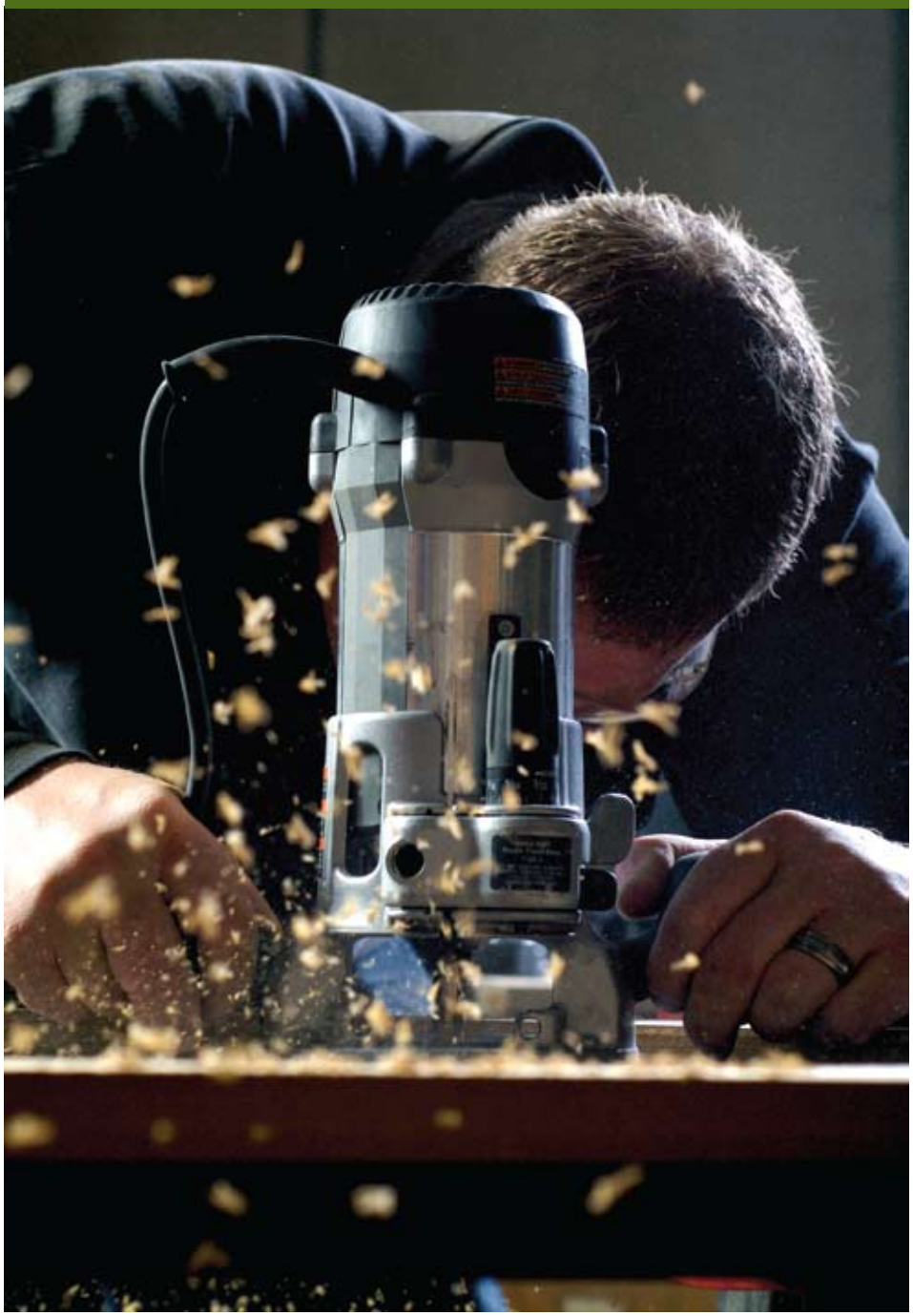
Fabrication and Finish Guide



PaperStone®

The Countertop with a Conscience™

040913

PaperStone® Fabrication Guide

Techniques for working with PaperStone®

PaperStone® machines and finishes like extremely dense hardwood. Panels can be cut and routed with carbide-tipped shop tools. However, all fabrication techniques should be tested by the individual fabricator as installations may have varying parameters that can affect the performance of joints and/or laminations.

These guidelines do not imply a warranty of any kind and are superceded by the PaperStone® material warranty.

