

FABRICATION MANUAL

2020



HanStone®
Quartz

LIVE BEAUTIFULLY



LIVE BEAUTIFULLY

Live beautifully is the ultimate expression of self. Like snowflakes, no two lives are alike. And we strive to make products that enhance life's journey.



TO ORDER SAMPLES VISIT:
HANSTONEQUARTZ.COM

HanStone Quartz is an innovative new product that combines natural quartz, one of nature's hardest materials, with high quality polymer resin and pigment to produce a durable yet luxurious stone surface. We source various types, sizes and colors of quartz crystals from around the world, which provide the desired hue, feel and design, and capture the spirit and essence of natural colors. Unlike granite and many other surfaces, HanStone Quartz is nonporous and requires no sealing. In addition to being even more durable than granite, HanStone Quartz is also stain-resistant, heat-resistant and easy to maintain. It has also been tested and certified by the National Sanitation for Food Safety and Food Contact under the NSF 51 Certification, and is backed by a Commercial 10-Year Lifetime Warranty and a Residential Lifetime Limited Warranty.

All of these qualities have made HanStone Quartz a premier choice among builders around the world. For homeowners, it's an ideal surface for kitchen countertops, bathroom vanities, bar tops and other surfaces. It's also perfect for high-traffic areas such as offices, banks, hotels and restaurants, where applications can also include walls, reception areas, serving areas, table tops, and much more.

If you're looking for a surface that is safe for food preparation and easy to maintain, yet will maintain its luster and natural beauty, you'll find HanStone Quartz to be the perfect choice!

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STORAGE & HANDLING

2.1 Basic Safety Information

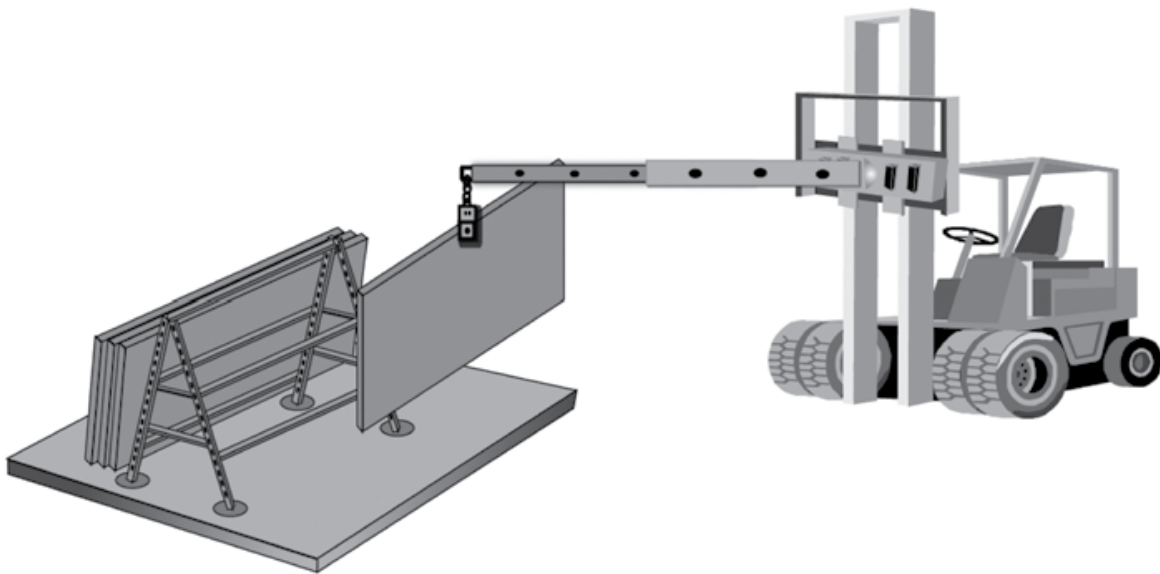
- To help prevent injuries, proper gear and apparel must be worn at all times before and when entering the fabrication area or when handling HanStone Quartz.
- Safety glasses, dust masks, ear protection, safety shoes, etc. must comply with HanStone Quartz fabrication shop standards.
- Keep all areas well lighted at all times.
- Tools, when in use, should be away from all wet locations or GFCI protected.
- Fabrication shop should be entered by authorized personnel only.
- Shops must have all up to date OSHA regulations posted and enforced.
- Proper ventilation is required when working with strong chemicals such as adhesives or when airborne dust is present.
- Proper apparel must be worn near machinery. Avoid wearing loose apparel, jewelry, etc. when working near any heavy machinery.
- Report any injuries or problems immediately to your supervisor.
- Know where the first aid kit and eye wash station is at all times.
- To help prevent accidents, we require all fabricators to follow all OSHA and ANSI guidelines related to safety.

STORAGE & HANDLING

2.2 Storage & Handling

HanStone Quartz slabs are typically transported from the factory on A-Frames or in bundle packaging. The slabs should be unloaded from the container with appropriate lifting machinery only. That machinery must be capable of handling the following dimensions and loads safely:

<u>HanStone Quartz Slabs</u>	<u>Width (inch)</u>	<u>Length (inch)</u>	<u>Weight (lbs)</u>
2 CM	55"	120"	467
3 CM	55"	120"	695
2 CM	65"	130"	590
3 CM	65"	130"	880



STORAGE & HANDLING

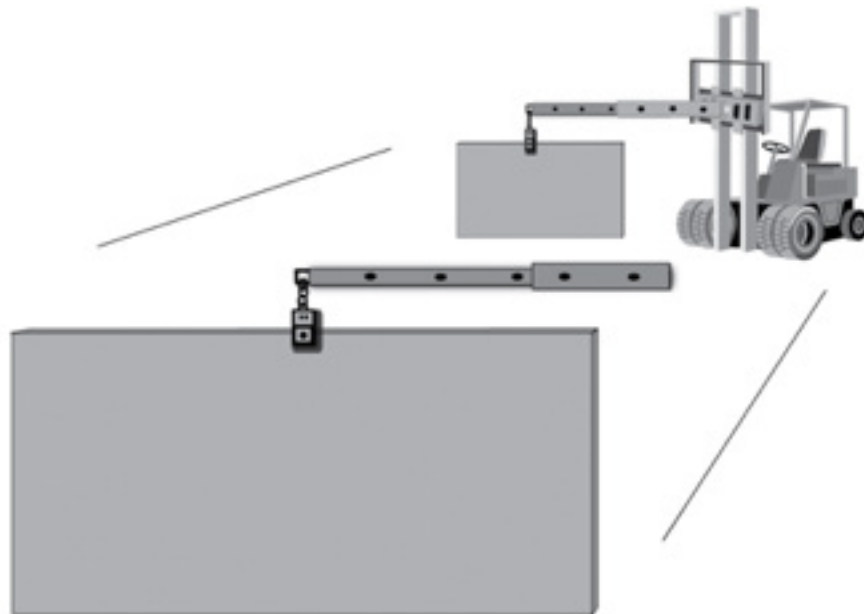
2.2 Storage & Handling Cont'd.

Slabs must be handled one at a time using commercially available clamps or sling straps designed and sold for that purpose.

If the available equipment has the appropriate lifting and carrying capacity, multiple slabs can be moved using properly sized sling straps as long as the slabs are carried face-to-face or back-to-back to minimize scratching. For containers that are packaged in bundles, the handler may use an appropriate forklift or overhead crane.

Note: For your safety and the safety of others:

- Read and follow all proper recommended use, maintenance, and care instructions for any equipment being utilized.
- Always maintain a safe distance and location when handling and lifting slabs.
- Always follow all OSHA and ANSI safety protocols and guidelines.



STORAGE & HANDLING

2.2 Storage & Handling Cont'd.

Depending on the shop layout, the handling equipment required may vary. Having the right equipment will save time, money, and will provide a safer working environment.

For example:

- If the shop possesses large fabrication equipment, jib booms or overhead cranes may be a better alternative to forklift handling.
- Other factors that will make a difference:
 - ◇ Total floor area in relation to inventory
 - ◇ Shop layout and storage rack access
 - ◇ Volume of material moved or stored
 - ◇ Shipping and receiving area

Different Types of Handling & Storage Equipment



Forklifts, lifting boom, overhead cranes, jib cranes, vacuum lifter, slab clamp, A-frames, slab storage racks, A-frame carts, slab dolly, vacuum cups, fabrication tables and work benches, and racks for finished goods.

STORAGE & HANDLING

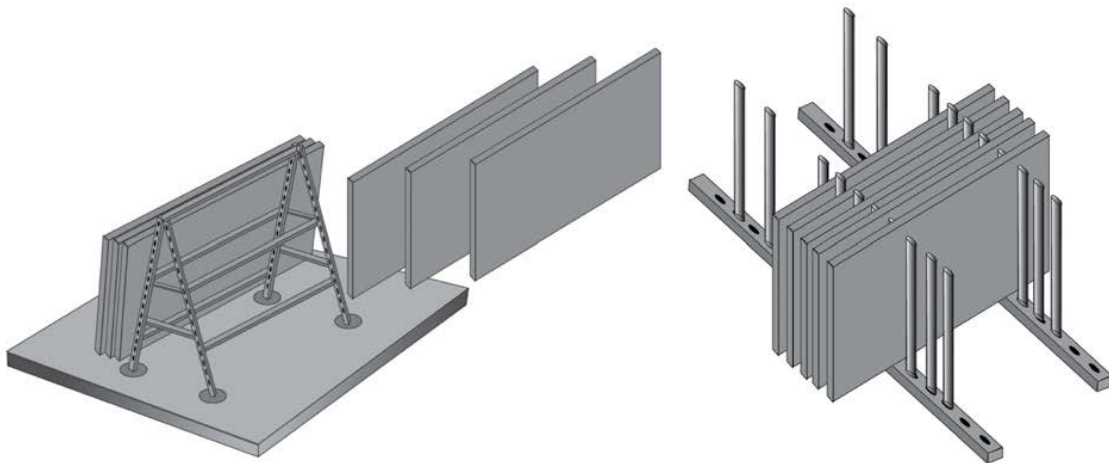
2.2 Storage & Handling Cont'd.

HanStone Quartz slabs should be stored inside, away from the outside weather conditions and away from UV rays, and on a storage system that is perfectly leveled. This is to prevent any warping or damage to the materials during storage. Make sure the storage system can provide leveled support throughout the entire length and width of the material.

PRO TIP

Here are some tips on storing HanStone Quartz Slabs:

- The slabs should be stored either on an A-frame or on vertical racks.
- Metal A-frames or metal racks should be covered with foam to eliminate dull or streak marks on the surface slab.
- Store slabs for easy access and verification, organized according to color identification and lot numbers.
- Polished face should not be stored in direct sunlight.
- Avoid extreme weather/temperature conditions.
- Remove all suction cups and lifting devices from material immediately after use.



STORAGE & HANDLING

2.2 Storage & Handling Cont'd.

It is very important to take every precautionary measure when handling and transporting fabricated tops to the jobsite due to the weight and size of each slab. Special attention should be taken when packaging, loading, transporting, and unloading slabs. Improper handling can result in unnecessary damage and injury.

Careful transportation to the jobsite is critical:

- Never transport or carry pieces flat, always carry vertically.
- Place support bars or boards onto any tops with cutouts.
- Always use an A-frame type support system to transport the pieces on a vertical or slightly angled plane.
- Do not drop or drag any pieces.
- Secure all pieces to the frame with properly rated straps or clamps before moving vehicle.
- When transporting laminate pieces, load with the lamination side up whenever possible.
- Be sure to carry pieces face-to-face or back-to-back to avoid scratches while handling.
- Be sure to carry pieces face-to-face with a film coat on one slab when transporting slabs to avoid dull spots within slabs.
- The clamps should be in place until the piece is ready to be placed in its final location.
- Remove clamps immediately after use.

PRO TIP

When transporting pieces face-to-face and one piece is shorter than the other, place masking tape along unfinished edges between the pieces to avoid scratches.

The use of a rolling A-frame or slab dolly can be helpful in transporting larger pieces from the truck to the installation site.

MATERIAL INSPECTION

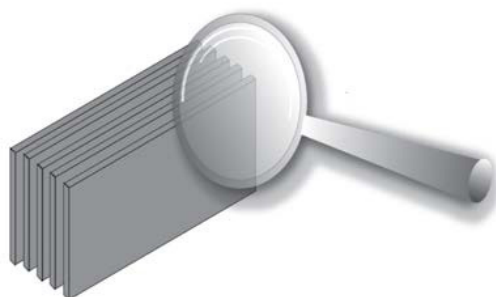
3.1 Material Inspection Checklist

When receiving material from your distributor, please inspect the slabs for any defect. Please check all HanStone Quartz slabs thoroughly before cutting, fabricating, altering, or before permanent installation.

- ✓ Blotches/resin blotches
- ✓ Scratches/streaks/swirl marks/dull spots in finish
- ✓ Pitting/bubbles
- ✓ Cracks/chips/stress marks
- ✓ Pooling
- ✓ Black spots/spots
- ✓ Foreign material
- ✓ Color variance
- ✓ Broken slab

Note: After checking and performing a quality control inspection of the slab, if you find any Product Non-Conformities (PNC), which will greatly increase your fabrication time and cannot be resolved quickly, please contact your local HanStone Quartz distributor for further instructions.

