# Technical Manual for Worktops

Lithotech
The Technical Stone

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## Contents



**CONTINUOUS IMPROVEMENT**

Good design, machining and assembly are all important when fitting high-performance sintered stone worktops. Lithotech provides the necessary support for designers, marble workers and fitters to bring their projects to fruition. If any additional information is required that is not contained in this guide, an e-mail can be sent to info@lithotechslabs.com

# 1 Introduction

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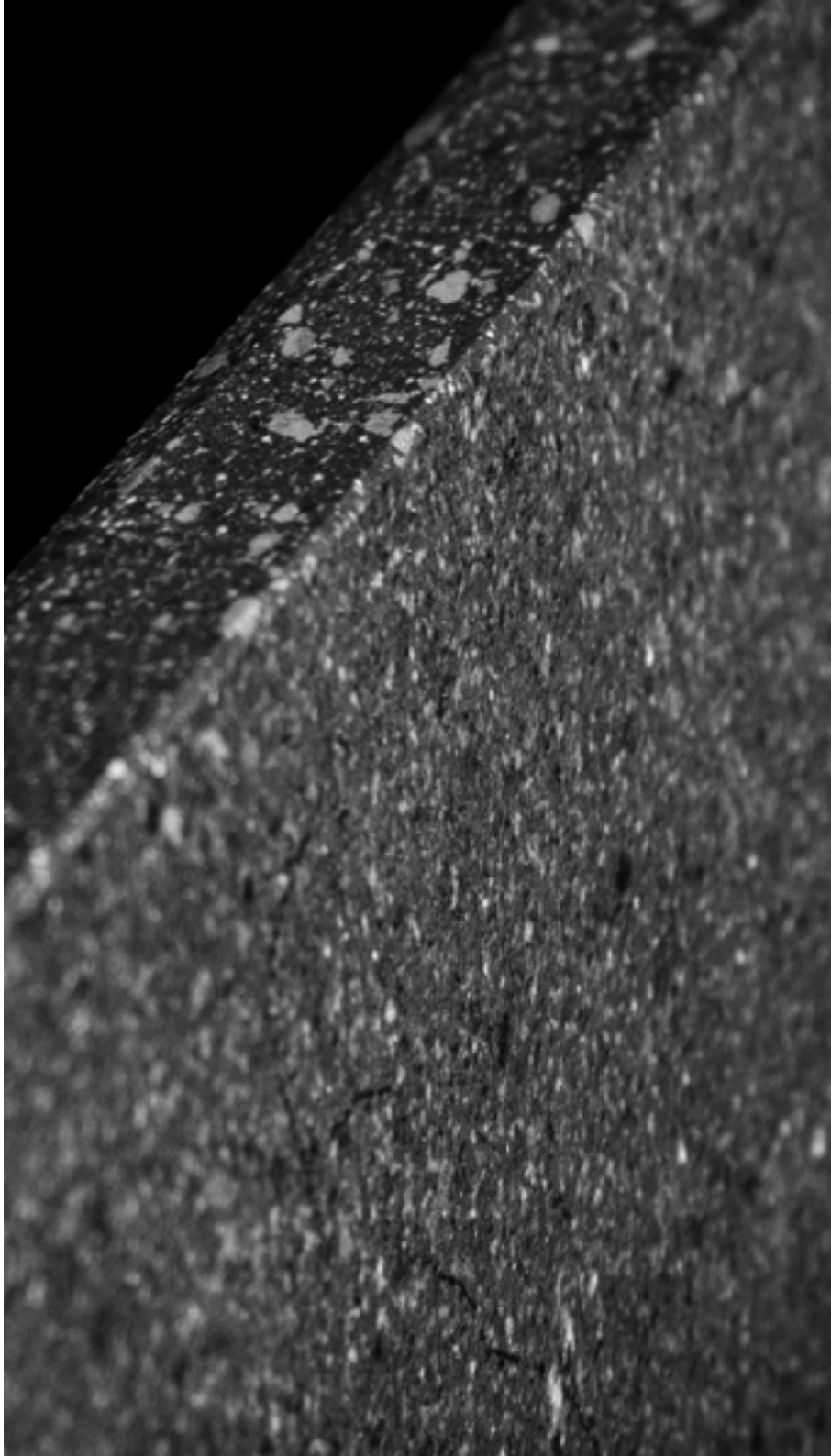
## What is Lithotech?

Lithotech is high-performance sintered stone, manufactured using a combination of cutting-edge high-pressure compacting technology and exposure to extreme heat. This leads to the creation of functional, highly resistant surfaces.

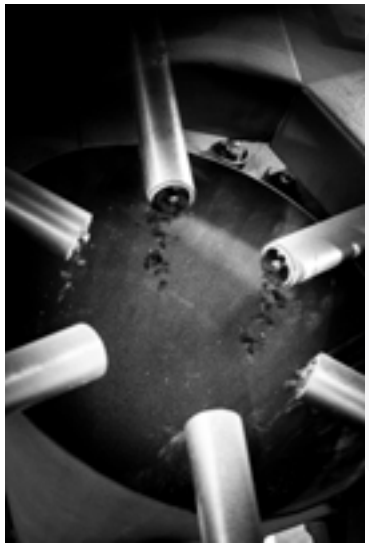
With this high-tech process, the perfection that nature achieves over many years is accomplished in just a short period of time.
Sintering takes advantage of natural raw materials, using them to create eye-catching practical solutions able to meet the demanding requirements of today's architectural and design worlds. The synergy between the consistency and elegant colour of Lithotech gives rise to a surface that is unbeatable when it comes to hygiene, resistance and durability.

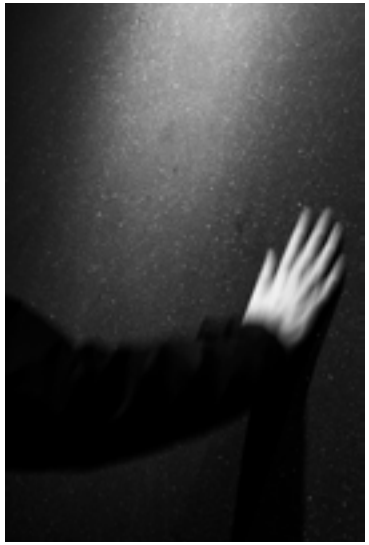


Innovation

# Corelith®
Technology

Lithotech is a high-performance sintered stone that has been developed using innovative Corelith® technology. This technology allows us to design the core of the slab, from the customised selection of each of its components, combined in different proportions, colours and gradings. The design of the core is a fundamental part of the surface appearance of the slab, allowing it to be seen as one whole piece and achieving flawless consistency between the surface, interior and edges. This dramatically increases the potential for producing worktops and decorative surfaces with visible edges.





# 3D·Fit®
Technology

Lithotech collections with 3D·Fit® textures are printed using innovative improved printing technology so that the sintered stone's appearance and relief texture marry to perfection. This ensures a far more realistic surface texture, giving each slab a unique, distinctive appeal.

Following extensive R&D&I, 3D·Fit® is now applied to Lithotech sintered stone. The perfect match between the texture and the design leads to high definition results, making each surface so much more realistic.

## Technical Characteristics

Thanks to the physical and mechanical characteristics of sintered stone, these surfaces can be used in endless different horizontal applications and for decorative functions.
The highly compacted sintered particles produce a surface that is entirely non-porous, meaning that there are no weak spots. This provides invaluable benefits when used for bathroom or kitchen worktops, as well as for any other kind of surface, whether indoors or outdoors.

- Scratch resistant
- Fire proof and resistant to high temperatures
- Stain resistant
- Impervious
- Easy to clean
- Resistant to ultra-violet rays
- Non-porous
- Hygienic surface
- Colourfast
- Resistant to chemicals and detergents

*Main Technical Characteristics of Lithotech.*

| | **Lithotech with Corelith® Technology & 3D·Fit® Technology** | Conventional Sintered Stone | Quartz | Wood | Solid Surfaces | Natural Stone |
|---|---|---|---|---|---|---|
| Non porous | ●●● | ●●● | ●●● | ● | ●●● | ● |
| Resistant to scratches | ●●● | ●●● | ●● | ● | ● | ●● |
| Resistant to High Temperatures | ●●● | ●●● | ●●● | ● | ● | ●● |
| Resistant to Stain | ●●● | ●●● | ●● | ●● | ●● | ● |
| Hygienic | ●●● | ●●● | ●●● | ●● | ●●● | ● |
| Resistant to chemicals | ●●● | ●●● | ●● | ● | ●● | ● |
| Resistant to humidity | ●●● | ●●● | ●●● | ● | ●●● | ● |
| Resistant to UV rays | ●●● | ●●● | ●●● | ● | ● | ●● |
| Graphic Texture Realism **3D·Fit® Technology** | ●●● | ●● | ● | ●●● | ● | ●●● |
| Surface/Core Simility **Corelith® Technology** | ●●● | ●● | ●●● | ●●● | ●●● | ●●● |

*Comparative table between materials aimed mostly use as a kitchen worktop.*

| TECHNICAL CHARACTERISTICS | | REFERENCE STANDARD | MEAN VALUE Family I | MEAN VALUE Family II | MEAN VALUE Family III |
|---|---|---|---|---|---|
| Dimensional Characteristics | Dimensions - Length and width* | ISO 10545-2 | ±2,0mm | ±2,0mm | ±2,0mm |
| | Thickness | | ±5,0mm | ±5,0mm | ±5,0mm |
| | Flatness Tolerance Width Slab | | ±2,0mm | ±2,0mm | ±2,0mm |
| | Flatness Tolerance Length Slab | | ±4,0mm | ±4,0mm | ±4,0mm |
| Physical Characteristics | Water absorption | ISO 10545-3 | 0.1% | 0.1% | 0.1% |
| | Bending strength | ISO 10545-4 | ≥50 N/mm² | ≥50 N/mm² | ≥50 N/mm² |
| | Breaking strength | | >4500 N | >4500 N | >4500 N |
| | Resistance to impacts | ISO 10545-5 | ≥ 0.80 without visible defects | ≥ 0.80 without visible defects | ≥ 0.80 without visible defects |
| | Resistance to deep abrasion | ISO 10545-6 | <102mm³ | <102mm³ | <102mm³ |
| | Resistance to superficial abrasion | ISO 10545-7 | PEI 3 or PEI 4 acording to reference | PEI 3 | PEI 3 |
| | Linear thermal expansion | ISO 10545-8 | ≤7 x $10^{-6}$ °C $^{-1}$ | ≤7 x $10^{-6}$ °C $^{-1}$ | ≤7 x $10^{-6}$ °C $^{-1}$ |
| | Thermal shock resistance | ISO 10545-9 | Resistant | Resistant | Resistant |
| | Frost resistance | ISO 10545-12 | Resistant | Resistant | Resistant |
| Chemical Characteristics | Resistance to household cleaning products and swimming pool additives | ISO 10545-13 | GA | GA | GA |
| | Resistance low concentrations of acids and alkalis | ISO 10545-13 | GLA | GLA | GLA |
| | Resistance high concentrations of acids and alkalis | ISO 10545-13 | GHA | GHA | GHA |
| | Resistance to staining | ISO 10545-14 | Class 5 | Class 5 | Class 5 |
| Lead and Cadmium Release | Lead Concentration | ISO 10545-15 | <0,01 mg/dm² | <0,01 mg/dm² | <0,01 mg/dm² |
| | Cadmium Concentration | | <0,001 mg/dm² | <0,001 mg/dm² | <0,001 mg/dm² |
| UV Resistance | Color Change | DIN 51094 | No Changed | No Changed | No Changed |
| Anti-Slip Properties | Critical Angle with footwear | DIN 51130 | Class R9 | Class R9 | Class R9 |
| | Critical Angle with barefoot | DIN 51097 | Class A | Class A | Class A |
| | Dynamic Coefficient of Friction | ANSI A137.1 | ≥0,55 | ≥0,50 | ≥0,45 |
| | Slip Resistance (Pendulum Method) | UNE-ENV 12633 | Class 1 | Class 1 | Class 1 |

*Only slab rectified

| TECHNICAL CHARACTERISTICS | | REFERENCE STANDARD | MEAN VALUE Family I | MEAN VALUE Family II | MEAN VALUE Family III |
|---|---|---|---|---|---|
| Physical Characteristics | Moisture Expansion | **ASTM C370** | <0,1% | <0,1% | <0,1% |
| | Water absorption | **ASTM C373** | 0,1% | 0,1% | 0,1% |
| | Breaking strength | **ASTM C648** | 1280 lbf<br>5730 N | 1180 lbf<br>5260 N | 1180 lbf<br>5260 N |
| | Thermal shock resistance | **ASTM C484** | Resistant | Resistant | Resistant |
| | Frost Resistance | **ASTM C1026** | Resistant | Resistant | Resistant |
| | Resistance to superficial abrasion | **ASTM C1027** | Class 3 | Class 3 | Class 3 |
| Chemical Characteristics | Chemical Resistance | **ASTM C650** | No affected | No affected | No affected |
| | Resistance to staining | **ASTM C1378** | No affected | No affected | No affected |
| Anti-Slip Properties | Static Coefficient of Friction | **ASTM C1028** | >0,50 (Dry/Wet) | >0,50 (Dry/Wet) | >0,45 (Dry/Wet) |

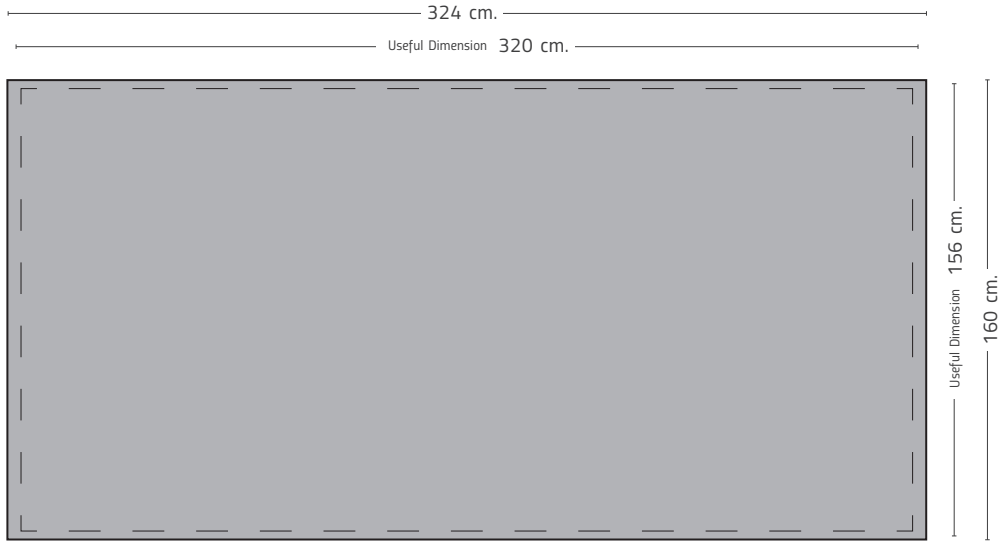
**TECHNICAL DATA SHEET LITHOTECH by Family Collections:**

**Family Group I** [Allure, Eme, Noon, Blanc]
**Family Group II** [Kron, Wega]
**Family Group III** [Era, Edra, Bera&Beren, Mood]

## Dimensions

The slabs are supplied with an indicative gross nominal size of 324x160 cm. This means that once the edges have been trimmed, they will have a useful surface of 320x156 cm. Depending on the type of colour and formula used to make Lithotech, the useful surface might be larger than the aforementioned dimensions.

12mm is a perfect thickness, guaranteeing durability, resistance, and a lighter weight. This makes the slabs easier to fit while also facilitating differing applications. A 12mm-thick solid, ultra-compact material, designed to meet the highest quality standards.




## Colours

Lithotech slabs have a high colour consistency. Every effort is made to ensure batches with a uniform appearance. Nonetheless, because natural raw materials are used to make the slabs, slight variations in colour might be noted from one batch to the next.

Before the slabs are fabricated, they should therefore be carefully inspected to check that the shade of the different slabs is within acceptable limits. **Slabs from different batches should not be fitted next to one another.**

### Available Sizes & Finishes

**Also available with fibreglass mesh reinforcement, total thickness 1,27cm.**

| *Indicative Nominal Size | Useful Dimensions | Useful M2/Pce | Kg/Pce | Pces/A-frame | Kg/A-frame | Kg/Total | Useful M2/Total |
|---|---|---|---|---|---|---|---|
| 324x160x1,2 cm.<br>127"x63"x0,5" Approx. | 320x156x1,2 cm.<br>126"x61"x0,5" Approx. | 4,99 | 155 | 22 | 140 | 3550 | 109,78 |

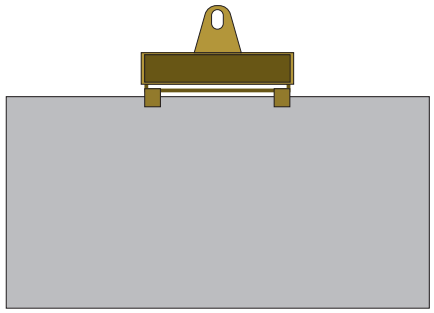
*Indicative gross nominal size of the slabs. Weights are given as a guide only.