After reviewing this guide, if you have questions regarding the fabrication or fnishing of PaperStone®, please contact your distributor or Mike Miller, Fabrication Manager, at 360.520.9930 or email at mike@paperstoneproducts.com.

040913

About PaperStone®

This is how PaperStone® begins

Recycled paper and old cardboard container paper is fully saturated with a pigmented PetroFree™ resin, then dried to a "B" stage paper (tacky but not sticky). Because of the natural characteristics of recycled paper, not all saturation levels are the same across the sheet. Unlike virgin fiber, this *flocculation* is what gives PaperStone® its unique, mottled look. Both the mottling and speckling of PaperStone® are enhanced by sanding away the surface micro-textured resin layer.

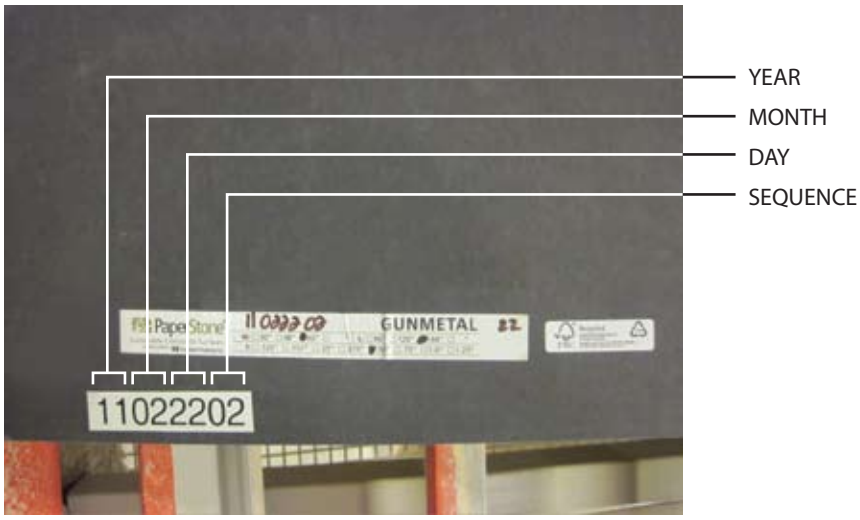
- Stacked layers of post-consumer recycled paper that have been saturated with petroleum-free resin and pressed under heat and pressure into a solid sheet.
- PaperStone® is not only recycled but also recyclable.
- No thermoset process means no off-gassing.
- Using pigments rather than dyes assures superior color stability.

Storage and Handling

- Store between 40° and 80° F
- Do not overstack
- Store flat, DO NOT store vertically on edge

Panel Identification by Label and Serial Number

Individual PaperStone® panels are trackable by serial number



Inspecting and Preparing Panels

Every effort has been made to provide high quality material, free of defects. However, each fabricator must:

- Conduct a final (pre-cut) inspection to continue the quality control process prior to fabrication.
- Remove banding and inspect material immediately upon receipt or at time of will-call.
- If the material is defective or flawed you can:
  - place templates in positions to avoid flaws
  - or contact your distributor of PaperStone® representative to initiate a replacement of the material

A word about wet fabrication

PaperStone® can be fabricated with water/coolant assisted equipment, however it is not necessary.

If using this method, ensure that all residual moisture is removed from the PaperStone® panel after cutting is completed. Trapped moisture can cause the panel to cup.

Use of a waterjet cutting device is NOT recommended for PaperStone®.

PaperStone®
The Countertop with a Conscience™

PaperStone Use In Wet Areas

PaperStone composite surfaces perform very well in wet areas. The material is impervious to water in a typical installation, like a kitchen or bathroom vanity.

Standing water on the surface of PaperStone will not penetrate the surface in a typical installation. In fact, PaperStone is used in exterior applications and has a line of durable cladding materials. PaperStone fibers are fully encapsulated in a proprietary resin making them resistant to water and moisture in general. Data from a standard boil test shows that a piece of PaperStone boiled for 24hrs absorbs less than 1% water.

The material can be cut with a wet or dry saw, and any cut pieces should be dried after they are cut, not stacked on top of each other, with water in between, as is best practice.