Hyundai L&C will not be held responsible for any labor charges incurred for fabrication of such defective materials or any incidental loss or damages as a result of mishandling. Any PNC issues should be reported to a local HanStone Quartz supplier prior to cutting, fabricating and/or installation.



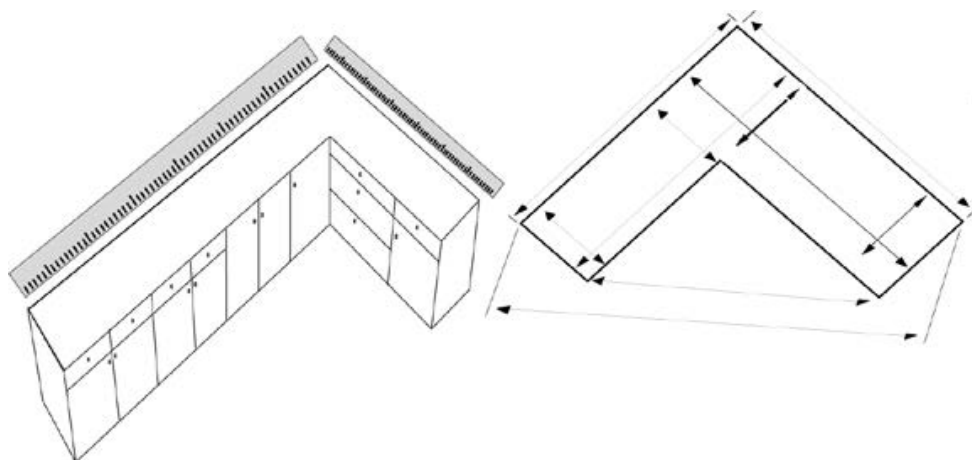
FABRICATION

4.1 Overview

Fabrication Overview:

- Measure all sides.
- Measure the diagonal lengths.
- Measure the mid points of the cutouts and setbacks.
- Measure the inside dimensions of the base cabinets where the cutouts will settle.
- Note any curvature of the walls or misalignment.
- Measure the clearance from the doors and drawers to the top of the face frames to ensure that laminations won't interfere with their operation.
- Make sure to check with the Fabrication Shop for other important information they might require.
- All corners must have a minimum radius of 3/8".
- Measure for overhangs at standing appliances for clearance and fit.

Note: Remember to have detailed drawings showing the layout, where to place the seams, sinks, appliances, and other information.



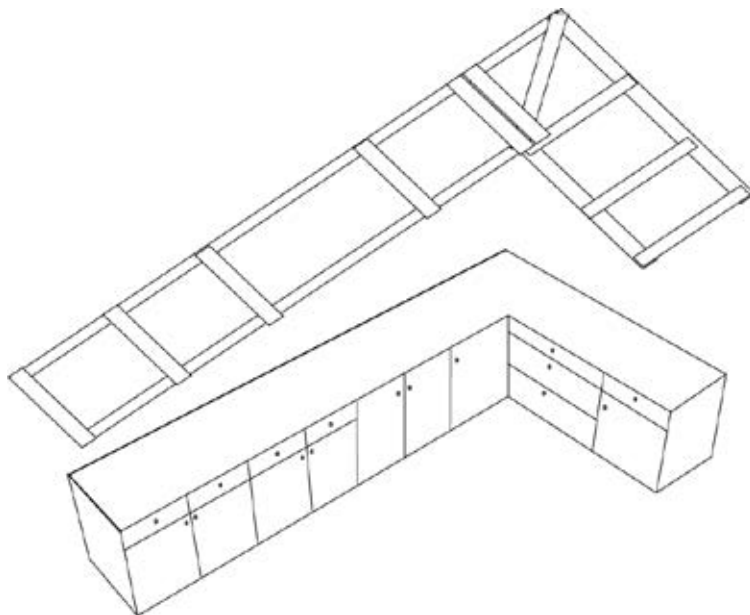
FABRICATION

4.2 Luan Strip Template Method

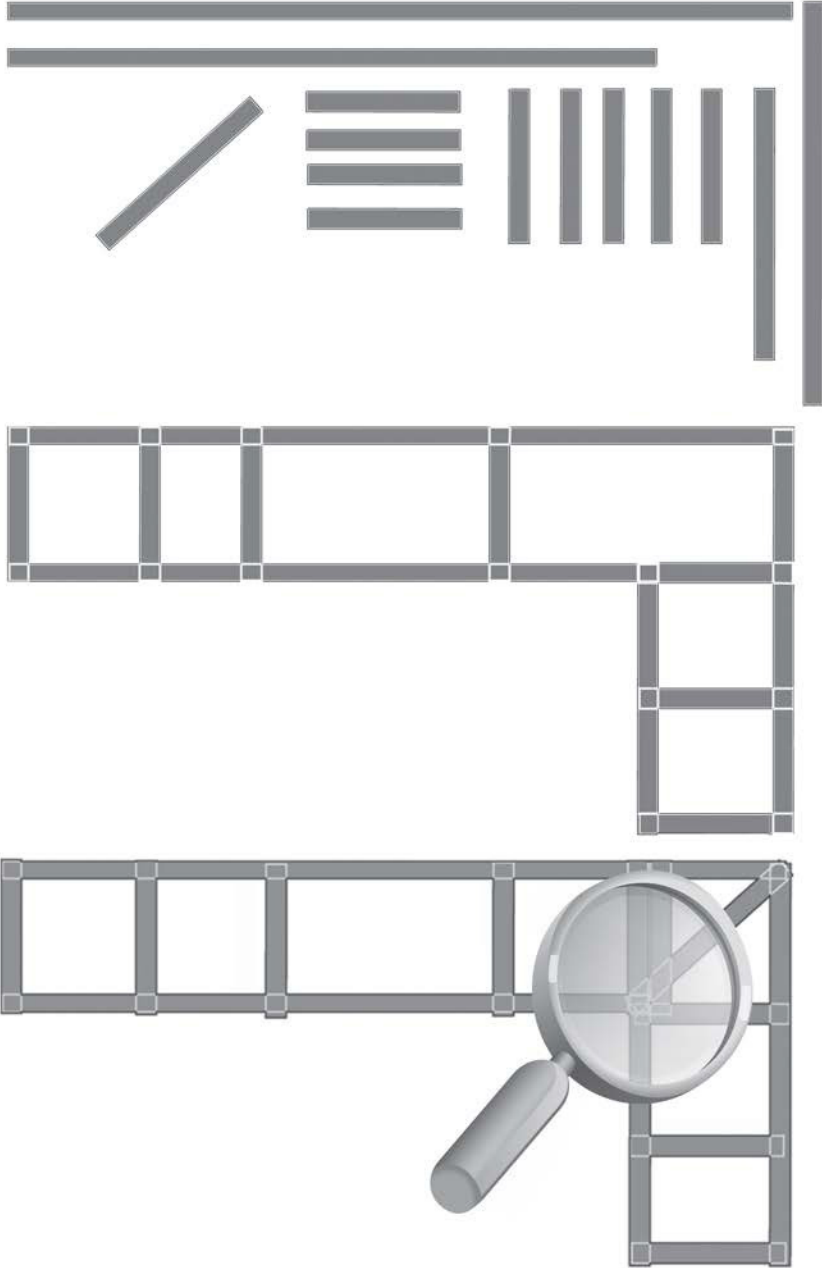
The Luan Strip Method of creating templates is a common method of templating. When constructed properly, wood templates offer the following advantages:

- Accuracy
- Rigid template – because of its rigidity, when removing it from the position it was created in, the template will often alert you to potential crash points that the installer might face during the installation.
- The material (usually 1/8" luan plywood), is readily available in most areas and may be labeled as "door skin" material.

Note: Making a perfect template of the job will be the first step in creating and installing a perfect countertop.



FABRICATION



FABRICATION

4.2 Luan Strip Template Method Cont'd.

When making Luan Strip templates, there are two methods to consider. The first involves making a template that matches the perimeter of the cabinets exactly and then writing the overhang dimensions on the template where applicable. Using the second method, the templates are constructed with the overhangs built into the template. We recommend this system for the following reasons:

- Less room for error due to inaccurately writing or reading the notes on the template.
- Identifying possible obstructions in the overhang requiring a notch (such as a door casing or door swing) that would not be obvious otherwise.
- Less chance of making a mistake when marking out the template on the stone.

Procedure

The first thing you will need to begin is an adequate supply of 1/8" Luan plywood strips cut into 2" widths. These strips can easily be cut to length with a utility knife or tin snips. Proceed as follows:

1. Tack the 2" strips around the perimeter of the cabinets to be templated with dots of hot glue to hold them in position.
 - a] Tack these strips so they protrude past the face frames and end panels creating appropriate overhangs where required.
2. Reinforce the template by hot gluing strips from front to back at a maximum of 24" intervals.
3. At seam locations, glue two strips parallel to the desired seam with one left of and one right of the seam so they are touching each other in the center. Create the seam by cutting through the front and back strips between the two seam strips with a utility knife. Be sure to lay out the seams so they are 90 degrees to the front edge.

Note: Final seam placement may be determined by the fabricator, however, the seam placements by the templator will help him understand the desired locations.

FABRICATION

4.2 Luan Strip Template Method Cont'd.

Detailed Drawings

In addition to the templates, a detailed drawing of a kitchen layout is important as well.

The drawings should include:

- Material color and edge finish
- Overall layout of the kitchen
- Location of all cutouts and holes (types & sizes)
- Any crucial information should be labeled and identified on the drawing
- The procedure differs depending on the company, so please check with your fabricator for details

Review all information and get sign-off from the Customer (Homeowner or the Contractor).

- Material color and edge finish
- Edge details (thickness)
- Corner details
- Backsplash
- Seam location and how it will look
- Overhang
- And any other information which might cause problems after installation

After all the information has been reviewed and all issues addressed, customers should sign off on the template, drawing or on a sign-off sheet.

Cutting templates for transportation

- Cutting templates are not usually recommended.
- However, the templates can be cut on the seam line, and all pieces numbered for later placement identification.

FABRICATION

4.2 Luan Strip Template Method Cont'd.

After the physical template is constructed, it is time to make all notes and identifying marks on the templates themselves.

Generally this is done with a felt tip permanent marker such as a Sharpie.

Every Fabrication Shop has their own preference as to how templates should be labeled so it's very important that the Template Technician and Fabricator discuss this in advance to eliminate any confusion.

Labeling Suggestions:

Mark radius corners

Using radius templates, mark the inside and outside corners with the desired radius. If practical, cut the corner radius on the template to make sure this detail is not missed during fabrication.

- Remember, the minimum requirement of all corners is 3/8".

Edge details

All finished edges should be marked and defined specifically with the name of the profile and sample drawing.

- Remember, there are many variations of symbols used by fabricators so please check with your fabricator for details.

Backsplash

Backsplashes should be marked and specified as to the height, placement, and polish locations.

Cutouts

Cutouts for sinks, faucets, cooktops, and other appliances should be available in measurements to be taken back to the Fabrication Shop, but precise measurements marked out on the templates is necessary.

Always indicate color of material and finish

Templator and date for reference

Total number of templates (i.e. 3 of 5)

FABRICATION

4.3 Alternative Template Methods

Cardboard or other materials like plastic can be used to make templates. Depending on the fabrication plant, the materials and/or process will differ.

The following instructions are suggestions and guidelines, however other methods are available as well.

Materials and processes should be verified with the fabricator before proceeding.

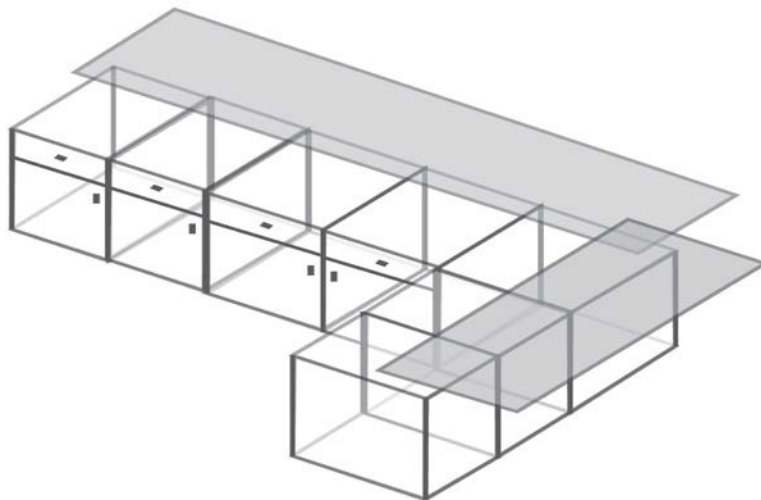
Similar to any other template method, make sure all the preparations are completed. Please refer to the checklist section within this manual.

