/min)	500-800 mm/min (20-32 in/min)
1800		300-400 mm/min (12-16 in/min)	500-800 mm/min (20-32 in/min)	500-800 mm/min (20-32 in/min)	500-800 mm/min (20-32 in/min)
2000		500-800 mm/min (20-32 in/min)	500-800 mm/min (20-32 in/min)	500-800 mm/min (20-32 in/min)	
2200	300-400 mm/min (12-16 in/min)	500-800 mm/min (20-32 in/min)	500-800 mm/min (20-32 in/min)		
2500	500-800 mm/min (20-32 in/min)	500-800 mm/min (20-32 in/min)			
2800	500-800 mm/min (20-32 in/min)				

Note:

- In case of machine with fixed speed and really low rpm, use a blade with bigger diameter. Please consult with your blade supplier to get the proper parameters.

- Blade with bigger diameter requires bigger size flange to avoid the deflection of blade.

6 - FABRICATION

CUTTING PARAMETERS

TYPE OF CUT	FEED RATE
Inclined cut	200-400 mm/min (8-16 in/min)
Sink cut	200-400 mm/min (8-16 in/min)

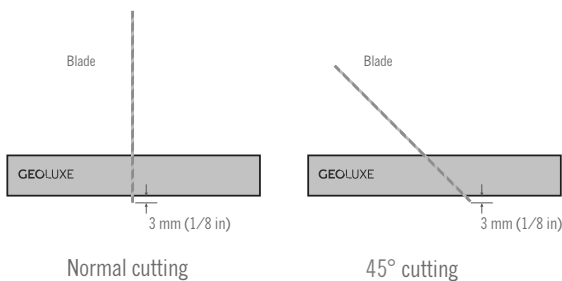


Any of the below-listed sign implies that the saw blade should be dressed with an abrasive material (brick, concrete block, abrasive stone).

1. Increase in the ampere
2. Louder noise during cutting
3. More noticeable chips
4. Rough rim of the segmented blade becomes smooth (no diamond exposure)

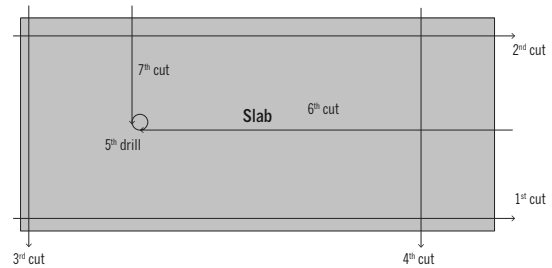
Note:

- For the very first trial without any experience in processing **GEOLUXE®** please start with low feed rate.
- Feed rate as shown here are indicative from **GEOLUXE®** internal test.
- Apply 50% of standard feed rate when entering and exiting the slab.
- Please respect the technical parameters recommended by your blade supplier.
- All parameters recommended in the above table are maximum and can be referred to as guidelines. They may vary depending on the conditions of machine, worktable, supporting base, blade, cooling water supply and etc. in a particular workshop.
- Portion of the blade penetrating into a slab with 45° cutting angle is higher than that with perpendicular cutting angle, and therefore the blade usually used for 45° cutting is easily dull. It needs to be redressed or sharpened once in a while.



CUTTING SEQUENCE

It is important to follow this sequence. Failing to do so will cause the slab to break.



- Avoid cutting across the middle of slab whose width ≥ 700 mm (28 in). When necessarily inevitable, cut with some area in spare.
- For large size holes, it is important to follow the sink cutting guideline.
- While it is recommended to use multiple slabs for L-shaped counters, if it is necessary to cut from a single slab, the minimum inside corner radius is 35 mm (1 3/8 in).

SINGLE CUT

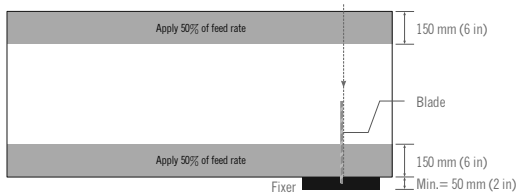
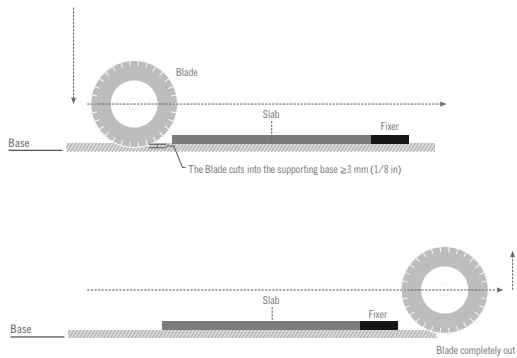
It is important to follow this sequence. Failing to do so will cause the slab to break.

- To fabricate the slab, it is recommended to proceed through the whole thickness of slab with a single cut. Step cut is prohibited.
- Cut lengthwise with reference to 3.2 m side (126 in) first and cut across afterwards.
- The blade should cut down into the supporting base at least 3 mm (1/8 in) to avoid the undesirable chipping of the lower edge.
- Start to cut from outside of the slab by slightly cutting the supporting base and proceed with the straight cut all the way through its length until the rear part of blade is completely out of the slab, then the blade can be lifted up.

6 - FABRICATION

■ BLADE EXIT

To avoid chipping, place a fixer (wood, stone or GEOLUXE®) at the blade exit with minimum width equal to 50 mm (2 in).



To avoid blade damage, do not cut through nails or metal fixers in wooden base.

■ 6.2 - WATERJET

■ WATER LEVEL IN WATER TANK

It is recommended to keep the water level lower than the bottom of slab = 20 mm (3/4 in), in other words 20 mm (3/4 in) from top line of the grate, to improve the quality of the finishing at the bottom.



■ WATERJET PARAMETERS

TYPE	PRESSURE		FEED RATE		ABRASIVE FEED RATE	
	MPa	psi	mm/min	in/min	kg/min	lbs/min
Piercing	69-104	10,000-15,000	-	-	0.40-0.45	0.9-1.0
Cutting	190-340	28,000-50,000	150-300	6-12	0.40-0.45	0.9-1.0

Suggestions:

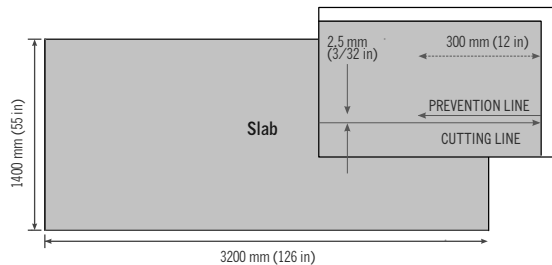
The above data refer to the maximum recommended values. To get a better finishing, reduce the feed rate. The worktable of the cutting machine must be in good condition, perfectly flat and with no processing waste. In case of angles equal to or smaller than 90°, it is recommended to join up the angle with radius ≥ 5 mm (3/16 in).

Note:

- Abrasive size should be 80-120 mesh (depends on machine supplier).
- In case of using low pressure, the feed rate must be operated slower according to the quality of the cutting line.