# Handling

## Handling

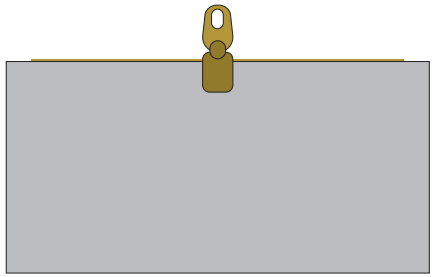
Lithotech slabs must be loaded, unloaded and transported using a forklift, overhead crane or other lifting device. In all cases of handling and transportation, the slabs must be balanced bearing in mind their centre of gravity. The following table is a summary of the weight per slab and square metre:

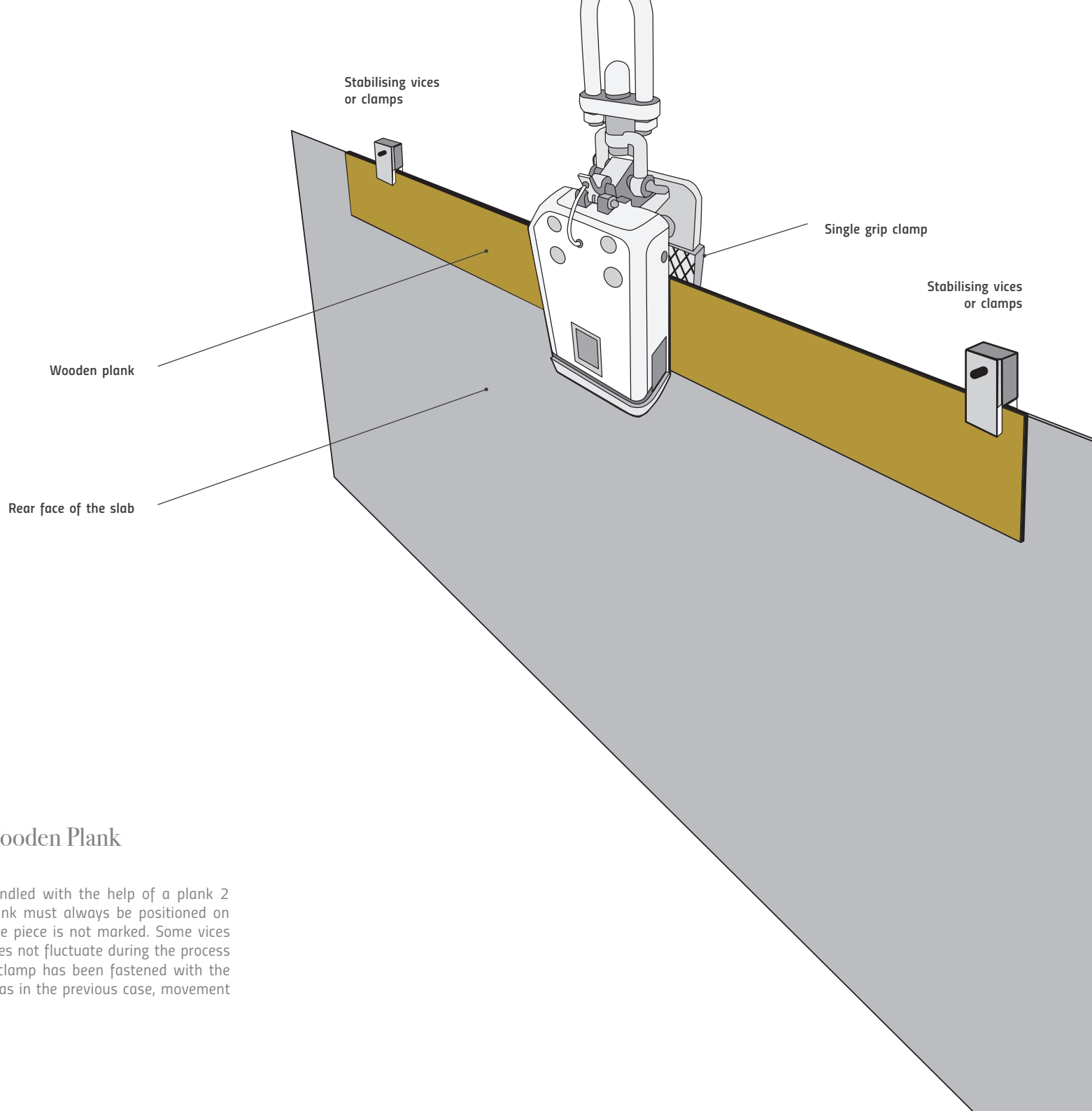
| **Indicative Nominal Size** | **324x160x1,2 cm.**<br>**127"x63"x0,5" Approx.** |
|---|---|
| Weight (Kg/m²) | 31 |
| Full weight table (Kg) | 155 |



## Handling With Clamp
### Double Grip Clamp

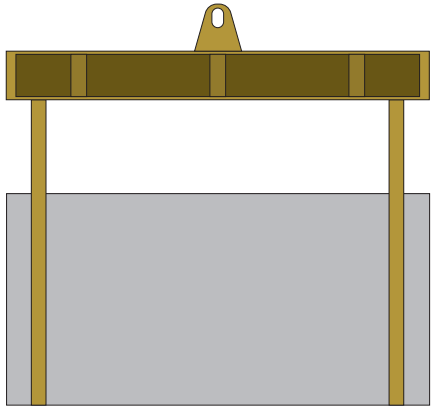
This is the most frequently used and the recommended option when transporting slabs. It is very simple to handle.
First, check the grip of the clamp to be used. Before carrying out any actions, check that the clamp can perform its function and that its fixings are in perfect condition. Also check there are no metal surfaces that will come into contact with the slab to be transported. If there are, steps must be taken to avoid contact between the parts using adhesive foam.
Handling with a clamp means special attention must be paid to the sag of the piece. Only by doing so, controlling the slab's movement at all times, can we prevent breakages and spalling in the slab. We recommend using extra-wide clamps and not handling more than two pieces at a time.






## Handling With Single Grip Clamp + Wooden Plank

If a double grip clamp is unavailable, slabs may be handled with the help of a plank 2 cm thick that covers 80% of the piece's length. This plank must always be positioned on the rear side of the slab to ensure the "good side" of the piece is not marked. Some vices should also be added to its edges to ensure the wood does not fluctuate during the process of transporting and clamping the piece. Only when the clamp has been fastened with the plank and side vices can the slab be lifted carefully and, as in the previous case, movement of the piece and sagging must be controlled at all times.



## Handling With Slings

If several slabs are to be moved simultaneously, canvas slings will be used. Pay special attention to the load characteristics recommended by the manufacturer and never use metal slings to handle Lithotech slabs.

## Manual Handling

The phase of moving and placing the pieces made is a delicate moment. Displacement and approach must always be carried out as vertically as possible.

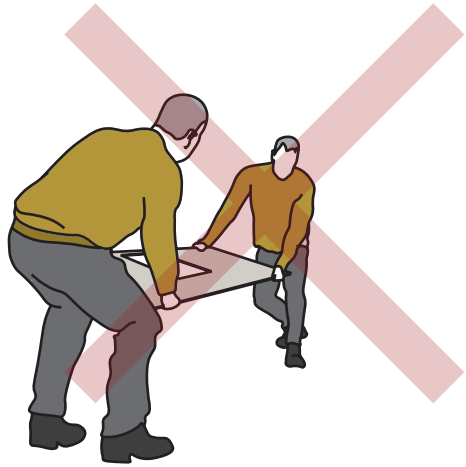
Before placement, ensure that the support is level and perfectly flat, otherwise adjustments must be made or shims used. The joined edges must fit together perfectly and have no differing angles that could cause breakages.

**CORRECT**

If there are holes in the manufactured piece, these must always be positioned facing upwards.

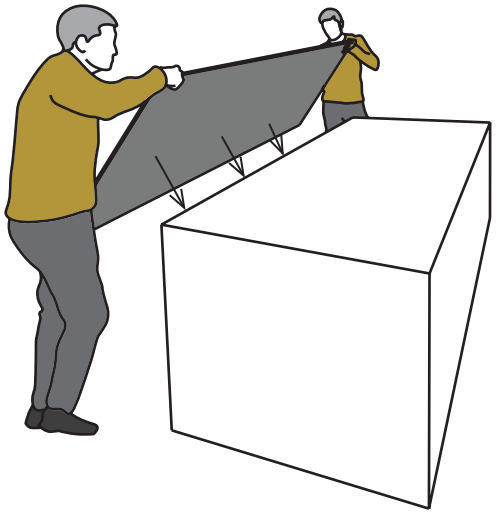
**INCORRECT**

Never transport the piece horizontally



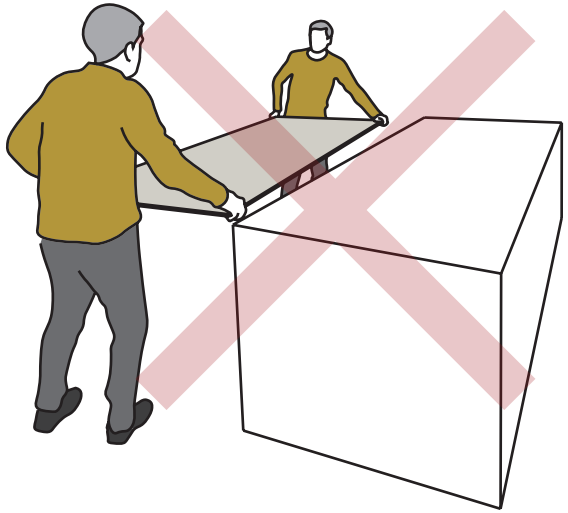
**CORRECT**

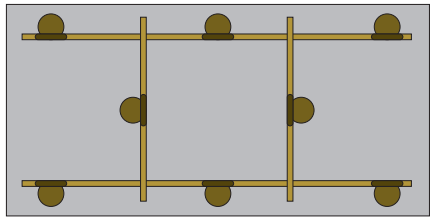
Look for the side support during the manoeuvre



**INCORRECT**

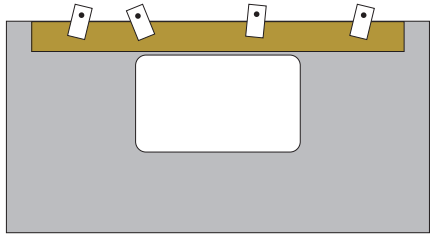
Never transport the piece horizontally





## Manual Handling With Suction Cups

Suction cup frames are extremely useful tools. Their guides mean they can slide, which helps to adapt the frame to any of the possible shapes the slab has been machined in. The suction cup grips the slab comfortably and reliably, meaning safe, ergonomic transport is assured.



## Manual Handling With Plank + Vices

If there is no suction cup frame available, the slab can be transported using a wooden plank along with vices, which assure the most delicate parts of the piece. The plank reinforcement is recommended for slimline pieces, or gaps with a great depth where the slab has a greater flex and, as a result, is more prone to breaking.

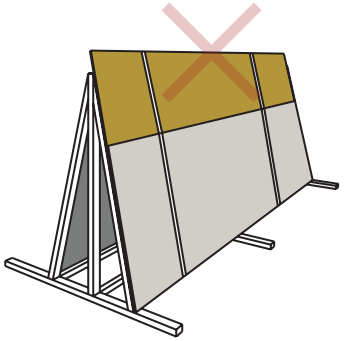
# Storing the slabs

## Transport

It is important the working limits of stands are never exceeded; if they are, this will always be to the detriment of the slab's correct attachment. Pieces must be well-attached to the structure using fastening belts and vices or jacks that prevent the piece from swaying.

**INCORRECT**

**The maximum height of the stand should never be exceeded**



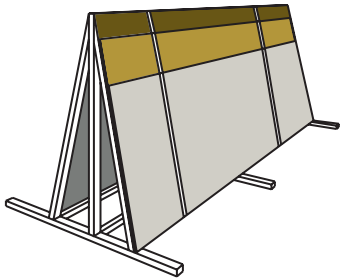
## Storing the slabs

To store the slabs on the worksite or in warehouses, they must be rested lengthwise on wooden beams to prevent them from getting chipped. The best way to keep them in perfect condition is to store them in their original packaging or else with the underside fully supported.

Do not rest larger slabs against smaller ones:

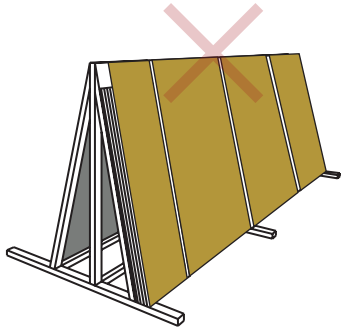
**CORRECT**

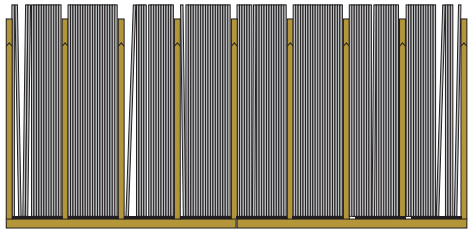
**Stack from greatest to smallest and always without exceeding the maximum height of the stand.**



**INCORRECT**

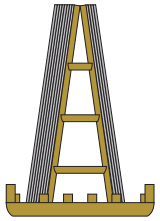
**Never stack large slabs against small ones**





## Storage. Supports for Slabs

Slab supports allow slabs to be stored, ensuring a minimum of three support points. This is one of the preferred options if there is not much space available in the warehouse. However, handling of the slabs requires some skill

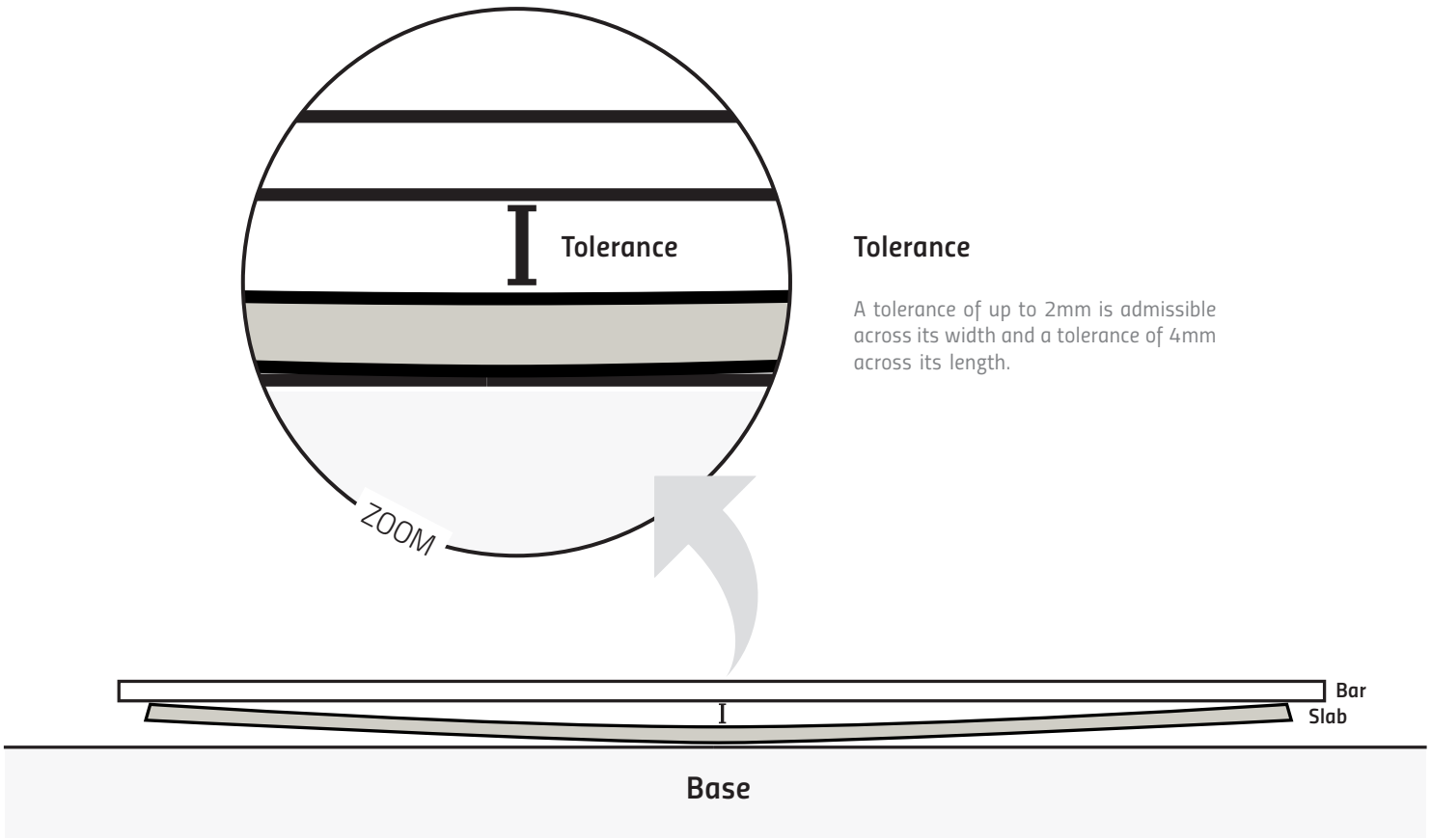


## Storage. Stands

When inclining the slab on a pyramidal structure, a larger surface area for the slab to lie on is achieved. The stand and its structure also allow slabs to be moved more quickly and comfortably than with simple supports. Bear in mind the correct way to attach the slab (mechanically) to the stands, especially during loading and unloading tasks, and also in outdoor storage, with the aim of protecting the pieces from the wind and inclement weather.

