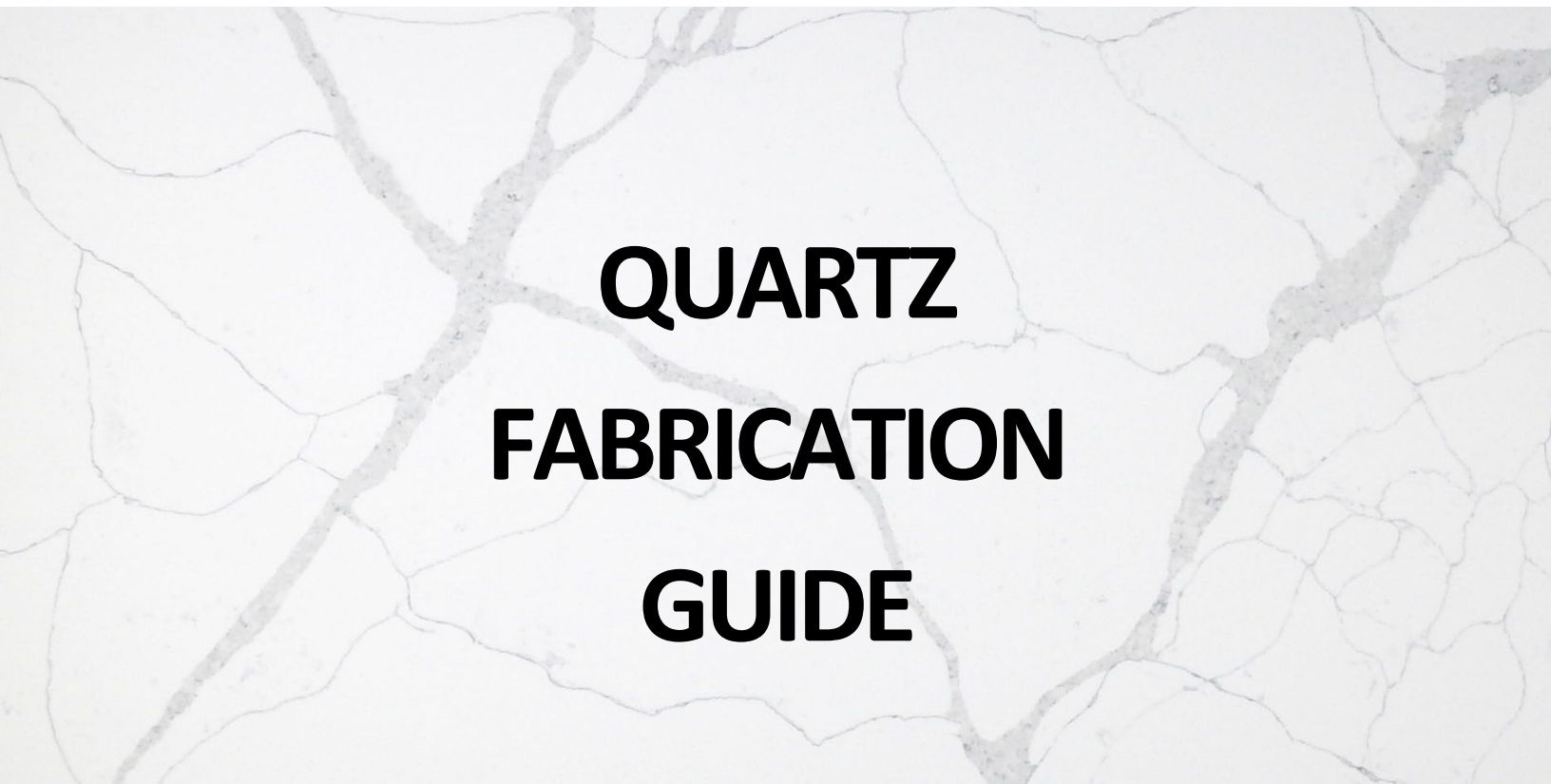




QUARTZ FABRICATION GUIDE

Product Description	<u>3</u>
Slab Inspection	<u>4</u>
Fabrication Equipment	<u>6</u>

FABRICATION TIPS

Special Statement on Silicosis	<u>7</u>
Cutting The Slab	<u>8</u>
General Instructions For Cutting	<u>10</u>
Tips To Avoid Breakage	<u>11</u>
Inside Corners	<u>12</u>
Cooktop Openings & L-Shapes	<u>15</u>
General Instructions For Cutting With CNC	<u>16</u>
General Instructions For Cutting With Waterjet	<u>17</u>
Polishing Edges	<u>18</u>
Positioning Joints & Gluing	<u>19</u>

COUNTER INSTALLATION

Installation Instructions	<u>23</u>
Support Requirements	<u>24</u>
Overhang Requirements	<u>25</u>
Post-Installation Troubleshooting	<u>27</u>

CARE & MAINTENANCE

Cleaning After Fabrication	<u>28</u>
Cleaning After Installation	<u>29</u>

PRODUCT DESCRIPTION

ENVI™ quartz surfaces are a blend of nature and technology, combining beauty and functionality in a high-performance surface. These surfaces are predominantly made of quartz, one of the hardest minerals in nature. Color controlled quartz is blended together with technologically advanced polymers. Because of the high quartz content, these surfaces are ultra-durable and resistant to scratches and chipping. The dense composition also makes these surfaces highly resistant to staining. During fabrication, it is recommended to use denatured alcohol (NOT acetone) to clean quartz slabs.

SLAB INSPECTION

Initial Inspection

Prior to fabrication, a careful inspection of the slabs is required. Carefully check the slab surface which, depending on the finishing process, must have a smooth appearance and meet the following criteria:

- No presence of foreign materials.
- No residue of color or mixture of the material produced previously bigger than 1/2".
- No holes or scratches.
- No pigment stains larger than 1/2" (only for monochrome materials).
- No dull areas (on polished surfaces).

Despite the strict procedures in place to ensure consistent appearance over time, slight variations in color and structure are possible due to the complex manufacturing system and the quartz used, which being a natural raw material, even if carefully selected from time to time can show slight variations in color and transparency.