Mike Miller
Sales / Technical Manager
PaperStone

Fabricate and Install

Step-by-step instructions for fabricating and installing PaperStone®

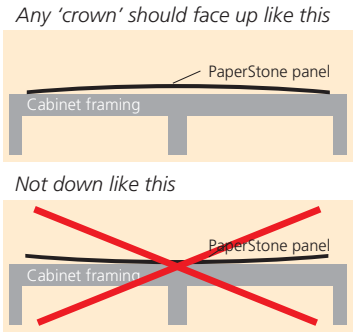


Fig. I

When the countertop is attached to the framing, the crown will straighten and become level with the cabinet frame.

Some PaperStone® colors have a more visible grain direction depending on how aggressively the panel surface has been sanded. Keep this in mind during your layout planning process.

Preparing the PaperStone® panel

- Choose the preferred side for the top. Small surface variations may be present that could need special attention during the finishing process if they cannot be worked around during templating
- If seams will be necessary, determine where they will be
- Sometimes there is a natural 'crown' in the material. This is not a problem. Just make sure it faces UP and that the ends of the panel come in contact with the cabinet framing [Fig. I]

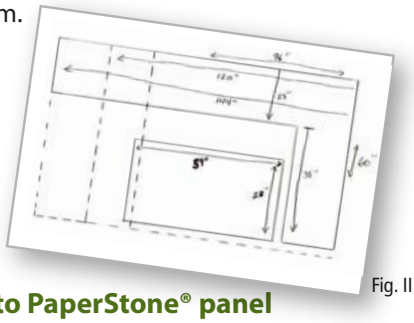


Fig. II

Transfer template to PaperStone® panel

- Locate the best position on the panel to make optimum use of the material [Fig. II]
- Place template on panel [2B] or [2C]
- Trace template onto panel and mark all internal cut-outs [2D]

Mark sink/stove cut-outs and faucet holes

- Carefully position sink/stove templates on panel and draw outline [2E] and [2G]
- Check number of faucet holes and diameter of each; typically most faucet holes are $1\frac{3}{8}$" in diameter
  - mark properly in relation to sink template [2F] and [2G]

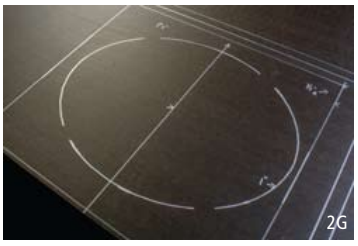
2B

2C

2D

2E

2F


2G

Fabricate and Install [continued]

2H

2I

2J

2K

2L

2M

Cutting

- CUTTING TIP: masking tape on the saw base plate will help prevent scratching [2H]
- Make a rough-cut of the countertop with a circular saw (try to stay $^{1}/_{8}$" outside of the traced line) [2I]
- A jig-saw can be used for tight spaces and curves, make sure cut stays perpendicular to the panel surface [2J]
- Make a clean-up cut precisely to the traced line with a router (utilize guides to ensure clean, straight cuts and smooth curves) [2K]
- For outside radius corners an orbital sander or router (with guide) works well [2L]
- For inside radius corners a router with radius guide is required to make a smooth, uniform radius cut
- Using a hole-saw, drill out the desired faucet holes

Pre-mount countertops

- Lay countertops on cabinet bases and check for proper fit and alignment
- Ensure all cutouts are in correct position, all overhangs are consistent and tops are resting level on cabinet bases [2M]

Edge detailing

2N

- Ensure that the desired edge finish is not extremely rough (if so, perform a preliminary sanding of the edge with 80 to 180 grit sandpaper depending on severity [2N]
- Using a profile bit with a guide bearing, route the desired edge detail into the panel's edge (if desired edge detail requires the removal of a considerable amount of material, utilize 'step-cuts' to maintain a better edge and prevent burning) [2N]

Seaming (if required)

Biscuit seaming option A

- Dry-fit seam pieces
- Perform a 'mirror cut'
- Mark necessary biscuit locations

040913

Fabricate and Install [continued]

2O

2P

2Q

Optional: using a wavy bit is an excellent way to align seams. A cam lock system also works well for fastening.