The template materials are usually pre-cut to depth before arriving at the job site. (Depending on the material being used, pre-cut size of the template material will vary.) Remember to have the template materials cut to perfect rectangles, with all the corners being 90 degrees.

Place the template materials on the cabinets as illustrated below and trim to fit.

Follow all instructions mentioned in the Luan Template Section as far as labeling, drawings, and customer acceptance are concerned.

Digital templates should be done according to template manufacturer's specs.



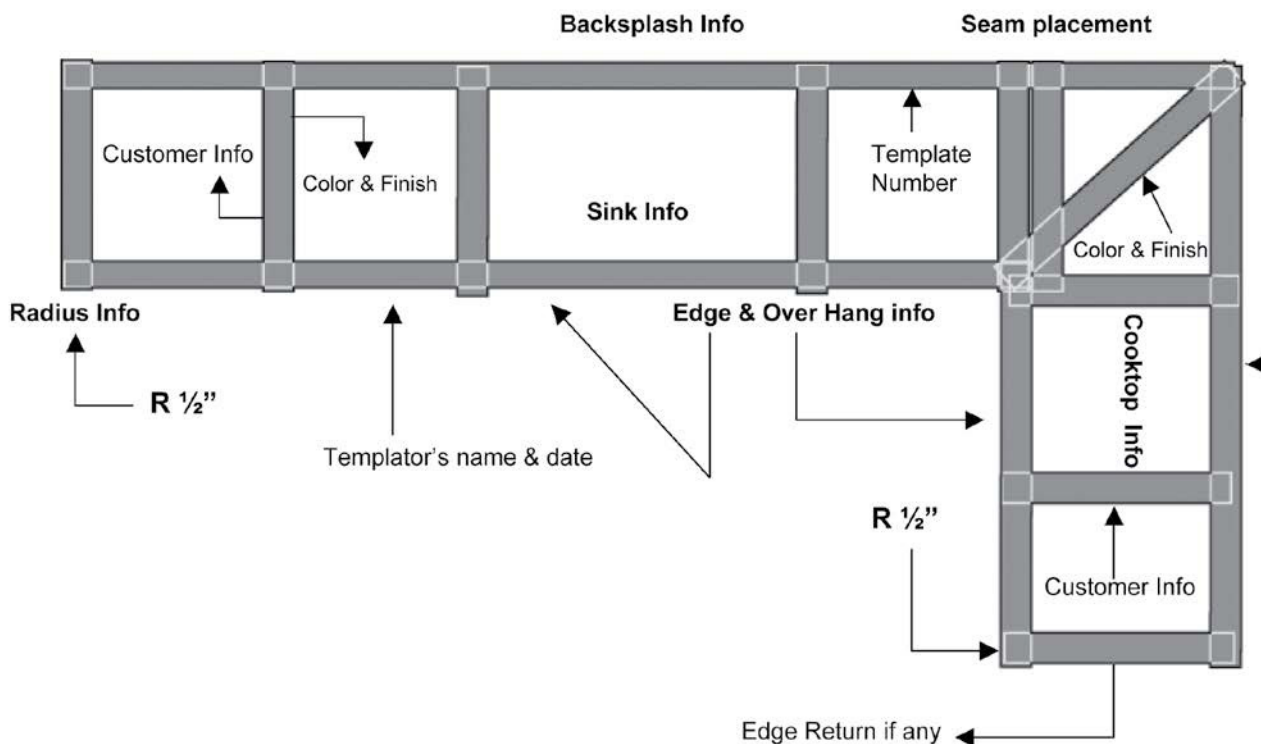
FABRICATION

4.3 Alternative Template Methods Cont'd.

Cutouts

- Though cutouts for sinks, faucets, cooktops, and other appliances should be available for measurement back at the Fabrication Shop, precise measurements and correct indications on the templates are very important.
- Sinks or cooktops:
 - ◇ Measure the inside dimension of the base cabinet (side-to-side and front-to-back).
 - ◇ Mark on the template the measurement of the openings.
 - ◇ Communicate to shop personnel how far back they should start the cutouts, indicate the front and back dimensions, cabinetry measurement, etc.
 - ◇ Indicate cutout type (under mount or top mount).
 - ◇ Indicate cutout profile if any.

Note: Remember that all inside and outside corners must have a minimum radius of 3/8".



FABRICATION

4.4 Electronic Template Method

With the advanced technology of automated equipment in many HanStone Quartz fabrication plants, Electronic Templating is used to integrate templating and fabrication to greater precision, accuracy, and proficiency.

There are many different electronic templating systems on the market today. Some employ mechanical means, laser, or even digital photography. Each has its own strengths and weaknesses. In all cases, both template technician and the fabrication shop must be on the same platform, to be able to integrate electronic templating into the fabrication process. Make sure to discuss this with the fabrication shop before making any investment in this technology.

Electronic templating uses different equipment with corresponding software to make digital templates at the job site in the form of DXF files. These files are then loaded into a CNC mill or router, from which hard templates are cut or stone pieces processed.

Done correctly, the electronic template method can be very accurate and proficient. Due to the complexity and variety of equipment available, for more information, please contact your local equipment supplier.

Note: Ensure you are proficient on all the equipment and software before going to the job.

When first starting with this system, it is advisable to take along tools and materials for an alternative template method in case of equipment failure.

FABRICATION

4.5 Seam Placement

When fabricating and installing HanStone Quartz products, there are a variety of factors that may make it necessary to seam two pieces of material together:

- The length of the top is longer than the slab
- Optimum material yield
- Weight of finished top size
- Configuration of finished top

Overview

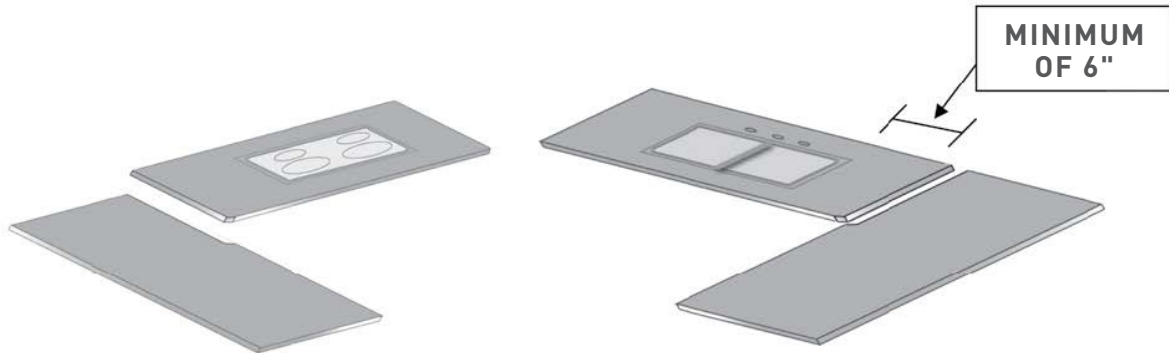
- Place seams to get maximum yield of the material.
- Try to minimize the number of seams in the countertop.
- Avoid placing seams over dishwashers or trash compactors.
- Do not place seams within 6" of cutouts (sinks, cooktops, etc.)
- Avoid placing seams within 18" of a finished end.
- All corners must have a minimum radius of 3/8".

Note: In order to minimize the possibility of cracking, there are several guidelines which need to be followed when positioning seams. Remember, even though the Template Technician will create seam placement when constructing the templates, the Fabricator may ultimately determine the final placement.

FABRICATION

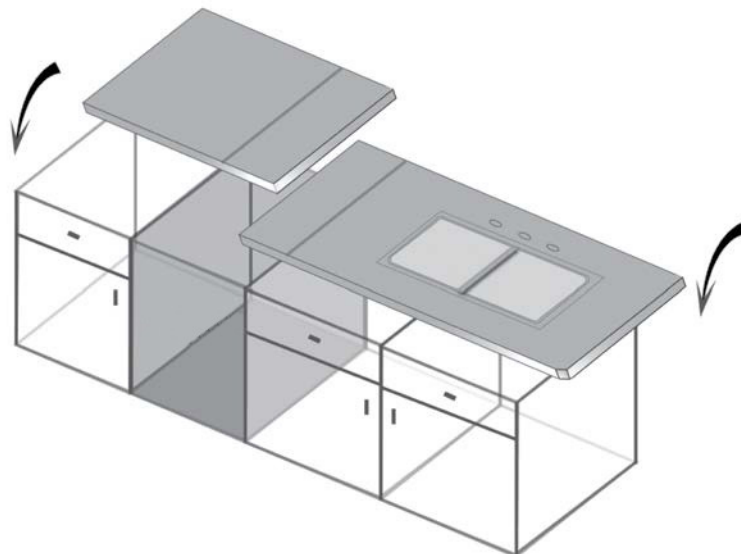
4.5 Seam Placement Cont'd.

All seams should be at least 6" from all cutouts, such as sinks, cooktops, and other appliances. In addition, from an appearance point of view, try to position the seams so that they don't look out of place.



Seams should be avoided over the dishwasher or compactor. We do not recommend or honor warranty if a seam is placed over a dishwasher or a trash compactor.

It is important to make a note on the templates if a seam has been placed over a dishwasher. The Fabrication Shop may review the layout and try to rearrange the design according to your notes.



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4.5 Seam Placement Cont'd.

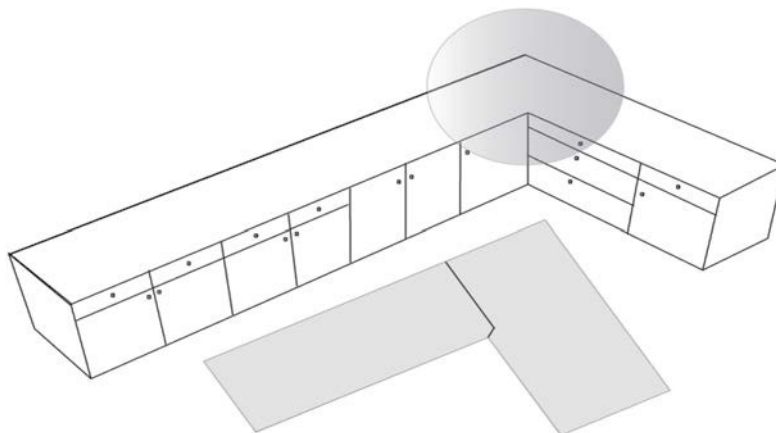
"L" shaped cabinets joined together at an angle are common configurations used to negotiate a corner. When building tops for these areas, it is advisable to place a seam at the corner rather than building one top.

The advantages of seaming the top are as follows:

- Reduced chance of breakage during fabrication
- Reduced chance of breakage during transportation
- Reduced chance of breakage after installation due to stress at the corner
- Improved ease of transporting and handling

There are three basic seam configurations used in corners as follows:

- Key cut - this is the most efficient seam configuration from the stand point of material yield and labor costs. (Shown Below)
- 2" return with 1 ½" radius cut on the inside corner - many shops prefer this seam configuration for aesthetic reasons, and to match other inside corners cut like this without seams on the same job.
- Mitered seam - this configuration is not commonly used because of poor material yield and it creates a longer seam that's more difficult to deal with.



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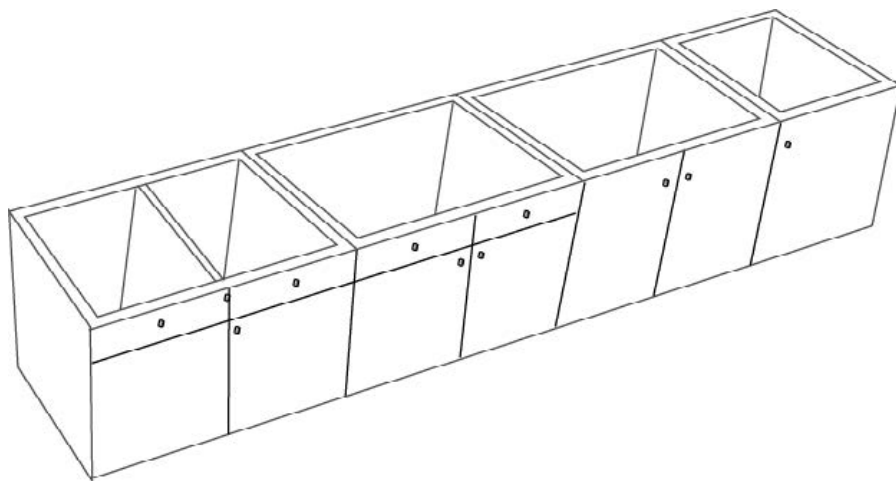
4.6 Supports

A| Perimeter Support

Similar to natural stone, HanStone Quartz is extremely heavy and needs to be supported properly. With 3cm material, the tops can be set directly on top of the properly installed and leveled cabinets, as this provides the perimeter and cross support required. This support is not adequate for 2cm tops, and 2cm profiled edges are generally laminated. For these reasons, we require a built up perimeter support or full sub top on our 2cm material.