SLAB INSPECTION

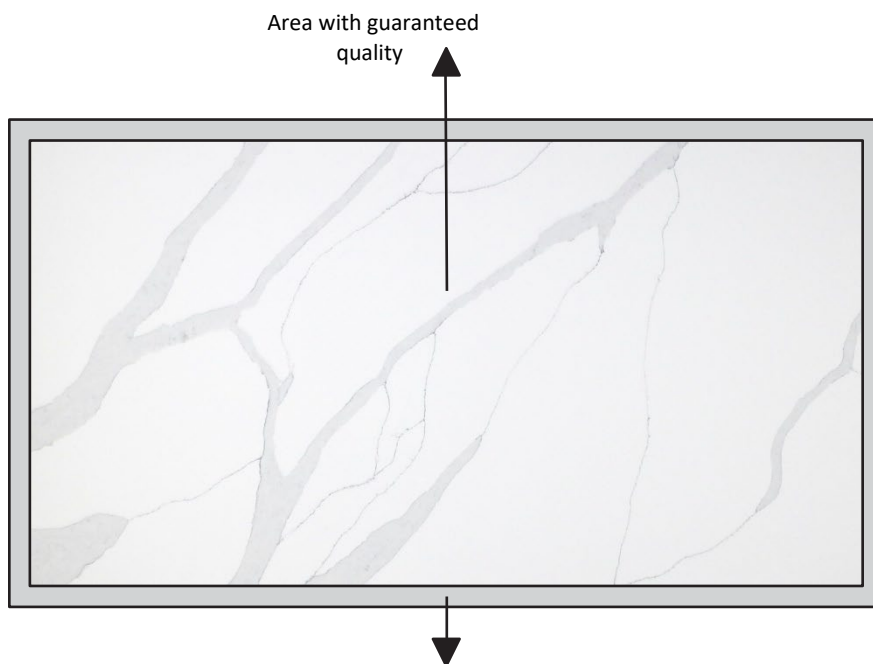
Initial Inspection

In addition to a visual inspection, verify compliance with the dimensional tolerances:

- Thickness tolerance ($-1/16''$ / $+1/64''$).
- Flatness tolerance ($5/32''$ in length / $5/64''$ in width).

NOTE: The flatness must be measured at the center of the slab itself while in a horizontal position, taking into consideration the entire length and width of the slab (not the diagonals).

The back of the slab must have a smooth finish. Surface roughness must not exceed $1/64''$. Small cracks are allowed in the peripheral area up to $1-1/2''$ from the edges.



The quality of the grey perimeter area is not guaranteed

NOTE: If the fabricator believes the slab is unsuitable it must be replaced before starting work. ENVI™ Surfaces will not accept claims for slabs which have been cut or modified from their original condition.

FABRICATION EQUIPMENT

Personal Protective Equipment

- Safety gloves
- Safety goggles
- Dust mask type FFP3
- Steel toe safety shoes
- Hearing protection
- Work clothing

Fabrication Tools

The equipment required for fabrication is the classic type used for fabricating natural stone, with tools designed specifically for quartz. Below is a list of the equipment commonly used for fabricating:

- Bridge saw
- CNC contouring machine
- Waterjet cutter
- Edge polisher
- Diamond cutting blades
- Diamond grinding wheels
- Diamond burs
- Forklifts for handling
- A frames or pin racks to store slabs
- Overhead cranes
- Jib cranes
- Air compressor
- Clamps
- Dust extraction system
- Water treatment system
- Diamond polishing disks
- Work tables

FABRICATION TIPS

Special Statement on Silicosis

This statement is a public service and does not serve as professional advice, nor does it replace any fabricator's personal responsibility to strictly comply with health and safety regulations and fully implement all relevant safety measures. In case of contradiction between this statement and the health and safety regulations that apply in your area, you must follow the latter. To protect the health and life of all workers exposed to crystalline silica dust, it is always necessary to consult with a local occupational health and safety advisor. This statement shall not be construed to impose any liability on ENVI™ Surfaces or its distributors.

ENVI™ Surfaces quartz slabs and derived products are not hazardous when transported, shipped or used by the end consumer. However, quartz slabs contain approximately 90% crystalline silica (quartz, silica sand and cristobalite), and the process of fabricating quartz slabs produces dust containing fine particles of silica, which is known as respirable crystalline silica dust. It should be noted that fabrication of natural stone products also produces this dust.

Unprotected and uncontrolled occupational exposure and inhalation of respirable crystalline silica particles without employing the protective health and safety measures required by law, is dangerous to health and may cause severe illnesses such as silicosis, which is characterized by fibrosis of the lungs. Silicosis is a chronic, incurable, progressive disease, which may cause severe physical disabilities and may be fatal. According to OSHA, exposure to airborne crystalline silica increases the risk for lung cancer, chronic obstructive pulmonary disease (COPD) and kidney disease, and may increase the risk auto-immune diseases like rheumatoid arthritis.

Silicosis and other diseases associated with silica dust are believed to be prevented by implementing all required safety precautions, including but not limited to, those described below. Such measures may include: improved work practices (such as working with wet tools); engineering controls including integral dust collection and/or use of local exhaust ventilation and filter systems; use of respiratory equipment and other PPE; and implementing effective health and safety training. Never clean up silica dust with a dry broom, brush or use compressed air. The protective measures employed should meet or exceed those required by your local and national laws and regulations regarding working in environments containing harmful dust.

Please note that the recommendations with respect to the work area relate mainly to production/fabrication facilities, but may also relate under certain circumstances to the adjacent offices and installation areas. In order to protect installers and consumers from the hazards of an unprotected working environment, all surfaces should be fabricated in the plant and not at the end user's location.

FABRICATION TIPS

Cutting The Slab

The information provided in this chapter is general and not specific. For detailed information on the type of tools and the speed rate of the blade (RPM), please contact the suppliers of the equipment or tools directly.

The quartz slabs must be cut with bridge saws, CNC machines or waterjet equipment with tools specially designed for quartz.

Cutting is an important fabrication phase and is affected by several variables:

- The speed rate of the blade
- The revolutions per minute of the blade (RPM)
- The type of blade
- The wear conditions of the blade
- The conditions of the cutter surface
- The shape of the piece to be obtained
- The flow of cooling water
- The cutting surface temperature
- The conditions of the saw head

Each of these variables and their combination affect the result of the cut slab. Therefore, when making a top, proper design and fabrication will help prevent problems from occurring during production and after installation.

FABRICATION TIPS

Cutting The Slab

The travel speed of the blade and the RPM depends on several variables, such as the type of cutter, the type of blade, the metal binder and the grain of the diamond, the wear of the disk, etc. We therefore recommend to always consult the manufacturers or suppliers of tools and cutters for the correct setting of this data.