- Cut biscuit grooves
- Hot glue four 'hold-down' blocks about 8" from seam on both sides
- Apply two-part epoxy to biscuits and to both seam edges
- Using two bar clamps, gently tighten seam together
- After adhesive is slightly set-up, peel off the excess from the top surface
- Remove first clamp and clean surface with acetone and replace clamp
- Repeat previous step for remaining clamp
- With clamps in place, allow adhesive to cure following manufacturer's directions

Seaming

Mechanical fastener seaming option B

- Dry-fit seam pieces upside-down
- Using a 'plunge' router, set the maximum depth to ½ of the overall thickness of the panel. Route "T" shaped grooves every four inches [2O]
- Repeat previous step on second seam piece so that pieces are mirror images
- Apply adhesive to both seam pieces
- Gently tighten seam pieces together with clamps [2P]
- Insert mechanical fasteners into their respective grooves [2Q]
- Ensure that the pieces are lined up correctly, then tighten fasteners
- After adhesive is slightly set-up, peel off the excess from the top surface
- Remove first clamp and clean surface with acetone and replace clamp
- Repeat previous step for remaining clamp
- With clamps in place, allow adhesive to cure following manufacturer's directions

Install undermount sink (self-rimming sinks will be installed after the top installation is complete)

- Turn countertops upside down
- Locate and mark center point of both the sink and the cutout

Fabricate and Install [continued]

2R

2S

2T

- Place sink upside down on the underside of the countertop and match up the two center marks, mark positions for pre-drilled mounting holes
- Remove sink
- Pre-drill holes in underside of countertop at specific mounting screw locations (use tape or a drill stop on your carbide-tipped bit to prevent drill-through)
- Apply a bead of silicone adhesive to the underside edge of the sink cutout
- Place sink back on the countertop and match up the two center marks
- Lightly insert screws into each pre-drilled mounting hole
- Turn countertop right side up
- Lightly tap the sink until it is in exact desired location (consistent reveal)
- Tighten all mounting screws
- Wipe away excess adhesive

Attach countertops

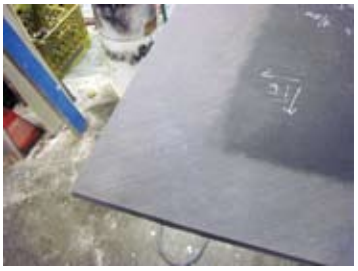
- Place countertops on cabinets
- Locate necessary anchor screw locations
- Pre-drill holes in underside of countertop at specific anchor screw locations (use tape or a drill stop on your carbide-tipped bit to prevent drill-through) [2R]
- Pre-drill holes in cabinet frame/supports at specific anchor screw locations (use larger bit here)
- Working with one section at a time, lift the countertop off the cabinet base [2S] and apply a thin bead of silicone adhesive to the cabinet base [2T]. Carefully lower the countertop back onto cabinet base, repeat this step as necessary to apply adhesive to other areas of the cabinet base (if possible, remove the entire countertop and apply a bead of adhesive on the top edge of all cabinet bases for added strength)
- Insert mounting screws into each anchor location (correct screw diameter and length)
- Wipe away excess adhesive

Fabricate and Install [continued]

Backsplashes (optional)

- Pre-mount backsplashes (check to ensure there are no gaps between countertop and backsplash or wall and backsplash) (scribing of the wall side of the backsplash is possible, but it can be a challenge)
- Remove backsplashes
- Mark correct length and cut to size (45º/butt cut)
- Apply a thin bead of silicone adhesive to underside and back of backsplash (hot glue if not using a fast-setting epoxy)
- Mount backsplash on top; clean any excess adhesive
- Allow adhesive to cure according to manufacturer's instructions

Preparing a built-up edge



- **Standard PaperStone® built-up edge glue up is two 1/2" x 2-1/2" strips adhered to a 1/2" thick PaperStone® panel making a 1-1/2" built-up edge which can then be routed to selected edge profile.**

  (Ensure edge depth is at least 1-1/4" minimum.)

IMPORTANT!
When building up the edge, you **MUST** scuff all surfaces that will be touching the adhesive.

- **Using a belt sander with 100 grit, you must aggressively remove the resin layer on the surface to be glued. Get down into paper.**

Sample Built-up Edge Profiles

040913

Glue Up

- **Touchstone Express II Adhesive by Bonstone is a two-part epoxy especially formulated to bond PaperStone®**

We recommend using Touchstone Express II Adhesive by Bonstone available in 450 ml and 50 ml sizes. This adhesive bonds in about one hour, depending on temperature.

Clean all surfaces to be glued with denatured alcohol. When using a new cartridge, purge a small amount of adhesive directly from the cartridge to be sure both sides are flowing.

Affix the mixing tip to the cartridge and purge about the length of the tip onto a paper towel. This insures that the adhesive is well mixed prior to glue up. Tips can only be used once.

Note:
As with any epoxy material it is important to wear protective gloves and avoid direct contact with skin.