Perimeter support:

- Recommended material – 5/8" or 3/4" x 2"
 - ◇ Moisture resistant MDF
 - ◇ Moisture resistant plywood
 - ◇ Particleboard is not acceptable for this application
- Wood strips should be installed continuously along the front and back of the cabinets, and crosswise, (front to back) at the ends, and a maximum of 3' o. c. (over cabinet partitions) intervals.
- Front-to-back support is also recommended under and along both sides of all seams.



FABRICATION

4.6 SUPPORTS CONT'D.

B| Full Sub Top Support

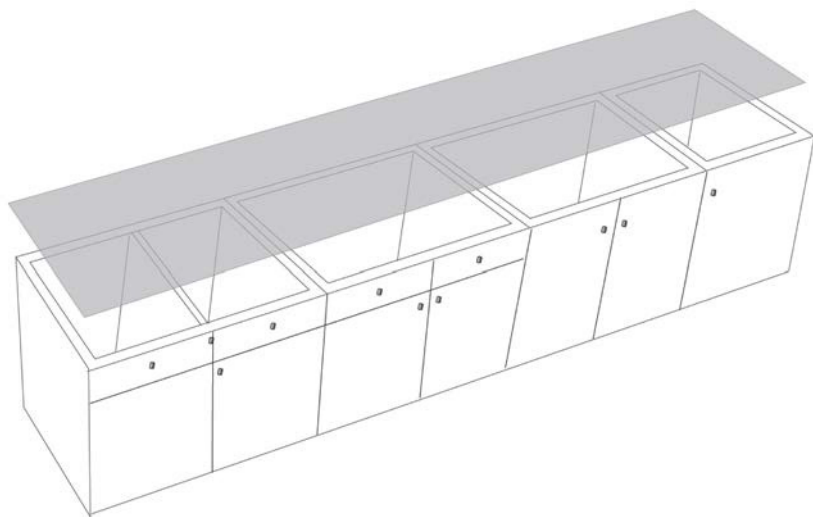
Many installers prefer to use a full sub top rather than support strips. A full sub top has some advantages and is required in areas of overhang and cantilever.

Recommended materials for full sub tops:

- 3/4" moisture resistant MDF
- 3/4" moisture resistant plywood
- Particle board is not acceptable for use as support

When installing a full sub top, do not seam the sub top material in the same location as the countertop material. Avoid seams in cabinetry whenever possible.

When using either full sub top support or full perimeter support, the material must be attached tightly to the cabinets and be flat and leveled.



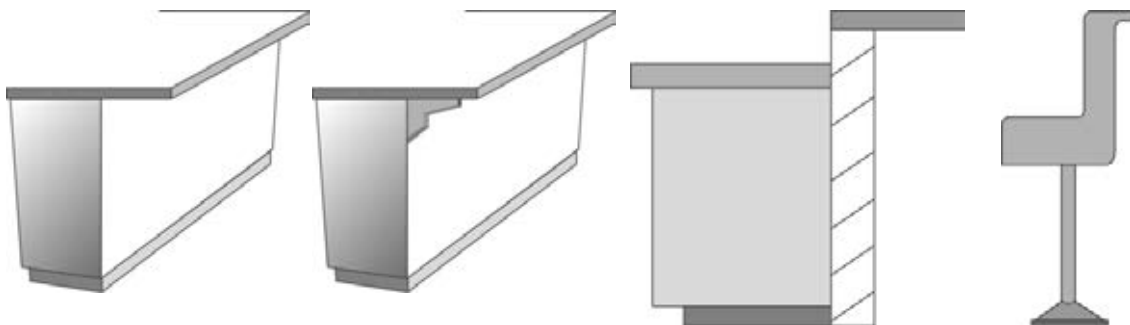
FABRICATION

4.6 Supports Cont'd.

C| Overhang Support

Depending on the application, you might be required to provide overhang support for the countertop. Following are some guidelines to follow when working with overhangs.

Requirements	2cm HanStone Quartz	3cm HanStone Quartz
Support not required	Overhangs under 12". Use full sub tops greater than 6".	Overhangs under 16".
Full sub top with corbels	12" - 18" use full sub top along with corbels evenly spaced at 3' on center or less.	16" - 24" use full sub top along with corbels evenly spaced at 3' on center or less.
Full sub top with legs or columns	Overhangs over 18" use full slab top along with legs or columns connected at the top with rails of adequate size to provide perimeter support.	Overhangs over 24" use full slab top along with legs or columns connected at the top with rails of adequate size to provide perimeter support.
Raised bar mounted on the top of pony wall	Full sub top and bracket or corbel support at 3' (on center or less) is always required.	



INSTALLATION

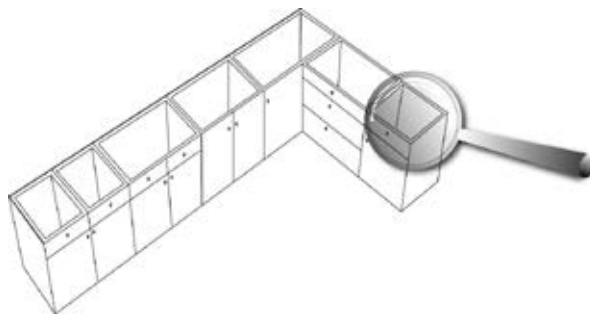
5.1 Site Inspection

This process is the responsibility of the Template Technician.

Remember, the fabricator and installer have not seen the job site and are relying on the information relayed by the Template Technician to understand the full scope of the job and its challenges.

Overview

- Accessibility – due to the significant weight of HanStone Quartz, accessibility to the installation site is very important and should be checked for any obstacles to minimize problems during installation.
- Parking/unloading area – note any parking/traffic considerations.
- Distance from parking area to installation area.
- Entrance gate/front door sizes.
- Hallways – note any narrow hallways, staircases, or tight turns along path to install location.
- Cabinetry condition – verify that cabinets are installed on a true flat plane and are leveled to within 1/4" per 10'.
 - ◇ Cabinets must be stable and rigid. (Re-facing is not sufficient.)
 - ◇ Cabinet clearance – installed upper cabinets must not interfere with installation of tops.



INSTALLATION

5.1 Site Inspection Cont'd.

- Areas adjacent to installation
 - ◇ Floor and wall areas under and around the cabinets where the new tops will be installed must be stable, rigid, and capable of handling the weight.
 - Minimum Load Deflection of $L/720$
- Clear all obstructions
 - ◇ Old cabinets
 - Make sure to remove anything that could interfere with the installation, such as old glue, screws, nails and/or other obstacles which might keep the new tops from sitting flat on the cabinets.
 - ◇ New cabinets
 - Many new cabinets have staples, screws, brads, etc. Make sure to remove before installation.
- All cabinets, end panels, overhangs, window sills and other base structures to receive the top should be secured to the floor or wall as applicable.
 - ◇ No movement should occur.
 - ◇ Remember any movement can cause stress to the top, possibly causing it to break and voiding warranty.
- Note electrical and plumbing positioning
- Note any irregular wall conditions
- Check for adequate reinforcement for areas with cutouts
- Check for adequate substrates
- Verify all faucets, sinks, cooktops, and other appliances to be installed with the top
- Cabinet doors and drawers should be installed to ensure that they do not interfere with any overhang or edge details

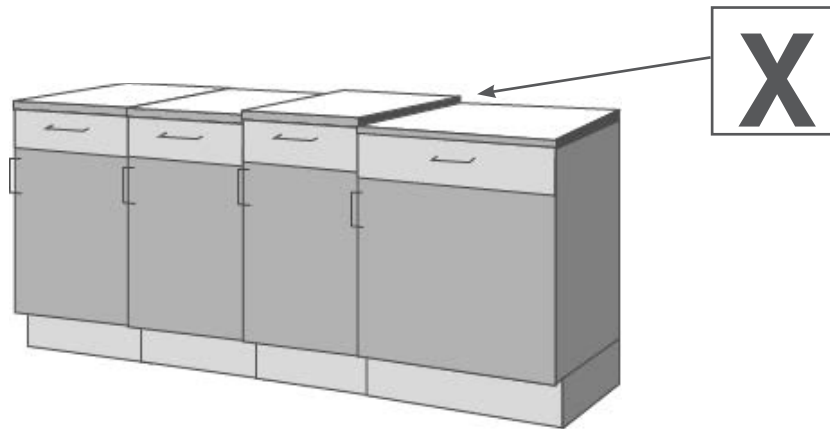
INSTALLATION

5.1 Site Inspection Cont'd.

At the time of templating, one of the most important tasks is to make sure all the cabinets are leveled. Leveling the cabinets will help prevent cracks and/or breakage of the tops due to stress points. Reporting discrepancies in level at the time of templating allows the contractor time to reset the cabinets before the installation of tops should it be necessary.

Overview

- Cabinets should be installed on a True (same) Plane.
- Cabinets should be leveled to within 1/4" per 10'.
 - ◇ Up to 1/4" difference can be corrected by various methods between the cabinets and the tops.
 - ◇ Anything more than 1/4" variance within 10 linear feet difference must be corrected by resetting the cabinets.



Note: Any resetting of the cabinetry should be done by the contractor or cabinet installers. Do not accept the liability of resetting the cabinets yourself.

INSTALLATION

5.1 Site Inspection Cont'd.

The following checklist is provided as an example and should not be taken as complete or sufficient for all applications. There could be other important information that needs to be added for the project.

- Accessibility
- Cabinet condition
- Surrounding areas
- Debris and obstacles
- Stability of the receiving area
- Electrical and plumbing position and condition
- Wall conditions
- Required reinforcements
- Adequate substrates
- Availability of cabinet doors and drawers
- Availability of all faucets, sinks, cooktops, appliances, and anything else that must be present at the time of installation
- Information for the Fabricator
 - Edge style
 - Splash details
 - Seam placement
- Material, color, and finish
- Any other information that might be required by the fabrication plant or by your company

Note: All corners must have a minimum radius of 3/8".

INSTALLATION

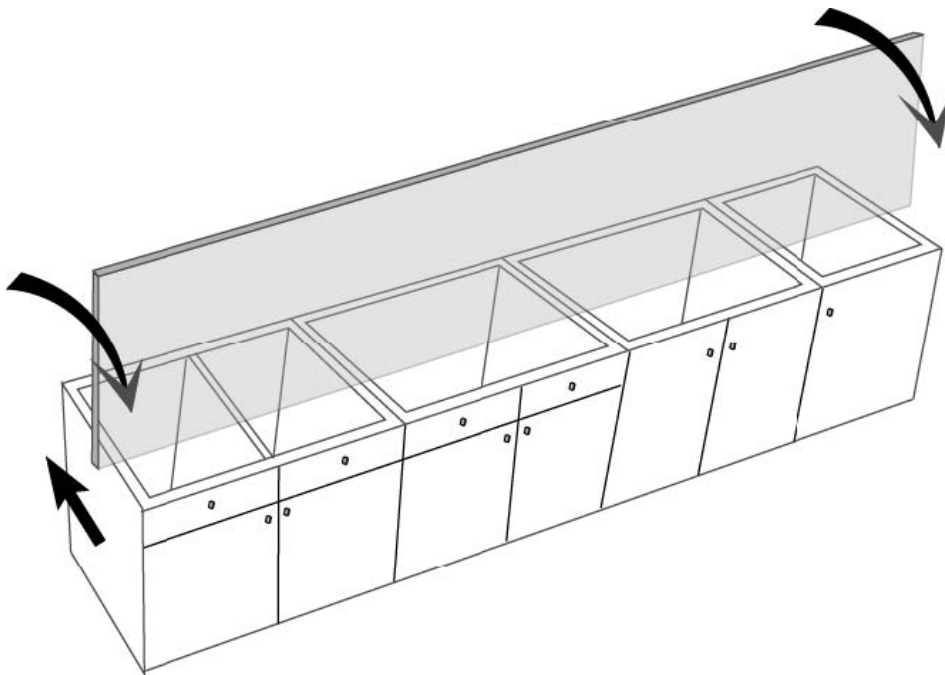
5.2 Dry Fit

When all the site preparations are satisfied, it is time to dry fit the pieces to make sure everything fits correctly. Remember, some pieces might be oversized purposely for on-site adjustment (field scribe).

Using the proper equipment (A-frame cart or slab dolly if needed) carry the pieces in vertically and place on top of the cabinets in their proper location (still in a vertical position). Before you start, it is a good idea to discuss with your install helper exactly how you will maneuver the piece into place once you get there. This will help prevent personal injury as well as reduce the chance of damage to the top.

Once the piece is sitting on top of the cabinet, slowly roll it down toward you and slide it back into place. It is very important that if two or more people are working together on this, they must be in sync with each other when lowering the top to help prevent breaking it.

Continue this process until all tops are placed in their proper positions.