The table below shows indicative values commonly used for cutting:

THICKNESS OF THE SLAB	NOTES	FEED SPEED	DIAMETER OF THE DISK	RPM
1/2"	Full cut	78-3/4"/min	12"	1850-1950
			14"	1600-1700
			16"	1400-1500
			20"	1100-1200
3/4"	Full cut or in steps of 3/16" - 3/8"	118"/min	12"	1850-1950
			14"	1600-1700
			16"	1400-1500
			20"	1100-1200
1-1/4"	Full cut or in steps of 3/16" - 3/8"	118"/min	12"	1850-1950
			14"	1600-1700
			16"	1400-1500
			20"	1100-1200

FABRICATION TIPS

General Instructions for Cutting

- Ensure that the work surface is in good condition so that the slab is not able to move during cutting.
- Use blades and tools specifically designed for quartz.
- Check the wear condition of the tools and replace them if damaged or worn.
- Keep an abundant and constant flow of cooling water in the working area of the blade.
- First, make the cuts for the trimming on the two long sides of the slab.
- It is not recommended to plunge the blade into the slab to make the cut. If it is necessary however, sink the blade very slowly.
- The holes for the sink/cook top should be made after all other cutting operations are complete.
- If you do not have a water jet to make the holes for sinks/cook top cut outs and internal angles, then first drill at the corners and then make the cuts.
- Do not change the original surface finish of the slabs.
- Use the cutting parameters recommended by the manufacturers of the cutting tools.

NOTE: Water that is left to dry on the surface of quartz can leave a calcium stain that is hard to remove and may be highly visible on darker colors. It is recommended to remove excess water before it can dry on the surface.

FABRICATION TIPS

Tips to Avoid Breakage

- Trim the edges of the slab by 5/8" or more, starting from the longer sides.



1-Start from the longer sides



2-Then the shorter sides

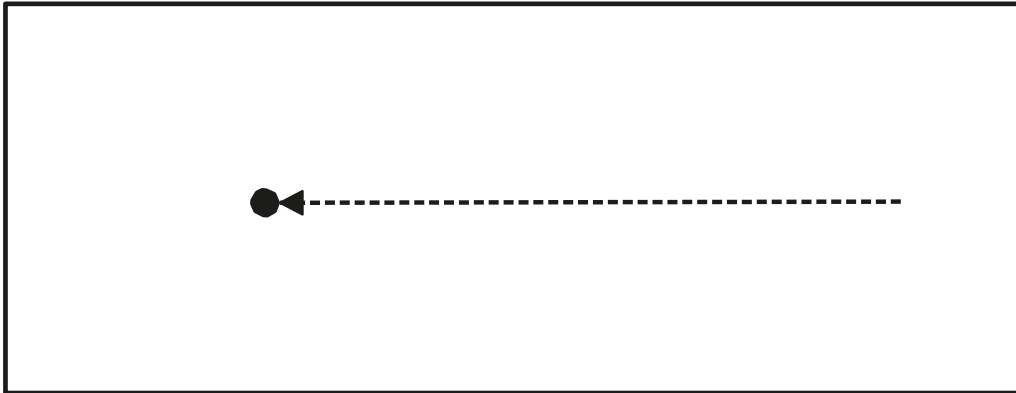
When cutting, if you note that the cut starts to close, before finishing it, insert a small wedge to keep it open.

To cut the entire length of the slab, drill a hole (3/4" to 1-1/4" hole) near the end of the cut and cut advancing toward the hole.

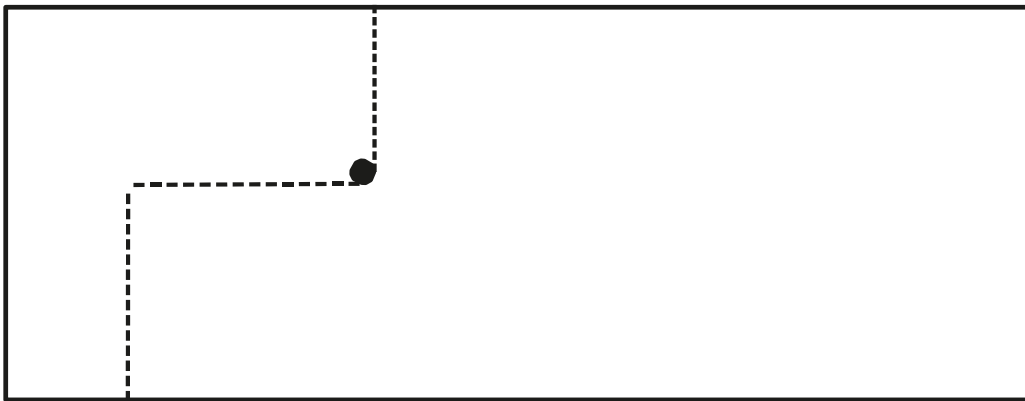
FABRICATION TIPS

Inside Corners

- If L-shaped pieces must be made, the inside corner radii should be drilled first (3/4" to 1-1/4" hole) and saw-cut into drilled hole, allowing for the required 3/8" to 5/8" radius.



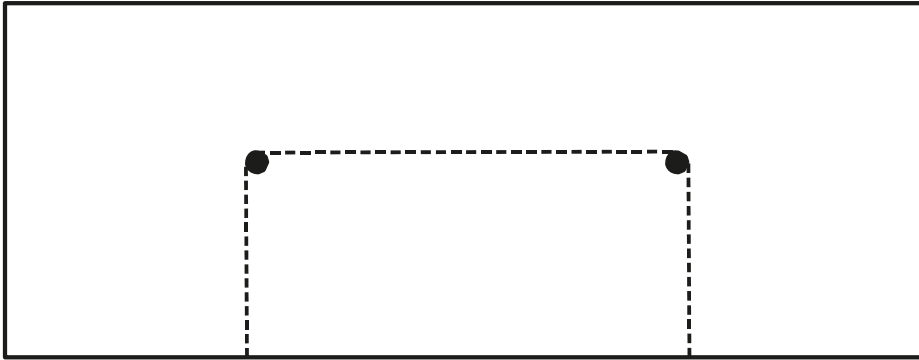
- Example (showing the larger piece intended for use):



FABRICATION TIPS

Inside Corners

- To make U-shaped pieces, before cutting, make the holes (3/4" to 1-1/4" hole) where the cut lines intersect, always making the shorter cut first.



- All the inside corners should be rounded, with a minimum radius of 3/8", although at least 1/2" is recommended when possible. By eliminating the corners, you remove the weak points most susceptible to breakage.



