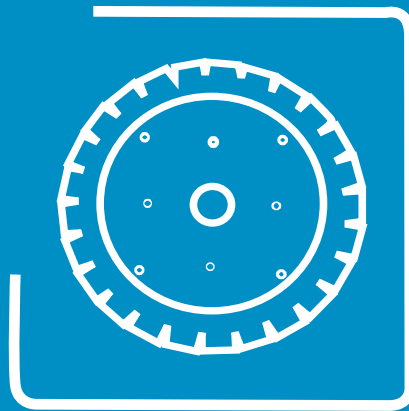


SILESTONE[®] TRAINING MANUAL



MANUFACTURING
WITH MACHINERY



MANUFACTURING WITH MACHINERY

PREPARING THE WORK

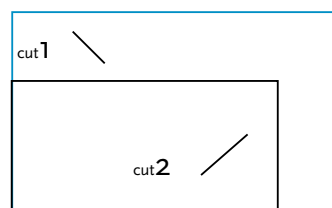
1. Check the slab before cutting it in order to find possible defects before starting the fabrication process. Clean off any dust from the slab and check it against the light from different angles.
 2. Ensure enough material is available prior to beginning.
 3. Check that the measurements of the various parts of the countertop do not exceed those of the Silestone® slab.
 4. If you need more than one slab to manufacture the kitchen countertop, check that both slabs are a color match. For this, a visual inspection of the slabs will be necessary.
 5. Check that the appropriate tools to manufacture the order are available.
 6. Check that it can be manufactured within the deadline indicated by the customer.
- Do not start cutting the slabs until you are clear about all the information in the order.**



CUTTING

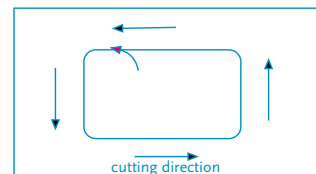
1. Check the diagram measurements before carrying out any cutting operation on Silestone®.

2. In order to cut a Silestone slab, first cut along the longest part of the slab and then the shortest part, as shown in the diagram.



3. Place the anchoring elements near the cutting line. This decreases the possibilities of the part moving during the cutting process.

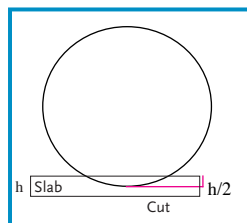
4. When making the holes, the cutting direction should be carried out as indicated in the diagram.



5. Place the anchoring elements near the cutting line. This decreases the possibilities of the part moving during the cutting process.

6. When making the holes, the cutting direction should be carried out as indicated in the diagram.

7. When slabs are incorrectly stored and become warped the cutting should be carried out twice. Cutting the material to half the thickness as shown in the diagram.



8. For slabs that are thick, the double-cutting technique should also be used. Check that the measurements of the pieces that have been cut are within the tolerances allowed.



MANUFACTURING WITH MACHINERY

CNC CUTTING

1. Follow the manufacturer's instructions at all times to avoid incorrect use.

2. The cutting table should be solid and resistant. It should be perfectly flat.



3. Check that the cutting tool is in good condition.

4. Hold down the Silestone® to the table by means of the CNC anchoring system. Check that it is properly secure with the CNC control elements.

5. Place the anchoring elements near the cutting line. This decreases the possibilities of the part moving during the cutting process.

6. Before carrying out the cutting process, an overhead test should be carried out (above the Silestone slab) to check that the machine follows the desired path.

7. Use the CNC cutting tools especially manufactured for cutting Silestone.



8. Do not use these tools to cut other stone.

Revolutions: 5500rpm.

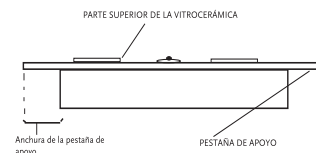
Progress: 350 mm/min.

Flow: Always cut with water. Check there is a continuous water flow during the cutting process.



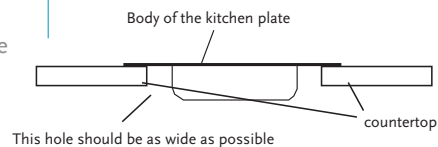
CUTOUTS

1. When carrying out any operation always take into account that the machine will have to go into the cutout.



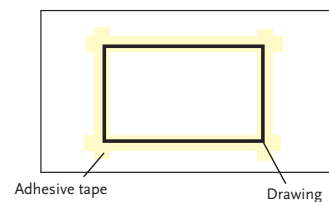
2. Check the cutout measurement and mark them on the Silestone®.