# I

# Inspecting The Slabs




**Tolerance**

A tolerance of up to 2mm is admissible across its width and a tolerance of 4mm across its length.

## Inspecting The Slabs.
## Physical conformity.

On receipt of the slabs, before they are machined, a close visual inspection should be made to check that they meet the necessary quality standards. The slabs must be carefully cleaned and the following points checked:

**Thickness**
**Variations in shine**
**Cracks**
**Flatness.**

To check the flatness of a slab, lay it horizontally on a completely flat base. To measure the flatness, an aluminium bar (or similar) covering the whole width or length of the slab should be placed on it.

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## Aesthetic Conformity

The slabs should be inspected from a distance of about a metre, preferably in a perpendicular direction, in natural light, in order to pinpoint possible flaws.

**Variation in the shade of different slabs**
**Contamination**
**Stains**
**Pinholes**

Irregularities within the tolerances shown below are considered to be admissible in 1st choice EXTRA XL products:

| Type of non-conformity | Dimension |
|---|---|
| Patches of a different colour | ≤0,5 mm. |
| Patches of a similar colour | ≤3 mm. |
| Pinholes | ≤0,6 mm. |

**IMPORTANT!**

**No claims will be accepted for material that is fitted or cut with existing flaws. The fabricator must check whether the slabs are apt for use before starting work on them. If they are not, they should be exchanged for new ones before they are cut or altered in any way.**

## Labelling

Each slab is identified with a unique, non-transferable label, featuring all necessary information.


**IMPORTANT!**

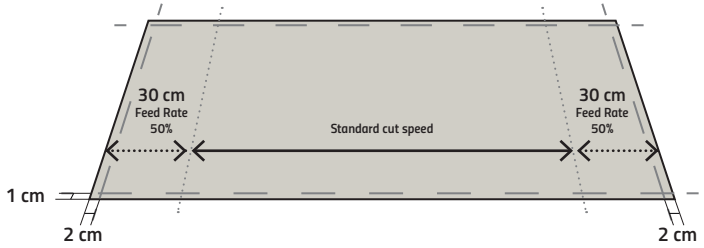
**It is necessary to save the Slab ID reference in order to be able to identify the material before or after the installation of the slab.**

# Machining

# Machining parameters
## Perimeter Distension

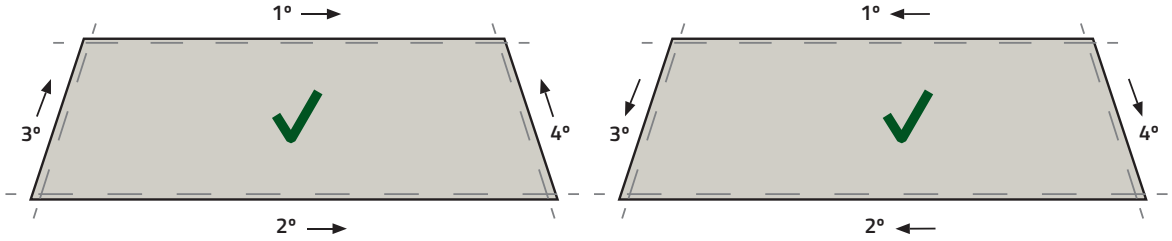
To machine slabs well, a good workbench is required. This must be solid, resistant, level, and absolutely flat. Water-refrigeration should be used to prevent the cutting equipment from over-heating.

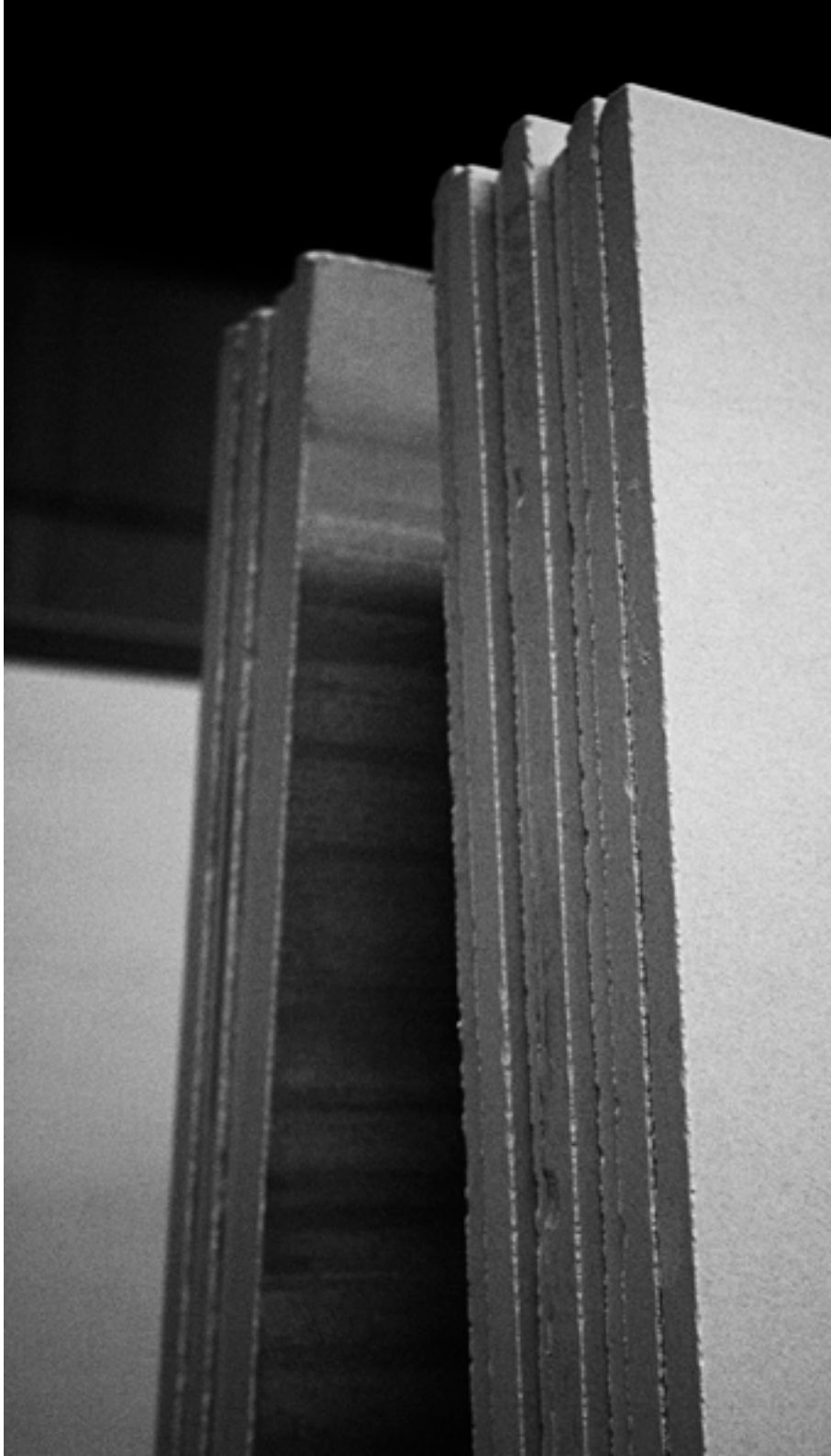
It is fundamental to use the righttype of machining tools. Special diamond drill bits and cutting discs for this type of product must be used.. Manual cutting disks with a diameter of between 115 and 125 mm have been shown to be the right ones for longitudinal cuts. Perimeter distension releases the slab from possible internal tension and helps to clean up its edges. To do this, a perimeter cut of a minimum of 2cm is carried out on the long and short sides of the slab. The slab will have a resulting maximum usable surface of 160 x 320 cm.




First, remove a strip from the long sides, always cutting in the same direction. Then repeat the same operation for the short sides.

Pay particular attention to the feed rate, reducing it by half during the first and last 30 cm of the line that is being cut. Generally speaking, when mitre joints are cut, a feed rate no higher than 0.5 ml/min should be used.



## Cutting Machinery Parameters

| Thickness | Straight Cut Speed (m/min) | Mitre Joint Cut Speed (m/min) | Ø Disc | RPM |
|---|---|---|---|---|
| 12 mm | 1,8 | 0,9 | 350 | 2300-2500 |
| | | | 400 | 2200-2400 |

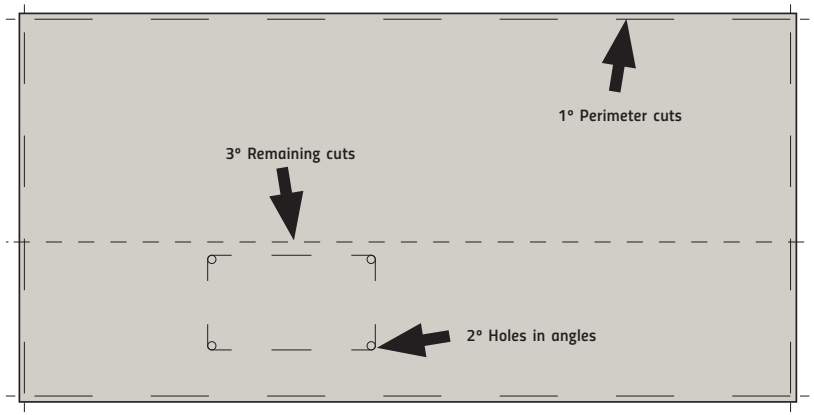
| Thickness | Straight Cut Speed (m/min) | Pressure (Bar) | Abrasive (Kg/min) |
|---|---|---|---|
| 12 mm | 1 | 3600-3800 | 0,4 |

| Tools | RPM | Mitre Joint Cut Speed (mm/min) |
|---|---|---|
| Core Bit | 4500-5500 | 15 |
| Rabetting Router Bit 12 mm | 4500-5500 | 160 |
| Cutting Router Bit | 8000-1000 | 260 |

## Cutting sequences
### Bridge Cutting Machine

To machine slabs well, a good workbench is required. This must be solid, resistant, level, and absolutely flat. Water-refrigeration should be used to prevent the cutting equipment from over-heating It is important that the flow of water is aimed fully at the cutting area, which will help to prevent tools from overheating. The type of tool used is also a key factor when machining the material, and special diamond drill bits and discs should be used for this type of product.

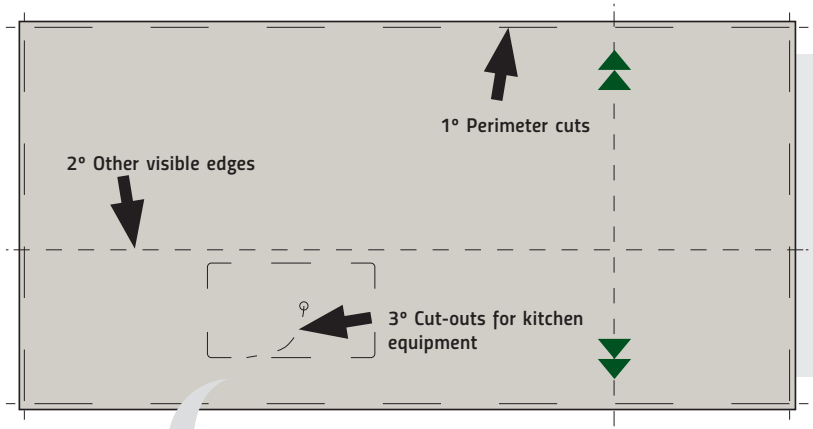
**1° Perimeter cut removing minimum of 2 cm from each side.**
**2° Drill holes in all inner angles using a drill bit with a minimum diameter of 3 mm.**
**3° Cut any other visible edges of the slab.**




## Waterjet

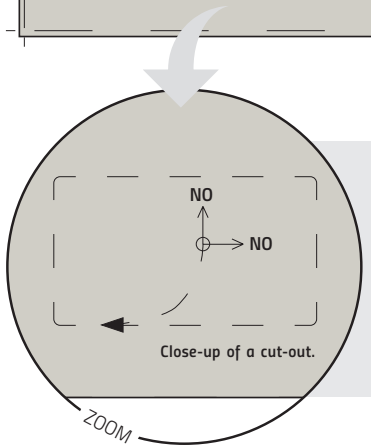
Before proceeding to start, make sure that the cutting table is straight and flat and that it fully supports the slab.

**1° Perimeter cut removing minimum of 2 cm from each side.**
**2. Cut other visible edges.**
**3. Make any cut-outs for kitchen equipment. All the inner angles must have a minimum radius of 3mm.**




The perimeter cut of the slab to release tension can be used as a final cut of the piece being made.

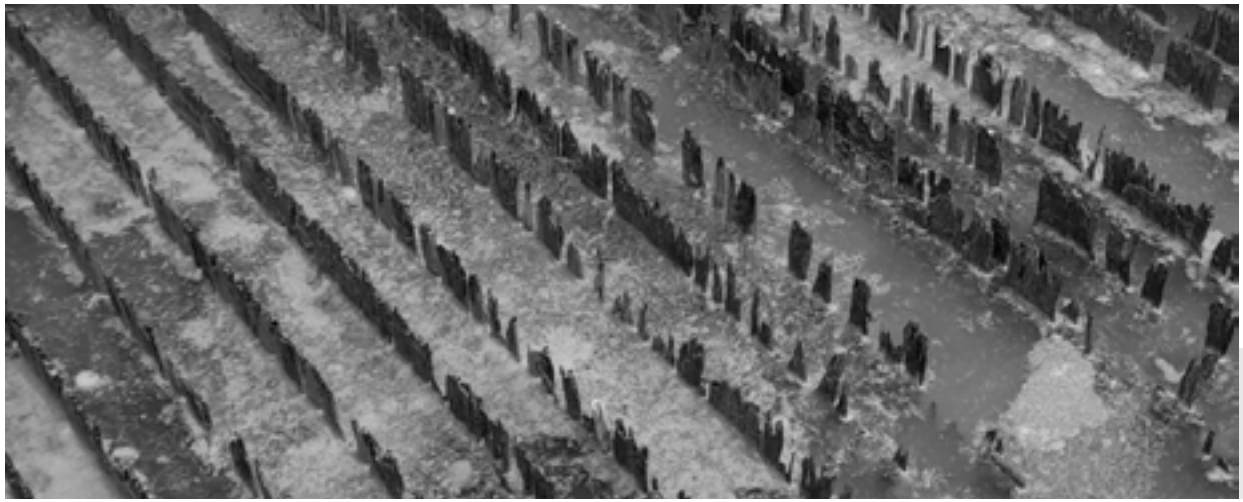
FOR PERFORATION, FIRST CUT TOWARDS THE EDGE OF THE SLAB OR PARALLEL TO THE SLAB EDGE AND CONTINUE THIS DIRECTION TO FINISH THE PIECE. WE DO NOT RECOMMEND MAKING THE FIRST CUT TOWARDS THE CENTRE OF THE SLAB.




REDUCE THE PRESSURE WHEN DRILLING HOLES.

To make a cut-out, start cutting from inside the marked area and then move in an arc toward the perimeter of the cut-out.

DO NOT START BY CUTTING IN AN INWARD DIRECTION.

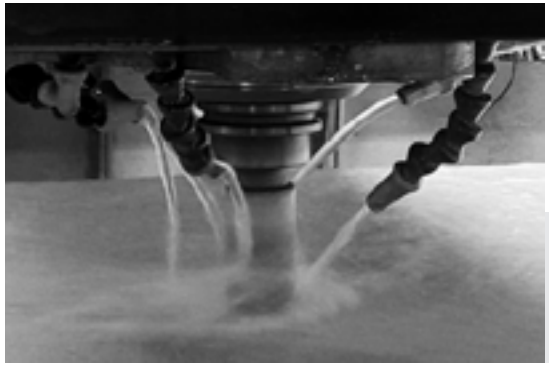


INCORRECT STATE OF WORK TABLE

CORRECT STATE OF WORK TABLE

## Computerised Numerical Control - CNC

Before proceeding to start, check that the cutting table is flat and level and that there are no residues on the suction cups. The cutting table must provide sufficient support for the slab, The suction pads must be correctly distributed across the surface, using at least two of them to stop the surplus
piece of slab from swivelling at the end of the cut.