INSTALLATION

5.2 Dry Fit Cont'd.

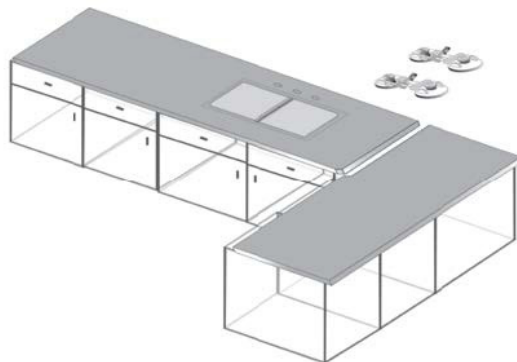
After all the pieces are in place, it is important to check the following and adjust as necessary:

- All pieces fit correctly against walls and cabinet sides where applicable. There should be about an 1/8" gap at all wall sections to allow for expansion of materials.
- Verify that all overhang areas are the correct measurements and parallel to cabinets.
- Check all surfaces with straight edges for flatness, adjust as follows:
 - ◇ If a perimeter support system was used, shim any low spots between the support strips and the tops.
 - ◇ If a full sub top was used, drive screws up from under the sub top to lift the counter top to the desired elevation.

Note: When using screws to jack up the countertop sections, they must be replaced with shims at the end. To do this, expose the screw tips by lifting the top along the front edge and tilting it up towards the back until it is easily held in place vertically by a helper. Cut shims to the height of the protruding screw tip and glue along side of it with a dot of CA glue or silicone. Remove the screw and lower the countertop back into place. Repeat this procedure at the seams if necessary.

- Make sure all pieces are properly supported.
- All the seam areas are aligned.
- Pull the seam together to see how the seam will turn out.
- Check margins against the walls especially at the ends.

If all pieces are placed properly and everything is in order, you are ready to fix the top to the cabinets.



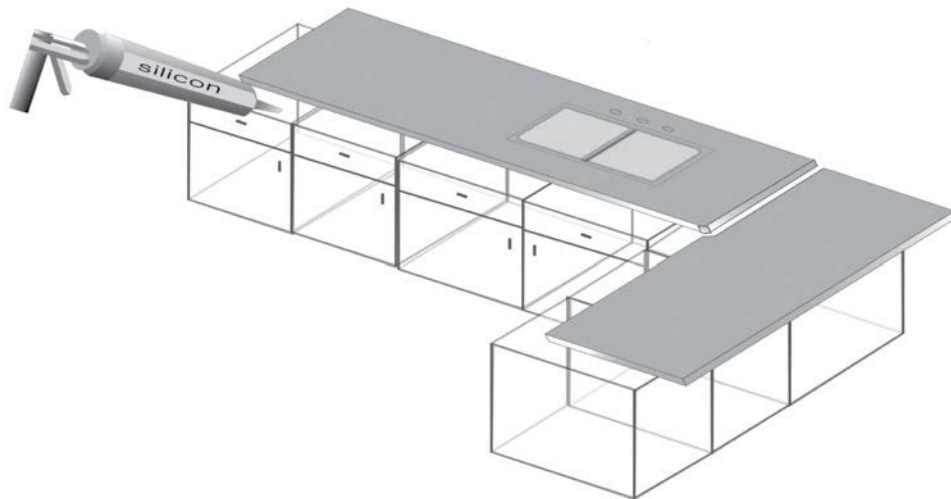
INSTALLATION

5.3 Seaming

How you glue the tops down will depend on the support system that is used. With either system, use a high quality 100% silicone adhesive for this job. This will allow the materials to expand and contract without breaking the bond.

- Do not use construction adhesive or any other rigid adhesive.

If a full sub top was used, lift the tops vertically in place and place 1" to 2" dots of silicone 10" apart completely across the front and back of the sub top, then lower the tops back down. Some shifting of position may have occurred when the tops were lifted, so be sure to reposition them where they belong.



If a perimeter support system was used, place a continuous bead of clear silicone under the overhang of the top where it meets the top of the cabinet.

Also, place a continuous bead inside the cabinet along the back where the top meets the back cleat or support rail of the cabinet.

Allow proper cure time for the silicone to dry completely before putting the counter tops into use.

INSTALLATION

5.3 Seaming Cont'd.

Before any seaming is started, make sure you have all the necessary materials and tools laid out for easy access. Once you apply the glue, you will have a relatively short period of time to complete the seam. Put strip of tape under the seam to prevent bond to substrate.

At this point, the seam pieces should be leveled, aligned front to back, and pulled together as they will be when the seam is finished. Make any adjustments now as there won't be time later. A seaming device such as the Gorilla-Grip™ is recommended. When using any vacuum operated device on the material, always ensure it is clean and dry prior to use.

Note: Be sure to clean both mating edges with Denatured Alcohol before bringing the pieces together. Allow to thoroughly dry. Do not soak substrate with Denatured Alcohol.

Overview

- Begin by spreading the two pieces to be seamed apart by at least 1/8".
- Place masking tape on the surface of both pieces along the seam edges to facilitate easier clean up later.
- Mix an appropriate amount of properly colored knife grade polyester and hardener (catalyst) together on a clean, dry scrap of cardboard or other suitable material.

Note: Be sure to mix completely to ensure an even cure. Do not over catalyze as this will weaken the cured glue and shorten the working time of the mix.

- Work the mixed glue into the seam with a spatula or putty knife. Be sure to push the glue far enough down so the entire inside surfaces of the seam pieces are covered.
- Push the two pieces back together and remove the masking tape along deck with the excess glue. At this point we recommend the use of seam clamps or a seaming device.
- Attach the clamps, adjust for level and pull the seam together as tightly as possible.

INSTALLATION

5.3 Seaming Cont'd.



PRO TIP

To check for a flat seam, hold a single edge razor blade vertical and perpendicular to the seam. Slide it across the seam from side to side with the blade touching the surface of the stone. It will catch on the high side if the stone pieces are not level with each other. Be sure to make any adjustments to the seam before the glue starts to gel.

- After the glue has cured, remove the clamps. There will be a raised bead of glue along the seam (that squeezed out when the pieces were brought together). This will need to be removed with a razor blade. Hold the blade vertical and at a 45° angle to the seam. Scrape forward and backward on the bead until the glue is flush with the surface of the stone.
- Approximately 1/8" gap will be enough to apply the adhesives.
- Remember, you will be using seaming tools to pull and separate the seams.
- There may be voids in the glue due to shrinkage or inadequate coverage during application. Repeat the process of taping, applying glue, and scraping again to accomplish a perfect seam.
- Sometimes after scraping, the glue will have a lighter appearance, simply clean with Denatured Alcohol and the darker original color of the glue will reappear.

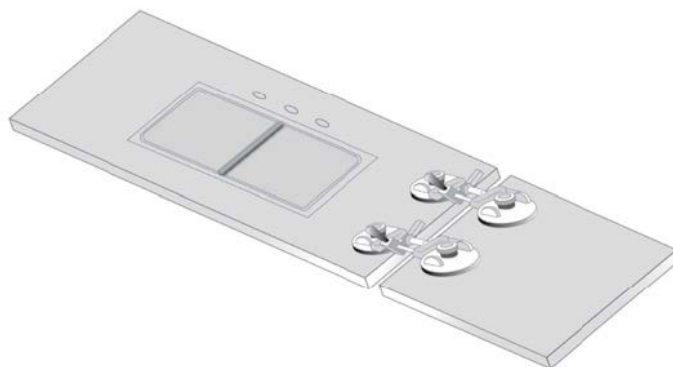


PRO TIP

Contact your Hyundai L&C Distributor for adhesive recommendations.

All inside corners must have a minimum radius of 3/8".

All edge profiles must have a minimum of a 1/8" bevel.



INSTALLATION

5.3 Seaming Cont'd.

The backsplash on a HanStone Quartz job is placed on the counter top, glued to the wall with silicone, and caulked at the countertop/splash connection with silicone or color matched siliconized latex caulking.

THE FOLLOWING ARE SOME GUIDELINES FOR INSTALLING BACKSPASHES:

- Check the splash for appropriate fit and then lay the top face down on the counter in the install position.
- Apply dots of silicone to the back of the splash on the ends and at 10" intervals along its entire length. Be careful to keep the upper dots low enough so the silicone doesn't ooze out the top when the splash is pressed against the wall.
- Roll the splash up and press onto the wall. Do not try to conform the splash to any curvatures in the wall as that would put undesirable stress on the stone.

PRO TIP

TO GET A NICE FINISHED BEAD OF SILICONE:

1. Apply a small bead along the entire length of the splash/countertop connection, in the splash corners, and any areas needing caulk in this section.
 2. Spray all caulked areas with window cleaner such as Windex®, or denatured alcohol and wipe off excess silicone with your finger, cleaning it off with a rag as you go. The silicone will not stick to the wet surface so you are left with a very small, nicely finished caulk joint.
- When setting the backsplash, it helps to put a few dots of hot glue between the silicone dots on the back before pushing the splash against the wall. The hot glue will set quickly, holding the splash tightly to the wall until the silicone dries.
 - Seams in backsplash sections are made up with colored polyester or color matched methacrylate adhesive, much like the countertop seams.

** Windex® is a registered trademark of S.C. Johnson a Family Company.

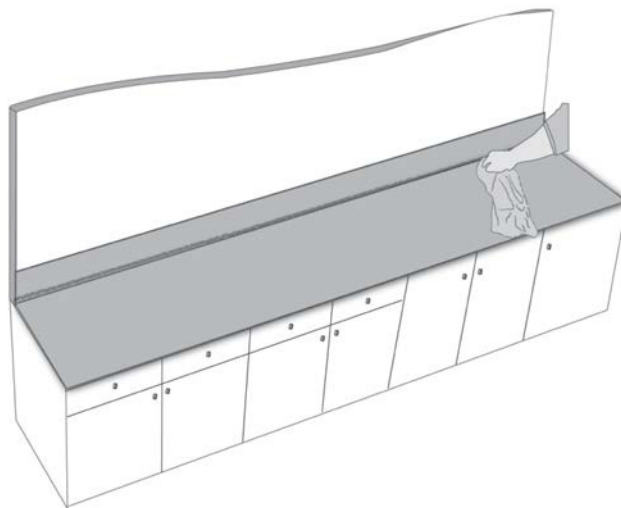
INSTALLATION

5.3 Seaming Cont'd.

Caulk between the top of the splash and the wall with paintable silicone or latex caulk either color matched to the wall color or painted to match the wall. Any gaps between the wall and splash will be less noticeable if the caulk matches the wall as opposed to matching the splash, which would give the appearance of an irregular thickness to the splash.

CUTOUTS IN THE SPLASH SUCH AS OUTLETS SHOULD BE DONE AS FOLLOWS:

1. Place masking tape and on it draw the outline of the cutout on the front and back of the splash in exactly the same place.
2. Core 3/8" holes in the 4 corners. With a grinder and a diamond blade, cut the drawn lines as deeply as possible from the front.
3. Cross cut diagonally from corner to corner in both directions (these cuts should go all the way through the stone). Do not over cut the corners.
4. Turn the piece over and follow the same procedure on the back. The resulting 4 triangles will tap out very easily leaving you a square or rectangular hole.
5. When setting a splash section with a cut out in it, be sure to put a bead of adhesive all the way around the hole on the back to support against the pressure applied by screws mounting wall plugs.



INSTALLATION

5.4 Cooktop & Other Appliances

We do not recommend accepting the liability for the installation of appliances. This job is better left to the appliance installers; however, it is a good idea to place any drop in appliances or sinks in the cutouts to ensure that there are no potential clearance issues that could create a call back situation.

Sink bowls may be set anytime, but we recommend setting under-mount sinks prior to deck installation to confirm fit.

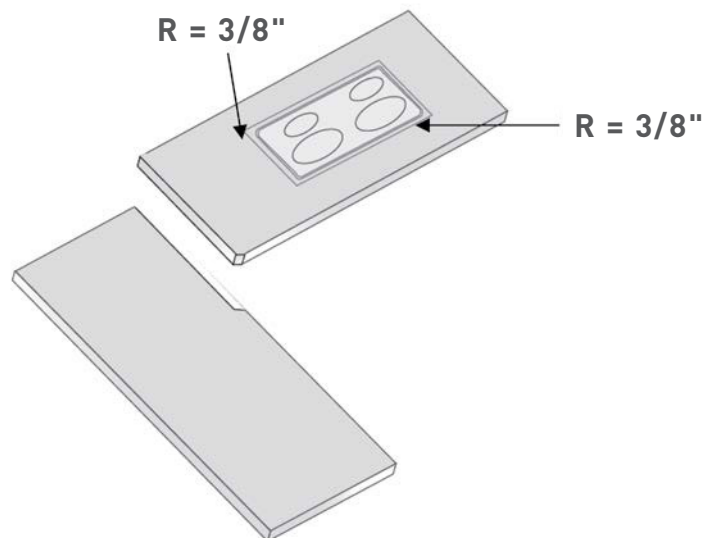
Under no circumstances should any mounting fasteners be drilled or screwed into HanStone Quartz surfaces.

For dishwasher mounting, where no sub top is present, there are metal plates designed for this purpose which are glued to the underside of the countertop.

These plates utilize small bolts to fasten through the dishwasher tabs.

Most tooling suppliers will have a source for these plates. The dishwasher must be in place in order to determine the mounting locations.

Again, this is just for locating purposes; do not install the appliance unless you are comfortable accepting the liability that goes along with it.