■ PREVENTION LINE

- It is highly advised to create a 300 mm (12 in) prevention line, about 2.5-7.5 mm (3/32- 19/64 in) from the real cut line on the exit side.
- In case that any unexpected crack may occur during the processing, it will follow the pre-cut prevention line without moving toward the usable area.



Pic: Detail of prevention line

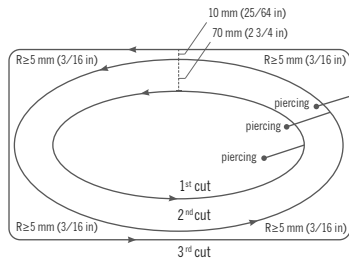


After each machining task, rinse the surface copiously with clean water before the workpiece has dried.

6 - FABRICATION

■ SINK CUT-OUT

- Start by drilling hole (piercing) at the starting point with low pressure then cut with high pressure.
- The outermost ring must be 10 mm (25/64 in) from the peripheral edge of the sink.
- The next ring toward the inner is 70 mm (2 3/4 in) from the outermost ring.
- To proceed with the cutting of the rings, always start from the inner rings toward the outer one.
- Always start and end the next cutting with reference to the previous ring to reduce the vibration.



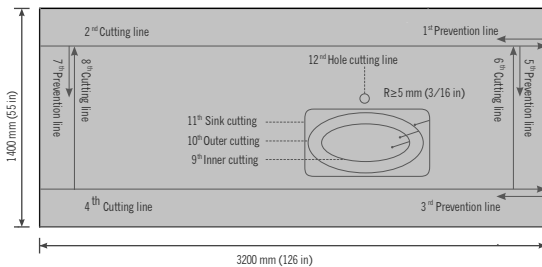
■ CUTTING SEQUENCE

I-shaped counter

- It is highly advised to create a 300 mm (12 in) prevention line, about 2.5 mm (3/32 in) from the real cut line on the exit side. In case that any unexpected crack may occur during the processing, it will follow the pre-cut prevention line without moving toward the usable area.
- Radius of corner must be ≥ 5 mm (3/16 in).

Cutting step:

- Cut to size no. 1-8
- Sink cut-out no. 9-11
- Faucet cut no. 12

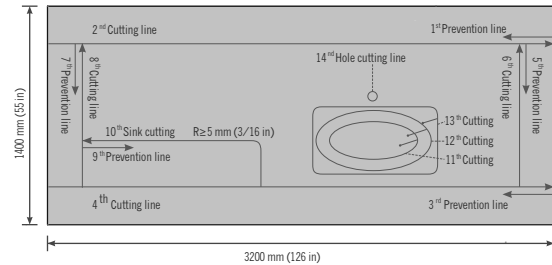


L-shaped counter

- It is highly advised to create a 300 mm (12 in) prevention line, about 2.5 mm (3/32 in) from the real cut line on the exit side. In case that any unexpected crack may occur during the processing, it will follow the pre-cut prevention line without moving toward the usable area.
- Radius of corner must be ≥ 5 mm (3/16 in).

Cutting step:

- Cut to size no. 1-10
- Sink cut-out no. 11-13
- Faucet cut no. 14

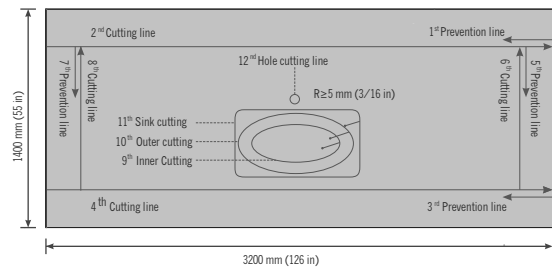


Apron Sink Counter

- It is highly advised to create a 300 mm (12 in) prevention line, about 2.5 mm (3/32 in) from the real cut line on the exit side. In case that any unexpected crack may occur during the processing, it will follow the pre-cut prevention line without moving toward the usable area.
- Radius of corner must be ≥ 5 mm (3/16 in).

Cutting step:

- Cut to size no. 1-10
- Sink cut-out no. 11-13
- Faucet cut no. 14



6 - FABRICATION

■ 6.3 - CNC MACHINE (MACHINING CENTERS)

For cutting or drilling **GEOLUXE®**, must use the tools designed for porcelain. During machining, use plenty of water directly surrounding the tool.

■ CNC CUTTING INSTRUCTION

Before starting a machining process, make sure the worktable is adequately configured to guarantee correct execution.

DO NOT - process the operation when the machine is not in good condition which may occur the vibration or the vacuum pump does not work properly.

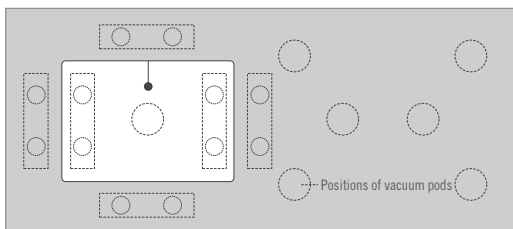
DO NOT - cut or drill when the vacuum pods is not sufficient or in good condition.

All work processes must be performed in compliance with the instructions in the Technical Manual, without using supports other than the vacuum pods and Teflon positioning end stops. The use of devices exerting mechanical action such as wedges, grippers and pistons could result in breakage of the workpiece.

Cutting face-up works well and avoids surface chipping. Faucet hole must be drilled face-up.

Use the following diagrams for the direction of outside corners and cut-out as well as the positioning of vacuum pods.

■ Positions of vacuum pods

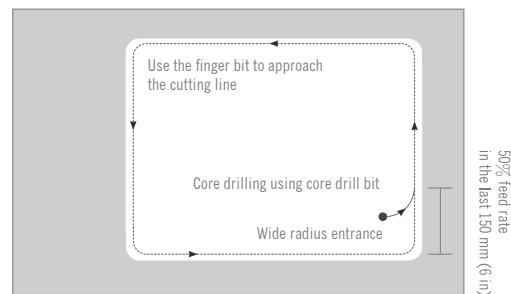


Vacuum pods must be used to hold and fix the slab during fabrication. Before start, check that all vacuum pods are turned on and the vacuum pressure must be in range (-0.6) - (-1.0) bar.



■ SINK CUT-OUT

Do not cut as contour process.



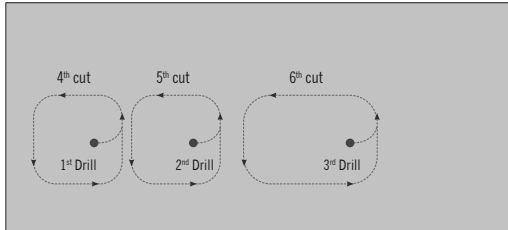
After each machining task, rinse the surface copiously with clean water before the workpiece has dried.

Note:

- Cut-out pieces must be held by vacuum pods to avoid breakage.
- Workpiece breakage is caused when the cutting weight is concentrated on a single point.

6 - FABRICATION

■ SEQUENCE FOR SINK CUT-OUT AND POWER SOCKET



STEP 1:

- Use core drill bit \varnothing 35 mm (1 3/8 in) to drill the hole.