- **Cox PPM 300LV Adhesive Mixing Gun**
  Available from Amazon

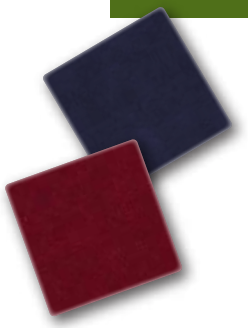
Clamping

- **Clamp built-up edge with 4" mechanical clamps ('C' clamps work well) every 4 inches until adhesive is set (about 1 hour).**

Edge clean up

- **Clean up any excess adhesive and uneven edges with a router and straight edge**
- **Rout selected edge profile**

PaperStone® Finish Guide



Step-by-step instructions for finishing PaperStone®

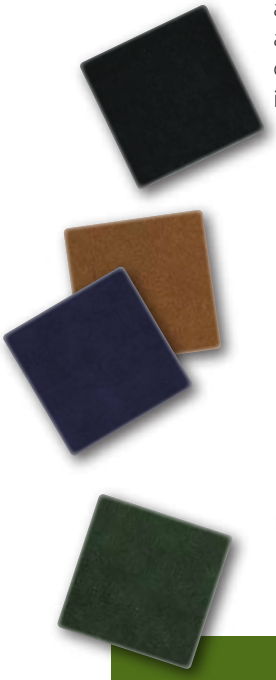
Surface preparation options – before applying finish

PaperStone® panels have a pleasing, natural micro-textured surface and can be used as is. However, the surface can also be prepared to the degree of smoothness desired with a medium grit non-woven abrasive pad, such as a Maroon 7447 Scotch-Brite™ pad. Or, for an extremely smooth surface, it can be sanded and buffed. The final appearance of the panel will of course vary based on the choice of surface preparation technique. *(Refer to Step 11 in the Fabricate & Install Guide for preparation instructions and examples of the look achieved with the various surface preparation techniques.)*

Surface finishes for PaperStone®

It is recommended that fabricated PaperStone® countertops be finished and sealed to obtain the best appearance and protect the surface from staining by household products such as cooking oils, marinades, make-up, cleaners, etc. PaperStone® may also be installed without any finish for a matte look, but will be prone to spotting or staining.

While any oil-based or wax-based wood finish may be applied to PaperStone®, we recommend OSMO® TopOil as an easy to apply, long-lasting, durable finish that is based on natural vegetable oils and waxes. It deepens the tone of the panel and adds a soft luster to the appearance. TopOil is a micro-porous clear, matte wood finish for kitchen work tops and general interior joinery *(table tops and furniture)*. The TopOil surface is extremely tough and hard-wearing. It is water and dirt-resistant. The finish is also resistant to wine, beer, cola, coffee, tea, fruit juices and milk, etc. Dirt can easily be removed. And, as an oil-based finish, it can be spot repaired if necessary.



OSMO® TopOil Application on PaperStone®

Use lint-free cloths to apply OSMO® TopOil to PaperStone®; to avoid streaks do not use a brush. It is important to wipe away all excess oil as the PaperStone® will not absorb it. Keep changing cloths and wiping until you cannot see fingerprints. TopOil will require 2-3 coats, with sufficient drying time after each coat.
Refer to Detailed Finish Application Steps on next page.

040913

Finish Guide [continued]

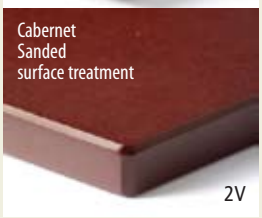
We recommend spraying on a coat of The Original Bee's Wax® furniture polish to provide further surface protection after the final application of OSMO® TopOil is cured. The Original Bee's Wax® may also be reapplied weekly or more frequently as a maintenance coat. The surface shouldn't show fingerprints and it doesn't leave a wax build-up.

Detailed Finish Application Steps

Fabricate the PaperStone® panels in accordance with instructions in the Fabrication Guide

You may choose to prepare the countertop surface and edges in the shop prior to installing the countertop, or you may install the countertop first and then prepare the surfaces. The steps to prepare the surface and apply the finish are as follows:

1. Sand the exposed countertop edges with 180 grit sandpaper, followed by 240 grit sandpaper.
2. Prepare the countertop surface with chosen option A or B.