FABRICATION TIPS

Inside Corners

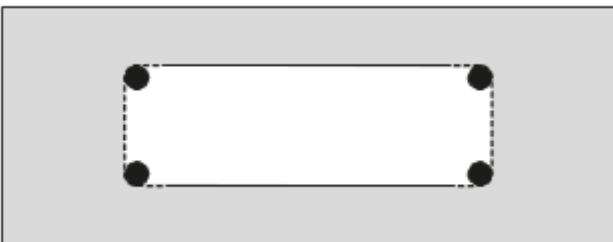
- If the opening for sinks or cooktop cut outs is made with a CNC machine and finger tool bits or with a Waterjet, the 4 corners should have a minimum radius of 3/8" (and larger if possible). If the opening is made with a bridge saw, drill a hole (3/4" to 1-1/4" hole) at the four vertices, then make the cuts to join the holes in order to leave the edges rounded. This helps prevent breakages even after installation, therefore it should always be done.



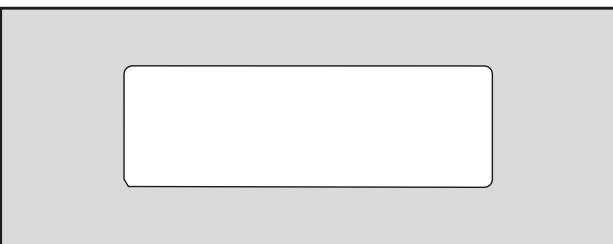
- 1 - Mark the vertices



- 2 – Drill holes corresponding to the vertices



- 3 - Make the cuts to join the holes

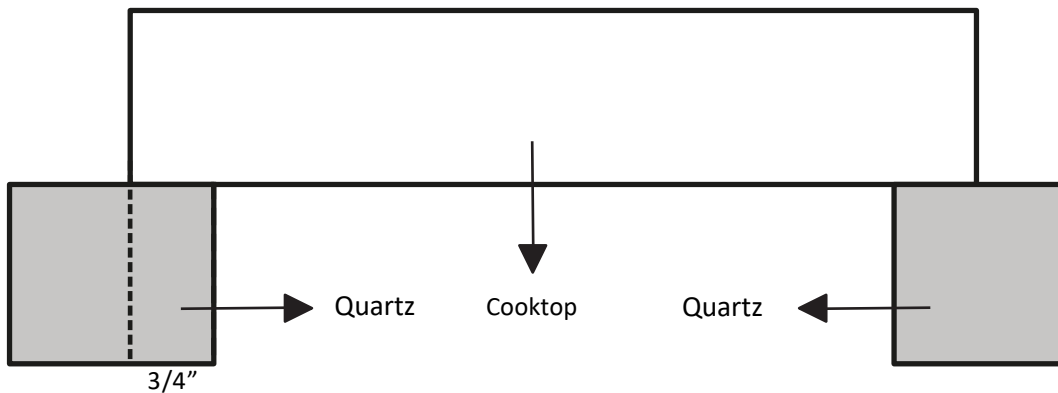


- 4 - Hole with rounded edges

FABRICATION TIPS

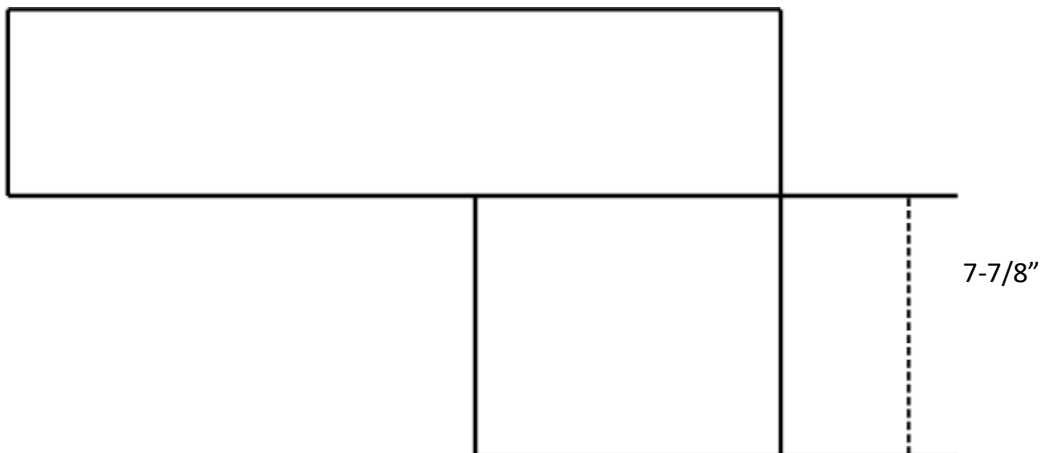
Cooktop Openings

- The opening for installing cooktop cut outs must be sized for the cooktop to rest no more than 3/4" on the perimeter of the opening made. This is to avoid possible breakages caused by the section of the slab that is left below the cooktop. Additionally, there should be at least 1/8" gap between the cut out opening and the cooktop chassis on all sides.



L-Shapes

- Fabricating L-shaped surfaces from a single piece is not recommended especially when the length of the smaller side is more than 7-7/8". These shapes are subject to breaking during and after installation.



FABRICATION TIPS

General Instructions for Cutting With CNC

- If cutting with CNC with a diamond blade, refer to chapter “General Instructions for Cutting.”
- If cutting with a diamond cutter (finger bit), use cutters specifically for quartz. The finger bits compared to diamond blades remove a substantial amount of material during fabrication and therefore require a reduced feed rate, usually between 7-7/8”/min and 15-3/4”/min and 4000-8000 RPM.
- Fabrication must be carried out in compliance with the recommendations provided by the manufacturer of the CNC machines and tools used.
- Keep an abundant and constant flow of cooling water in the working area of the tool so as to prevent the cutter and the quartz from overheating. It is appropriate to keep a greater amount of water in quartz fabrication in comparison with the flow usually used for fabricating marble or granite. The water flow must be directed into the working area of the cutter and in the same rotation direction of the tool.
- Periodically check the tool to verify its state of wear or damage. Make sure that the slab is secured to prevent movement during the fabrication process. If chipping or breakage occurs during fabrication, reduce the feed rate.

FABRICATION TIPS

General Instructions for Cutting With Waterjet

Waterjet cutting is possible thanks to a water jet and abrasive particles at very high pressure (2500 - 5000 bar). The cut generated usually has a width ranging from 1/64" to 1/16". The feed rate affects the quality of the cut, which at high speeds becomes very irregular and serrated on the bottom.