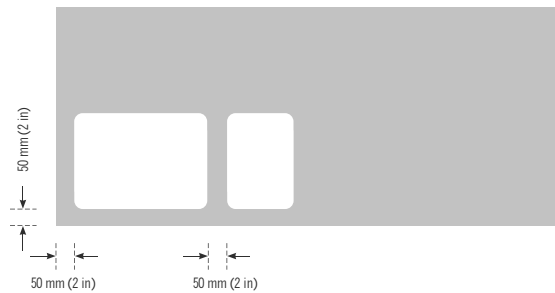
STEP 2:

- Use finger bit \varnothing 23 mm (29/32 in) to cut through all 20 mm (3/4 in) thickness at once.

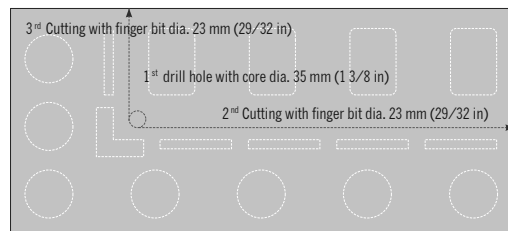
- Reduce the feed rate when working on radius point and the end point.



Narrow gap between cut-out, recommendation not less than 50 mm (2 in).



■ SEQUENCE FOR L-SHAPED COUNTER



STEP 1:

- Use core drill bit \varnothing 35 mm (1 3/8 inches) to make a hole at the corner of L-shaped point.

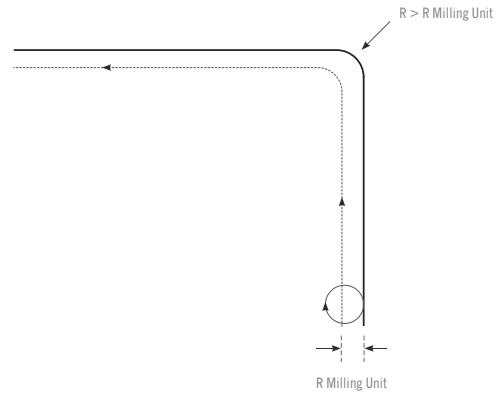
STEP 2:

- Use a finger bit with correct parameter to cut slab from inside to outside (long side).

- Use a finger bit with correct parameter to cut slab from inside to outside (short side).

■ INSTRUCTION FOR INSIDE CORNER

Each inside corner should have larger radius than that of the milling tool. This will reduce the force exerted by the tool on the part, as shown in the following diagram.



When using the milling tool, the tool shall be centered with respect to the thickness of the slab. Also the tool shall not be oscillated back and forth during the operation. The bottom of milling tool must be below slab thickness as shown below.



■ MACHINING ADVICE

Tools are more susceptible to be broken because:

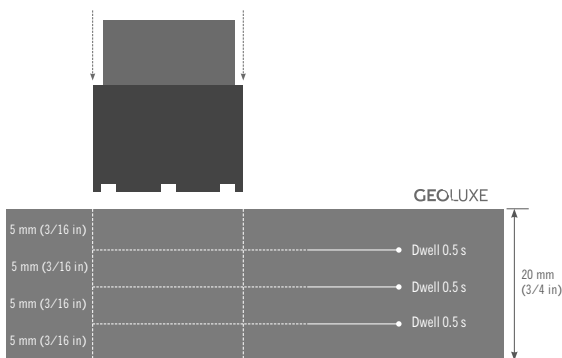
1. Insufficient use of cooling water
2. Feed rate is too high.
3. The number of rotation speed is significantly lower than the nominal rotation speed of the tool.

6 - FABRICATION

■ PARAMETER FOR CORE DRILL BIT

AVAILABLE DIAMETER		SPINDLE SPEED	FEED RATE	
mm	in		mm/min	in/min
35	1 3/8	3000	20	3/4

To avoid fractured openings on the back of the workpiece, we recommend 5 mm (3/16 in) step drilling with secured support on the rear surface until the bit cuts through the entire thickness.



■ PARAMETER FOR FINGER BIT (MILLING TOOL)

Each inside corner should have larger radius than that of the milling tool. This will reduce the force exerted by the tool on the part, as shown in the following diagram.

TOOL DIAMETERS Ø		SPINDLE SPEED	FEED RATE	
mm	in		mm/min	in/min
23	29/32	4500-6000	150-200	6-8

* Reduce feed rate when entering / exiting about 150 mm/min (6 in/min) down to 40 mm/min (1 1/2 in/min).

■ PARAMETER FOR PROFILING TOOLS (FULL BULLNOSE AND CHAMFERING)

For profiling **GEOLUXE®**, it is recommended to use polishing wheels for porcelain. Parameters data refer to tool measuring Ø 80 mm (3 5/32 in).

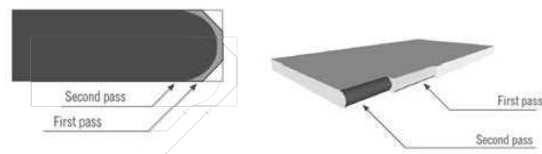
GRINDING WHEEL	TYPE	FEED RATE		SPINDLE SPEED
		mm/min	in/min	rpm
1	Metallic	1000	40	4500
2	Metallic	1000	40	4500
3	Metallic	1200	48	4500
4	Polishing	800	32	2400
5	Polishing	800	32	2400
6	Polishing	800	32	2400

* Reduce feed rate when entering / exiting about 150 mm/min (6 in/min) down to 40 mm/min (1 1/2 in/min).



During machining, use plenty of water directly on the outside and inside of the tool. After each task, rinse the surface copiously with clean water before the workpiece has dries.

For profiling shapes with major removal, divide removal by the first metal tool into 2 passes.



6 - FABRICATION

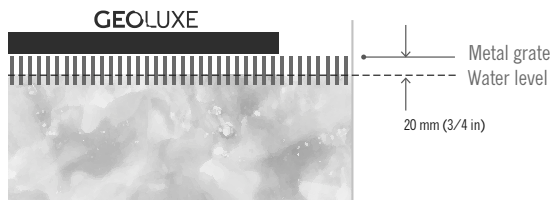
6.4 - SAWJET MACHINE

WATER LEVEL

We recommend to keep the water level 20 mm (3/4 inch) lower than the top line of the grate.

GRATE AND ITS SUPPORTING BASE

Grate must be in good condition and uniformly levelled. We recommend to lay cement backer boards with thickness at least 10 mm (25/64 in) over the whole area of cutting table as supporting base for cutting by saw blade.



Remarks:

Please check the condition of the supporting base as it always influences the final result. The full-cover backer board is highly advised in order to obtain its best cutting performance. Make sure to lay all backer boards one closest to another to cover the whole area and minimize the gaps between them.

In the situation where the supporting base has been used for a considerable period of time*, in other words quite consumed by cuts with lot of noticeable tiny wastes, we recommend to change a new supporting base for the full supporting function during processing. Failure to do so may cause the crack of the slab during processing.

Note:

*It is highly recommended to change the supporting base at least once a day. Frequency may vary depending on the number of jobs done and the actual condition of the supporting base on the date of operation.