INSTALLATION

5.4 Cooktop & Other Appliances Cont'd.

UNDER-MOUNT SINKS

In most areas, under-mount sinks are traditionally installed by the countertop installer. Commercially manufactured mounting systems are available for all sink, styles, makes, and models. We recommend using sink setters to properly and efficiently install your sink. The following are some sink mounting suggestions:

CAST IRON/COMPOSITE/ANY RIGID SINK

Sink setting rails are the best option. They should be available through your tooling supplier or most plumbing supply stores. There are many options to choose from. The sink setter consists of two rails with tabs at each end which are attached to the inside of the face frame at the front, and into the cabinet cleat at the back, one on either side of the sink. The sink then rests on a front and back bolt that are threaded up through the rails. With this system, if the sink ever needs to be changed, it can be lowered, removed, and replaced from the bottom without having to disturb the countertop.

When installing a sink using this system:

1. Mount the rails to the cabinet.
2. Set the sink on the rail bolts set to a height of at least a 1/2" below the under side of the counter top when laying on the cabinets.
3. Place a bead of silicone around the sink flange and raise the sink until it meets the bottom of the counter top by tightening the rail bolts.
Note: When adjusting the bolts, do not put so much pressure on the sink that it raises the counter top.
5. Clean off excess silicone on the inside lip of the sink with Denatured Alcohol.

STAINLESS STEEL SINKS

Unlike rigid sinks, stainless steel sinks are flexible and sag in the middle if not well supported. There are also many accepted methods for under mounting stainless steel sinks. The most common system uses clips (usually supplied with the sink).

- Contact our local tool supplier for the best available system for your shop.

INSTALLATION

5.4 Cooktop & Other Appliances Cont'd.

DROP-IN SINK

Drop-in (top mount) sinks, though not as common as under mounts, are still used extensively. Usually the top mount cutouts are made on the job to avoid the risk of breakage during transportation. It is highly recommended that the cuts be made outside since dust is generated during this process. Be sure to wear proper dust mask and eye protection as needed.

Cutting a hole for a top mount is accomplished by tracing the sink template on the countertop using masking tape, usually centered in the sink cabinet, and cutting the line with a grinder and a diamond blade. When cutting curved lines, use a contour blade.

As with appliances, it is not recommended that you install these sinks. Place the sink in the hole to verify fit and clearance, then remove it but let the plumber install it. Again, this is for liability reasons.

INSTALLATION

5.5 Cutting on the Job

Most of the time, all necessary cutouts are done in the fabrication shop. If you do end up in a situation where a cutout must be made on the job, it is always advisable to cut outside whenever possible and always wear appropriate protective gear.

COOKTOP AND SINK CUTOUTS

1. Measure and mark the cutout on the stone. Place masking tape and mark with a ball point pen or pencil.
2. Square cutouts:
 - A) Drill out corners with a core bit (usually a 1 3/8" bit works well).
 - B) Cut out perimeter with a grinder or circular saw with a diamond blade.
 - C) If the appliance requires a cutout with a smaller radius than the core bit used, clean the remaining material out of the corner with a grinder, diamond blade, or an outside diamond "barrel" bit. Leave a smooth radius within the corners to avoid stress within each corner (3/8" minimum).
 - D) Remove all blade marks and leave cut smooth. Bevel the top and bottom of cut to a 1/16".
 - E) Heat tape is required and to be installed and applied to the edge of the cooktop flange.
3. Round or oval cutouts:
 - A) Cut with a grinder or circular saw and a contour blade.

INSTALLATION

5.5 Cutting on the Job Cont'd.

ELECTRICAL OUTLETS

1. Measure and mark the cutout on the face and back to the stone by placing masking tape and marking it with a ball point pen or pencil.
2. Drill the 4 corners out with a 3/8" core bit.
3. Cut the face around the perimeter and diagonally from corner to corner in both directions. Do not over cut past the cored corner holes.
4. Flip the piece over and repeat the cuts from the back side. The 4 resulting triangles should tap out easily.

Note: Whenever possible, leave at least a 3/8" radius in all corners to reduce stress at these points.

TOOLS & EQUIPMENT

6.1 Basic Machinery

HanStone Quartz fabrication shops should be fitted with machinery designed to work with natural quartz surfaces while providing the highest quality possible. Consideration of heavy equipment should be carefully researched and implemented before working with HanStone Quartz.

The following chart briefly describes some of the basic heavy machinery used in a fabrication shop. The type of machinery in each shop will differ according to individual needs, and state/federal requirements for safety.

Saw (Bridge Saw)	This is the most important piece of equipment. Bridge saws will cut full slabs of material with greater accuracy, precision, and speed than conventional hand tools. Bridge saws can have many different options ranging from manual to fully automated.
CNC Machine	Computer Numerically Controlled (CNC) Technology. The CNC mill (router) uses digital templates or measurements to automatically cut out, profile, and polish the perimeter of a piece and internal cutouts such as sink holes, etc.
Line Polisher (Single Head)	Machine designed to profile and polish edges in a straight line only.
Line Polisher (Multi Head)	Similar function as the single head polisher but it is capable of much higher production rates.
Handling Equipment	Overhead gantries and jib booms facilitate the movement of material around the shop and the ability to load pieces on the machines without the necessity of forklifts in space prohibitive areas.
Water Treatment	A system of pumps, filters and settlement tanks used for the recirculation of shop water.
Air Compressor	Used to supply machines and pneumatic hand tools with sufficient air pressure and volume to operate efficiently.

TOOLS & EQUIPMENT

6.1 Basic Machinery Cont'd.

A fabrication shop, large or small, will require most of the tools listed in this section.

While the following is a brief overview of some of the basic tools and equipment required in a shop in order to fabricate HanStone Quartz, it is not intended to be comprehensive or complete and should not be solely relied upon for information. This overview does not address any personnel safety equipment or requirements. Contact OSHA and your local Employment Development Department for that information.

Handling & Storage Equipment	Fork lift, vacuum lifter or slab clamp, lifting boom, A-frames, slab storage racks, A-frame carts, slab dolly, vacuum cups, work fabrication tables, and racks for finished pieces.
Hand Tools	Rail saw/polishers (air or electric) that are usually 4" and must be variable speed with center water feed. Angle grinders for hand cutting and shaping (min. 5"), router and appropriate profile cutters (4"), and clamps for laminating if needed.
Adhesives	The following two component adhesives are commonly used in a fabrication: flow and/or knife grade epoxy, polyester, methacrylate ester, and penetrating acrylic. Also required are appropriate pigments.
Cutting & Grinding Supplies	Diamond granite blade, properly sized to fit rail saw, turbo diamond blades properly sized to fit angle grinders (4" min. diamond cup wheels), 5" contour blade for cutting radius, zero tolerance grinding drums 50 & 80 grit, and core bits for faucet or grommet holes (usually 1 3/8" to 2 1/2").

TOOLS & EQUIPMENT

6.1 Basic Machinery Cont'd.

Polishing Supplies

3" and 4" flexible and ridged backer discs (velcro), 3"and 4" polishing pads (50, 100, 200, 400, 800, 1500,3000 grit), final polish pad, granite polishing powder, and felt pad.

Note: Grit combinations vary with different manufacturers.

Safety Equipment

Respiratory dust masks, ear plugs, safety glasses, steel toe rubber boots, waterproof aprons, gloves, back supports, and ground fault interrupters for all electrical applications.

Adhesives

Tape measures, carpenters square, combination square, bevel square, angle finder, compass, C-clamps, bar clamps, extension cords, air hoses and accessories, 4' level, 8' straight edge, whiteout pens/china markers, rags, or denatured alcohol (preferred), single edge razor blades, propane torch & tips, steel wool, masking tape, and shims.

Note: Tools mentioned above are a condensed version of the tools and equipment found in Fabrication Shops. Please ask your tool suppliers for additional tool and equipment recommendations.

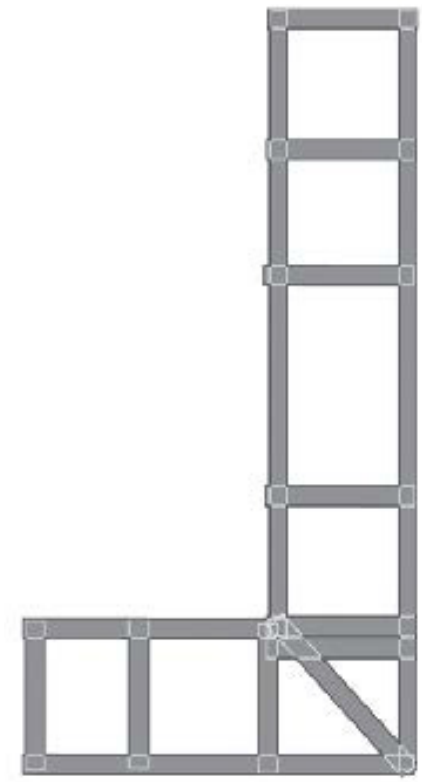
Remember, every shop has different needs. Each tool has its own advantages and disadvantages. The tools listed in this manual are for your consideration only. It is important to evaluate your individual needs and set up your shop according to those needs within compliance of all federal, state, and local guidelines.

TOOLS & EQUIPMENT

6.2 Template Tools

TOOLS:

- Adequate number of Luan Strips (Usually 1/8" thick, 2" wide, and about 8' long). Please check with the fabrication plant for preference.
- Utility knife
- Heavy duty scissor or shears
- Hot glue gun with extension cord
- Glue sticks
- Cardboard
- Magic markers or Sharpie pens
- Tape measure
- Pen and paper
- Straight edges
- Level 2, 4, or 6
- Square framing or construction protractor
- Sample decorative edges
- Sample corner profiles
- Plastic corner templates (to trace different corners on the template)



Note: Digital templating is available through different manufacturers. Please ask your tool supplier which system will benefit you most efficiently.

TOOLS & EQUIPMENT

6.3 Installation Tools

As an installation technician of HanStone Quartz, you will require the following tools. Having the right tools for the job will save time and yield professional results.

TOOLS:

- Handling Equipment
 - ◇ A-frame cart or slab dolly to carry the top from the truck to the installation site

- Safety Equipment
 - ◇ Protective gloves
 - ◇ Proper safety shoes
 - ◇ Safety glasses and dust mask (when cutting materials)
 - ◇ Ear plugs
 - ◇ Back support

- Straight Edges
 - ◇ Various sizes (4' to 8' recommended)

- Level
 - ◇ Various sizes (At least 4' recommended)

- Angle Grinder
 - ◇ 4 1/2" or 5" with diamond blades and cup wheels

- Polisher and Polishing Pads
 - ◇ Various pads for any touch-up work and/or other alterations made in the field

- Silicone
 - ◇ Variety of colors to match different colored tops
 - ◇ Utility grade for setting tops

- Jig Saw or Circular Saw
 - ◇ Used to cut out holes in the sub top if applicable (i.e. sinks, cooktops) or other woodworking applications such as filling in missing cleats, cutting prop sticks, etc.

TOOLS & EQUIPMENT

6.3 Installation Tools Cont'd

- Basic Tools
 - ◇ Hammer
 - ◇ Tape measure
 - ◇ Combination square
 - ◇ Framer's square
 - ◇ Hand tools such as screwdrivers, chisel, flat pry bar, etc.
- Seaming Kits
 - ◇ 2-part knife grade polyester
 - ◇ Variety of color pigments to match the top
 - ◇ Spatula or putty knife for mixing and applying glue
 - ◇ Seaming clamps
- Drill
 - ◇ Core bits for any necessary drilling (various sizes)
- Shimming materials (only to align the top for seaming)
- Vacuum
- Masking tape
- Single-edged razor blades
- Steel wool (#0)
- Denatured alcohol to clean excess adhesive and tools
- Clean rags
- Masking tape
- Roll of utility paper to protect finished floors in path of install
- Saw horses for cutting on tops outside
- Checklist and customer sign-off sheets

ADHESIVES

6.4 Adhesive Application

Basically, there are two types of silicone used in a typical HanStone Quartz installation:

- 100% pure silicone is used to fix the tops to the substrate and glue the splash or other vertical pieces to the wall as well as sealing any seams between pieces.
- Paintable silicone is used to caulk between stone and wall connections.

Note: Many Distributors carry colored silicones which can be used to caulk splash to counter top connections with very good results, but colors are usually not exact matches to the stone colors.

Many installers prefer to use a semitransparent or translucent silicone which tends to take on the color of the stone and create a more acceptable caulk joint.

ADHESIVES

6.4 Adhesive Application Cont'd.

In the natural quartz surface industry, many companies use polyester to seam materials together. Whether seaming two countertops or laminating a built up edge for profiling, polyester is the most versatile adhesive due to its fast cure time, ability to color match and great bonding qualities to engineered stone.

Polyester is a two-component glue consisting of adhesive with about 3-4% hardener added to it to cause the mixture to cure. Once the proper amount of hardener is added, the mix will be workable for about 10 minutes, depending on the temperature of the air and the surface. Clamps can be removed and work on the pieces can begin in about 30 to 45 minutes.

