

DuPont Surfaces

DUPONT™ CORIAN® SOLID SURFACE COMMERCIAL FOOD SERVICE INSTALLATION

TECHNICAL BULLETIN

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INTRODUCTION

Successful food service countertop design requires careful attention to detail and technical guidance. This bulletin is intended to provide guidance for fabricating and installing Corian® food service countertops.

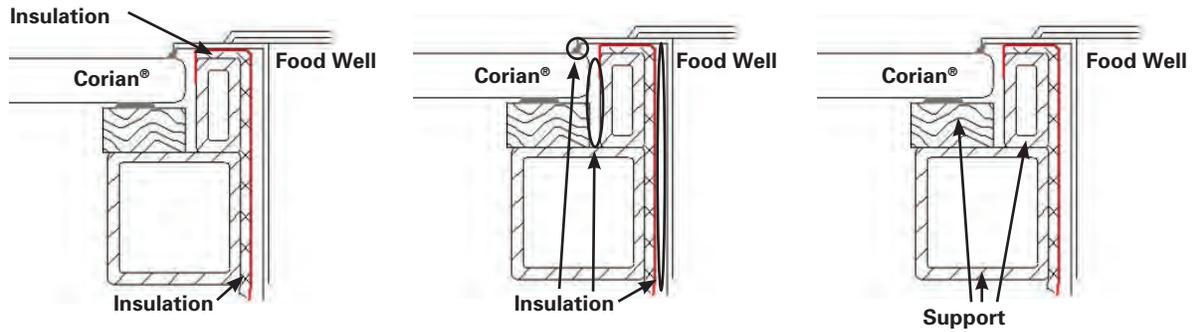
The requirements and recommendations in this technical bulletin will help ensure long lasting, beautiful Corian® food service installations. The critical aspects of a food service installation are: Insulate, Isolate, and Support.

- **Insulate** Corian® from all potential heat sources, such as food well or cooktop insert cutouts, with Nomex® fabric and heat reflecting aluminum tape to protect the Corian® from thermal stresses.
- **Isolate** Corian® from the weight of appliances or equipment placed on top of the surface by providing independent structural support.
- **Support** the countertop and all equipment or appliances with sturdy, correctly installed materials.



corian®

Figure 1
Insulate, Isolate, and Support Illustrations



To better understand Insulate, Isolate, and Support, think about your food service application without the Corian® installed. All equipment (appliances, hot wells, ice bins, etc.) should be supported by the support frame so that no additional support is needed from the countertop. Corian® is a durable surface, however, it should be treated as a decorative surface that must be insulated, isolated, and supported from the influences of thermal and mechanical stresses.

Note: DuPont does not provide a warranty for installation of Corian® in commercial applications.

B. Safety

DuPont™ Corian® solid surface can be cut and worked like wood. Shavings and dust are created when cutting and sanding the product. It is best to minimize dust and shavings by containing them with a vacuum. Use proper safety equipment (Figure 2) when working with Corian®, including safety glasses, gloves, steel-toe shoes, and ear plugs. Lifting devices or carts may be used to improve safe handling of larger pieces, as seen in Figure 2.

Figure 2
Recommended Safety Equipment



C. General Overview

Sheet Handling

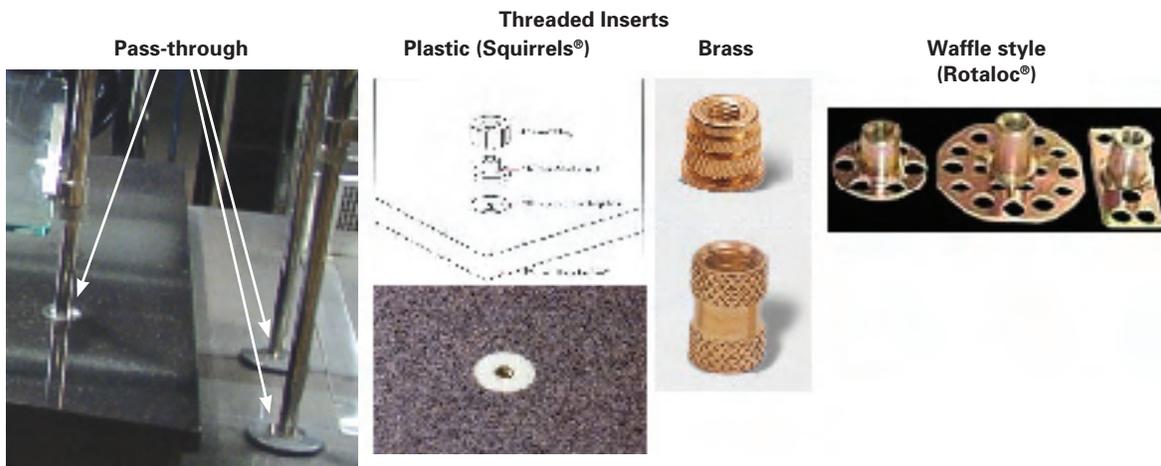
Large pieces of Corian® can be heavy. The use of carts or lifting devices are recommended when lifting and moving the sheets into place. Sheets should be carried vertically, on edge, with cutouts located at the top. Carrying the sheets vertically will reduce stress in the sheet and reduce potential cracking from handling.