BLADE

Must use the appropriate blades designed for cutting porcelain material, some of which were tested and approved for use with GEOLUXE® (Please refer to Appendix)

SAW BLADE PARAMETERS

RPM	BLADE DIAMETER				
	300 mm (12 in)	350 mm (14 in)	400 mm (16 in)	450 mm (18 in)	500 mm (20 in)
1200			300-400 mm/min (12-16 in/min)	300-400 mm/min (12-16 in/min)	500-800 mm/min (20-32 in/min)
1500			300-400 mm/min (12-16 in/min)	500-800 mm/min (20-32 in/min)	500-800 mm/min (20-32 in/min)
1800		300-400 mm/min (12-16 in/min)	500-800 mm/min (20-32 in/min)	500-800 mm/min (20-32 in/min)	500-800 mm/min (20-32 in/min)
2000		500-800 mm/min (20-32 in/min)	500-800 mm/min (20-32 in/min)	500-800 mm/min (20-32 in/min)	
2200	300-400 mm/min (12-16 in/min)	500-800 mm/min (20-32 in/min)	500-800 mm/min (20-32 in/min)		
2500	500-800 mm/min (20-32 in/min)	500-800 mm/min (20-32 in/min)			
2800	500-800 mm/min (20-32 in/min)				

Remarks:

- When working with a brand new blade, start to cut at lower feed rate for about 10 m (34 ft) then follow the feed rate as recommended by the blade company. Recommendations for a new blade may vary from one company to another. Kindly refer to your supplier's latest recommendations on its website for the instruction of use.

- All the above-listed parameters are indicative by GEOLUXE®'s internal tests only. It is advisable to consult with your blade supplier for its standard recommended parameters.



The following signs indicate that the blade is losing its cutting power and needs to be redressed by passing it through an abrasive material like brick, concrete block or dressing stone.

1. Increase of ampere
2. Louder noise during cutting
3. More noticeable chips
4. Rough rim of the segmented blade becomes smooth (no diamond exposure)

6 - FABRICATION

■ WATERJET PARAMETER

TYPE	PRESSURE		FEED RATE		ABRASIVE FEED RATE	
	MPa	psi	mm/min	in./min	kg/min	lbs./min
Piercing	69-104	10,000-15,000	-	-	0.40-0.45	0.9-1.0
Cutting	190-340	28,000-50,000	150-300	6-12	0.40-0.45	0.9-1.0

Remarks:

- Parameters in the table are the maximum recommended values.
- For better quality of the cut piece, try at lower feed rate.
- In case of 90° or <90°, we recommend a radius of minimum 5 mm (3/16 in).
- In case of low pressure jetting, work at lower feed rate, taking into account the final cutting quality.

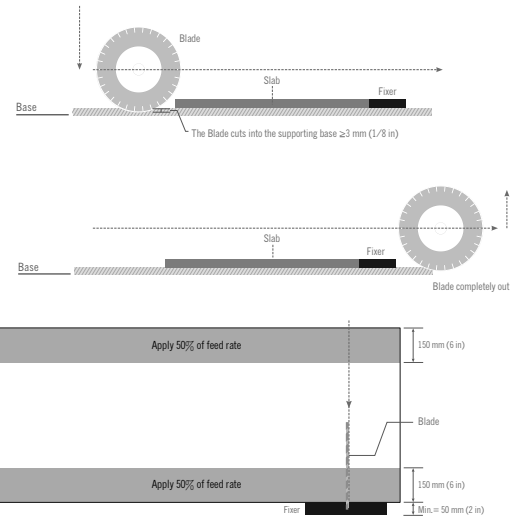
■ CUTTING METHOD

For the fabrication of **GEOLUXE®** by Sawjet machine, it is recommended to process the Cut-to-size by saw blade and manage the sink cut and faucet hole by waterjet cutting. The sequence shall be as listed below:

1. Cut-to-size
2. Sink/Stove cut
3. Faucet hole

■ CUT-TO-SIZE BY SAW BLADE

1. Cut through the whole thickness of slab by single cut
2. Cut lengthwise (refer to 3.2 m side) first and cut across afterwards.
3. The blade should go into the supporting base at least 3 mm (1/8 in) to avoid the problem of lower edge chipping.
4. Apply 50% of the standard recommended feed rate when entering and exiting the slab.
5. To prevent chipping problem caused by wobbling, we recommend to use a fixer made of wood/stone or **GEOLUXE®**, width ≥ 50 mm (2 in) at the blade's exit. Start the cut outside the slab on the supporting base before entering into the slab and run through its whole length (reduce the speed at blade's exit) until the blade is completely out of the slab then lift up the blade.



To avoid chipping, place a fixer (wood, stone or **GEOLUXE®**) at the blade exit.

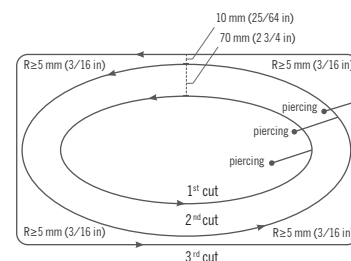
■ CHECK POINTS

- Use appropriate blade for porcelain in good condition + good level of flat table and supporting base.
- Follow the technical instructions and parameters (rpm/feed rate) as suggested by blade company.
- Make sure to have enough cooling water direct to cut point ≥ 50 liters per minute (13.2 gallons/min.).

■ SINK CUT AND FAUCET HOLE BY WATERJET

Firstly drill a hole by low pressure (piercing) at the starting point of each cut line. Then start to cut with high pressure.

For sink cut, it must start cutting the internal oval rings first in order to reduce weight and prevent the breakage of slab. The starting point of each ring must start inside the previous cut ring.



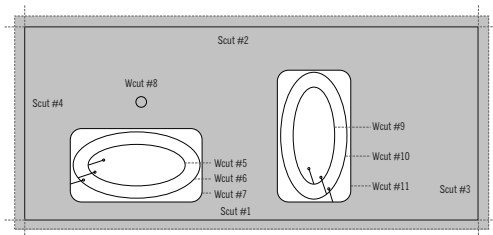
6 - FABRICATION

Note:

Since there are a lot of factors involved with the quality of waterjet cutting, for example machine condition itself, to cut the sink by waterjet we do recommend the following conditions.

- With a seam at the sink area.
- Without a seam, should make a sink cut-out by hand tools.

■ SEQUENCE FOR SINK CUTTING AND DRILLING



Note:

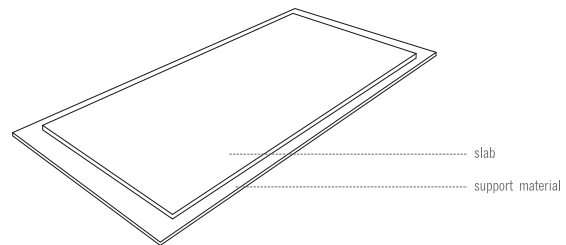
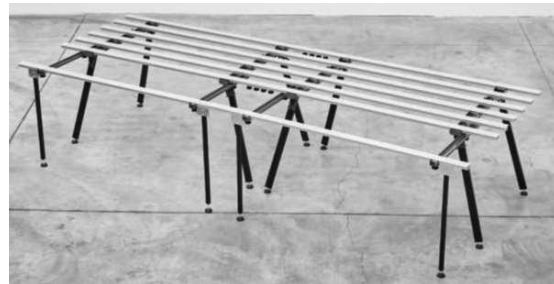
Scut: Cut by saw blade

Wcut: Cut by waterjet

1. Start with Cut-to-size by saw blade, cutting the two long sides of the slab first followed by the wide sides.
2. Drill a hole with low pressure (piercing) at the starting point of each Waterjet Cutting line.
3. Cut the innermost ring (Wcut#5) then the next one (Wcut#6) and the outer line (Wcut#7).
4. Cut the faucet hole (Wcut#8).
5. Cut the innermost ring (Wcut#9) then the next one (Wcut#10) and the outer line (Wcut#11).