Poor quality cuts can cause the quartz slab to break.

The quality and speed of the cut can be affected by many variables, such as the type of equipment used, the pressures used, the type and amount of abrasive, the equipment software, etc.

For this reason, it is essential to consult the equipment supplier for information on operational procedures.

Some general measures for fabricating are:

- Reduce the feed rate to improve the quality of the cut
- Use abrasives specifically made for use with quartz
- Inspect the equipment regularly
- Use updated software
- When possible, the direction of the cut must be from the outside to the inside
- The cut must begin as far as possible from the piece to be obtained
- Make sure the support surface is in good condition
- Make sure the correct quantity of abrasive is used
- If necessary, reduce the distance between the nozzle and the slab

FABRICATION TIPS

Polishing Edges

The edges can be polished with edge polishing machines for stone materials using grinding wheels with a diameter of 5-1/8" specifically for quartz. The piece to be polished must be secured to prevent any movement during polishing. The cooling water must have a steady and adequate flow to ensure sufficient cooling. The feed rate and the pressure of the grinding wheels must be adjusted in order to obtain a good polishing, and may vary depending on the type of machine and abrasives used.

Indicative grinding wheel series to be used for polished finish: 100 200 400 500-800 1500-2000 2000-3000

NOTE: Water that is left to dry on the surface of quartz can leave a calcium stain that is hard to remove and may be highly visible on darker colors. It is recommended to remove excess water before it can dry on the surface.

Edge Details

Any edge detail typically used with natural stone is acceptable with ENVI™ Surfaces quartz.

Acceptable production methods include:

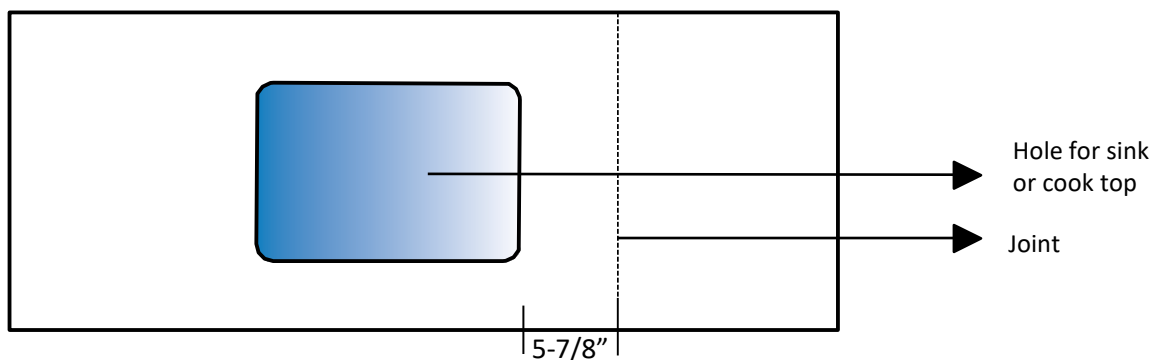
1. Non-laminated edges are the easiest, strongest and most cost-effective to produce. These edge details are limited to the material's thickness.
2. Laminated edges make it possible to produce edge details thicker than the material. The thicker 'built-up' edge gives the appearance of more mass, but the quality of the fabrication and the buildup material's color match will affect the quality and appearance of the finished edge.
3. Mitered edges are used for producing larger edge details. It is not recommended to produce mitered edges over 4 inches in height unless support is provided behind the mitered edge to prevent breakage.

FABRICATION TIPS

Positioning Joints & Gluing

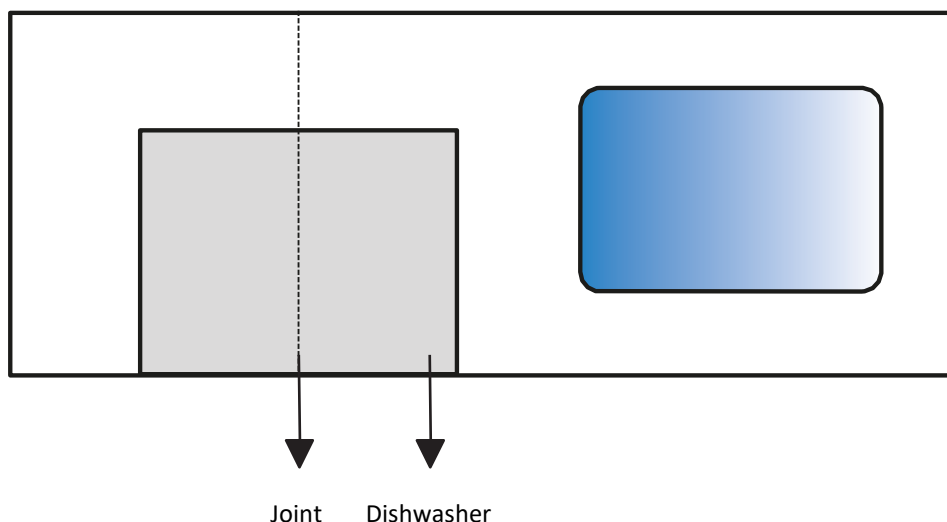
When planning the joint location on tops made of several pieces, in addition to allowing the maximum use of the slab surface, you must consider certain technical aspects:

The joints must be at least 5-7/8" from the holes (sink or cooktop cut out).



- The joint must not be positioned above the dishwasher or any other household appliance that radiates heat.