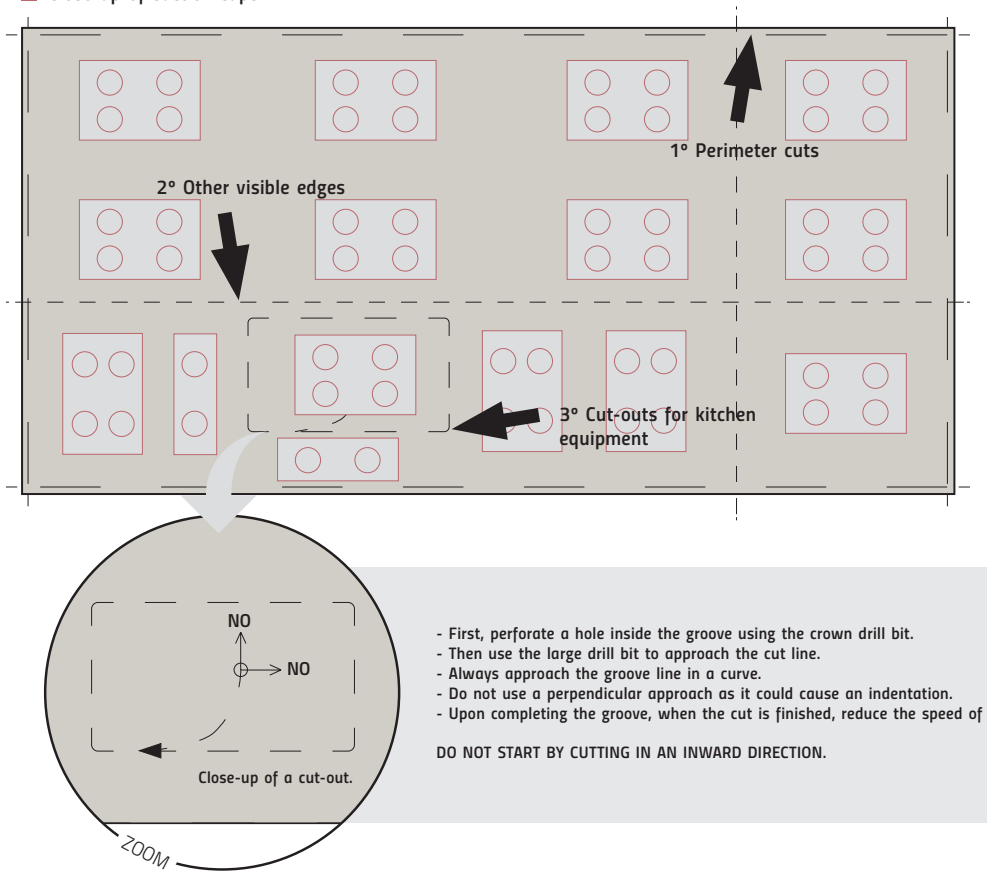


CHECK THE SLAB IS SUFFICIENTLY SUPPORTED AND THERE IS SUFFICIENT WATER PRESSURE TO COOL THE TOOL USED.

## Computerised Numerical Control - CNC

**1° Perimeter cut removing minimum of 2 cm from each side.**
**2° Drill a hole with a core bit.**
**3° Make the cut-outs with a router bit. A minimum 3mm router bit will be needed for all the inner angles**

Close-up of suction cups




- First, perforate a hole inside the groove using the crown drill bit.
- Then use the large drill bit to approach the cut line.
- Always approach the groove line in a curve.
- Do not use a perpendicular approach as it could cause an indentation.
- Upon completing the groove, when the cut is finished, reduce the speed of approach to 50%.

DO NOT START BY CUTTING IN AN INWARD DIRECTION.

## Computerised Numerical Control - CNC Routers.

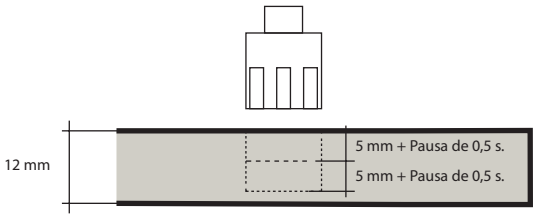
RECOMMENDATIONS:

- **Core bit:** Drill into the slab at 5mm deep intervals, at the lowest possible speed, particularly at the end of the process. The core bit should be lifted up a little, just prior to finishing, to release the pressure on the inside of it.
- **Rabetting router bit:** Always start from a hole previously drilled with a core bit. Never lower the bit directly onto the surface. During the first two passes, just remove 0.5 mm. Then remove 2 mm per pass. In the case of 12mm-thick slabs, never remove more than 6 mm.
- **Cutting router bit**: The slab to be cut must be centred at the same height as the cutting bit. Do not use the oscillating mode. This could lead to chipping.

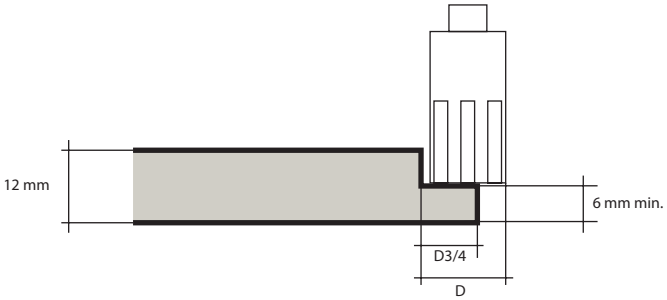
The paler models (Blanc Carrara, Blanc Statuarietto, Blanc Calacatta, Blanc Calacatta Gold, Blanc Invisible, Blanc Arabescato and Era Infinity White) are the hardest for tools due to the raw materials used to make them.

**THE FEED RATES SHOULD BE REDUCED FOR THESE MODELS TO PREVENT THE DISC FROM OVERHEATING DUE TO THE HARDNESS OF THE MATERIAL.**

**Core Router Bit**

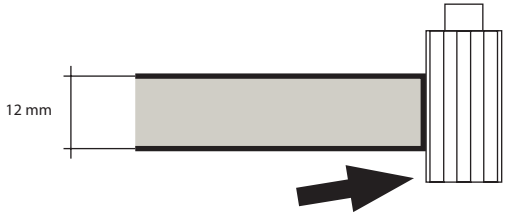



**Rabetting Router Bit**




**Cutting Router Bit** ✖


**Cutting Router Bit** ✓



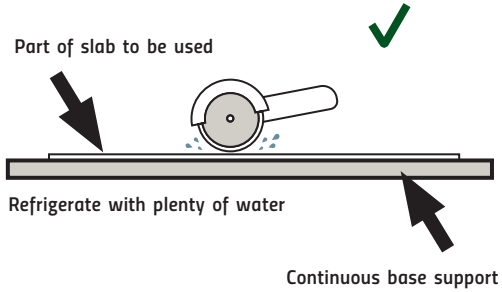

**IF EQUIPMENT IS INTEGRATED FLUSH WITH THE WORKTOP, TRIM DOWN THE EDGE OF THE CUT-OUT TO REDUCE ITS THICKNESS USING AN INCREMENTAL ROUTING BIT.**

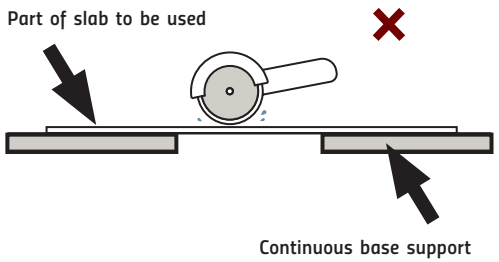
## Manual Cutters

If a manual cutter is used, a low feed rate should be used, with high refrigeration. The slabs should not be dry cut. Always use plenty of clean cool water to refrigerate the disc and the slab, exerting sufficient pressure to expel any dust and cutting residues. The water jet should be aimed at the cutting line.

Before commencing, make sure that the slab rests on and is fully supported by a solid, resistant workbench that is flat and level, with no unevenness. Always start cutting from the part of the slab to be used for the worktop, moving toward the surplus piece of slab. Next, sand the upper and lower cut edges (using 60/120 grit diamond sandpaper) to prevent them from chipping and to avoid injuries caused by hard sharp corners.

Only officially approved discs should be used to cut Lithotech.



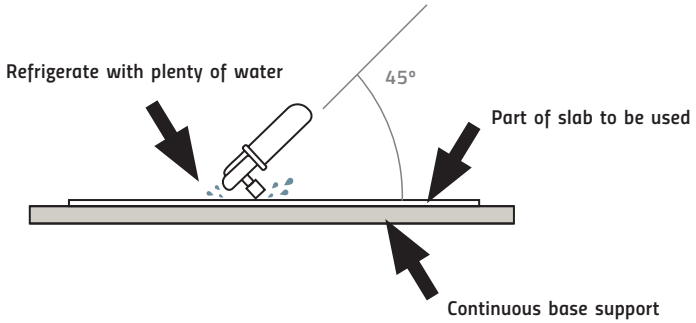



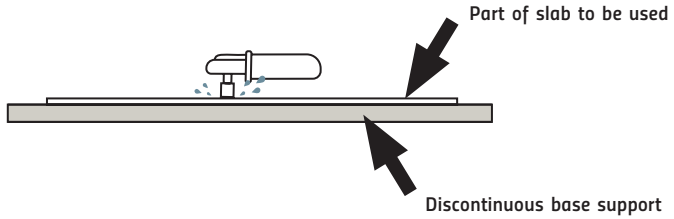

### Discs

ø115 mm, ø22 spindle (*) from 11.000 to 13.000 rpm
ø125 mm, ø22 spindle (*) from 11.000 to 13.000 rpm
ø230 mm, ø22 spindle (*) from 9.000 to 11.000 rpm

## Manual Machining - Drills

Only officially approved drills should be used to machine Lithotech. As with a manual cutter, a very low feed rate and high refrigeration should be used. If the drill slips on the surface at the beginning, holes should be made in a material that can be used as a guide. This can then be clamped onto the surface of the slab. If the Lithotech surface is drilled directly, it should first be done at an angle of 45° to a depth of 3 mm. Then the drill can slowly be straightened to an angle of 90°. When it is at a right angle, the drill hole can be finished off, making small circular movements.



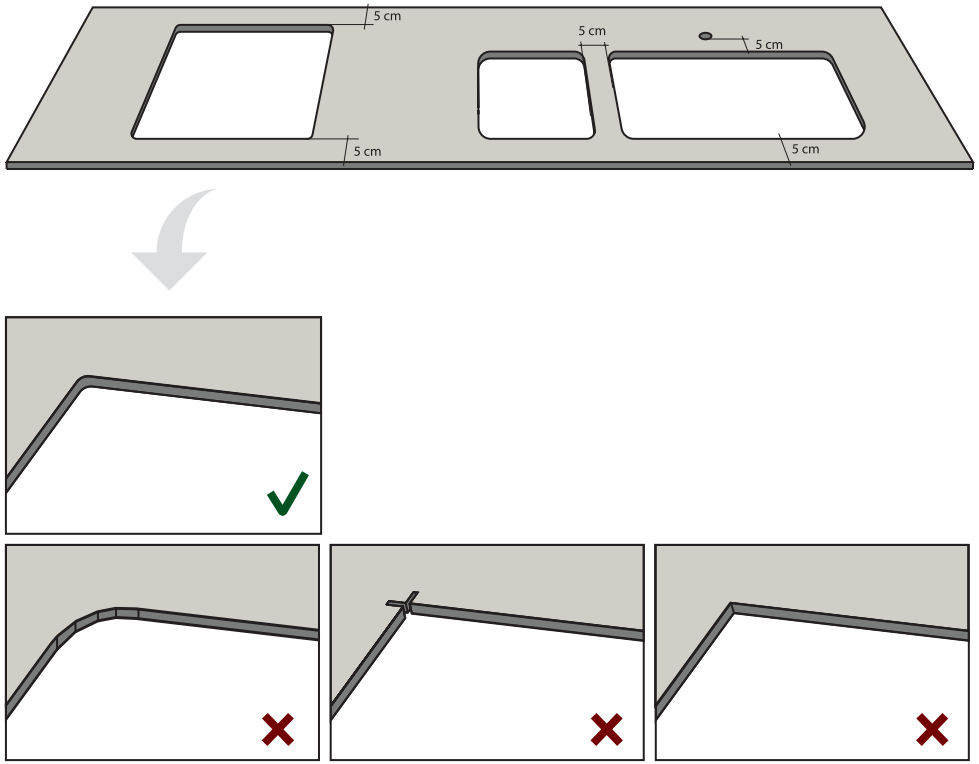
# Principles of Design and Manufacture

# Principles of Worktop Design and Manufacture

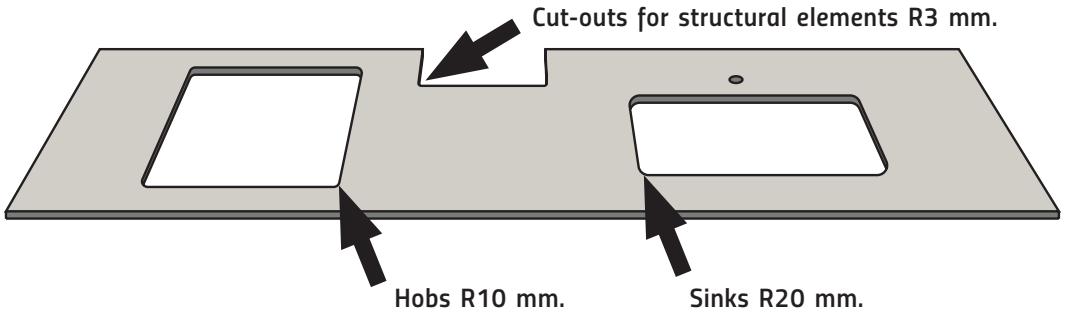
## Minimum Distance, Inner Angles and Bedel Edges.

A minimum distance of over 5 cm should be left between cut-outs or between a cut-out and the edge of the slab so as not to weaken it too much. The bigger the distance, the more rigid and resistant the slab will be.

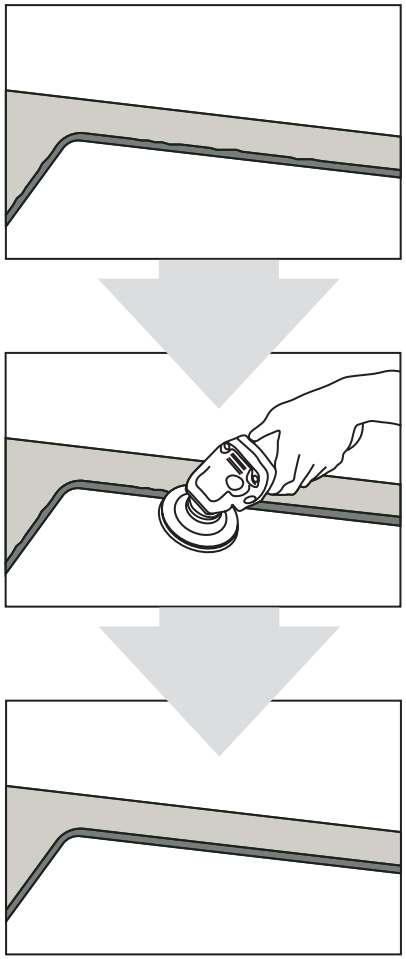
The inner angles of cut-outs and inner perimeter angles should have a radius of at least 3mm to avoid delicate breakable areas. The bigger the radius, the more resistant the slab will be. In the case of cut-outs for kitchen appliances or equipment made with saws or cutting machines, the corners of the cut-out should first be drilled with the right radius, before proceeding to cut the rest of it.




If the edges of a cut-out will be concealed by a top-mounted sink or hob, a larger radius should be used.
In such cases, a minimum radius of 10 mm is recommended for hobs and 20 mm for sinks. Cut-outs to accommodate structural elements like columns should have angles with a radius of 3 mm.




When the material is cut, it might have uneven edges or ones with chips or tiny cracks. To prevent this from leading to future breaks, the top and bottom edges of cut sections and cut-outs must be polished and given a bevel edge. To make bevel edges, special diamond cutting discs or sandpaper should be used.