Scotch-Brite™ option A [2U]

- This option will maintain PaperStone's natural micro-textured surface.
- Sand the PaperStone® surface with a maroon non-woven pad (*7447 Scotch-Brite™* or similar product) to achieve an even surface treatment. Non-woven pads can be used with a vibrating orbital sander. Be sure to treat the entire surface evenly.

Sanding option B [2V]

- This option will produce a smoother PaperStone® surface.
- Sand the PaperStone® surface with 240 grit sandpaper using a vibrating orbital sander. Be sure to sand the entire surface evenly.

NOTE: Depending on condition of top surface, sand with coarsest required grit to remove any rub marks or scratches, then work up to 240 grit sandpaper.

- Finish with a maroon non-woven pad

3. Clean surface with water (or denatured alcohol) and allow to dry after each sanding step.
4. DO NOT touch the prepared surface with bare hands prior to finish being applied.
5. Once the surface is clean, dry and free of any dust, apply a coat of the OSMO® TopOil to the installed countertop using a soft, clean cloth. Rub the finish into all exposed areas, spreading evenly and generously in a circular motion to ensure consistent coverage.
6. Wipe off excess finish; then continue buffing with clean cloths or towels. Buffing should continue until finish no longer changes appearance. Keep changing cloths and wiping until you can no longer see fingerprints when the surface is touched.
7. Allow first coat to dry at least two hours.
8. Apply a second coat of the TopOil and allow to sit overnight to fully cure prior to use *(at least 8 -10 hours)*.
9. After the final coat of OSMO® TopOil is cured, spray on a liberal amount of The Original Bee's Wax®. Wipe onto the entire surface, ensuring it is spread evenly. Then wipe off the excess using a soft, cleancloth towel until the appearance of the surface no longer changes. Allow to dry for a few minutes. The surface should not show fingerprints when touched.
10. Refer to the PaperStone® Care & Maintenance Guide for usage, cleaning and maintenance guidelines.

Troubleshooting

- **OVERSANDING**
  Oversanding will create an undesirable pattern, like contour rings on a map. It is most noticeable in darker colors. Be cautious with seams and uneven surface areas (bumps or divots). After applying finish, these may even out, but the lines will never disappear.

- **SANDING TOO AGGRESSIVELY**
  Will develop an extremely mottled pattern; especially noticeable in the Gunmetal and Sienna colors. Use only a random orbital sander on the finish surface with no added pressure.

- **ADDRESSING UNEVEN THICKNESS**
  Tolerance is 40/1000 per inch, (+/- 4%) Index from the top and belt sand difference along the bottom front edge. Dry-fit all seams. See tolerance on page 26.

- **REPAIR**
  Use router dust mixed with epoxy in thick paste form to do small spot repairs. Depth of repair may need to be made deeper for repair to take.

Questions?

If you have questions regarding fabrication and finishing of PaperStone® please contact Mike Miller at 360.520.9930 or email at mike@paperstoneproducts.com

Sustainable Composite Surfaces by

Little Green LLC

2999 John Stevens Way | Hoquiam, WA 98550

Manufactured in Hoquiam, Washington, USA since 2004.
PaperStone is a beautifully finished, earth-friendly, sustainable composite surface.

040913

Fabrication Manual Addendum for ½" PaperStone

About PaperStone

- PaperStone is NOT inert. It needs to breathe or it can cup or pull away from the substrate to which it is adhered if moisture is introduced.
- PaperStone does not perform well with anchors that need to be glued in place because it is non porous and the glue does not adhere to the PaperStone.

Horizontal Applications

- Horizontal applications, like countertops should use ¾" or thicker PaperStone. If ½" must be used, special considerations must be taken based on the application, including special fasteners, edge details, and joint treatment.
- ½" PaperStone **should** be installed on strips or base cabinetry with supports every 12", NOT adhered directly onto a solid substrate. Moisture can get trapped on one side of continuous substrates and may cause the material to cup or curl. In an ideal indoor environment, temperature and humidity would stay constant and not cause an issue, but circumstances are never perfect. Environments where liquids are being dispensed and not properly cleaned up can also cause moisture to reach the substrate, and cause the same cupping issue.
- Keep Nut fasteners can be used to prevent cupping in ½" material. These are mechanical fasteners similar to a wall anchor that do not require glue to stay attached to the PaperStone. Keep Nut fasteners include an insert that goes into a predrilled hole and have "crowns" that fan out into the PaperStone, like a wall anchor, creating a physical bond with the material.

Vertical Applications

- See PaperStone Cladding Guide