■ 6.5 - INSTRUCTIONS FOR HANDHELD TOOLS MANUAL MACHINING

- Do not cut when the support is not strong enough.
- During any type of manual processing, the workpiece should be adequately supported by good-condition flat supporting base, preferably made of wood or backer board.



- Do not cut with a dry process. Always use high water flow rate for any type of machining process.

* For cutting and drilling **GEOLUXE®**, must use tools designed for porcelain.

6 - FABRICATION

■ DRILLING PARAMETER

CORE DRILL DIAMETER	RPM
30 mm (1 3/16 in)	3,000-5,000
32 mm (1 1/4 in)	
35 mm (1 3/8 in)	

■ CUTTING PARAMETER

CUTTING BLADE DIAMETER	RPM
100 mm (4 in)	8,000-12,000
115 mm (4 1/2 in)	
125 mm (5 in)	

■ EDGE POLISHING PARAMETER

GRIT NO.	RPM
50-100*	3,000-4,000
200-300*	
400-500*	
800-1,000*	
1,500-2,000*	
3,000	

Remark: * select one number in such range for use.



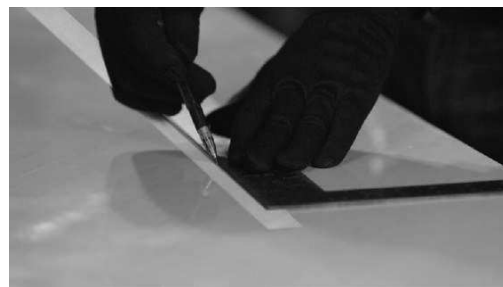
- Check the proper condition of all equipment and tools especially the electric ones and follow the guidelines of use according to suppliers' instruction manuals.

- To prevent against exposure to silica dust, in accordance with CCOHS, NIOSH and OSHA, safety goggles and approved particulate respirators (N99, R99, P99, R100, P100) must be worn at all times. Always cut and polish **GEOLUXE®** using wet process and take appropriate measures to provide sufficient ventilation in the working area.

■ STEPS FOR CUTTING GEOLUXE® SLAB

STEP 1:

- Indicate the dimension of the cut-out to be cut and mark the precise cutting line on masking tape (do not write directly on slab).



STEP 2:

- Use manual grinder with the proper cutting disc designed for cutting porcelain.



STEP 3:

- The cutting direction must follow the arrow indicated on the blade.

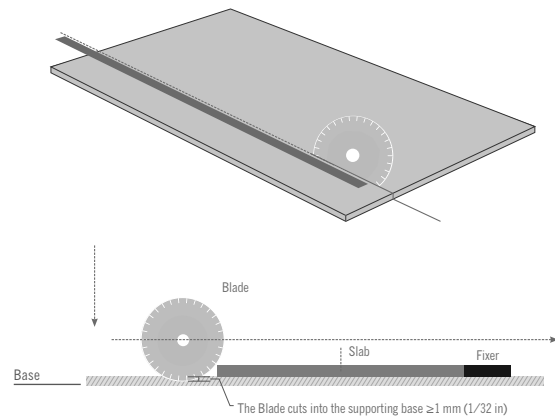
- To avoid any possible breakage during processing, the slab must be placed on a flat and levelled supporting base such as plywood and backer board.



6 - FABRICATION

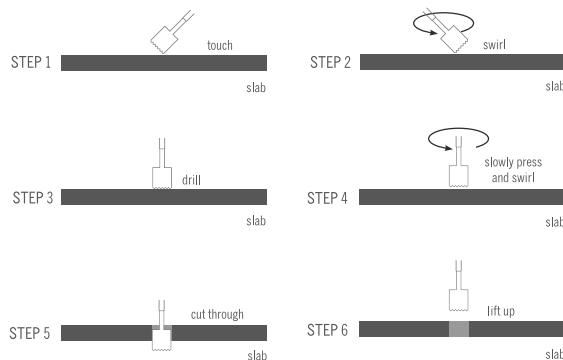
CUTTING METHOD

We recommend the single cut by cutting through the entire thickness at once. If the cut is a long line, use a guide for cutting to maintain its straightness.

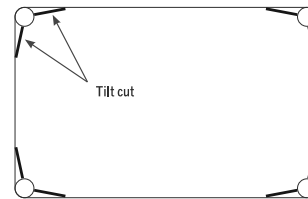


SINK CUTTING

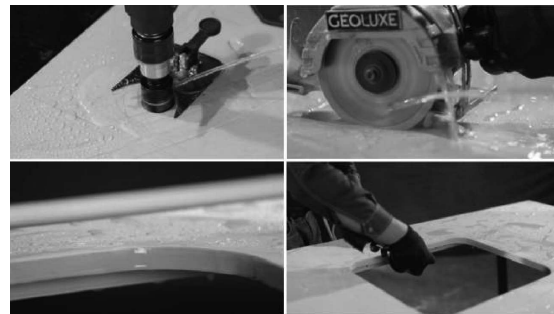
1. Indicate the dimension of the cut-out to be cut and mark the precise cutting line on masking tape (do not write directly on slab).
2. Before the start of work, try the drill bit with a small piece first to check the quality of outcome (for example chipping).
3. Use core drill bit diameter 30-35 mm (1 3/16 - 1 3/8 in) with guide to lock the hand grinder from slipping and prevent any chipping of work piece. Rock the drill bit while drilling.



4. Use wet type hand grinder with Porcelain blade diameter 100 -125 mm (4-5 in) to cut according to the pre-determined lines. The incomplete cuts around holes must be done in tilted direction from the hole toward the edge.

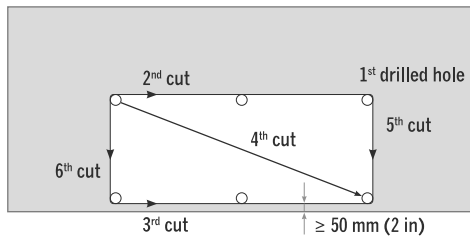
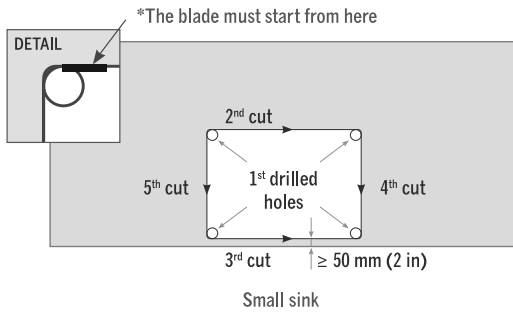