Polyester is colored using different tints designed specifically for polyester. These colors are combined to match the stone being used and are added to the adhesive before the hardener is added.



PRO TIP

When mixing and matching colors, place two scrap pieces of the stone to be matched together side by side, creating a simulated seam. Knife the colored glue in the seam. It will be obvious whether you need to lighten or darken the color in the finished mix.

Methacrylate ester is a two component adhesive that is also commonly used in quartz surface fabrication and installation. Although not as versatile as polyester because the color is pre-mixed and cannot be adjusted, this adhesive is much more convenient because it is dispensed and automatically mixed with a caulking gun with mixing tips, making the application much quicker and with far less clean up. Methacrylate adhesives can be used in all applications where polyester would traditionally be used.



PRO TIP

Please consult your Distributor regarding adhesive recommendation for HanStone Quartz.

CHECKLISTS

7.1 Site Evaluation

The following checklist is provided as a sample and should not be taken as complete or sufficient for all applications. There might be other important information that should be added for the project.

- Contact name, address, phone number, map, mileage, and other information about the job site
- Accessibility: Verify truck and other equipment accessibility to the jobsite, road conditions, and product accessibility to the jobsite, after the materials are unloaded from the truck
- Cabinet condition
- Debris and obstacles
- Electrical and plumbing position and condition
- Wall conditions
- Required reinforcements
- Adequate substrates
- Availability of cabinet doors and drawers
- Availability of all faucets, sinks, cooktops, or appliances that will impact the installation

CHECKLISTS

7.2 Templates and Measurement

The following checklist is provided as a sample for the Template Technician and should not be taken as complete or sufficient for all applications. There might be other important information that should be added for the specific project.

- Templates and measurements have been made according to specification by the fabrication plant
- Create drawing of the project including the countertop lay out and all appliance placements
- Mark location and center lines of all cutouts
 - ✓ Sinks
 - ✓ Cooktops
 - ✓ Others
- Indicate all overhangs and other special features of the installation
- Indicate extra support needed on the installation
- Indicate all profiled edges on drawings
- Mark all corners to its appropriate radius
- Indicate all splash locations and details (placement, height, edge profile)
- Indicate all seams in both drawings and in the templates
- Indicate all drilling configurations (faucet holes, soap dispensers)
- Go over all details and customer sign-off sheet with the customer
- It is a good practice to take photographs of the job area (optional)
Indicate material, color, and finish

CHECKLISTS

7.3 After Installation

When the installation is complete it is very important to do a thorough inspection of the job site to make sure all tasks are complete and the area is completely cleaned and all debris and tools are removed.

Below is an example of what an installation checklist should include:

- Are all pieces placed, glued down, and caulked?
- Are all appropriate edges polished?
- Slide in stove edges?
- Edge at refrigerator?
- Are all seams satisfactorily filled and finished?
- Have all tops and edges been inspected and all chips or minor imperfections been fixed?
- Have any residual glue spots been removed?
- Have all drop in appliances been checked for fit?
- Is under mount sink properly installed and all necessary fixture holes drilled?
- Are all cabinets vacuumed out inside and wiped down outside?
- Have the floors been cleaned?
- Installation walkthrough with homeowner?
- Are pictures taken?

PRO TIP

When everything on the checklist has been completed, be sure to have the customer sign off on the sign-off sheet.

WARRANTY

8.1 Warranty Statement

Commercial 10-Year Limited Warranty for North America

Hyundai L&C USA (hereunder “Hyundai L&C”) warrants to the original purchaser in the U.S. and Canada that its product HanStone Quartz, shall be free from defect in material under normal use and service, for ten (10) years from date of installation to the original purchaser. Hyundai L&C, at its discretion, will provide material only, to repair or replace product failures due to manufacturing defect during the 10 years following initial installation.

The professional fabricator/installer is responsible to inspect the HanStone Quartz material before fabricating and/or installing the HanStone Quartz product. It is also the end user’s responsibility to inspect the finished product before permanent installation. The user of HanStone Quartz product assumes full liability for usage of HanStone Quartz. This warranty applies to HanStone Quartz Surface product only for interior, commercial application(s) in North America. This warranty is non-transferable and is void unless the product has been paid for in full.

Exclusions for HanStone Quartz Commercial 10-year Limited Warranty:

1. Failure to comply with Hyundai L&C’s recommended storage, handling, usage, fabrication/ installation guide, and Care & Maintenance guidelines
2. Fabrication or installation error
3. Any harm, loss, injury, liability, or any expense, including, not limited to, labor, associated with original installation or repair or replacement
4. Damages caused by accidents, abuse, misuse, exposure to extreme heat, act of nature, job site conditions, or structural movement
5. Installed HanStone Quartz product that is removed from its original place of installation
6. Seam appearance or performance
7. Color variance or minor conditions such as stains or water spots
8. Materials or product produced by other manufacturers, whether or not used in association with HanStone Quartz
9. Without limitation, any indirect, punitive, or consequential damage or loss
10. Any warranty or representation made on behalf of Hyundai L&C by a third party without authorization by Hyundai L&C

WARRANTY

8.1 Warranty Statement Cont'd.

Commercial 10-Year Limited Warranty for North America

No other warranties, express or implied, are made, including merchantability or fitness for a particular purpose. Except as provided herein, Hyundai L&C is not liable for any loss or direct, incidental, or consequential damages as a result of the inability to use HanStone Quartz.

To obtain service under this warranty, first contact the source from which the HanStone Quartz product was originally purchased. In addition, Hyundai L&C or its authorized agents must be permitted to inspect the HanStone Quartz product being claimed under this warranty, with full cooperation by the party requesting service under this warranty.

For more information, please contact Hyundai L&C as below:

Hyundai L&C USA
2839 Paces Ferry Rd SE, Suite 1100
Atlanta, GA 30339
Tel: 888.426.9421
Tel: 770.431.6110
info@hyundailncusa.com

WARRANTY

8.1 Warranty Statement Cont'd.

Residential Lifetime Limited Warranty for North America

Hyundai L&C USA (hereunder "Hyundai L&C") warrants to the original purchaser/owner in the U.S. and Canada that its product HanStone Quartz, shall be free from manufacturing defects in material under normal use and service. Hyundai L&C, at its discretion, will repair or replace product failures only due to manufacturing defects.

This Lifetime Limited Warranty is available only to the original owner(s) of the residence in which HanStone Quartz has been originally installed. The Lifetime Limited Warranty is non transferrable and applies to HanStone Quartz product only, for interior, residential application(s) in North America. This warranty is void unless the product has been paid for in full, and the product must be registered on or before 30 days of installation.

Under this Lifetime Limited Warranty, Hyundai L&C's authorized agents must be permitted sufficient time and opportunity to inspect the product(s), evaluate and respond to any claim(s). All decisions regarding the existence of manufacturing defects or affecting this warranty shall be made by Hyundai L&C and shall be final and binding upon all parties.

The professional fabricator/installer is responsible to inspect the HanStone Quartz material before fabricating and/or installing the HanStone Quartz product. It is also the end user's responsibility to inspect the finished product before permanent installation. This warranty does not cover any defects that were visible at the time of fabrication/installation and were not avoided during fabrication/installation. All parties must agree to comply with the terms and conditions outlined in this Lifetime Limited Warranty.

This Lifetime Limited Warranty applies to product(s) that was installed after January 1, 2010.

WARRANTY

8.1 Warranty Statement Cont'd.

Exclusions for HanStone Quartz Residential Lifetime Limited Warranty:

1. Failure to comply with Hyundai L&C's recommended storage, handling, usage, supports, cutouts, and Care & Maintenance guidelines.
2. Exterior application.
3. Flooring application.
4. Fabrication or installation error.
5. Damage caused by improper use or abuse includes, but not limited to, damage from accidents, abuse of impact, chemical damage, acts of nature, job-site conditions, or structural movement.
7. Installed HanStone Quartz product that is removed from the original place of installation.
8. Seam appearance, seam performance, adhesives, caulk and/or other accessory items.
9. Thermoforming: Product failure due to bending or curving is not covered under warranty.

WARRANTY

8.1 Warranty Statement Cont'd.

Residential Lifetime Limited Warranty for North America Cont'd.

10. Color Variance: HanStone Quartz is composed of natural quartz, as a result, variance in color, size, shape and particulate distribution is an inherent trait expected of this product.
11. Chips and Cracks: Chips may be caused by impact. Cracks may be caused by "dry" cutting, polishing, unevenness or improper edge details. Minimum requirements for fabrication and installation must be followed.
12. Scratch: HanStone Quartz is scratch resistant, but not scratch proof. Cutting boards are highly recommended.
13. Blemishes: A certain level of blemishes is an inherent trait expected of this product.
14. Minor conditions such as stains or water spots. HanStone Quartz is stain resistant, but not stain proof. To clean tough stains, please visit our care and maintenance section of our website.
15. Supplemental repair including, but not limited to, electrical, tile or wall surfaces, backsplashes, cabinetry, freight, and plumbing modifications necessary to repair HanStone Quartz.
16. Product usage for commercial application(s) including, but not limited to, installation in store, office or other places of business.
17. Appearance of edge, re-fabrication, or polishing of surface slabs.
18. Exposure to extreme heat. Trivets must be used for any hot pots, pans, crock pots, and for any heat generated items. Heat resistant pads are highly recommended.

WARRANTY

8.1 Warranty Statement Cont'd.

Residential Lifetime Limited Warranty for North America Cont'd.

When choosing a color, please refer to samples only as a general indication of a particular color's design pattern, aesthetics, and hue. Samples are not guaranteed to be an exact replica of HanStone Quartz slabs and may vary from the actual, installed HanStone Quartz surface.

No other warranties, express or implied, are made, including merchantability or fitness for a particular purpose. Except as provided herein, Hyundai L&C is not liable in tort or contract for any loss or direct, incidental, or consequential damages as a result of the use or the inability to use HanStone Quartz. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state, or in Canada, from province to province. Some states/provinces do not allow the exclusion or limitation of implied warranties or of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Hyundai L&C makes no other guarantee, representation, or warranty (express or implied) with respect to its products, except as expressly stated herein. No one other than Hyundai L&C is authorized or permitted to make or provide any promise, representation or warranty with respect to HanStone Quartz.

To register, please visit us at hanstonequartz.com. To obtain service under this warranty, first contact the source from which you purchased HanStone Quartz.

For more information, please contact Hyundai L&C:

Hyundai L&C USA
2839 Paces Ferry Road SE, Suite 1100
Atlanta, GA 30339
770.431.6110

CARE & MAINTENANCE

9.1 Care & Maintenance Information

INTRODUCTION

The Natural Beauty of HanStone Quartz is easy to maintain. Made from the finest natural quartz, HanStone Quartz is the premier surfacing material with all the beauty of nature without its drawbacks. HanStone Quartz is a non-porous material that is highly resistant to stain, scratches and heat. However, it is not stain, scratch, or heat proof. Following the proper care & maintenance recommended by your professional HanStone Quartz distributor or installer, you can keep your HanStone Quartz beautiful for many years.

ROUTINE CARE & MAINTENANCE

Simply clean HanStone Quartz with soap and water on a regular basis to keep the lustrous gloss and radiant sheen. For routine cleaning, use warm water and a damp cloth with a small amount of non-abrasive cleaner that does not contain bleach.

Although HanStone Quartz is resistant to staining, spills should be cleaned as soon as possible. Liquid spills and stains from fruits, vegetables, or other foods should be wiped up and cleaned with soap and water.

PREVENTING DAMAGES

HEAT

HanStone Quartz is designed to be resistant to heat and can withstand exposure to normal cooking environments for brief periods of time without being damaged. Although HanStone Quartz withstands heat better than most surfacing materials on the market, all surfacing materials, including stone, can be damaged by extreme temperature changes, whether prolonged or sudden. Non-metal trivets with non-metal legs and hot pads should be used when placing hot skillets, pans, crock-pots or other heat generating kitchenware on the surface.

SCRATCHES

HanStone Quartz's durable surface is designed to withstand normal use. While it is resistant to scratches, cuts, and chipping, cutting directly on HanStone Quartz should be avoided. Using cutting boards and taking care not to drop or move heavy objects on the surface will help to ensure the long-lasting beauty of HanStone Quartz.

CARE & MAINTENANCE

9.1 Care & Maintenance Information Cont'd.

CHEMICAL

Avoid exposing HanStone Quartz to any strong chemicals and solvents. It is important to note that some of these chemicals and solvents can be found in household items like paint removers, paint and stain strippers that contain trichlorethane or methylene chloride, nail polish removers, bleach, furniture cleaners, oil soaps, permanent markers or inks, and chemicals with high alkaline/PH levels (oven cleaners, drain openers, etc.). Avoid using cleaning products that contain oils, powders or abrasives.

Although long-term or frequent exposure must be avoided at all times, the following products may be used with short-term exposure (removing and rinsing immediately after application with water) to clean difficult stains or residues. Always handle such cleaning agents with care and rinse the applied surface with water completely afterwards.