3. Check the thickness of the supporting flange.

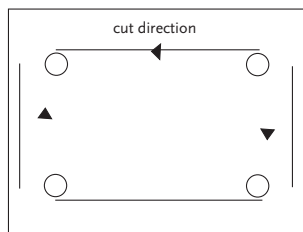


4. The maximum width possible should be left between the countertop and the body of the kitchen plate.

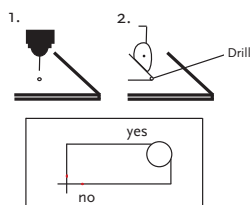
5. Draw the cutout on the adhesive tape.



6. Place adhesive tape on the surface of the Silestone to mark the cutout.



7. Drill a hole in each corner of the cutout. It is very important that the holes have a rounded shape. This way, the breakage possibilities are reduced by a high percentage. The smaller the radius of the hole, the less breakage possibilities.



8. Cut using the hole radius.

Do not cross the cuts in the corners. This can cause the breakage of the countertop in the future. The cutting should end in the hole and will never go beyond it.



TROLLEY DISK CUTTING

Follow the instructions previously included for the section 2.2 bridge disk.

MANUAL RADIAL CUTTING

Manual radial cutting is only appropriate for smaller jobs that do not need precision.

1. Follow the manufacturer's instructions at all times, to avoid incorrect use.



2. Use a radial with a sufficient minimum power to cut Silestone®. Normally between 5000 and 7000 rpm.

3. Hold down the Silestone with anchoring elements, to prevent it from moving while the cutting operation is carried out.

4. The disc should be in good condition (no teeth missing, etc.)

5. The table should be well supported to avoid any movement during the cutting process.

Use the disc especially manufactured for cutting Silestone.



DISC-BRIDGE CUTTING

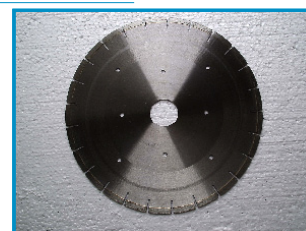
1. Follow the instructions of the machine manufacturer at all times, to avoid incorrect use.

2. The cutting table should be solid and resistant. It should be perfectly flat.

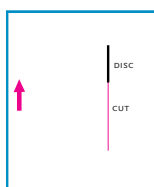
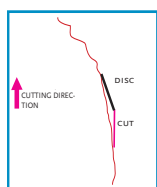


3. Check that the surface on which the slab is going to be placed is in good condition, avoid cuts in any one area, this can cause movement in the material.

4. The disc should be in good condition (no teeth missing, etc).



5. The disc should be perfectly lined up with the cutting direction.



Revolutions: between 2500 and 3500 rev/min.

Progress speed: for 3/4" Silestone® slabs: between 3 and 3,5 m/min.
For 1 1/4" Silestone® slabs: between 2,5 and 3 m/min.

Flow: always keep the water on the cutting disc in the area where the disc comes into contact with the material.



PROBLEM SOLVING DURING CUTTING PROCESS

Disc marks appearing on
the side of the edge.

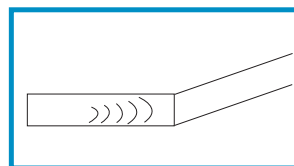
1. Check that the disc is in
good condition.

2. Check that the disc is
lined up with the cutting
direction.

3. Check that the table is
in good condition and that
the material does not move
during the cutting process.

4. Check that the piece to
be cut on the table is not
too small, as this can make
it move during the cutting
process.

5. Check that the speed is
not high.



Slabs breaking during
the cutting process.

1. Check that the disc is lined-
up with the cutting direction.

2. Check if the slabs are
warped.



MANUFACTURING WITH MACHINERY

MANUAL CUTTING

1. Check the measurements and mark them on the Silestone®.

2. Place adhesive tape on the surface of the Silestone® in order to mark the shape of the cutout.

Drawing

Adhesive tape

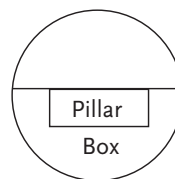
3. Draw the shape of the cutout on the adhesive tape.

Pillar

4. Make a hole in each corner of the cutout. It is very important that the cutout corners are rounded. This way, the breakage possibilities are greatly reduced. The bigger the radius of this curve, the less possibilities there are for breakage.