Mechanical Fastening

Corian® has special requirements when it comes to the types of fasteners used. Never mechanically fasten directly to Corian® with a screw, bolt, or nail. The only acceptable ways to mechanically fasten to Corian® (Figure 3) are:

- **Pass-through method** – Pass the support through a penetration in the Corian® surface and attach to the main support structure. Provide a 1/8" perimeter clearance around the penetration to allow the material to expand and contract freely. This allows mechanical fastening to the support frame but not to the Corian® itself and is typically used for sneeze guards.
- **Plastic or brass threaded insert** – Cut the required diameter and depth to slip fit the insert in the sheet, then secure the insert with DuPont™ Joint Adhesive. Squirrels® are an acceptable example of a plastic threaded insert.
- **Waffle style** – Secure a waffle style fastener, such as Rotaloc® fasteners, to the Corian® with DuPont™ Joint Adhesive.

Figure 3
Acceptable Fasteners for Corian®



Securing Corian® to the Support Frame

Secure Corian® to the support structure with dime sized dabs of silicone adhesive every 12"–18". In general, a flexible silicone adhesive is used to secure Corian® to:

- Wood
- Steel
- Natural or Engineered stone
- Glass
- Support structure, underlayment, and any other dissimilar material

Expansion Clearance

Corian® expands and contracts when exposed to fluctuating temperatures. It is important to never restrict the thermal expansion and contraction movement by holding the material in place or by failing to provide an expansion gap between Corian® and any other dissimilar materials.

Guidelines for clearances:

- Isolate Corian® from potential heat sources with Nomex® and aluminum tape to reduce expansion and contraction
- Accommodate expansion and contraction to minimize buildup of mechanical and thermal stresses. The coefficient of thermal expansion for Corian® is 1.80 x 10⁻⁵ in./in./°F (3.02 x 10⁻⁵ in./in./°C).
- Provide clearance between Corian® and adjacent walls, support frames, cabinets and all other possible movement restraints with
 - 1/8" minimum radial clearance for any penetration passing through the surface;
 - 1/8" minimum clearance between buildup edges and any support structure or underlayment and
 - 1/16" minimum clearance at all walls. (This gap may be filled with silicone sealant.)

Inside corner radius

The minimum allowable inside corner radius for an edge is 1/2" (13mm), though a larger radius is preferred.

D. Cutouts

Standard Cutouts

All standard Corian® cutouts must have:

- At least a 3/16" radius
- Been made with a 3/8" or larger diameter router bit
- Top and bottom edges rounded over for a finished edge radius of at least 1/8"
- All nicks, tool marks, etc. removed with 150-grit or finer sandpaper
- Support within 3" from the cutout edge
- 1/8" perimeter clearance for expansion and contraction

Note: Cutouts exposed to temperature extremes, like hot and cold food wells, have additional requirements

Hot and Cold Food Wells

Support and insulation requirements in addition to all standard cutout requirements for hot and cold food wells include:

- 1/8" nominal overlap of the food well flange over the countertop (see Figure 7A and B)
- 1/16" clearance between the food well flange and the countertop surface which is to be filled with silicone sealant (see Figure 7A and B)
- 1/8" clearance between the food well support and both the countertop and countertop support edge (see Figure 7A and B)
- 1/8" expansion clearance for the entire perimeter of the food well equipment as well as between the food well equipment and both the food well support and the main support structure (see Figure 7A and B)
- High-strength corner blocks are required for all hot and cold food wells and other cutouts subject to temperature fluctuations (exception is soup wells and small condiment wells less than 7" diameter in ambient temperatures)
- Insulate between food well and both the food well support and main support structure (see Figure 7A and B)

High-Strength Corner Blocks

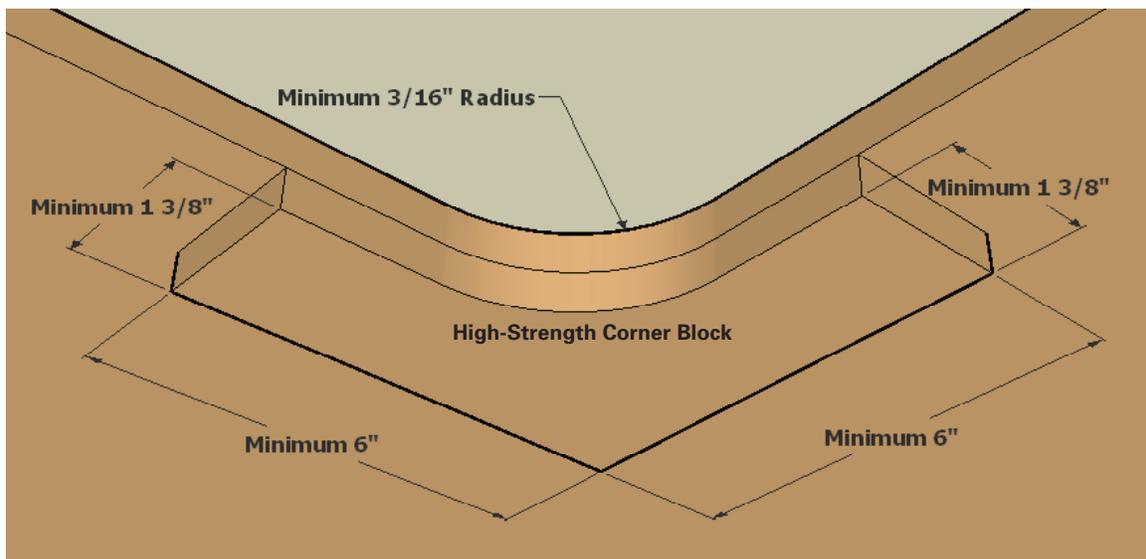
Corian® high-strength cutout corner blocks help reinforce and support the inside corners. They are:

- Required for all hot and cold food well cutouts because of the thermal loading
- Made with Corian® the same color or lighter than the countertop
- At least 6" x 6" with a minimum depth of 1-3/8" as seen in Figure 4
- At least as thick as the countertop surface
- Attached to the bottom of the countertop surface at each inside corner with DuPont™ Joint Adhesive

Cutouts that do not require high strength cutout blocks:

- Soup wells and circular cutouts over 7" in diameter
- Small circular cutouts (less than 7" [175 mm] diameter) in an ambient or cold section that usually are used for condiments and are not subject to large stresses, though still require adequate support

Figure 4
High-Strength Cutout Block Assembly

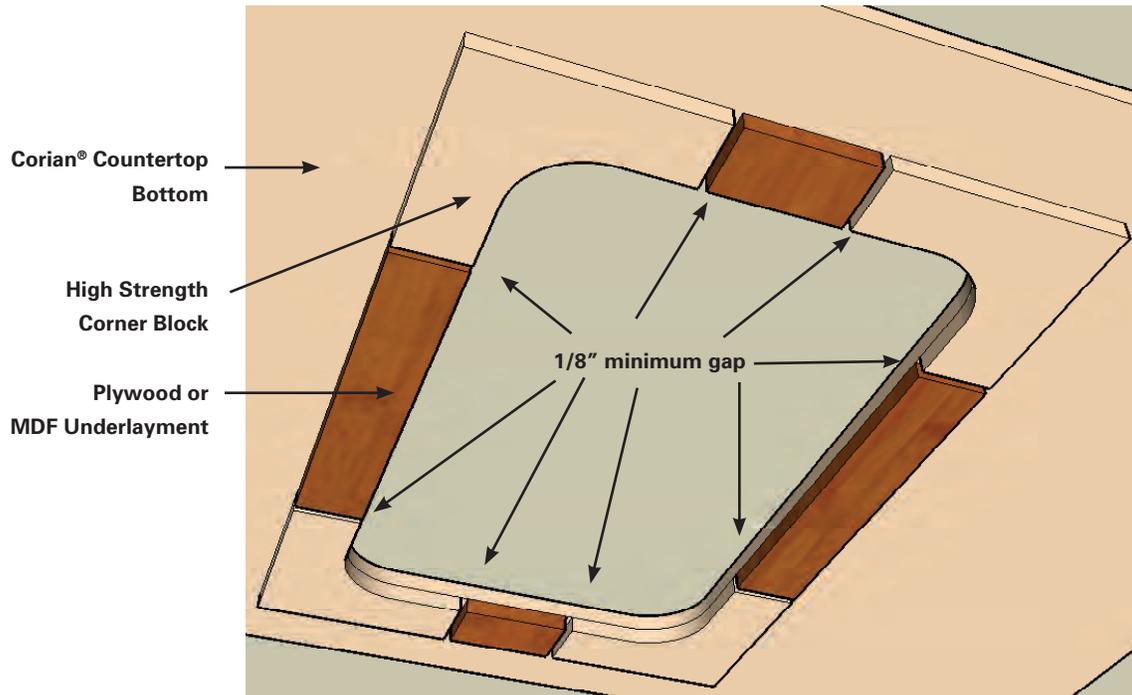


Cutout Underlayment and Support

Full perimeter support is required for all cutouts. High-strength cutout blocks help reinforce and support the cutout corners for hot and cold food wells. Since the high-strength blocks are only at the corners, they do not provide perimeter support for the entire cutout. Underlayment is required between the cutout blocks for full perimeter support. The underlayment between high-strength cutout blocks should be made of plywood or MDF with a minimum thickness of 3/4". A 1/8" gap is to be left between underlayment and high-strength cutout blocks.

The blocks and underlayment are to be supported from the main support structure. Figure 5 illustrates the perimeter support for the cutout that must be supported from the main cabinet support frame.