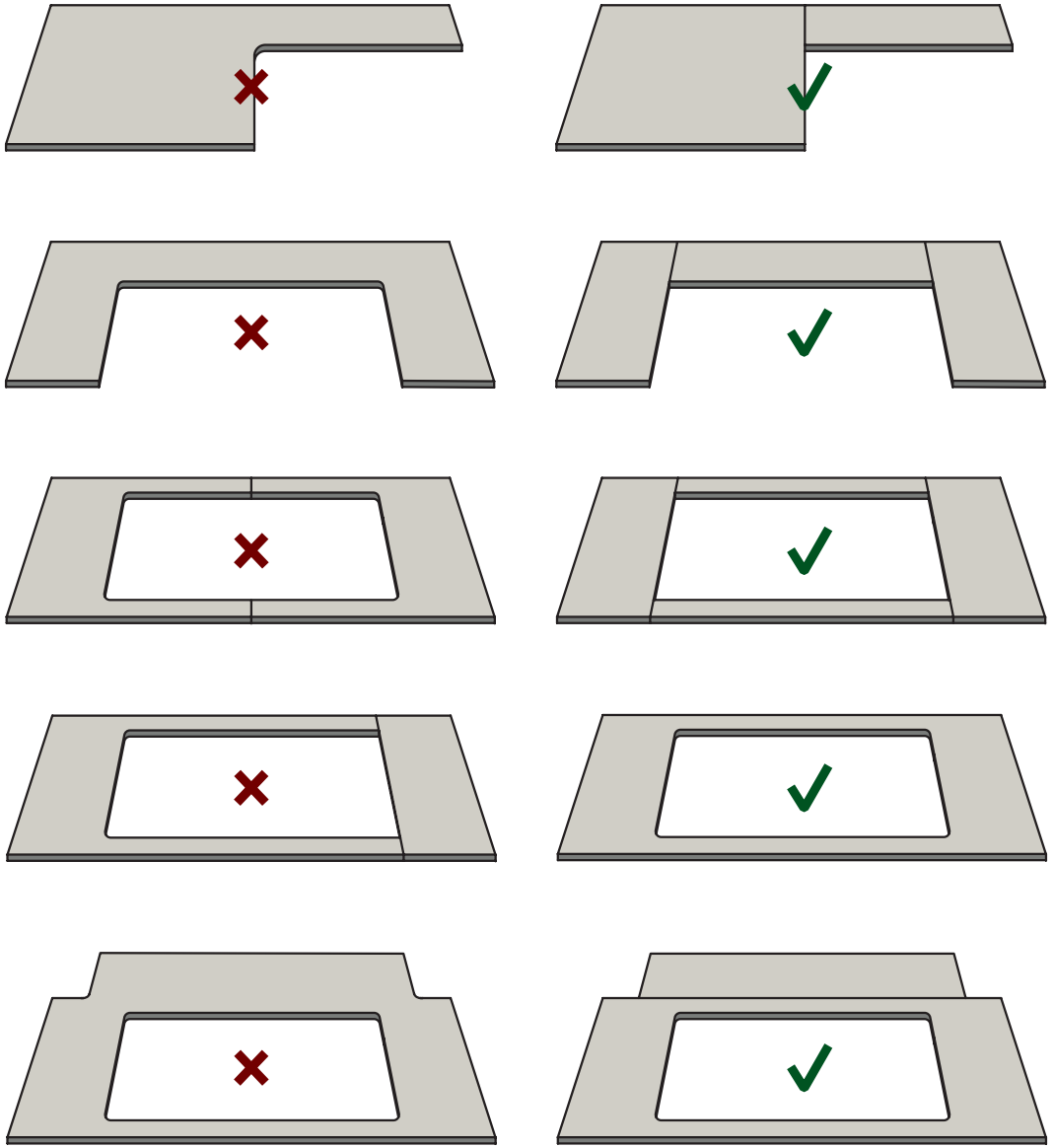
*Polishing and sanding cut edges.*

## Recommended Division Of Slabs

When a slab must be divided into parts to make a worktops, the end design must be geometrically balanced and, insofar as is possible, all loads must be uniformly distributed.
The following illustrations show the most common recommended ways of dividing a slab into parts.

**IMPORTANT!**

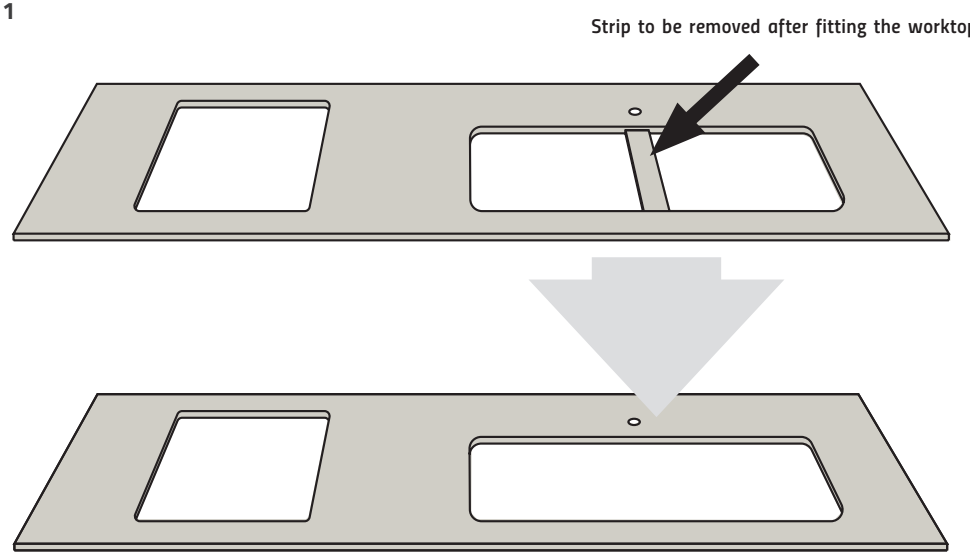
**If the recommended cutting cannot be carried out due to the design of the kitchen, send an email to info@lithotechslabs.com to consult possible solutions.**



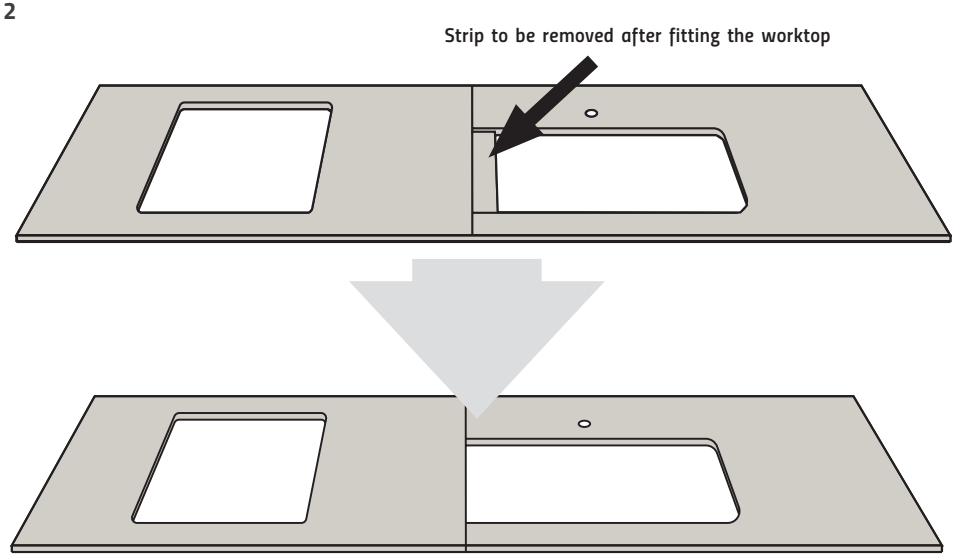
## Large Cut-Outs

If large cut-outs or ones with extreme angles have to be made in a slab for design reasons (>45 cm in any direction), leave a strip of material as a temporary reinforcement. This strip, which should be trimmed down to half its original thickness, can then be completely removed once the worktop has been fitted. This will reduce the risk of the slab breaking when it is being handled or fitted.

**CASE 1**

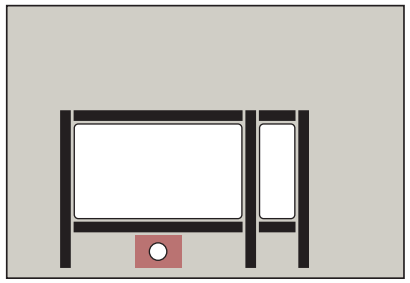



**CASE 2**

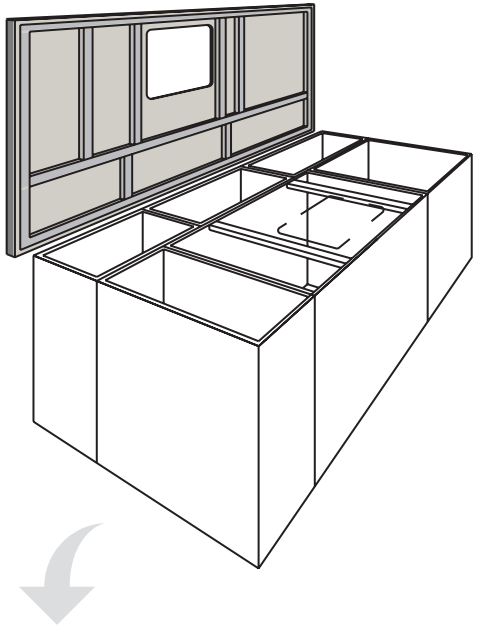


## Reinforcing the Worktops

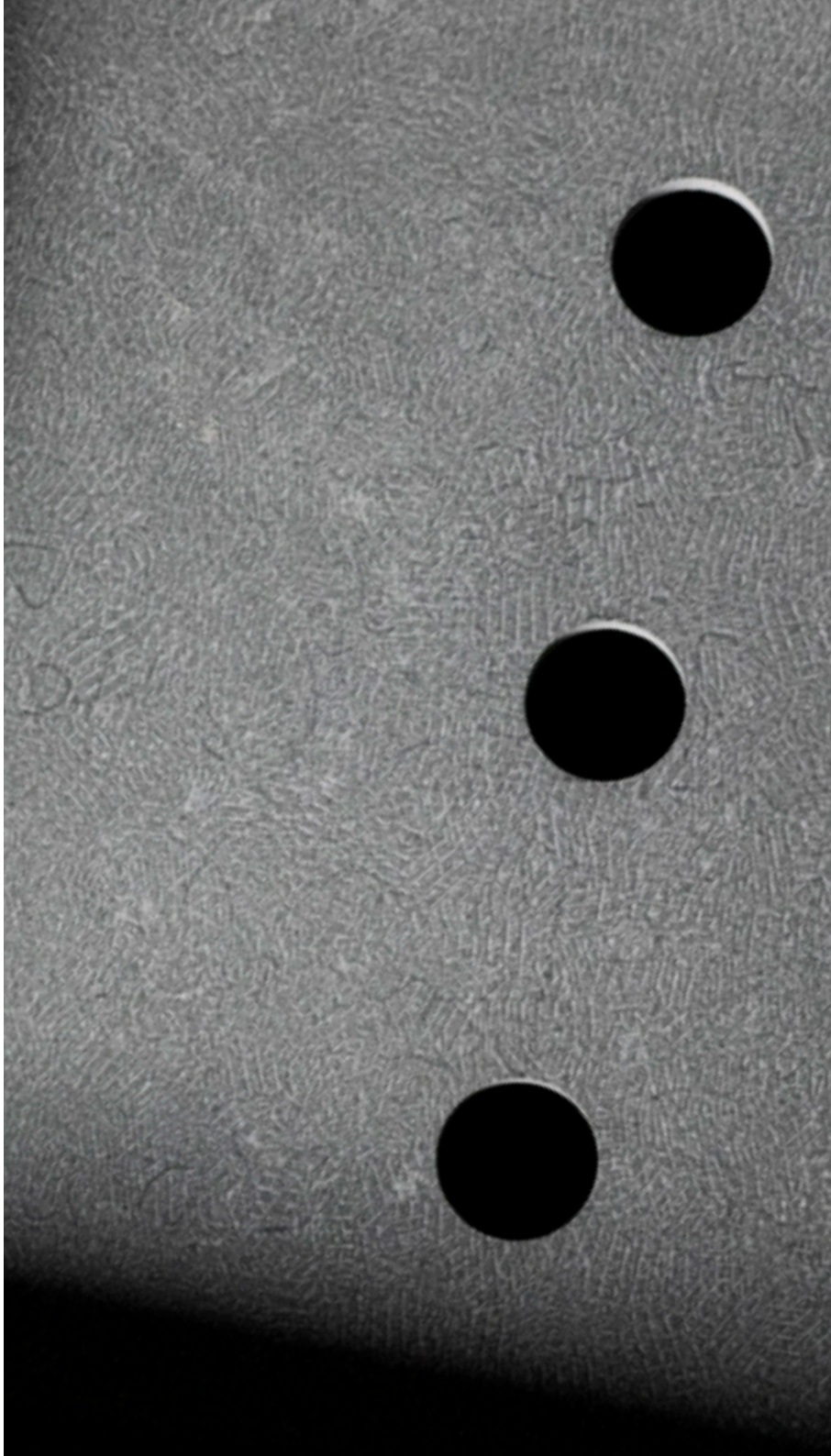
The reinforcements of the mitre joint edges must use Lithotech strips, dense granite or expanded polyurethane. Other reinforcement materials may experience thermal expansion that may cause the worktop to curve. It could also cause the mitre joint edges to open over time. In the case of worktops with or without a mitre joint edge, we recommend placing reinforcements that will provide the worktop with greater rigidity. These reinforcements must be distributed along the perimeter such that they are directly supported by the sides of the kitchen units.



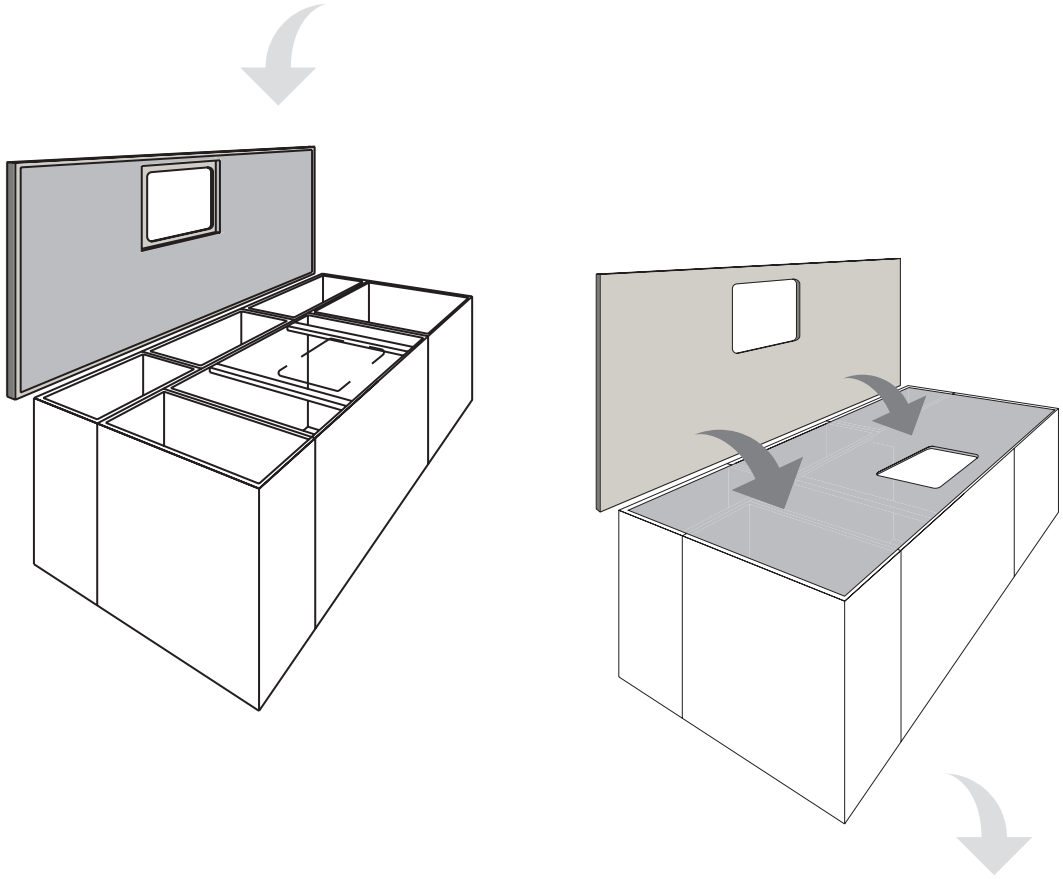
We recommend installing a reinforcement piece (wood, rubber or similar) in the gaps left for the taps to strengthen this area. This reinforcement will distribute the forces generated during installation and daily use.



If a system of crossbars is used, it is particularly important to reinforce the perimeter of the slab and any cutouts, in addition to points where the worktops is supported by the units. There should be a distance of no more than 60 cm between the crossbars. The crossbars should be made of a material with a high expansion coefficient similar to that of the slab, such as strips of dense granite or Lithotech, and they must have a width of at least 2cm.