5. Use diamond polishing pads to finish the edges properly.



6 - FABRICATION

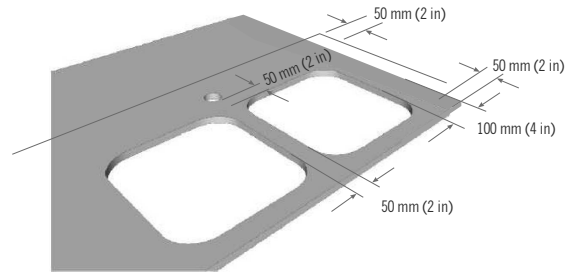
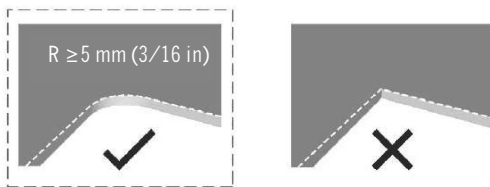
CUTTING SEQUENCE



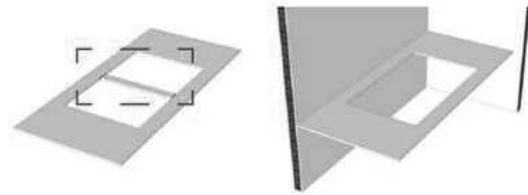
Diagonal cut is necessary for large sink 480 x 560 mm (19 x 22 in)

TIPS FOR SINK CUT-OUT

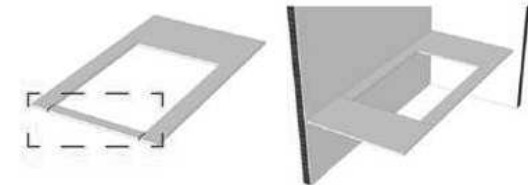
1. Use drill bit \varnothing 30-35 mm (1 3/16-1 3/8 in) to drill holes at corners. It is recommended to have a radius \geq 5 mm (3/16 in). Avoid 90° cut or cross cut as this may damage the slab and cause the breakage.



2. Keep the distance from the edge of slab and also between sink cut-out at least 50 mm (2 in).
3. Keep the distance between faucet hole and sink cut-out at least 50 mm (2 in).
4. In case of large cut-out in the single slab, follow the cutting sequence as recommended and leave a supporting stick in the middle of cut-out to prevent undesirable breakage during handling, transportation and installation. After the workpiece is properly installed on the target structure, the supporting stick can be cut away.



5. If the large cut-out with seam is at the joined area of two slabs, follow the recommended cutting sequence and leave a supporting stick at the joined edge to prevent the undesirable breakage of the slab during handling, transportation and installation. After the workpiece is properly installed on the target structure, the supporting stick can be cut away.



6 - FABRICATION

■ EDGE POLISHING

EDGE POLISHING PARAMETER

GRIT NO.	RPM
50-100*	3,000-4,000
200-300*	
400-500*	
800-1,000*	
1,500-2,000*	
3,000	

Remark: * select one number in such range for use.

Pneumatic or electric grinder can be used depending on its appropriateness with reference to the parameters as recommended by the supplier of polishing pads, depending on diameter of the pads.

- The edge of countertop can be polished by using the wet diamond polishing pads for porcelain available in the market. Please refer to the technical parameters provided by the producers before use.

- Use pad no.50 or 100 to finish the edges before gloss polishing.

- The gloss polishing is by wet method only.

- Polished surface : Use polishing pads no.200-300, 400-500 , 800-1000 , 1500-2000 and 3000
- Honed surface : Use polishing pads no.200-300, 400-500 and 800

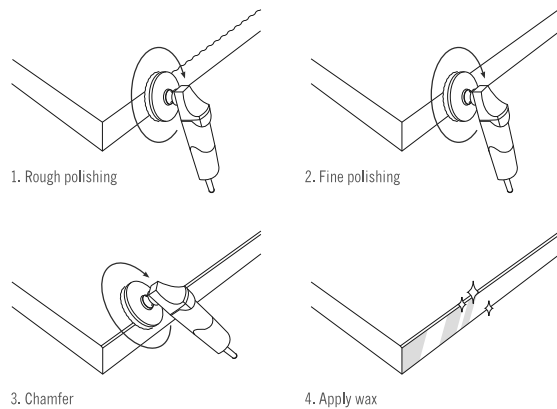
- Do not skip the steps (in other words do not skip some numbers of pads) since this will reduce the performance of the edge especially the shining effect.

- Once done with all pads, check the gloss and see if any hairline is noticeable then clean it thoroughly.

- Use clean cloth and air to dry the piece then use another clean cloth to apply wax for protection of edge and enhancing its shine.

■ TIPS FOR EDGE POLISHING

1. If few tiny chips are noticeable after cutting, use polishing pads no.50,100,150 for correction to get the smooth edge.
2. In case some chips are quite remarkable and cannot be corrected by rough polishing pads, it is better to perform a slight cut of the chipped edge then follow the edge polishing steps.
3. Start to polish with pads. Make sure that the pad is perpendicular to the edge of slab.
4. Use fine polishing pad for chamfering the edge.



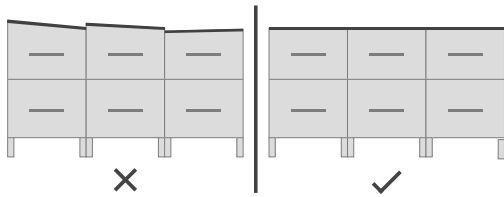


CHAPTER 7: INSTALLATION

7 - INSTALLATION

■ STRUCTURE PREPARATION

In general, make sure the cabinets are straight, flat and suitable for supporting the weight of the countertop. Verify that the countertop has enough support in areas where there are seams and cut-out for appliances.



The majority of breakages during assembly and post-installation are probably caused by an unevenly shaped, inadequate support, the presence of debris or processing residues.

Support distance: $G < 600$ (24 in) (standard specification)
Maximum load = 100 kg (220 lbs)

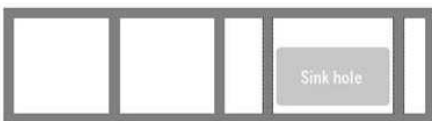
Maximum load = 150 kg (330 lbs) (depends on specification of supplier)

Case 1 : I-shaped (Top without hole)



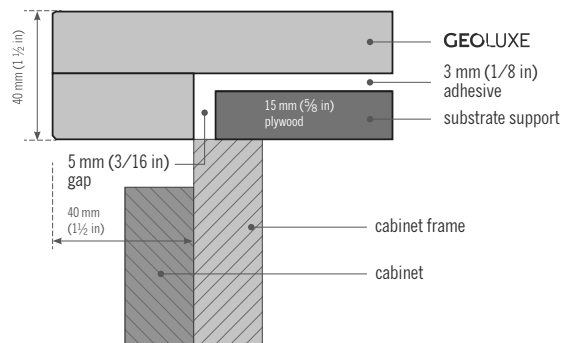
G = outside dimension

Case 2 : I-shaped (Top with hole)



■ COMPLETE FULL SUBSTRATE SUPPORT FOR BUILT UP EDGE

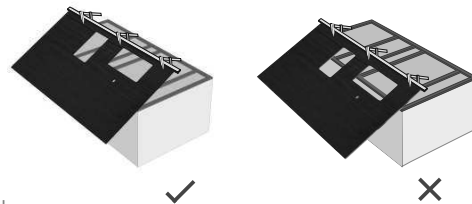
Alternatively the complete surface area of the countertop can be supported over the kitchen cabinets with full width self-supporting underlay made up of plywood, following diagrams below.