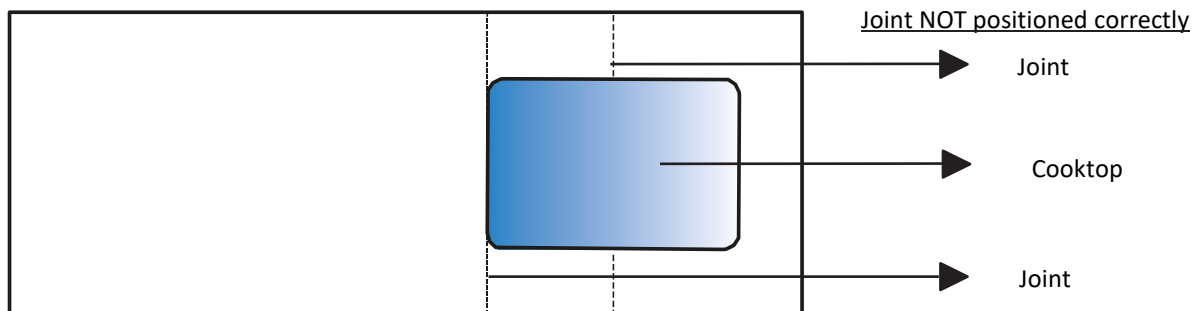
Joint NOT positioned correctly



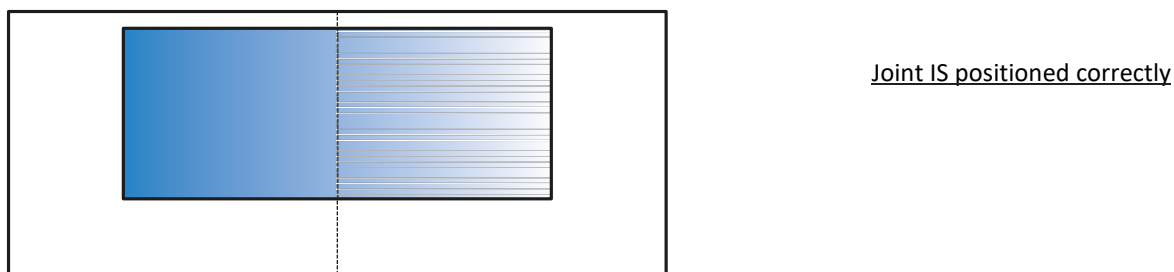
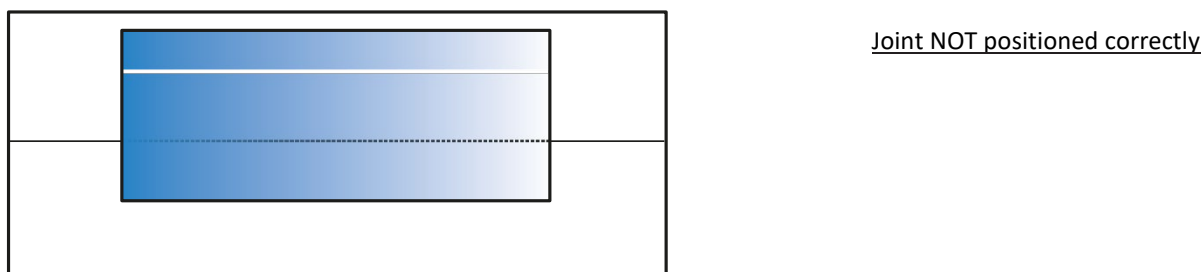
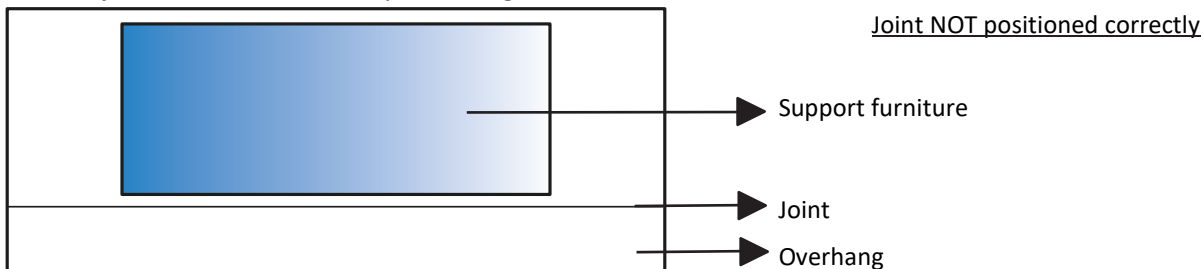
FABRICATION TIPS

Positioning Joints & Gluing

- It is not recommended to position the joint in line with the cooktop.



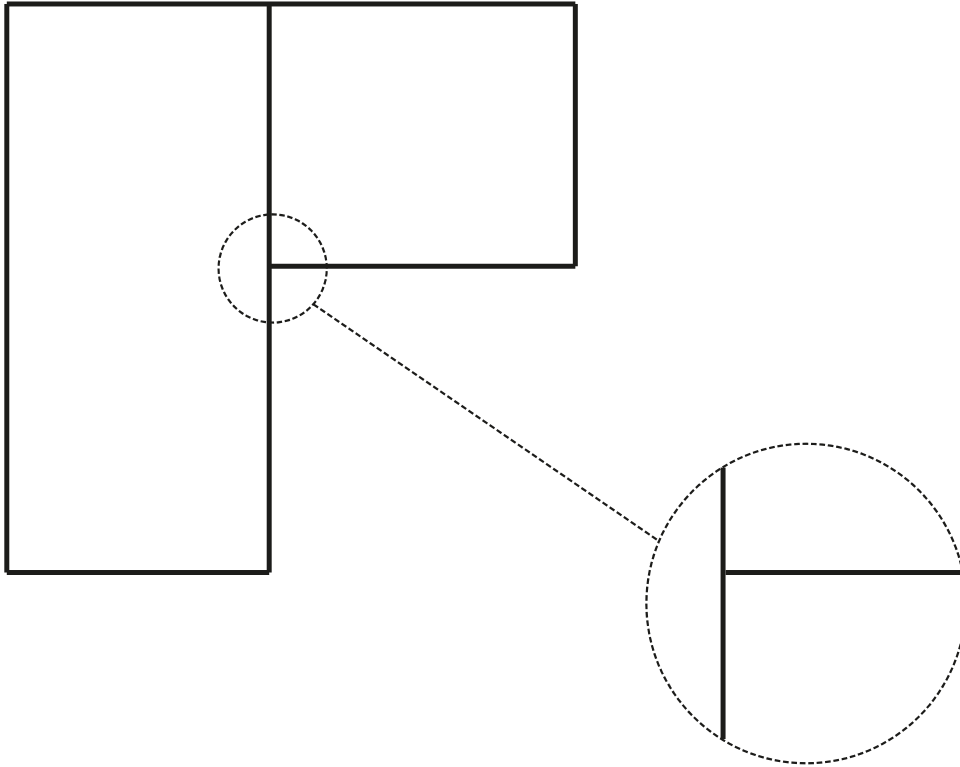
- The joint must not affect any overhangs.



FABRICATION TIPS

Positioning Joints & Gluing

- If the top is made from two or more pieces and the seam is located at the inside corner, a radius is not required.