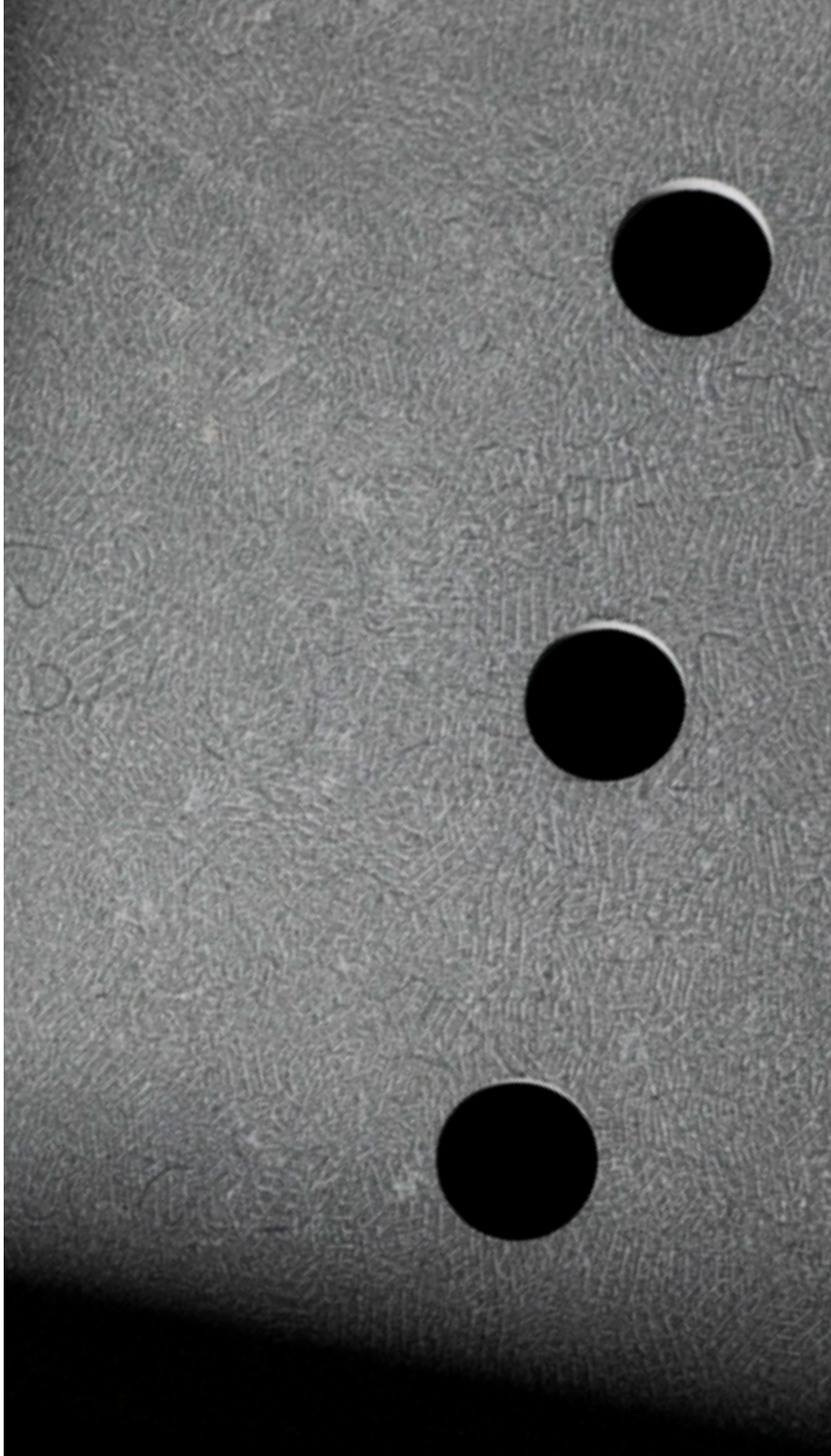


A continuous base support should be prepared that runs under the whole underside of the fabricated slab to give it greater stability. Marine plywood with a minimum thickness of 20 mm should be used to support the whole worktop. The adhesive for bonding the Lithotech worktop to the support should be sufficiently elastic (e.g. silicone) to compensate for differences in the expansion of both materials.

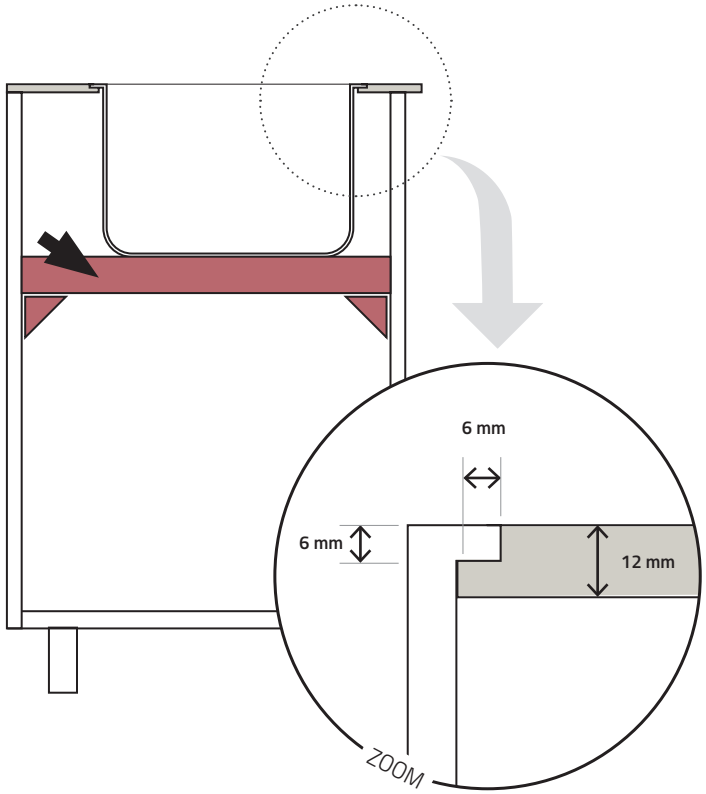


When slabs have straight edges, because concealed reinforcements like crossbars or a continuous bonded base support cannot be used, a continuous piece of board must be fixed to the kitchen units to provide full, level support across all the furniture.





**Close-up of reinforcement strips**



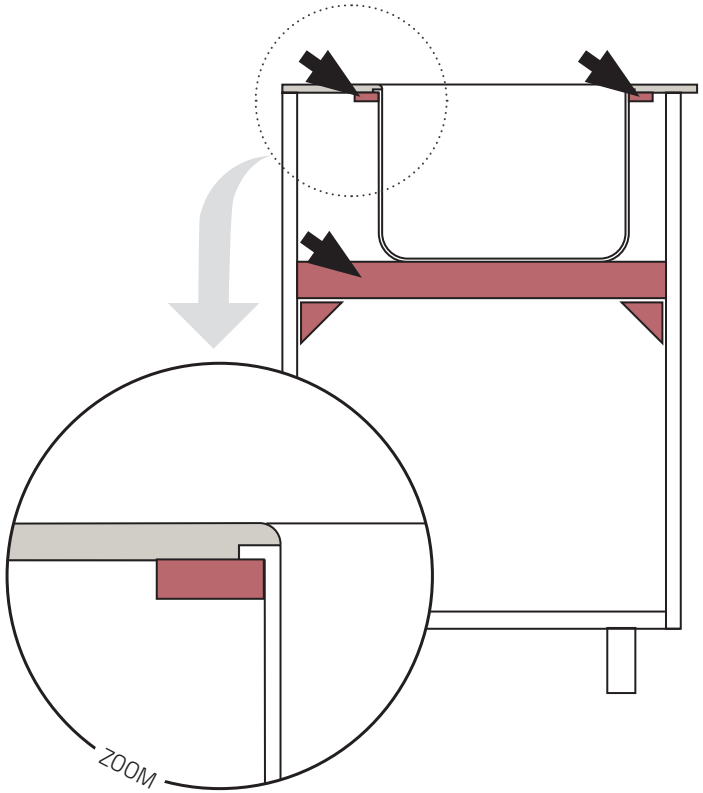

In the case of large sinks (>45 cm in any direction) and **under-mount sinks**, **a support bar should be fitted below the sink** to prevent the weight of water from breaking the slab or pulling the sink loose.

In the case of under-mount sinks, the edge of the cut-out should be given a half-round finish. The sink should also be reinforced underneath by bonding Lithotech strips with a minimum width of 30mm around 50% of the perimeter.

**IMPORTANT!**

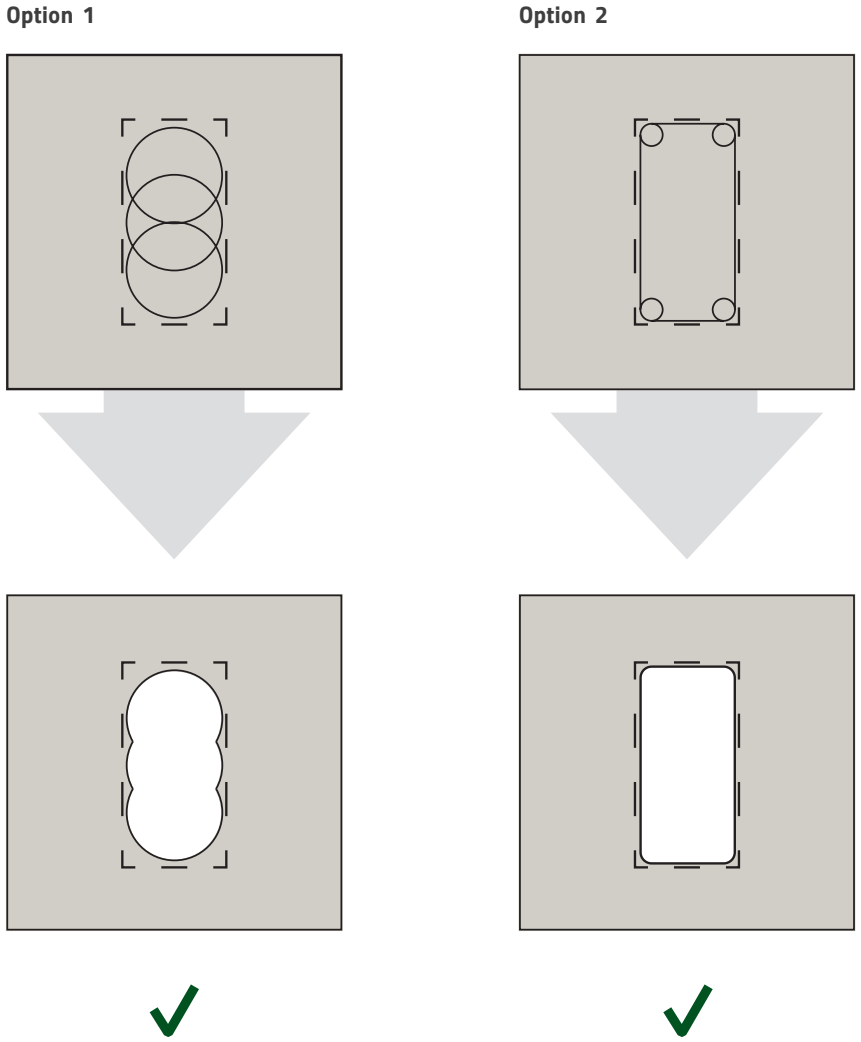
**Removing more than 6 mm is not recommended on a slab of 12 mm.**

**Close-up of reinforcement**



## Cut-outs For Switches & Accessories

To make a cut-out in the slab for accessories, plugs or switches, round holes should first be drilled. Alternatively, the whole cut-out can be made by overlapping several drill holes.

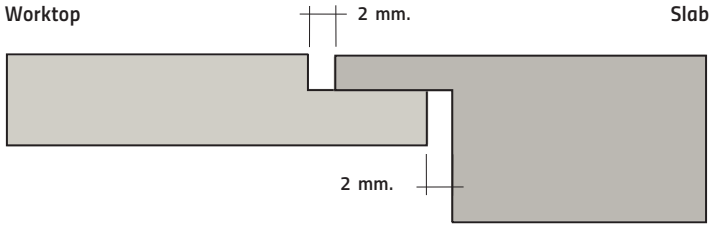



*Diagrams of alternative ways of making outlet cut-outs.*

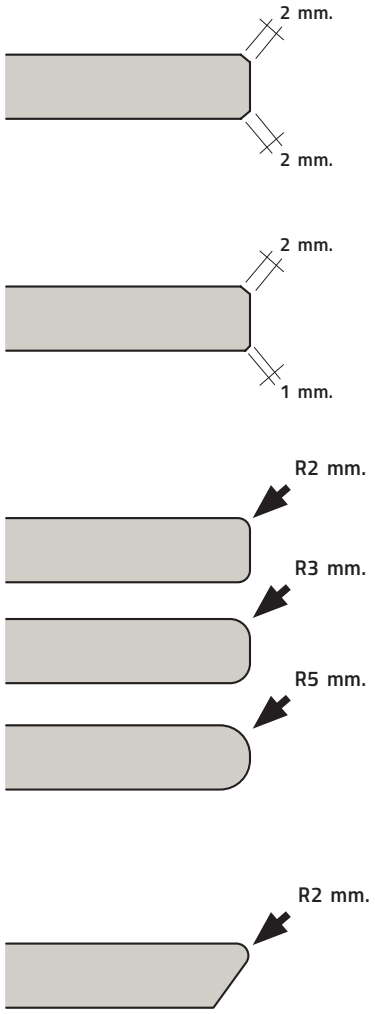
# Edges and Joints

The outer edges of slabs are more prone to impacts and so they should be given a bevel or rounded edge to boost their resistance. The bigger the bevel edge or radius, the higher the slab's resistance to impacts.
Lithotech recommends the following finishes:

### JOINS IN GROOVES

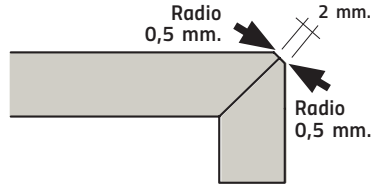



### SIMPLE EDGES

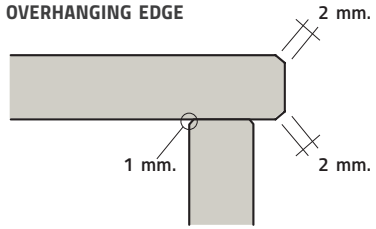



### COMPOUND EDGES

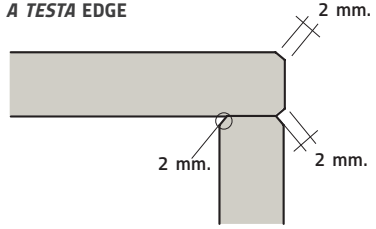
#### STRAIGHT MITRE JOINT




#### OVERHANGING EDGE

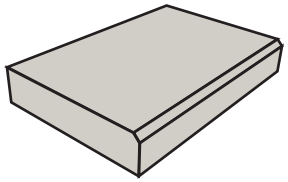



#### *A TESTA* EDGE

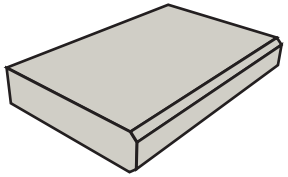


When a finish is chosen, the slab's required appearance and resistance must both be taken into account. Note that the bigger the bevel edge on straight edges or the bigger the radius on rounded edges, the higher the slab's resistance to impacts.
Thanks to the use of earth pigments and the Corelith technology used to design the inside of the slabs, whenever required, big bevel edges and edges with large radiuses can be made to ensure a higher resistance. The bigger the bevel edge or the radius of the edge, the more visible the slab's inner core is. This reflects the bid by Lithotech to achieve seamless continuity between the inner and outer design of its slabs.
In areas with a high risk of impacts (e.g. close to sinks or dish washers), rounded edges can be used to boost the slab's impact resistance.
Edges can be dry or wet-polished dry, using standard discs for granite or marble.

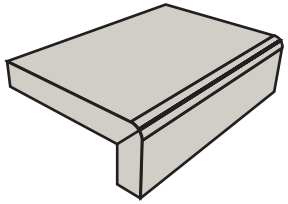
After machining and polishing the slabs, whatever the chosen finish, the edges must be treated with a sealant to enhance their appearance. One example of a possible sealant is Fila MP/90 by FILA.
In the case of straight edges or double straight edges, a bevel of at least 2 mm is recommended to boost their impact resistance.