5. Cut using the hole radius.

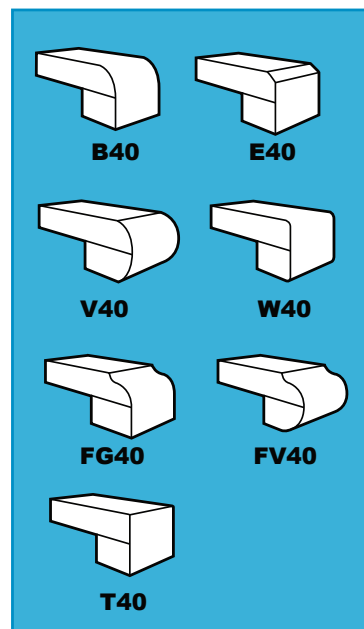
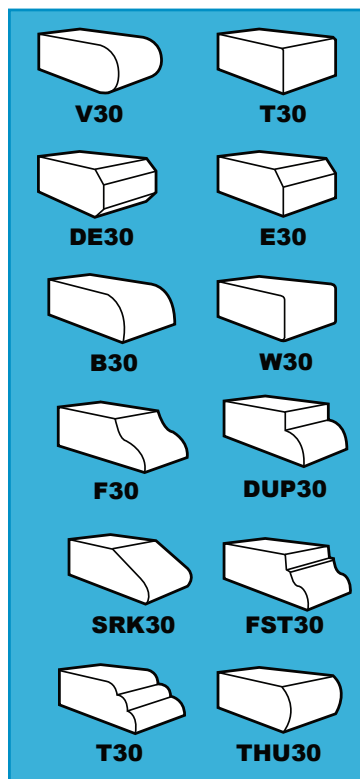
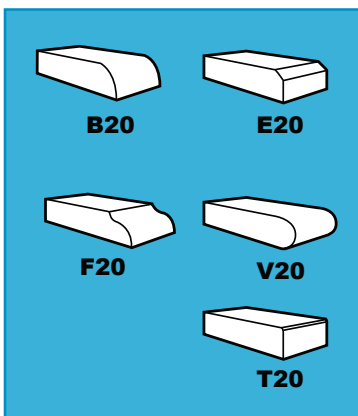
Detail



6. Under no circumstances should the cuts cross in the corners. This can cause breakage of the worktop in the future. The cutting should end in the hole and will never go beyond it.



EDGE POLISHING





MANUFACTURING WITH MACHINERY

SILESTONE® EDGE POLISHING

SILESTONE EDGE POLISHING WITH A MANUAL WATER POLISHING MACHINE.



2. Follow the machine manufacturer's instructions at all times, to avoid incorrect use.

1. Use a pneumatic polishing machine. Avoid using electric machines as they are more dangerous due to water being used.

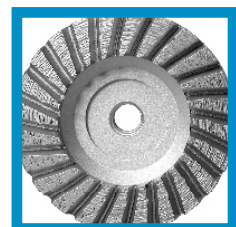
3. The polishing discs should be in good condition (no missing parts, etc.).

4. The table should be properly supported to avoid movement during the polishing process.

5. The polishing machine will turn at less than 4000 rpm.

6. The water flow should be high in order to allow the cooling of the material and avoid burning the polyester resin.

7. Cut off the rough edges with the diamond disc. The cutting of the rough edges consist of initially shaping the edge. (If the edge is straight the diamond disc is not needed). This should be carried out gently without pressing down on the material.





MANUFACTURING WITH MACHINERY

8. Use the following grain sequence (the sandpapers are characterized by the size of the grain, defined by a number):

- 60, 120, 220, 400, 600, 1200, 3500.

- We should make sure that with each grain we eliminate the marks of the previous grain.

9. Use the sandpaper disc specifically created for Silestone®. These discs adhere to the machine plate with velcro and have excellent performance.



10. This should be carried out gently without pressing down on the material. Polishing should not be carried out with the machine fixed on a point; the machine should be in continuous movement.



11. When completed, the entire edge perimeter should be smooth. For it to be perfect use dry polishing with a 120 grain.

12. The edge polishing quality depends on various aspects, such as the type of machine, water, abrasive, pressure, speed, etc.

In any case, the parameters that are included below should be taken as a working basis, from which modifications should be carried out in order to obtain quality polishing.