Figure 5
Cutout Perimeter Support Structure



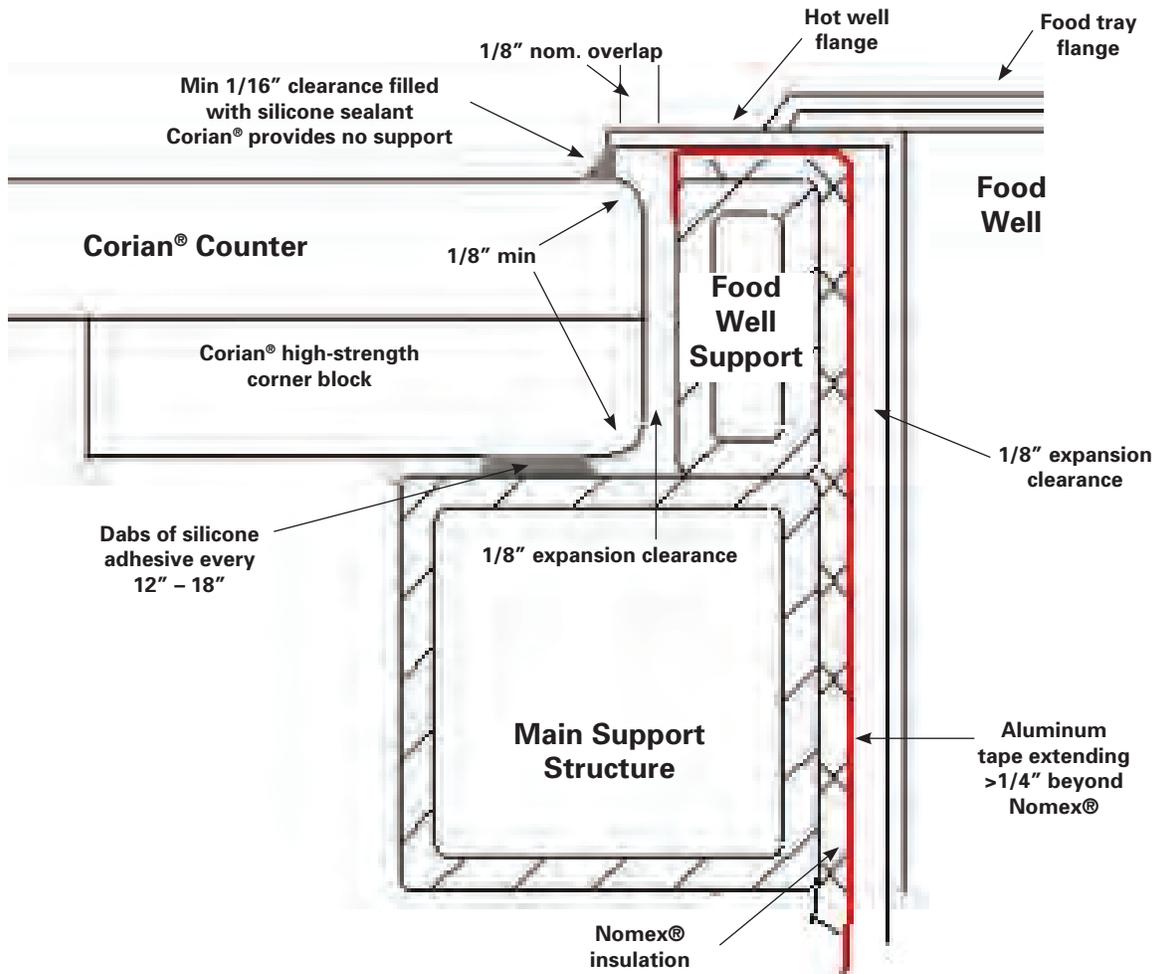
Typically the high-strength corner blocks are thinner than the underlayment. Small strips of plywood or MDF should be used to create a level perimeter surface to provide uniform support as seen in Figure 6.

Figure 6
High-Strength Cutout Perimeter Buildup



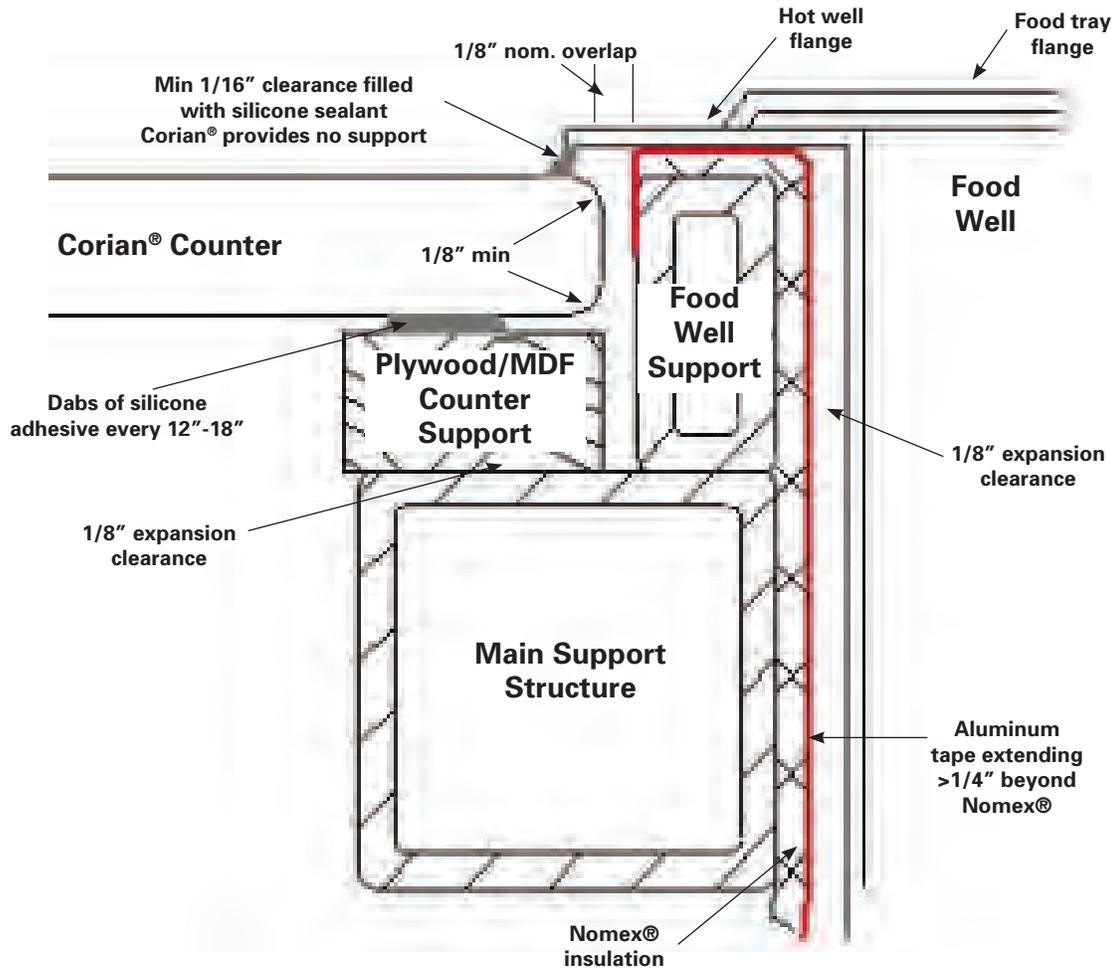
Tube steel, angle iron and wood are acceptable support materials (additional information in Support section). Particleboard and equivalent products are not acceptable as support or underlayment materials. Figures 7, 8, and 9 show support structures of tube steel, angle iron, and wood. In each set of diagrams, Figure A shows support for a cutout corner with the high-strength corner reinforcement block and Figure B shows support for the underlayment between the corner blocks.