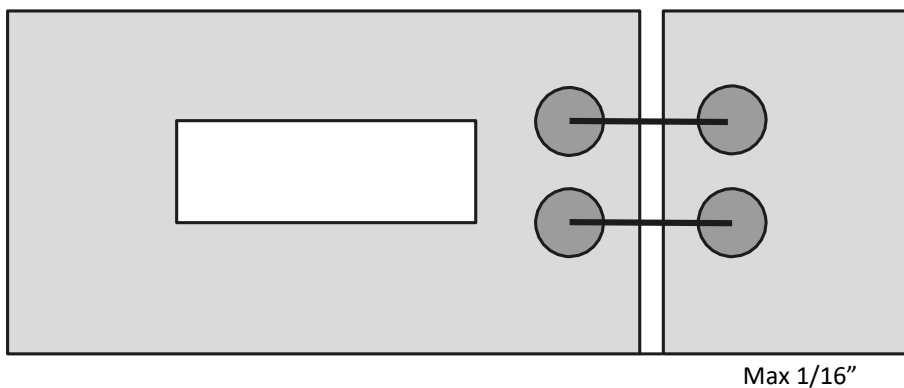


- The joint area must be well supported from below.
- Carefully check the alignment of the two parts before gluing.

FABRICATION TIPS

Positioning Joints & Gluing

- Use masking tape to protect surfaces adjacent to the two parts to be glued.
- Use alcohol to clean the parts to be glued.
- The surfaces to be glued must be rough, flat, dry and thoroughly clean. Do not use A/B epoxies for seaming quartz, as the cured adhesive residue cannot be removed.
- For gluing you can use polyester resin or acrylic epoxies, following the instructions provided by the manufacturer.
- If you need to adjust the color of the polyester based adhesive, use specific colored pigment.
- It is recommended to remove excess mastic from the top before it hardens completely.
- The joint must be as thin as possible (max 1/16"), therefore we recommend the use of proper equipment for the purpose (such as Gorilla Grip system).
- Seams through an overhang must be supported.
- Seam support paralleling the seam is strongly recommended.



- Leave the retaining clips in place until the glue has set, then remove the clips and the masking tape and remove any excess adhesive with alcohol.
- Avoid joining the two parts mechanically with screws or nails in direct contact with the quartz.

Specific mastics for gluing many products of the quartz range can be found at www.tenax4you.com and www.integra-adhesives.com.

COUNTER INSTALLATION

INSTALLATION INSTRUCTIONS

- Tops must be handled in a vertical position, avoiding twists or impacts. Before proceeding with the installation, carefully check that the counter is not scratched, has no cracks or aesthetic imperfections.
- Make sure the support surface of the unit is perfectly level, and if composed of several parts, that these are levelled, adjusting the legs of the unit, if necessary. Gently rest the counter upright on the rear side of the unit, apply some neutral silicone on a few points on the base of the unit and then lower the top by adjusting its position.
- In order to keep the counter clean while adhering the back, or joining L-shaped counters, apply masking tape near the areas to be joined and then apply a bead of neutral silicone.
- Remove excess silicone with a spatula, razor or putty knife. The masking tape should be removed only after the silicone has hardened. Remove any silicone residue with sharp metal scrapers, taking care not to mark the surface.
- To secure the counter to the unit, only use neutral silicone and not epoxy adhesives or other adhesives. In fact, the silicone guarantees the necessary flexibility to compensate for small movements caused by thermal contraction and expansion.
- Leave an expansion space of about 1/8" between the counter and the walls or the units and seal it with neutral silicone, always making sure to first protect the surface with masking tape.
- Do not apply pressure to the quartz around any sink or cooktop cutouts.

COUNTER INSTALLATION

SUPPORT REQUIREMENTS

- ENVI™ Surfaces quartz is only recommended for interior installations.
- Perimeter support is recommended instead of full underlayment, especially close to heat generating appliances. If an installation requires full underlayment for structural support, see "Support Materials" below for recommendations.
- ENVI™ Surfaces quartz requires a structurally sound base for installation. It is up to the Fabricator to determine the suitability of support for the installation.
- The installation area must be true and flat within 1/8 inch over a 120-inch length.
- Do not use metal fasteners (screws, nails, etc.) with ENVI™ Surfaces quartz.

4-SIDED SUPPORT

Support structures with **4-sided support** do not require additional support if the following conditions are met. When exceeding these dimensions, support is required every 36 inches.

- Countertop depth < 26 inches.
- Countertop length < 118 inches.

3-SIDED SUPPORT

Support structures with support on **3 sides** (dishwashers, desks, frameless cabinets, etc.) always require additional support.

- 2 CM with countertop depth < 26 inches requires support every 24 inches.
- 3 CM with countertop depth < 26 inches requires support every 36 inches.
- 2 CM and 3 CM with countertop depths > 26 inches require support every 24 inches.

SUPPORT MATERIALS

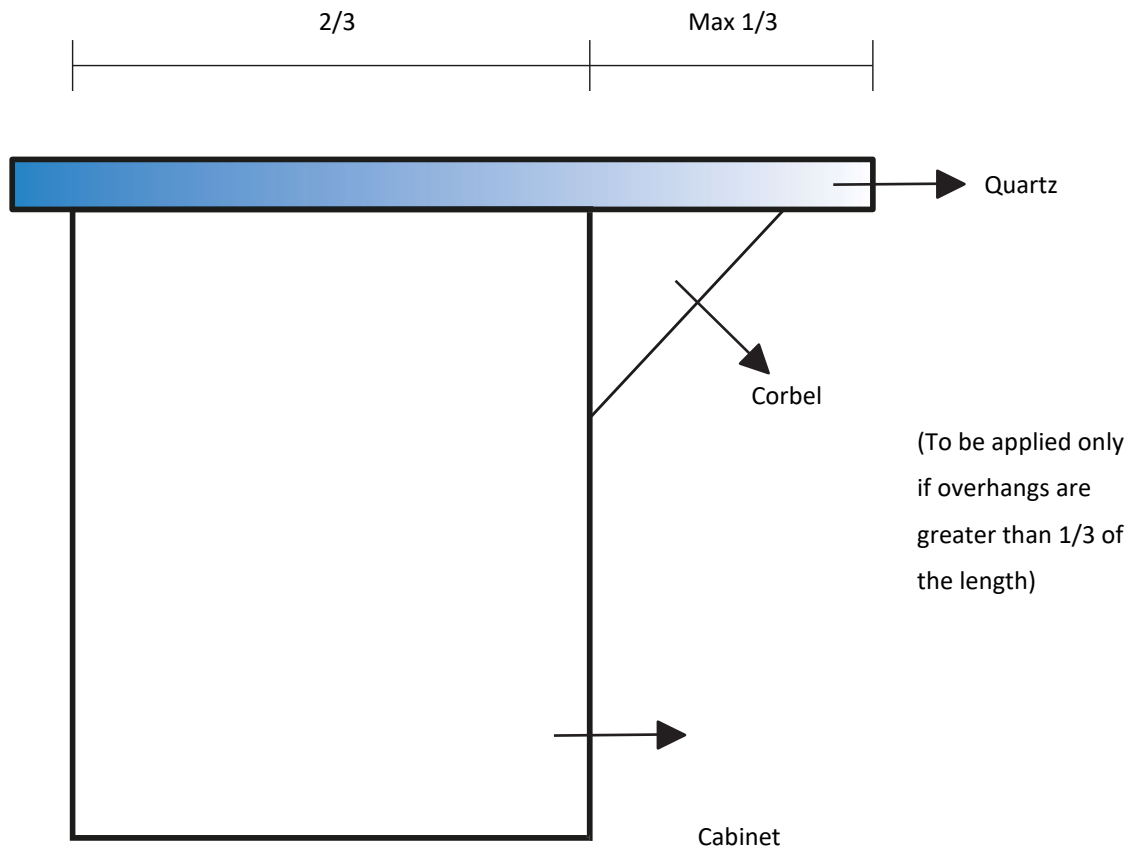
The following materials are examples of acceptable substrate materials; MDF board, Plywood and Wood.