13. In order to produce this type of edge, quick fit crowns (Ref.90015) are used. The set is made up by seven 5.9" crowns. The grain sequence is 40, 60, 200, 300, 500, 700 and extra gloss.

STRAIGHT EDGES:

14. motors machine:
Abrasive grains 60, 120, 200, 400, 800, gloss.

8 motors machine: Grains 40, 120, 200, 400, 800, 1200, gloss.



MANUFACTURING WITH MACHINERY

PROBLEMS IN EDGE POLISHING WITH THE MANUAL WATER POLISHING MACHINE.

The machine is left on the same area for a long time, instead of progressing.

The edge is not highly polished

The appropriate tools are not being used.

The machine revolutions are too high.

There is too much pressure on the material. Gentle movement should be made.

The sandpapers are not being used in the set order. The sandpaper grains are being inserted in a different order: 60, 220, **120**, 400, 1200, **600**, 3500.

Not enough time is being spent working with the coarser grains (60, 120, 220)

Speed*: Approximately 50 – 60 cm. per min.
Pressure: Between 2,8 and 3 bar.

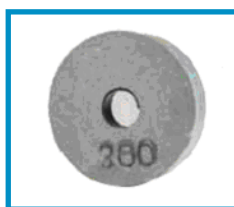
* For colors: Tebas Black, Stellar Marine the speed will be 40-50.

ROUND EDGES AND MEDIUM ROUND EDGES.

NOT STRAIGHT.

6 motors: Grain: 120, 220, 400, 800, gloss, gloss.

8 motors: Grain: 120, 220, 220, 400, 800, 1200, gloss, gloss.



Speed: Approximately 20-25 cm. per min.
Pressure: Between 2 and 2,4 bars.

In order to produce this type of edge, quick fit crowns (Ref.90015) are used. The set is made up by seven 5.9" crowns. The grain sequence is 120, 220,300, 400, 600, 800 and extra gloss.



MANUFACTURING WITH MACHINERY

There are marks on the edge

The sandpapers are not being used in the set order. The sandpaper grains are being inserted in a different order: 60, 220, **120**, 400, 1200, **600**, 3500.

One of the sandpapers has not removed the marks from the previous grain. This is due to the fact that insufficient time has been spent polishing with one of the sandpapers.

When the material was cut before being polished, deep cutting disc marks remain that cannot be eliminated when using the smoothing cutting disc.

In the event that the cutting disc problem cannot be resolved, the disc marks should be eliminated with the diamond smoothing disc or with the smoothing sandpaper.

POLISHING OF SILESTONE® EDGES WITH AUTOMATIC EDGE POLISHING MACHINE.

1. Follow the machine manufacturer's instructions at all times. To avoid incorrect use.



2. The water flow should be set on high in order to prevent the polyester resin from burning.

3. The abrasive heads should be in a good condition (no parts missing, etc.)



MANUFACTURING WITH MACHINERY

CNC POLISHING OF SILESTONE® EDGES

3. Check that the polishing tool is in good condition (no missing parts, etc)

1. Follow the machine manufacturer's instructions at all times, to avoid incorrect use.

2. The cutting table should be solid and resistant. It should lay perfectly flat.

4. Fix the Silestone on the table using the CNC anchoring system. Check that it is properly anchored with the CNC control elements.

5. Place the fixing elements near the polishing line. This helps prevent movement during the polishing process.

6. Before carrying out the cutting process, an overhead test should be carried out, (above the Silestone slab), to check that the machine follows the correct path.

7. Use the CNC polishing tools especially manufactured for the polishing of Silestone.

8. Silestone can be polished with the use of up to 5 mills: mill type 1, type 2, type 3, type 4, type 5. These mills are specific for Silestone. Before polishing, the edge should be cut. Mill 1 is used for cutting.

The other four mills are used to polish: mill 2 has the coarsest grain while mill 5 is used for extra fine polishing.



MANUFACTURING WITH MACHINERY

PROBLEMS WITH EDGE POLISHING

The head polishing pressure is too high.	The edge is not shiny enough	
	The appropriate abrasive tools are not being used.	
	The machine revolutions are too high.	There is not enough water to cool the piece.
	The abrasives are not being used in the set order. The grain of the abrasive is being used in a different order. For example: 40, 120 , 220, 400, 800, 1200, gloss.	If a line is not showing along the edge, this is due to the fact that the cutting disc is not cutting at 90°.
There are marks in the edge	The abrasives are not being used in the set order. The grain of the abrasive is being used in a different order. For example: 40, 120 , 220, 400, 800, 1200, gloss.	One of the abrasives has not removed the sandpaper marks from the previous grain.
	When the material was cut before being polished, deep cutting disc marks remain that cannot be eliminated when using the rough cutting disc.	In the event that the cutting disc problem cannot be resolved the disc marks should be eliminated by using the coarsest grain abrasive twice, that is to say, 40, 40, 120, 220, 400, 800.