Recommended cleaners:

- Simple Green
- Tenax Stone Polish
- Soap and Water
- Denatured Alcohol
- Hopes Surface cleaner
- Rock Doctor cleaner

** All products must have all excess removed immediately after application with water and cloth. Prolonged exposure may ruin the surface of the slab.**

CARE & MAINTENANCE

9.1 Care & Maintenance Information Cont'd.

Chemicals to Avoid

The below list of chemicals should be avoided with HanStone Quartz; however, the below list is not a complete list, and there may be other chemicals not listed here that may damage HanStone Quartz. The effect of any chemical usage on HanStone Quartz is ultimately dependent on the type of chemical, the length of exposure, and the degree of concentration.

- Oil soaps, bluing agents, dyes, stains, paint thinner or strippers
- Solvents such as acetone, nail polish remover, lacquer thinner, etc.
- Chlorinated solvents such as trichloroethylene or methylene chloride
- Benzene, toluene, methyl ethyl ketone
- Concentrated acids such as hydrocyanic acid, hydrofluoric acid, hydrochloric acid, sulfuric acid, nitric acid
- Chemicals with high alkaline/PH levels (pH → 10)

If any of the substances listed come into contact with HanStone Quartz, rinse with plenty of water and follow routine cleaning procedures immediately.

CARE & MAINTENANCE

9.1 Care & Maintenance Information

REMOVING DIFFICULT SPILLS

On stubborn or dried spills where routine cleaning procedures do not work, use a nonabrasive cleaning pad along with the following recommended cleaners:

Recommended cleaners:

- Simple Green
- Tenax Stone Polish
- Soap and water
- Denatured alcohol
- Hopes surface cleaner
- Rock Doctor cleaner
- Steel wool with denatured alcohol

If gum, nail polish, paint, or other substances are accidentally allowed to adhere to the surface, they can be removed with the use of a plastic scraper or putty knife to gently scrape off the substance and by following routine cleaning procedures.

GENERAL PRECAUTIONS

HanStone Quartz is made from fine natural quartz, making it one of nature's hardest surfaces. As a result, HanStone Quartz will keep its beauty for years without sealing or polishing. It is also non-porous, so it won't absorb stains or harbor harmful bacteria. However, as a general precaution, use trivets and cutting boards to avoid damages caused by extreme or sudden change in temperature or impact on surface.

SPECIFICATIONS

10.1 Product Dimensions

HANSTONE QUARTZ SLAB SIZES

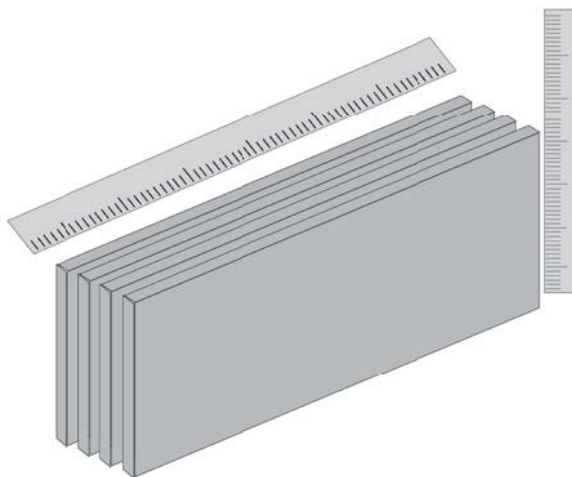
<u>Thickness (Centimeter)</u>	<u>Width (Inch)</u>	<u>Length "usable" (Inch)</u>
2 CM	55"	120"
3 CM	55"	120"
2 CM	65"	130"
3 CM	65"	130"

- Usable area is: 46 Sq. Ft.

HANSTONE QUARTZ CONTAINER PACKAGING

<u>Thickness (Centimeter)</u>	<u>Slab Weight (lbs.)</u>	<u># of Slabs in Full Container</u>
2 CM	467	80
3 CM	695	54-56*

*where weight restriction permits.



SPECIFICATIONS

10.2 Technical Data

Property	Test Method	Result
Abrasion Resistance (Weight Loss)	ASTMD 4060	1094 mg
Izod Impact Strength	ASTM D 256 (Method A)	13.3 J/m
Boiling Water Resistance	NEMA LD3 2000 3.5	No effect
Colorfastness	ANZI Z124.6.5.1	Pass
Compression Strength (Dry)	ASTM C 170	209 MPa
Compression Strength (Wet)	ASTM C 170	203 MPa
Density	KSF 2530	4.465 g/cm ³
Deflection Temperature Under Load (1.82 MPa)	ASTM D 648	243° C
Flammability		
Flame Spread	ASTM E-84, NFPA 255	Class A
Smoke Developed		
Flexural Modulus	ASTM D 790	39.7 GPa
Flexural Strength	ASTM D 790	41.4 MPa
Freeze & Thaw Cycling	ASTM C 1026	Unaffected
Fungal & Bacterial Resistance		No Growth
Barcol Hardness	ASTM G 21	86
Rockwell Hardness (HRM)	ASTM D 785 (Procedure A)	115
Point Impact	ANSI Z124.6.4.2.1	Pass
Slip Resistance		
Static Coefficient of Friction (Dry)	ASTM C 1028	0.67
Static Coefficient of Friction (Wet)	ASTM C 1028	0.49
Stain Resistance	ANSI Z124.6.5.2	Pass
Tensile Strength	ASTM D 638	17.8 MPa
Thermal Expansion	ASTM D 696	1.52x10 ⁻⁵ in/in/°C
Water Absorbion	ASTM D 570 (24 Hr. Immersion)	←0.011%
Long-term and Short-term		
Wear & Cleanability	ANSI Z124.6.5.3	Pass

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SPECIFICATIONS

10.3 Chemical Resistance Data

With testing done at an independent laboratory for stain resistance, the results showed that HanStone Quartz complied with all the requirements of ANSI Z124.1.2-2005.

Some stains that have been tested are listed below:

REAGENTS

Black Crayon	Hydrogen-Super-Oxides 3%
Nail Polish Remover	Blue Berries
Black Liquid Shoe Polish	Sodium Chloride
Salt-Acidity	Coke
Blue Washable Ink	Sodium Hydroxide
Soapiness Detergents	Disinfectants
Bentian Violet Solution	Vinegar
Water	Household Soaps
Beet Juice	Ball Point Pen
Concentrated Milk	Lemon Juice
Grape Juice	Iodine
Benzene	Soda
Lipstick (Contrasting)	Lye
Citric Acid	Wine
Hair Dye (Contrasting)	
Hand Cream	
Mercurochrome Solution	
Ink	
Wet Tea Bag	
Mustard	
Acetic Acid	
Olive Oil	
Ammonia Washer	
Sanitary Cleaner	
Butter	
Sodium Carbonate	
Coffee	
Toothpaste	
Ethl-Butyl-Acetate	

SPECIFICATIONS

10.4 MSDS

1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION OF THE COMPANY / UNDERTAKING

Product Name:

HanStone Quartz is a registered trademark of Hyundai L&C.

Manufacturer/Supplier:

Hyundai Living and Culture

7_8F, CENTER1 Bldg, 26

Uljiro 5-gil, Jung-gu

Seoul, 04539, Republic of Korea

Tel: 82.2.729.2051

Fax: 82.2.729.1447

Contact for Product Information or
Emergency:

Hyundai L&C

11165 Knott Ave., Suite C

Cypress, CA 90630

Tel: 888.426.9421

2. COMPOSITION / INFORMATION ON INGREDIENTS

Component	% by Weight	CAS #
Synthetic Resin	← 10	-
Quartz (Crystalline silica)	→ 40~90	14808-60-7
Colorant	← 1	Trade Secret
Additives	← 1	Trade Secret

3. HAZARDS IDENTIFICATION

Potential Health Effects:

- This product is not hazardous as shipped.
- However, sawing, routing, drilling and/or sanding can generate dust.
- Dust generated during handling of this product can irritate eyes, nose and respiratory passages and can cause sneezing and coughing.
- Dust generated during handling of quartz surfaces products can contain particles of crystalline silica.
- Overexposure to airborne crystalline silica can cause silicosis, symptoms of which include difficulty in breathing, wheezing, coughing and impairment of lung function.

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SPECIFICATIONS

10.4 MSDS Cont'd.

4. FIRST AID MEASURES

- Inhalation – Move to fresh air. Give artificial respiration if not breathing. Give oxygen if breathing is impaired. Call a physician.
- Eye Contact – Rinse immediately with plenty of water. Call a physician.
- Skin Contact – Not applicable
- Ingestion – Not applicable

5. FIRE HAZARD DATA

- Extinguishing media: Water, Dry Chemical, CO₂, Foam
- Fire-fighting instructions: Keep personnel removed and upwind of fire. Wear self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

- Safeguard (Personnel)
NOTE: Review fire fighting instruction and handling (personnel) sections before proceeding with clean-up. Use appropriate personal protective during clean up.
- Spill clean up: Not applicable

7. STORAGE AND HANDLING

- Handling (Personnel)
 - ◇ Avoid breathing dust generated during sawing, sanding, routing or drilling.
 - ◇ Avoid breathing fumes generated during sawing, sanding, routing or drilling.
- Storage
 - ◇ Store in a cool place. Avoid extreme weather/temperature conditions.
 - ◇ Avoid exposure to direct sunlight.
 - ◇ Never store material flat.
 - ◇ Store materials on storage system to provide full support of the entire length and width of the material that are perfectly leveled.

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SPECIFICATIONS

10.4 MSDS Cont'd.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

- Use ventilation that is adequate to keep employee exposure to airborne concentrations below exposure limits.

National occupation exposure limits: 0.3mg/m³ OSHA TWA (total dust) – Quartz
0.1mg/m³ OSHA TWA (airborne particle of respirable size) – Quartz

- Personal Protection
 - ◇ Protective equipment: Eye/Face/Hand Protection
 - ◇ Wear safety protector during operations such as sawing, sanding, drilling or routing.

9. PHYSICAL AND CHEMICAL DATA

- Safety data
 - Decomposition temperature: None
 - Water solubility: None
- Appearance as delivered
 - Form: Solid, sheets and shaped articles
 - Color: Various
 - Odor: None (Nelible odor)
- Flash point: Not applicable
- Autoignition temperature: Not applicable

10. STABILITY AND REACTIVITY

- Stability: Stable at normal condition.
- Conditions to avoid: None reasonably foreseeable.
- Incompatibility (materials to avoid): In the event of fire, carbon monoxide hydrocarbons smoke may be produced.
- Hazardous decomposition product: Fumes of metal oxides and mica particles could also be released.

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SPECIFICATIONS

10.4 MSDS Cont'd.

11. TOXICOLOGICAL INFORMATION

- Operations such as sawing, routing, drilling and sanding can generate dust.
- High concentrations of dust can irritate eyes, nose and respiratory system and cause coughing and sneezing.
- Dust generated during handling of quartz surfacing products can contain particles of quartz (crystalline silica).
- Overexposure to airborne quartz can cause silicosis.
- Symptoms of silicosis include coughing, difficulty in breathing, wheezing and progressive impairment of lung function.
- Epidemiology studies show limited evidence of lung cancer in occupations involving exposure to crystalline silica (quartz), such as stonecutters and granite industry workers.

12. ECOLOGICAL INFORMATION

- Biodegradation: No information available
- Bioaccumulation: No information available
- Aquatic toxicity: No information available
(The product is insoluble and sinks in water.)
- When properly handled and used in accordance with guidelines, our experience suggests that there are no negative effects to be expected on the environment.

13. DISPOSAL CONSIDERATIONS

- Waste should be disposed of in a place certified to accept such materials in accordance with federal, state, and local regulations.
- Contaminated packaging: Not applicable

14. TRANSPORT INFORMATION

- Product is not classified for any mode of transportation.

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SPECIFICATIONS

10.4 MSDS Cont'd.

15. REGULATORY INFORMATION

- This product does not require labeling

Quartz USA	CERCLA103	{40CFR302.4):	none
	SARA302	{40CFR355.30):	none
	SARA304	{40CFR355.40):	none
	SARA313	{40CFR372.65):	none
	OSHA313	{29CFR1910.119):	none
	SARA311/312	{40CFR370.21):	acute: no
			chronic: yes
			fire: no
			reactivity: no

16. OTHER INFORMATION

- The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.
- Responsibility for MSDS: HanStone Quartz products
- This information is based on technical information deemed reliable and is subject to revision as additional information is made available.

* This Technical information is designed to provided support in fabrication, installation, and/or to ensure performance of HanStone Quartz. The information is based on the technical data which Hyundai L&C believe to be reliable and is intended for person or persons having knowledge of this technical area. None of the contents, including but not limited to the instructions, recommendations, graphics, techniques, and guidelines should be understood as implying of legal, warranty, or any type of liability by Hyundai L&C and its affiliates.

Working and Living Green

Our integrated environmental, health and safety stewardship commitment encompasses Hyundai L&C USA products, operations and employees. It is our commitment to customers, partners, communities and employees to produce more and more sustainable products, pursue environmentally friendly manufacturing processes and to be ecologically minded and responsible in all we do.



GLOBAL HEADQUARTERS

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