- Structural steel is acceptable.
- Particle Board, Flake Board, OSB or other non-moisture resistant products are NOT acceptable as a support material.

COUNTER INSTALLATION

OVERHANG REQUIREMENTS

- Overhangs must never be greater than $\frac{1}{3}$ of the depth, and the remaining $\frac{2}{3}$ of the counter must be well supported.
- In addition to depth requirements, counters with overhangs must be a minimum of 24 inches in length.



- It is allowed to have a maximum unsupported overhang of 10" for tops that are 2CM thick and of 13-3/4" for 3CM tops.
- If the overhang exceeds the requirements, it must be supported with brackets, legs or columns as detailed below.

COUNTER INSTALLATION

OVERHANG & SPAN REQUIREMENTS – SUPPORT

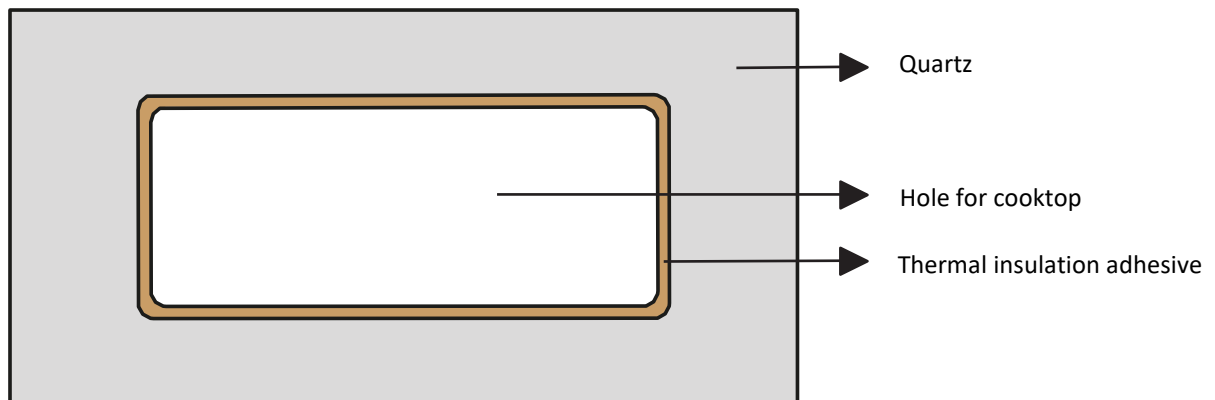
- 2CM material requires support every 24 inches, and 3CM requires support every 36 inches.
- Install support strips where necessary to meet span requirements.
- Outer perimeter support (4-sided box) is acceptable when depth is 26 inches or less.
- No cutouts or holes are allowed in the overhangs.

Material Thickness	Maximum allowable overhang before additional support required	Additional support requirements in addition to a ¾ inch plywood or metal frame
2 cm	<10 inches	10 to 18 inches - Corbels >18 inches - Columns or Legs
3 cm	<13-3/4 inches	13-3/4 to 24 inches - Corbels >24 inches - Columns or Legs

COUNTER INSTALLATION

POST-INSTALLATION TROUBLESHOOTING

- Many problems can occur around the cooktop area due to:
- Excessive heating of the top which causes breakage due to thermal shock or repeated cycles of extreme heat/cold.
- Major weaknesses in the area of the hole, typically in the corners, especially if they are not rounded.
- Incorrect cooktop hole size (the cooktop should not exceed 3/4" over the perimeter of the cutout).
- To reduce the heat transfer from the cooktop, glue specific adhesive tape for the thermal insulation of household appliances on the edge of the hole (3M '1452' Aluminum Tape). This tape should never be removed.



CARE & MAINTENANCE

CLEANING AFTER FABRICATION

- When slab machining is complete, remove any residue from the counter with running water and a clean cloth.
- Thoroughly clean the counter with denatured alcohol to remove excess adhesive.
- If, after cleaning, a haze remains on the surface, rinse again. If there are traces of dirt, clean again. The materials containing mother of pearl should not be washed with acidic cleaners.
- On smooth surface tops, we do not recommend the application of a surface treatment, such as protective or sealant wax, which over time may cause loss of shine or unevenness in the surface, if not applied correctly.
- As with all matte finishes, non-polished quartz slabs can show fingerprints and other marks of daily living more readily than their polished counterparts. We recommend applying a suitable color-enhancing sealer (such as Tenax Ager) to all non-polished quartz slabs to help repel dirt and oils.

CARE & MAINTENANCE

CLEANING AFTER INSTALLATION

- On completion of installation, thoroughly clean the surface by spraying a detergent made specifically for quartz slabs (such as Tenax Quartz Ax Cleaner) on the surface, distributing it evenly with a soft sponge.
- Leave it for 5 minutes and then rinse with water until the detergent is completely removed. Remove any excess water with a cloth and dry.
- The materials containing mother of pearl should not be washed with acidic cleaners.
- NOTE: Pay attention to delicate metal parts and other acid-sensitive materials.