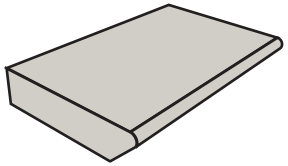
**Straight edge**



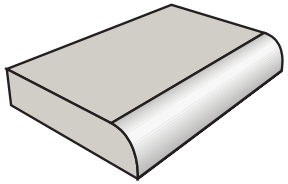
**Double straight edge**



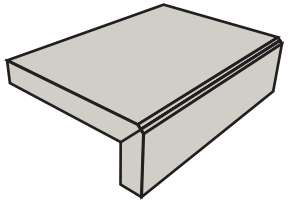
**Rounded mitred edge**



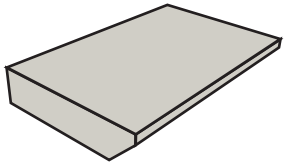
**Rounded reverse bevel**



**Demi bullnose**



**Straight mitred edge**



**Straight reverse bevel**

*Types of common finishes.*

A recommended minimum distance of 2 mm should be left between Lithotech slabs and other elements, like walls, sinks or hobs.

Walls might have an uneven surface, affecting the meeting point with the slab. To avoid problems, insert a 2mm expansion joint. This joint can be concealed with a backsplash. Joints that are left unconcealed can be filled with silicone. When silicone is applied, protect the slab with masking tape.

**IMPORTANT!**

**We recommend using the joins that the induction hob manufacturer supplies or a high-temperature or heat-resistant silicone.**

**MEETING POINTS**

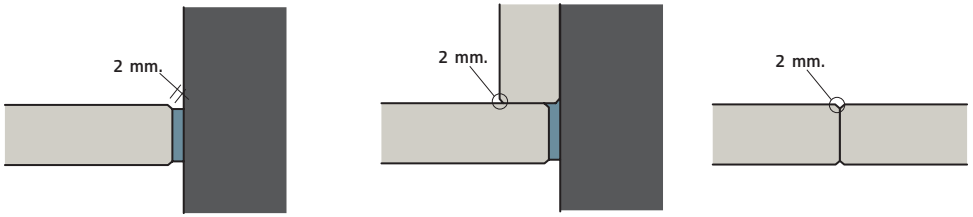
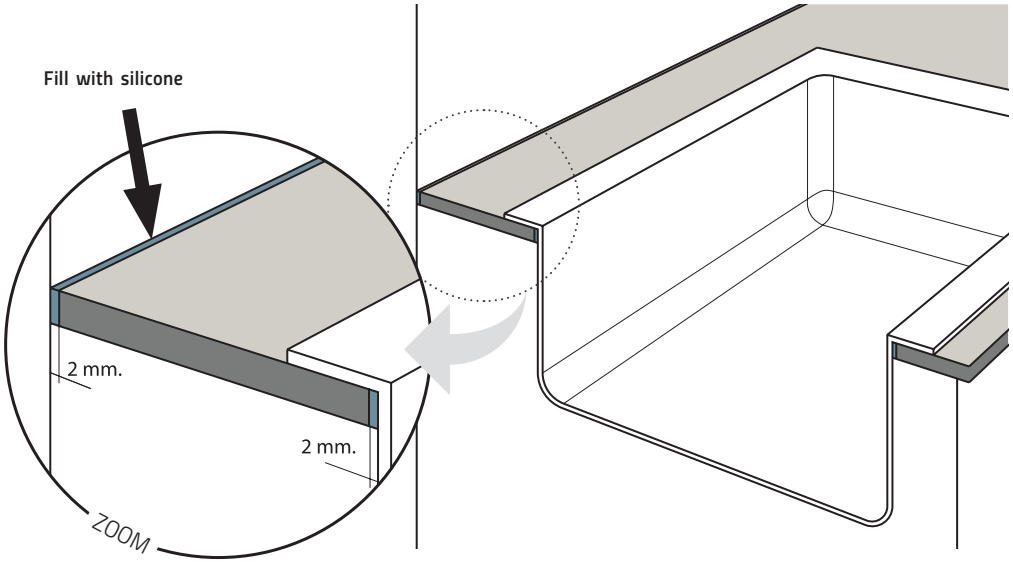
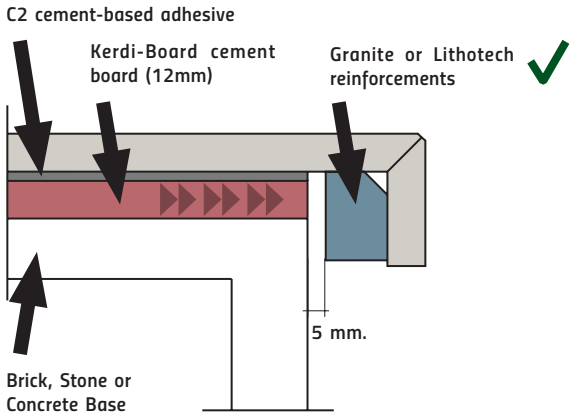


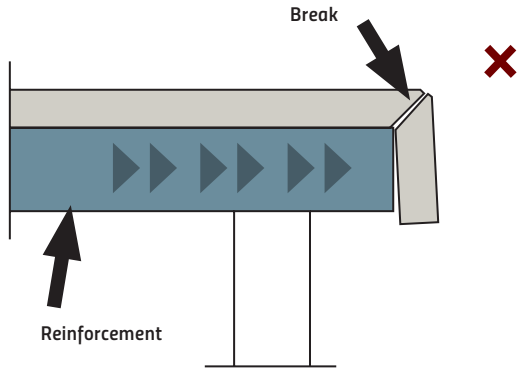

**DIAGRAM OF INSTALLATION OF TOP-MOUNTED SINK**



## Outdoor Worktops

When worktops are fitted outdoors, a distance of 5 mm should always be left between the reinforcement and the mitred edges. This distance will allow for the absorption of any expansion or contraction to which the worktop is subject outdoors.
To prevent the worktop from breaking, it should be laid on a continuous base of brick, stone or concrete. If this base has any kind of unevenness, cement board like Kerdi-Board should be placed on top. Wood board or marine plywood should not be used since they might become deformed due to the weather.
The worktop should be bonded to the base with a C2 cement-based adhesive. Flexible adhesives such as epoxy or construction adhesive should be avoided. To bond mitre joints, UV-resistant adhesives suitable for outdoor applications should be used.

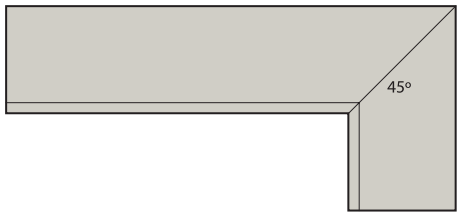


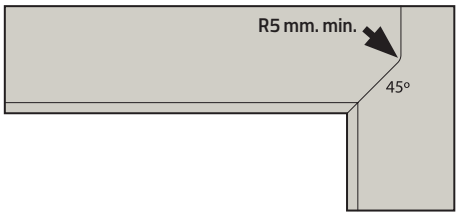



## Large or L-Shaped Worktops

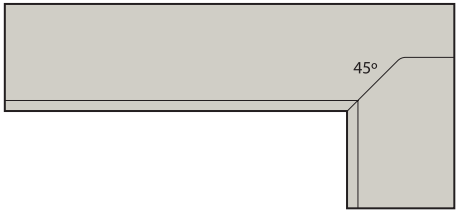
In the case of large or L-shaped worktops, Lithotech recommends the use of a mitre-jointed profile to boost the perimeter's resistance. With L-shaped worktops, it is also advisable to divide the slab into parts to form the L shape. This will avoid unevenly distributed loads and the formation of right angles.

In this last case, the recommendations on internal reinforcements and worktop supports, shown in section "Reinforcing the slabs", must be carefully followed.



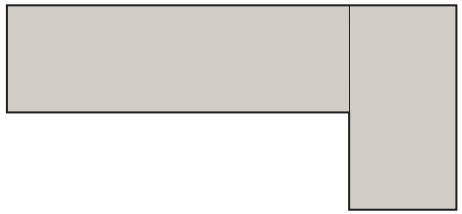

**Lithotech** recommends pieces joined at a 45° angle to increase the stability of the worktop once fitted.

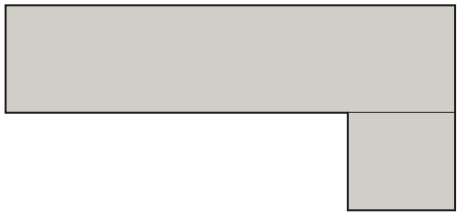


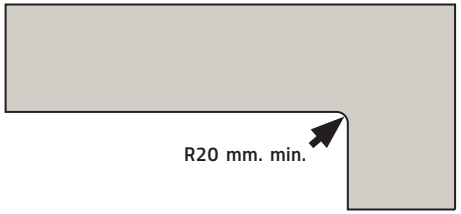

In addition to the recommended designs for pieces bonded with a mitre joint, when worktops have a straight edge, straight pieces can be joined to form a flag-and-pole shape.

Single-piece L-shaped worktops with straight edges must have angles with a minimum radius of 20 mm. Make sure that the kitchen units are level and in perfect condition before fitting a worktop of this kind.

*Straight Edges:*

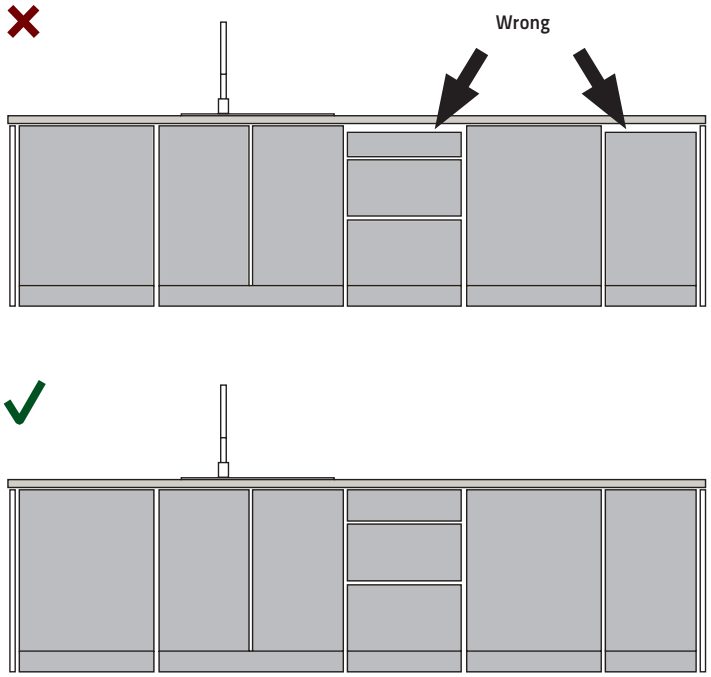






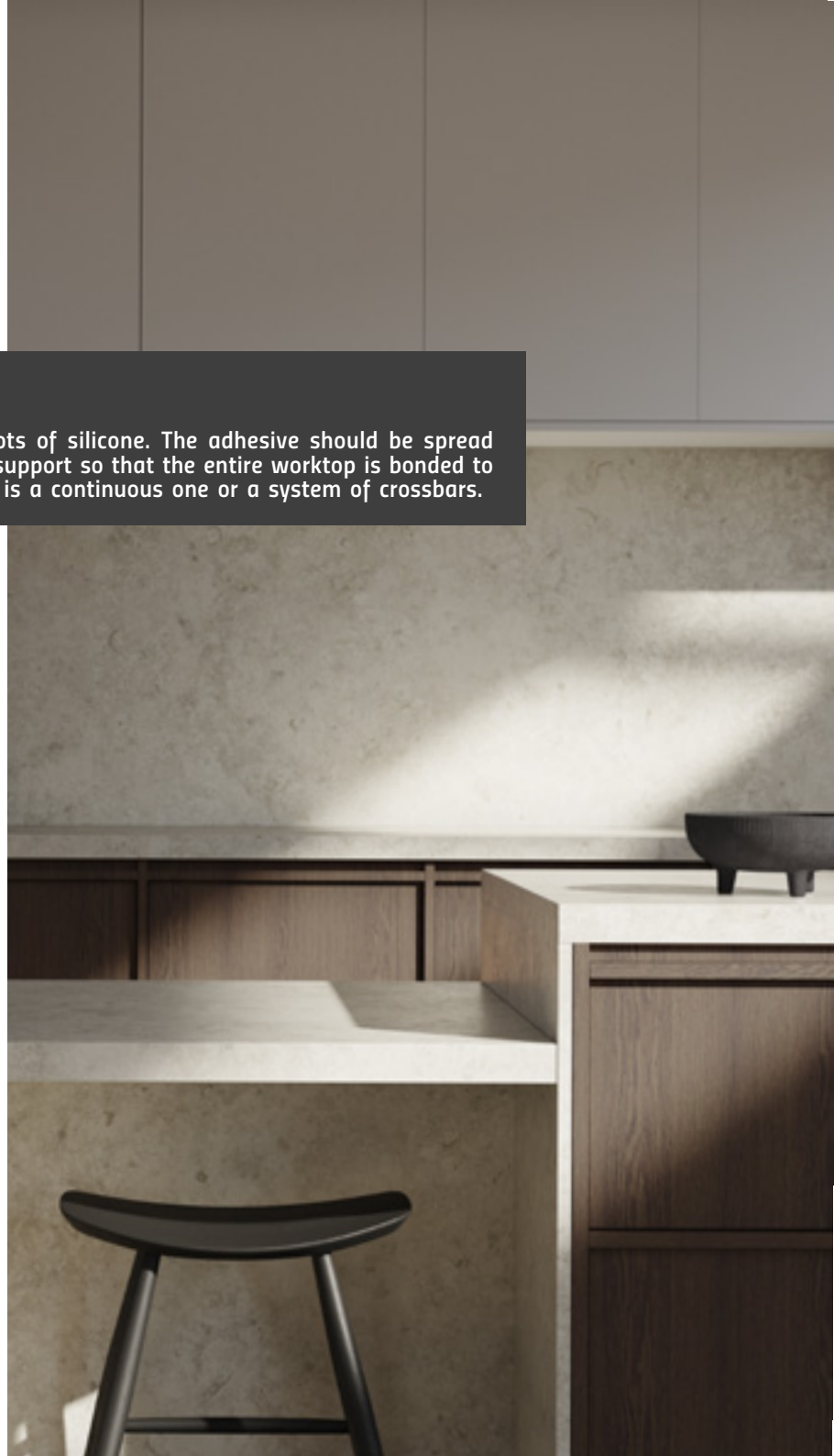
# Worktop Installation.
## Fitting the Slabs

The base support on which the slab is laid must be structurally solid and totally flat and level. Most breaks during and after the installation process are caused by an uneven support or by dirt or residues from the fabrication process.
The surface of the worktop should be fully supported by the base, because any unsupported area will make it more fragile.




**IMPORTANT!**

**Never apply isolated dots of silicone. The adhesive should be spread across the whole base support so that the entire worktop is bonded to it, whether the support is a continuous one or a system of crossbars.**

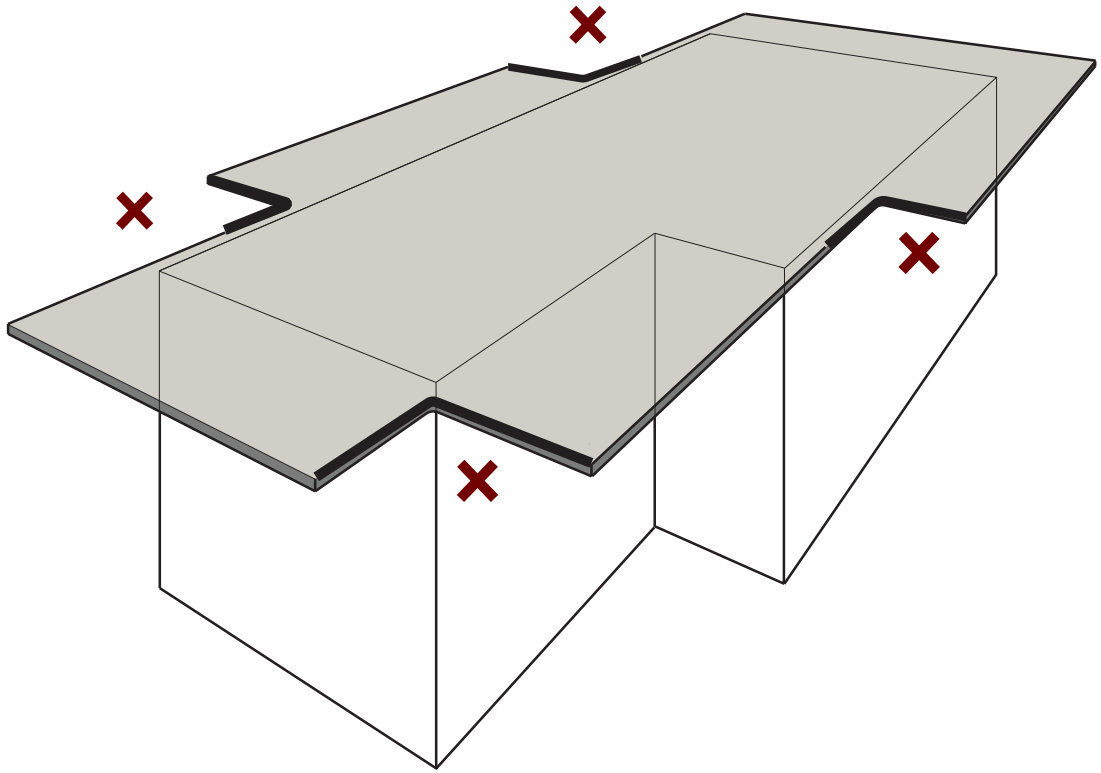


## Overhangs.

In the case of all slabs with overhangs, the supports should be reinforced (particularly ones close to cut-outs) using an expanded polyurethane sealant to absorb any tensile or compressive stress and to minimize the possibility of the slab becoming deformed due to uneven loads.