Figure 7A
Cutout Cross-Section with Tube Steel Support and High-Strength Corner Block



1. *Caution: Do not allow foil tape to create a heat transfer path directly to the Zodiac®. This is to minimize the heat transfer to the Zodiac®.*
2. *DuPont™ Nomex® insulation with a minimum thickness of 0.11"/layer and a minimum weight of 9.5 oz/yd²/layer.*
3. *In some instances, the thickness of the vertical support requires it to be face applied to the plywood underlayment.*

Figure 7B
Cutout Cross-Section with Tube Steel Support and Underlayment



1. *Caution: Do not allow foil tape to create a heat transfer path directly to the Zodiac®. This is to minimize the heat transfer to the Zodiac®.*
2. *DuPont™ Nomex® insulation with a minimum thickness of 0.11"/layer and a minimum weight of 9.5 oz/yd2/layer.*
3. *In some instances, the thickness of the vertical support requires it to be face applied to the plywood underlayment.*

Figure 8A and B
Cutout Cross Section with Angle Iron Support
High-Strength Corner Block (left) and Underlayment (right)

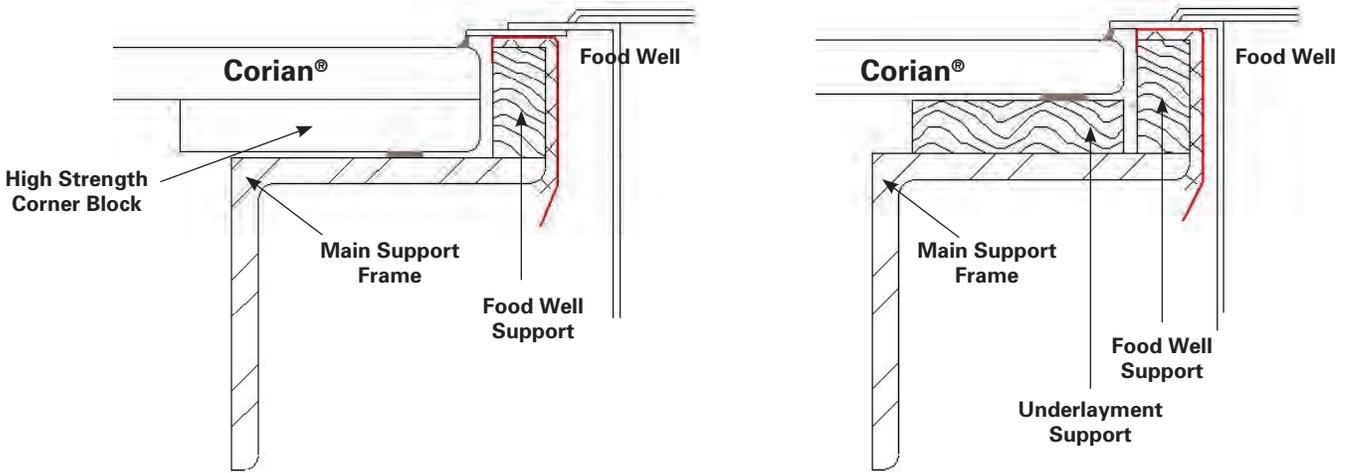
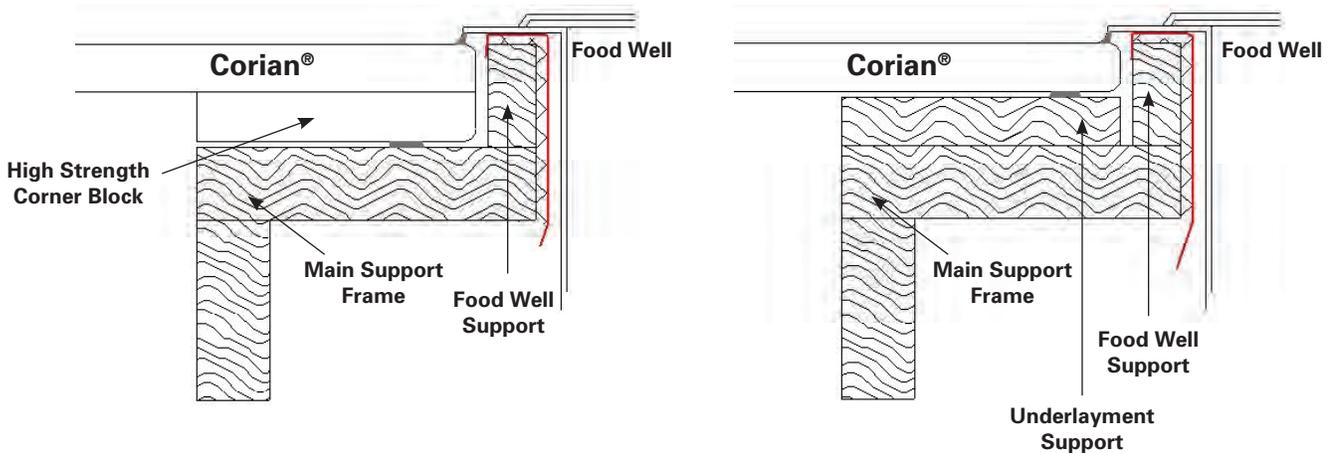