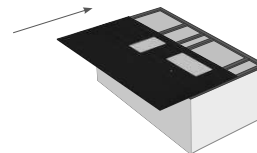
■ POSITIONING THE WORKPIECE

When positioning the workpiece it is advisable to follow the recommendations given below to ensure the optimal results.

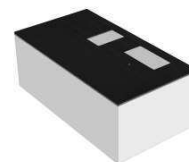
1. Touch



2. Slide



3. Lay



7 - INSTALLATION

■ ADHERING THE WORKPIECE

1. When selecting adhesive, please consider the specific application of the workpiece to identify the most suitable product.
2. Before applying the adhesive, the surface to be glued must be clean, dry and free of any type of treatment.
3. The worktop must rest perfectly on the support; any parts of the worktop that are not supported are potentially fragile. For this reason, never apply isolated spots of adhesives but spread it over the entire supporting area to ensure that is adhered completely to the worktop.

Note: - Please refer to adhesive's technical specifications and proper instruction of use.
 - Do not remove with a blunt force.

■ SEAMING



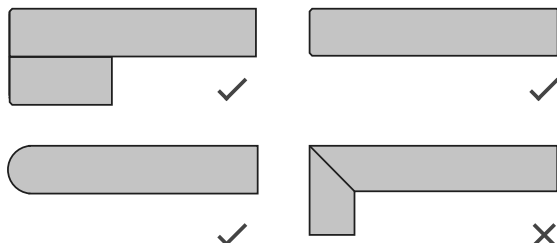
For joined workpiece, all corners must have a minimum edge chamfer to ensure the solid structured workpiece.

■ SEALING

Clean the spaces of any debris and seal all spaces between countertop, cabinets and wall with natural silicone.

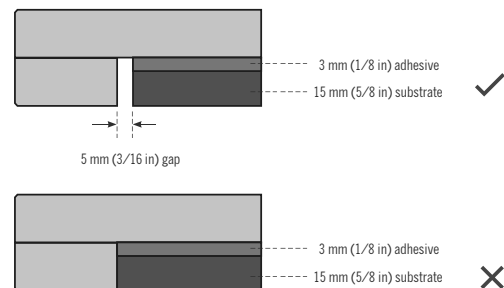
■ OUTDOOR APPLICATIONS

For outdoor applications we recommend reinforced concrete structure. We recommend edge profiling or lamiating. Mitring is not recommended due to a risk in detachment after installation.



Due to the potential expansion of timber substrate in outdoor application, supporting the worktop with a single substrate should be avoided. Use adhesive specifically for outdoor application.

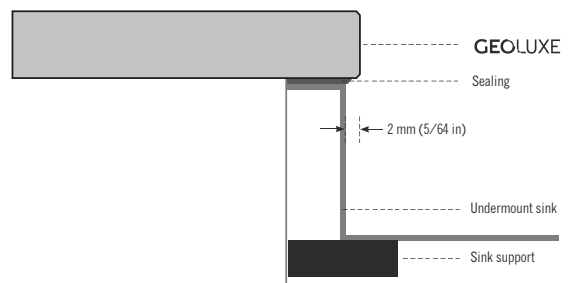
We also recommend maintaining a gap of at least 5 mm (3/16 in) between substrate and stack piece, and chamfer the substrate in order to compensate for any expansion.



■ SINK

After installing the appliance as per manufacturer's instructions, to minimize the risk of chipping, the following diagram is recommended for undermount sink.

For undermount sink installation, the minimum chamfer of 2 mm (5/64 in) is required for internal edge.



7 - INSTALLATION

RECOMMENDED ADHESIVES

Adhesive for seam, joint and laminate



TENAX®
GLAXS (Indoor and outdoor)



INTEGRA ADHESIVE®
- SURFACE BONDER XI (Indoor)
- SURFACE BONDER ULTRA (Indoor)

ADHESIVES FOR INSTALLATION



- 254 PLATINUM



- 257 TITANIUM



- 310 LATAPOXY

COLOR MATCHING CHART

Please note that this is only the guideline for color matching. In real situation, slabs possibly are a bit different in tonality due to the manufacturing process replicating the way that natural marbles are made, and therefore it is recommended to recheck the color before using.

GEOLUXE®	TENAX® GLAXS	INTEGRA ADHESIVE® Surface bonder
	COLOR	COLOR
EREBUS	ABSOLUTE BLACK	RASIN BLACK
ERAMO	MUDDY	AMAZON, SUEDE
ALIVERY	PIOMBO	IRON GREY
BLUETTE	LUNAR GREY	SILVER
PALISSANDRO	PAPER WHITE	WHITE NORTH
DIONYSOS	PAPER WHITE	NOUGAT
NESTOS GREY	ICE	CREGRIS
NESTOS ROYAL	DEW	SAND
ARTEMIS	PURE WHITE	WHITE NORTH
AEOLUS	CITY GREY	RASIN BLACK



CHAPTER 8: CARE AND MAINTENANCE

8 - CARE AND MAINTENANCE

■ 8.1 - GUIDE FOR CLEANING

PRECAUTIONS

1. Chemicals to AVOID

To prevent its sheen of all finishes and keep it long lasting, it is recommended NOT to use following cleaning agents to clean the surface:

- Alkaline solution with pH higher than 10 e.g. ammonia, caustic soda, sodium hypochlorite
- Glass etching acid or hydrofluoric acid (HF)
- Solvents e.g. nail polish remover, acetone
- Abrasive cleaner

2. Tools to AVOID

Despite processing with high temperature giving its hardness and unmatched durability, there remain other factors affecting visibility of scratch such as light & dark color, the degree of glossiness and the reflection of light, it is recommended NOT to use following tools which possibly affect **GEOLUXE®** surface in the same way as they do on others as well:

- Ceramic knives
- Metal scouring pads
- Sharp tools
- Objects as hard as **GEOLUXE®** (e.g. bone china plate, porcelain)

3. Things to remember

3.1 It is recommended to clean stains within 24 hours for better result.

3.2 Please **STRICTLY FOLLOW** the instruction using the specified cleaning agents and a recommended period of time. If others are used, please do dilute them with water and **DO NOT** leave them on **GEOLUXE®** surface longer than 10 minutes.

3.3 Due to the different cleaning agents in each local area, it is recommended to read their cautions and follow their instruction.

4. Things to beware

4.1 Please note that the edge area is the most sensitive part of countertop, which requires special attention. **DO NOT** hit it with pointed or heavy impact because this possibly causes chipping.

4.2 To avoid hard water stain for **outdoor use**, please cover your outdoor countertop when not using for long period.

4.3 **Honed surface** needs more attention and special care. It is recommended to use soft brush for better stain removal.

EVERYDAY CLEANING

For general cleaning, simply use a soft damp cloth to wipe your **GEOLUXE®** surface with mild soap and warm water. It should be cleaned and dried immediately, not leaving stains over 24 hours for better result of cleaning. The faster you clean, the easier the stains are removed.