**IMPORTANT!**

**Overhangs leading to a perimeter with inner angles must never be made. These angles create a stress point due to the differing stresses that each part of the slab has to withstand.**

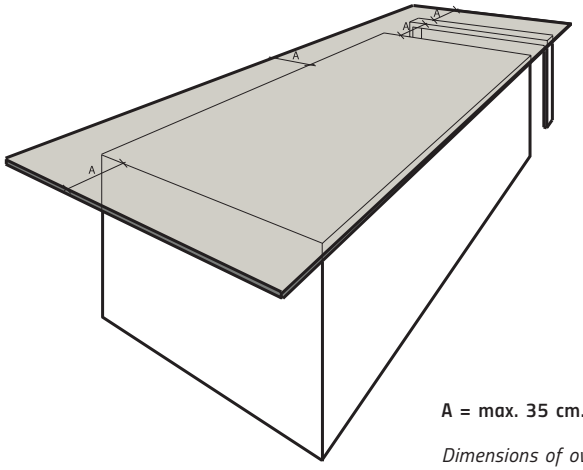


So as not to weaken the worktop, avoid overhangs or lengths of over 35 cm between supports (A), as shown in the following illustrations.
When a bigger overhang is needed, reinforcements will be required to avoid unsupported projecting surfaces of over 35 cm. If a slab contains a cut-out, it should be positioned at a distance of at least 10 cm (B & C) from any edge of the slab. If a slab contains both an overhang and a cut-out, it must be supported for a length of at least 35 cm (B+C).

If a partial overhang is made (that is, with a support on both sides), it can jut out up to 20 cm along its short side (D) and up to 50 cm along its long side (E).

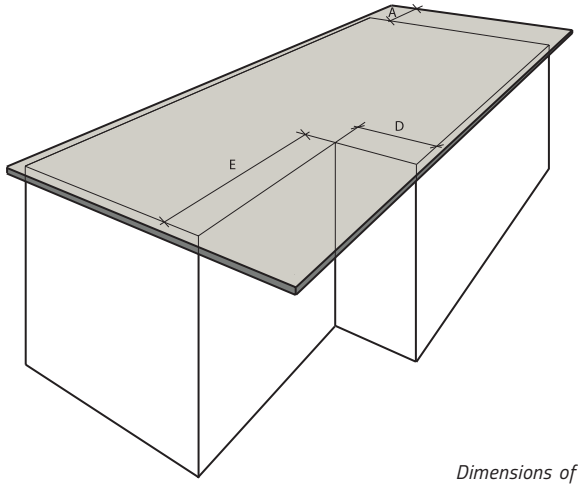
**IMPORTANT!**

**Occasional maximum static load = 100kg**



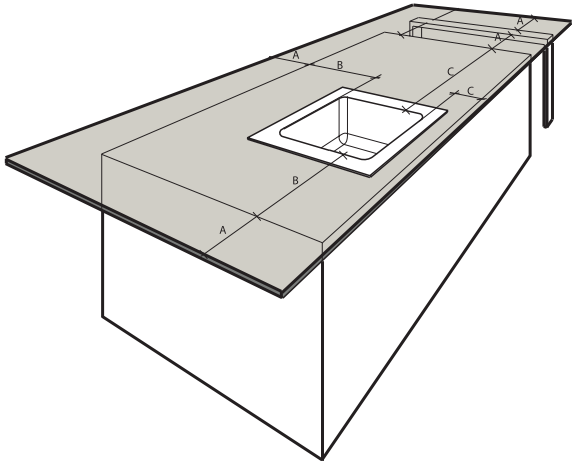

**A = max. 35 cm.**

*Dimensions of overhangs.*



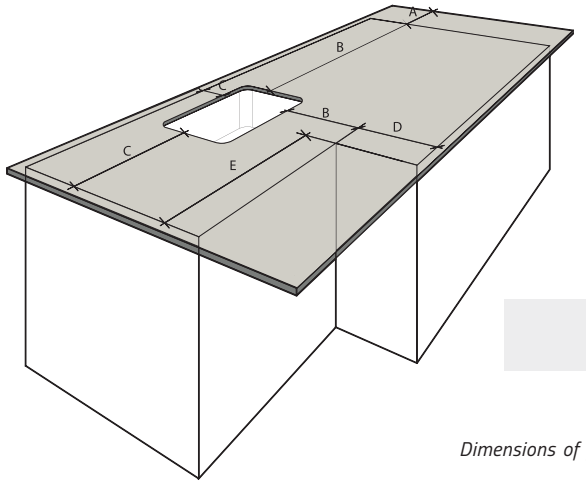

**A = max. 35 cm.**
**D = max. 20 cm.**
**E = max. 50 cm.**

*Dimensions of partial overhangs.*



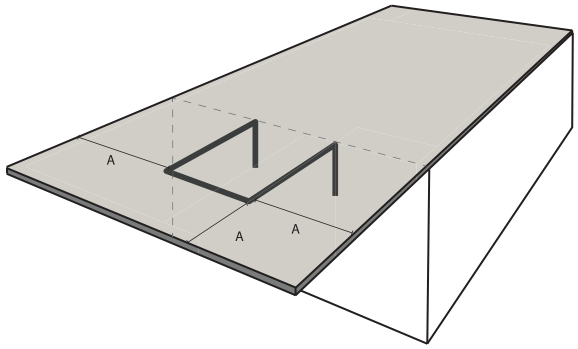

**A = max. 35 cm.**
**B > 10 cm.**
**C > 10 cm.**
**B+C > 35 cm.**

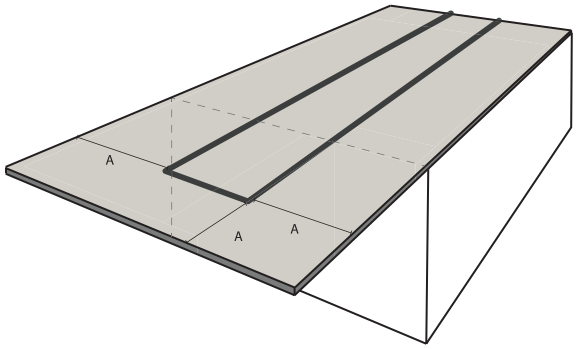
*Dimensions of overhangs with a cut-out.*

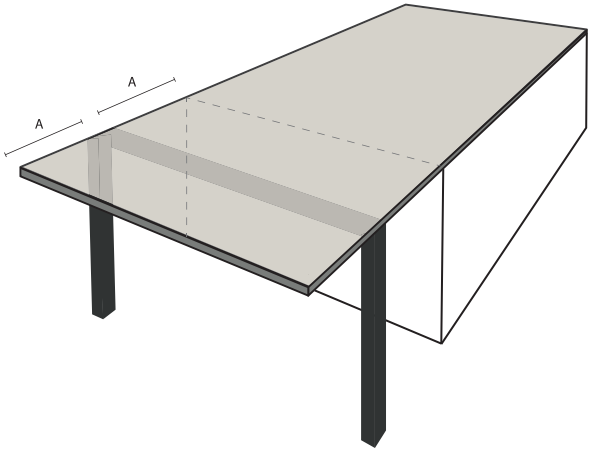


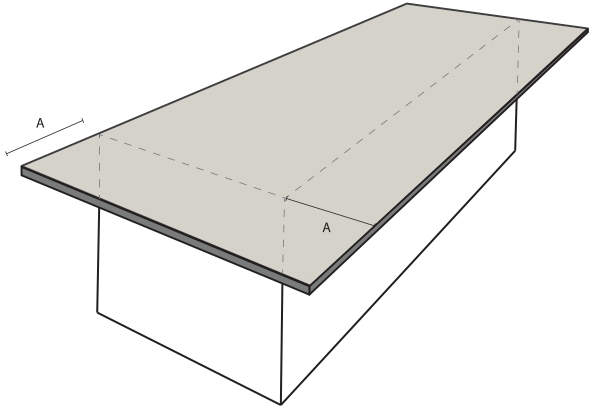

**A = max. 35 cm.**
**B > 10 cm.**
**C > 10 cm.**
**B+C > 35 cm.**
**D = max. 20 cm.**
**E = max. 50 cm.**

*Dimensions of partial overhangs with a cut-out.*




**A = max. 35 cm.**

*Dimensions of overhangs.*

**IMPORTANT!**

**Occasional maximum static load = 100kg**

## Bonding the Slabs

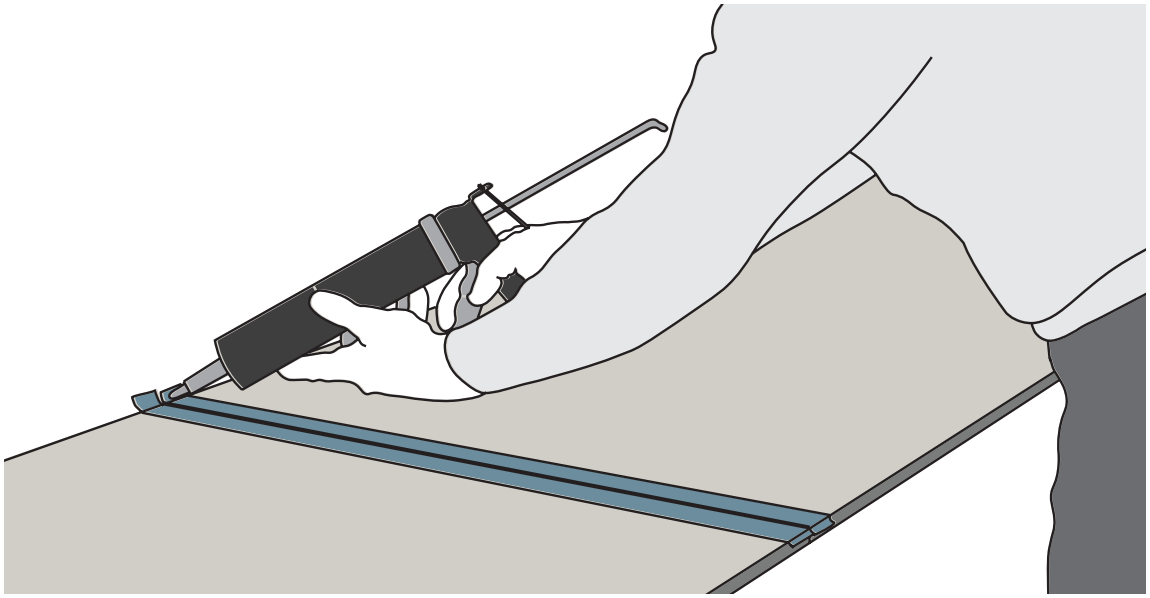
To bond slabs, the following instructions must be followed:

1) Clean the surfaces to be bonded in order to remove any dust or dirt. Before proceeding to bond them, masking tape should be run along both sides of the joint to ensure clean end results.

2) Fill the gap with coloured silicone or Mastidek. Officially approved materials must be used in the same colour as the worktop. All adhesives recommended by Lithotech can also be used (Akemi, Integra, QMC, etc.).

3) Smooth the silicone and clean away any residues with silicone remover or acetone.

To bond the slabs, officially approved putties should be used (Mastidek or epoxy or polyurethane adhesives). These putties' special characteristics make them suitable for non-porous materials and they are resistant to ultra-violet rays, making them suitable for use outdoors.



When preparing the glue colour, look at the side of the slab. The colour of the surface is not exactly the same as the base colour of the slab. This is important as polishing the edges will expose the base colour of the slab.

Recommended glue: Akemi or similar.
Akemi Colour Bond P+ 6 min
Akemi Colour Bond P+ 12 min
Akemi Platinum P+
Akemi Spectrum Paste

See more information at:
LITHOTECH - COLOUR CHART AKEMI

# Cleaning

## Cleaning

For the everyday cleaning of Lithotech surfaces, use a microfibre cloth to remove any dust. Clean the surfaces with warm water, adding detergent in the amount recommended by the manufacturer as required, providing that it does not contain hydrofluoric acid or its by-products. Then rinse the surfaces with warm water and dry them with a cloth. If liquid is spilled onto the slab, clean it away as promptly as possible to prevent a stain from forming that might be hard to remove.

Do not use soap detergents containing wax or polish or water-repellent treatments, since they might leave an oily film on the surface that could alter its appearance. Do not use abrasive scouring pads that might scratch the surface. Scouring pads like blue non-scratch Scotch-Brite ones should be used.

Specific procedures might be needed to remove some stains, depending on the type. Listed below are some recommended cleaning products for common stains.

## Cleaning Persistent Stains

If a stain cannot be removed using normal cleaning methods, other procedures and specific cleaning products should be used, depending on the type of stain. Test out the procedure on a small patch of the slab to check the results before cleaning the rest of the surface.

**DO NOT USE:**

**Strong Acids:**
**Do not use hydrochloric acid or caustic soda under any circumstances.**
**Do not use products that contain hydrofluoric acid and its derivatives.**
**Strong Alkaline Products:**
**Do not use concentrated potassium hydroxide or sodium hydroxide under any circumstances.**

| Type of dirt | Type of detergent | Cleaning material for smooth surfaces | Cleaning material for textured surfaces |
|---|---|---|---|
| Rust | Acidic: | Moistened non-scratch Scotch-brite pad | Thin-bristled brush |
| Lime-scale | | | |
| Cement, plaster or lime | | | |
| Aluminium marks | | | |
| Fat, grease, dust | Alkaline/solvent-based | Damp cloth | Sponge |
| Coffee, soft drinks, fruit juice | | | |
| Ink | Oxidizing/solvent-based | | |
| Oil | Solvent-based | Moistened non-scratch Scotch-brite pad | Thin-bristled brush |
| Rubber | | | |
| Wax | | | |
| Epoxy adhesive | | | |
| Resin | | | |
| Ink, indelible marker pen | | | |
| Wine | Oxidizing | Damp cloth | Sponge |
| Iodine | | | |
| Blood | | | |
| Fruit juice | | | |
| Ice cream | Alkaline | | |

**Acidic cleaning agents: acidic detergents, lime-scale removers, cement removers. / Alkaline cleaning agents: alkaline detergents, ammonia, fat removers. / Solvents: universal solvents, paint thinners, turpentine, alcohol. / Oxidizing: bleach, hydrogen peroxide.**

# Recommended Tools

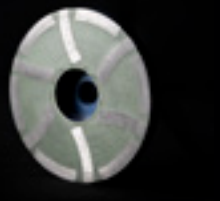
# Recommended Tools

**Discs**

Toothed discs for Sintered Stone / Porcelain

**Silicon Carbide Discs**

Flexible silicon carbide disc with Velcro for dry work.
Grain 60, 120, 220, 400



**Milling Cutter Grinder Discs**

Milling Cutter Grinder (Nanocut.DK4 Resin Filled Cup WHEE D100 mm.)

**Felt Discs**

**Cup Grinding Wheel**

Prior bevelling and polishing of edges

**Silicon Carbide Discs**

Discs for wet work

**Core Bits 20-35 mm.**

Electroplated diamond drill bits

**Drill bits 6-12 mm.**

Electroplated diamond drill bits
Use the drill without percussion drill bit and water to cool.

**Core Bits (CNC)**

**Rabetting Router Bit (CNC)**

**10 cm diamond disc**

Toothed disc for Sintered Stone / Porcelain

**Suction Cup Rings for Drill**

**Diamond Hand Polishing Pads**

Sandpaper to dry polish in three steps

**Frame With Suction Cups for Transport**

**Cutting Router Bit (CNC)**

**Expanded Polyurethane**

Worktop reinforcement

**Manual Cutter for Large Formats**

## Disclaimer

This guide was drafted to provide informative guidelines on how to design and fit surfaces made of Lithotech. The information contained herein is purely informative and customers should check it first. Lithotech cannot be held liable for any damage that might be incurred when the said information is put into practice.

In the event of a query, Lithotech can be contacted through its website at www.lithotechslabs.com or by e-mail (info@lithotechslabs.com).

Lithotech

The Technical Stone