Figure 9A and B
Cutout Assembly Cross Section with Wood Support
High-Strength Corner Block (left) and Underlayment (right)

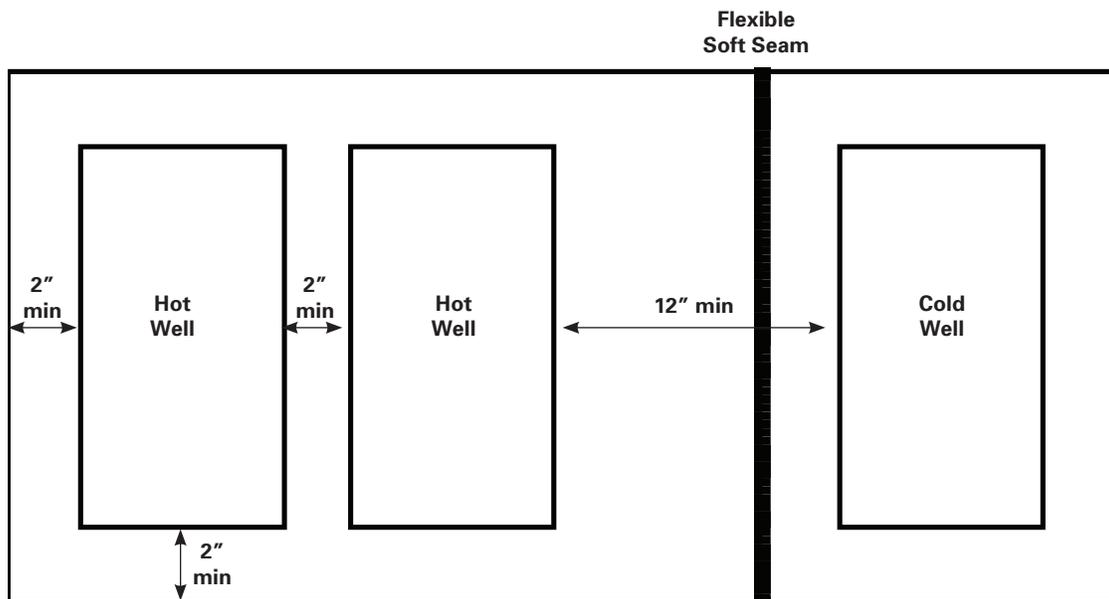


Cutout spacing

Cutouts have spacing requirements to allow adequate room for insulation and support. Cutouts (as seen in Figure 10) must have at least:

- 2" between all cutouts for wells of same temperature
- 12" between all adjacent hot and cold food wells to allow for the temperature differential
- 2" between all cutouts and all deck edges
- 2" between all cutout edges and all seams (For more information, see the Seams Section of this bulletin.)

Figure 10
Cutout Spacing Requirement Illustration



E. Support

General zero-load support requirements

Corian® is a durable surface, but is not a structural material. Full support is required to reduce mechanical stresses. The support guidelines outlined in this section are for zero-load installations. Additional equipment or loads located on the counter will require additional support.

The support structure must:

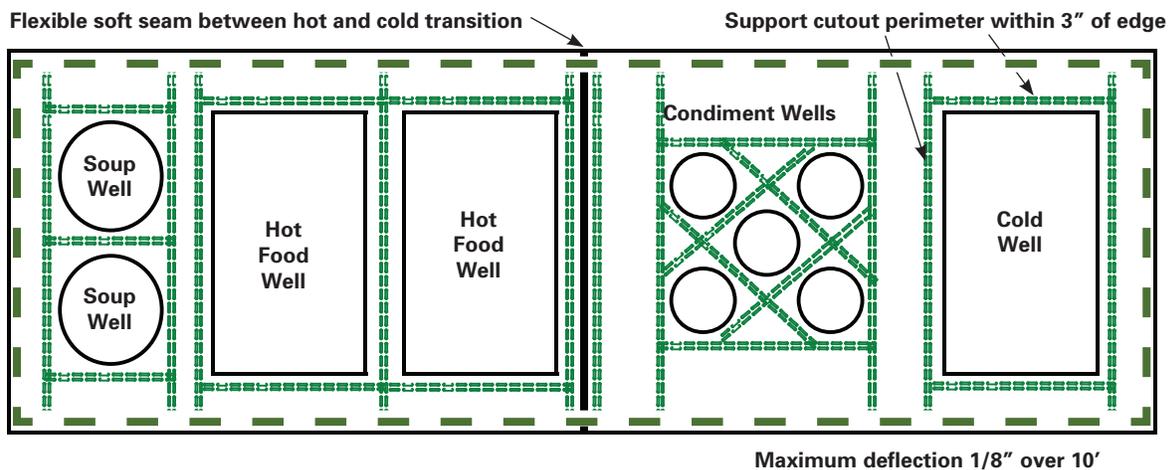
- Be level, specifically, it must be the same plane within 1/8" over 10'
- Extend around the full perimeter of the countertop.
 - The wood cabinet perimeter may be used as support if designed to support the required weight
 - Perimeter support strips may be used to create a larger, more broad base to support the countertop (more discussion in Underlayment and Support Strip Material section)

General zero-load support requirements (continued)

- Include full perimeter support for each hot and cold food well cutout
- Have cross supports every 24"– 36" so deflection is less than 1/8" over 10'. (Test deflection by placing a with a 300 lb. weight at center of each span.
- Provide support directly under all equipment or countertop loads so deflection is less than 1/8" over 10' after the equipment is installed.
- Have the longer support rails attached to the main cabinet support frame. (The smaller support rails can be attached to the longer support rails.)

Locations for typical support system components are shown in Figure 11.

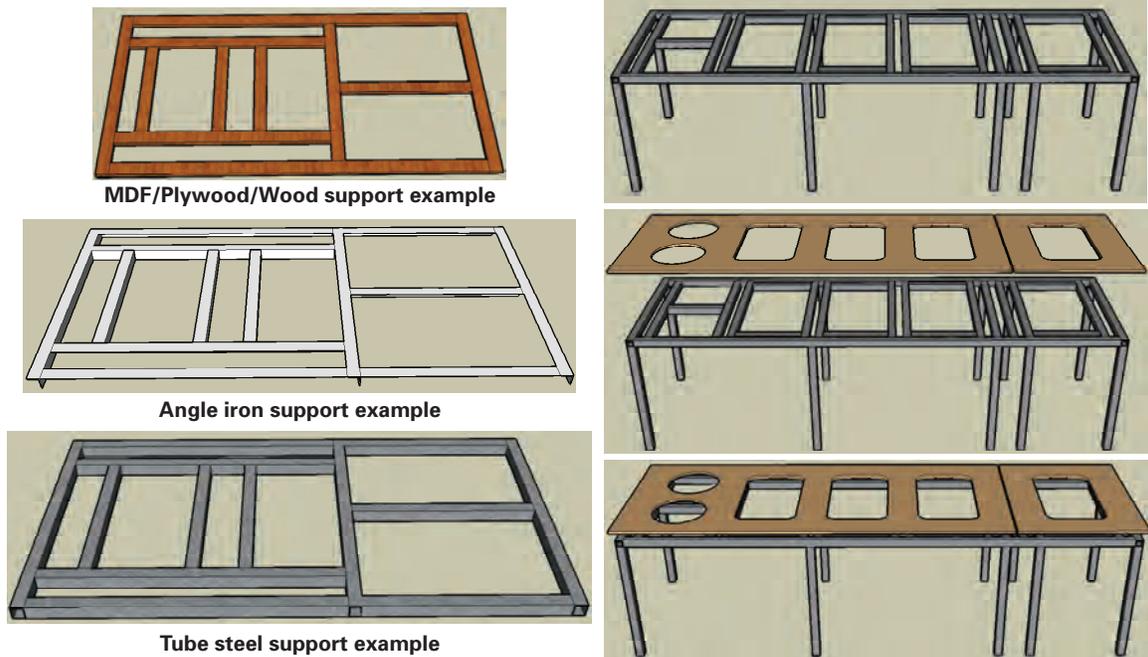
Figure 11
Food Service Support Location Requirements



Acceptable Support Materials (see Figure 12):

- MDF, plywood, or wood
 - Moisture resistant products are recommended to reduce degrading and warping
 - Never use particleboard, wafer board, chip board, or equivalent products
- Metal angle iron
- Tube steel

Figure 12
Acceptable Food Service Support Material Frames



Underlayment and Support Strip Materials

Underlayment or support strip materials may be made of MDF or plywood. Support strips must be at least 3/4" thick and 2" wide. Never use particleboard, wafer board, chip board, or equivalent products. Secure to the support frame with screws or silicone adhesive

Overhang guidelines

Overhangs in food service applications must be supported properly. Use Table 1 to determine the necessary support required for zero-load overhangs. If equipment or loads are going to be located on the overhang, additional support is required and must be incorporated into the design and installation.