LEATHER EDGE POLISHING

Use the abrasives for Leather™ finish that can be found in any of our Cosentino N.A. authorized warehouses and distributor locations.

POLISHING OF LEATHER EDGES WITH MANUAL WATER POLISHING MACHINE.

The polishing should be carried out with water. Check that the manual polishing machine has a continuous water supply for the Silestone® product to be continuously cooled.

LEATHER EDGES POLISHING WITH AUTOMATIC EDGE POLISHER.

The grain size sequence to be used is the following:
36, 46, 60, 120, 220, 400, 600

For grains 36, 46 and 60 speed will be between 3500 and 4000 rpm.

The pressure of the head against the edge should be the minimum possible in order to prevent the teeth from breaking. For this purpose counter pressure will also be used to counteract the head pressure.

For the rest of the grains the speed will be between 2000 and 2500 rpm.

IMPORTANT: The more pressure that is applied to the edge, the rougher it will become.



MANUFACTURING WITH MACHINERY

TECHNICAL DATA:	A. It has been found that by alternating head plates the finish is better.	
	B. The revolutions of the first 4 heads will be 1500 rpm.	C. The revolutions of the 4 last heads will be 1000 rpm.
		D. The pressure will be the same on all the heads: 1.2 bar pressure and 1 bar counter pressure.
Note: we should take into account that these values have been obtained on a COMANDULLI machine.	In other types of machines we should take into account the machining and operation, always keep in mind the operation principle (that the brushes do not get flattened against the edge that is to be manufactured);	For this the machine will have to be adjusted until the optimum pressure is obtained complying with the pressures required by the machine or positioning.



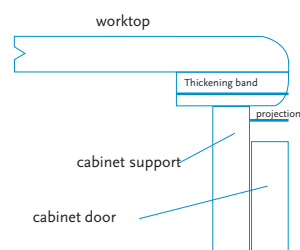
LAMINATION

Check the diagram measurements before carrying out any operation on Silestone.

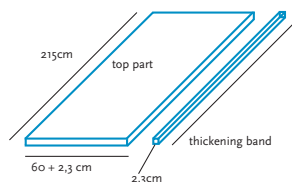
TWO PLUS TWO EDGE ADHESIVE

The projection desired by the customer for the kitchen worktop will have to be taken into account.

The edge adhesive is carried out when we want to manufacture edges with a thickness of more than 3cm, since the maximum thickness of a Silestone® slabs is 3 cm.



Cut a Silestone strip for edge thickening. The strip should be width A with an extra 2.3cm. The top part making up the worktop surface will also have 2cm more than the final measurement.





MANUFACTURING WITH MACHINERY

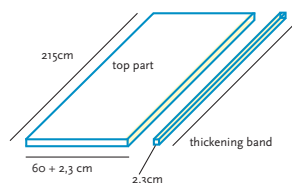
Join the pieces together making up the edge and press with clamps. Place one clamp every 4".



A band should also be placed on the back part of the countertop so it can be levelled.

After 30 minutes, remove the clamps and cut with the bridge-disc or with the hand disc.

The result of the cut will be a piece with 2mm more than the final measurement. This extra 2mm is left to reach the exact final measurement when polishing the piece.



Finally the edge polishing should be carried out, an operation during which we will obtain the final measurements of the piece. The polishing results in the removal of the 3mm excess.

USE OF SOLUMASTIK

Polyester putty with Microban®.



Manufactured with high quality raw materials in order to avoid polymerisations, sediments or changes in color. Lower the resin-hardener ratio than usual for an excellent adhesion and a higher gloss effect.



MANUFACTURING WITH MACHINERY

Add the Silestone® adhesive putty on a surface where it can be removed, for example on a piece of cardboard.



Add the Silestone hardener to the putty until perfectly mixed. The proportions should be according to the following table:

TEMPERATURE of the working area	
More than 25 °C	30/1
Between 10 and 25 °C	20/1
Less than 10 °C	10/1



Add the prepared mixture along the band and on the countertop.





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