CLEANING METHODS

Three main cleaning methods are used to clean the surface. Their cleaning sequence is different depending on kinds of stains as shown in the table.



Rubbing

Rub the surface with recommended cleaning agent and tools until the stain is completely gone.



Soaking

If the stain persists, saturate the sheet of cotton pad or tool specified with recommended cleaning agent, and then place it on the stain for a specific period of time.









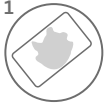






Rinsing

Rinse the surface or wipe out the leftover cleaning agent and dry with recommended tools.

8 - CARE AND MAINTENANCE

GUIDELINE FOR DIFFICULT STAIN REMOVAL

STAIN	CLEANING AGENT	CLEANING METHOD	
Coffee	Multi-purpose Cleaner (e.g. Mr.Clean: Multi-purpose Cleaner)	<p>Simple step</p> <p>1  Rubbing Tool: a soft damp cloth</p> <p>2  Rinsing Tool: a soft damp cloth</p> <p>Advanced step (Only if the stain persists)</p> <p>1  Soaking Tool: cotton pad Time: 10 minutes</p> <p>2  Rubbing Tool: a soft damp cloth</p> <p>3  Rinsing Tool: a soft damp cloth</p> <p>Note: Repeat the process with longer soaking time, if necessary</p>	<p>TIP</p> <p>To make soaking method more effective, please cover the cotton pad with clear tape to prevent evaporation of cleaning agent.</p> <p>CAUTION</p> <p>DO NOT use high alkaline solution for soaking method. Instead, please strictly use the cleaning agent as recommended.</p>
Wine			
Soft Drink			
Fruit Juice			
Cooking Oil			
Soap			
Limescale & Hard Water Stain	Acid Detergent (e.g. Zep: Calcium, Lime and Rust Stain Remover)	<p>1  Soaking Tool: cotton pad Time: 10 minutes</p> <p>2  Rubbing Tool: a soft damp cloth</p> <p>3  Rinsing Tool: a soft damp cloth</p> <p>Note: Repeat the process with longer soaking time, if necessary</p>	<p>CAUTION</p> <p>DO NOT use high alkaline solution for soaking method. Instead, please strictly use the cleaning agent as recommended.</p>
Rust			
Cement-based Residue & Grout			
Grease	Epoxy Grout Haze & Coating Stripper (e.g. Stonetech: Epoxy Grout Haze & Coating Stripper)	<p>1  Soaking Tool: a soft dry cloth Time: 1 minute</p> <p>2  Rubbing Tool: a soft dry cloth</p> <p>3  Rinsing Tool: a soft damp cloth</p> <p>Note: Repeat the process, if necessary</p>	<p>CAUTION</p> <p>The property of stain resistance of GEOLUXE® might be reduced when Epoxy grout haze & coating stripper is left on the surface more than 5 minutes.</p>
Candle Wax			
Epoxy			
Paraffin			
Metal Mark	Metal Polish Cream/Liquid (e.g. Brasso: Metal Polish, Wenol: Metal Polish)	<p>1  Rubbing Tool: a soft dry cloth</p> <p>2  Rinsing Tool: a soft damp cloth</p> <p>Note: Repeat the process, if necessary</p>	<p>TIP</p> <p>Metal mark may resemble scratches but is actually residue from metal rubbing against the surface, and can be easily removed.</p>

If the stain is remained after all attempts are done, please contact **GEOLUXE®** via info@geoluxe.com

8 - CARE AND MAINTENANCE

■ 8.2 - GUIDE FOR REPAIRING DEFECTS CAUSED BY CHIPPING

The following steps explain how to repair a chipped edge due to daily household usage. Please note that it is not a perfect repair since it is quite difficult to match the tonality and texture of the surface exactly with epoxy resins.

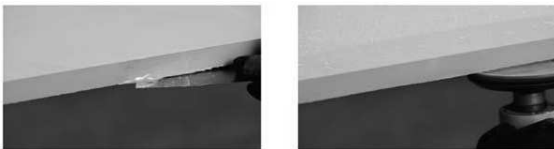


STEP 1:

Clean and free the chip from loose particles.

STEP 2:

Select the appropriate color-matched adhesive.



STEP 3:

Fill the chipped area with adhesive, take out the excess then let it dry for at least 10 minutes.

STEP 4:

Once the adhesive is hardened, grind down the surplus adhesive on the edge mechanically, the surface repairs are best ground down gently and manually.













Do not hit your countertop with blunt and heavy objects. It could chip or even break, especially at the edge.



CHAPTER 9: TECHNICAL SPECIFICATIONS

9 - TECHNICAL SPECIFICATIONS

CHARACTERISTICS	TEST METHODS	SPECIFICATION		
Width	ISO 10545-2	1400 mm		
Length	ISO 10545-2	3200 mm		
Thickness	ISO 10545-2	20.0 ± 0.5 mm		
Water absorption	ISO 10545-3	≤ 0.50 %		
Breaking strength	ISO 10545-4	Not less than 3000 N		
Resistance to deep abrasion	ISO 10545-6	Maximum 175 mm ³		
Resistance to frost	ISO 10545-12	Resisted		
Resistance to thermal shock	ISO 10545-9	Resisted		
Resistance to stains	ISO 10545-14	Minimum Class 4*		
Resistance to chemical - Common household - Acid	ASTM C650	Not damaged		
Reaction to fire	EN 13501-1	Class A1**		

* Based on ISO 10545-14, Class 4 is defined that the stain is removed using a weak commercial cleaning agent.

** Based on EN 13501-1, Class A1 is defined as non-combustible product.

Remark: Specific test result by lot can be obtained upon request.





CHAPTER 10:
DISCLAIMER

10 - DISCLAIMER

The objective of this manual is to offer helpful guidelines and suggestions about machining and maintaining the slabs.

Information in this manual reflects the manufacturer's technical, scientific and operational knowledge at the time of its publishing; it is highly recommended to keep up with the latest version available on the site www.geoluxe.com.

Product warranty is applicable only under terms and conditions as specified in **GEOLUXE®** warranty document available on the website.

If you would like to consult on fabrication tools and techniques, it is advisable to contact **GEOLUXE®** technical team, addressing your email to Info@geoluxe.com; our technicians will contact you back as soon as possible.

Appendix

■ APPENDIX 1: Friends of GEOLUXE®

1. Adhesives

- Tenax (www.tenax.it)
- Integra (www.integra-adhesives.com)
- Laticrete (www.laticrete.com)

2. Blade & tools and abrasive products

- Surfaces Group ADI metallic blade for Porcelain (www.aditools.com)
- Alpha Silencer III for Porcelain (www.alpha-tools.com)
- Italdiamant Evogres (www.italdiamant.com)
- Terminator DK3 S2 (www.terminatordia.com)
- Raimondi Professional Tools (www.raimondispa.com)
- Diatex Gres Cut (www.diatex.it)

3. Chemicals for protection, care and maintenance

- Fila (www.filasolutions.com)
- Bellinzoni (www.bellinzoni.com)

4. Fabrication machinery solutions

- Baca Systems (<https://bacasystems.com>)
- Park Industries (www.parkindustries.com)