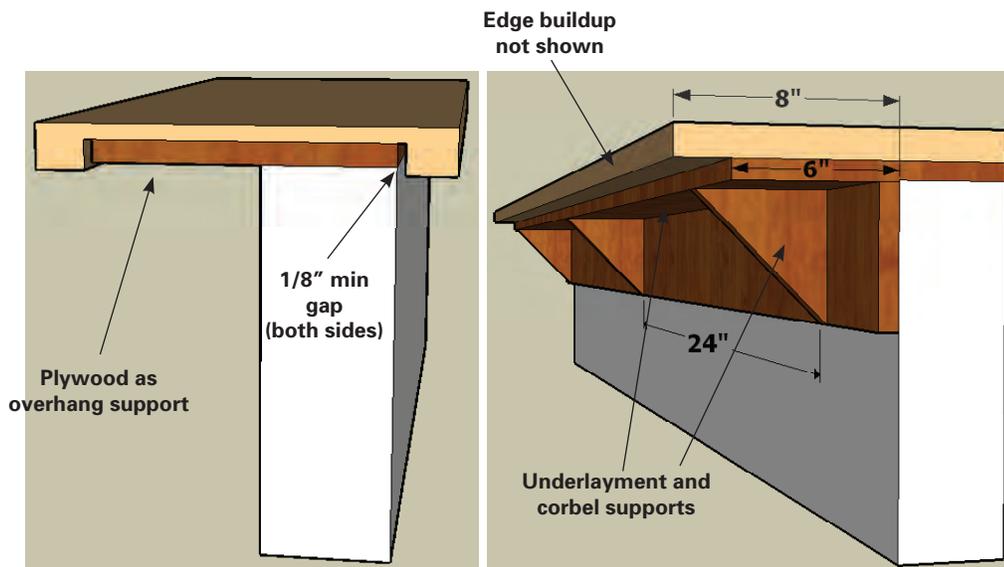
Table 1
Corian® Overhang Guidelines

Overhand Distance	Support Required
Less than 6"	Perimeter Support
6" min - 18" max	Brackets, angles, or tube steel every 24" max or full plywood underlayment
Over 18"	Support legs and full underlayment every 24"

Corbel or angle overhang supports (as seen in Figure 13) must:

- Be located at least every 24"
- Be secured to cabinet studs and
- Extend 3/4 the total overhang distance

Figure 13
Overhang Illustrations



F. Insulation

Insulation is important to help protect the Corian® from temperature extremes and reduce the effects of temperature fluctuations that exist in a food service application. Insulation is required for all hot and cold food wells and cook-top inserts. It is also important to try to keep the cabinet or casework temperature down to reduce the thermal loading on the countertop.

Insulating materials

Insulation materials required for food service wells and cooktop inserts that may be available from Corian® distributors:

- Nomex® insulating fabric at least 0.11" thick (9.5 oz/yd²) with an adhesive backing
 - 1-1/2" wide rolls for residential cooktop inserts
 - 3" wide rolls for commercial food wells
- Heat conductive aluminum tape to reflect radiant heat and protect Nomex® insulation in 2" wide rolls

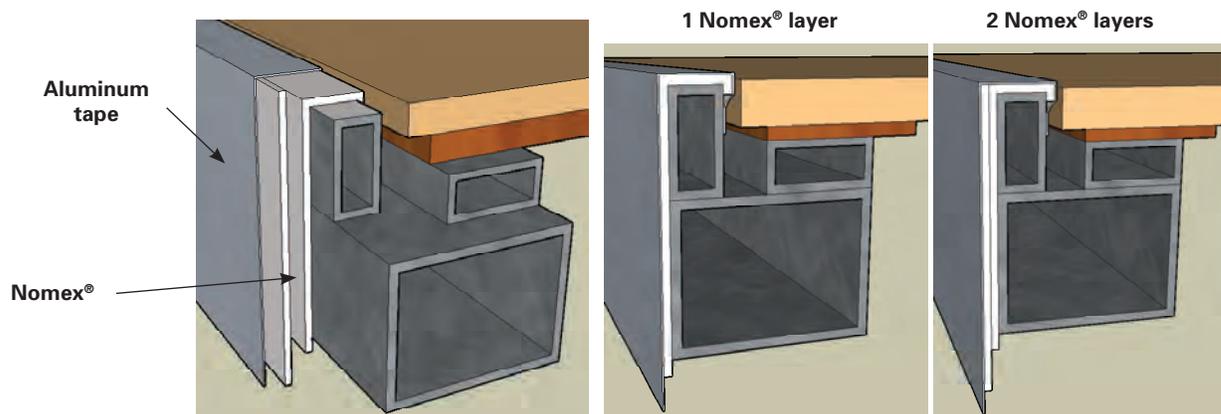
The number of layers of Nomex® insulation needed depends on the proximity of two adjacent cutouts and the temperature of the cutouts. Table 2 provides guidance for the correct number of layers of Nomex® that must be installed for proper countertop surface protection.

Table 2
Nomex® Insulation Guidelines

Cutout Spacing (edge-to-edge)	Same Temperature	Hot-Cold
More than 12"	1 layer	1 layer
6"-12"	1 layer	2 layer
Less than 6"	1 layer	3 layer

Attach the Nomex® and aluminum tape as seen in Figure 14. Wrap the first Nomex® layer over the top and down to side of the food well support. Additional layers of Nomex® should be placed vertically over prior layers. Cover the Nomex® completely with aluminum tape and allow excess aluminum tape to hang vertically and extend at least 1/4" beyond the Nomex®.

Figure 14
Insulation Assembly and Illustrations



Ventilation

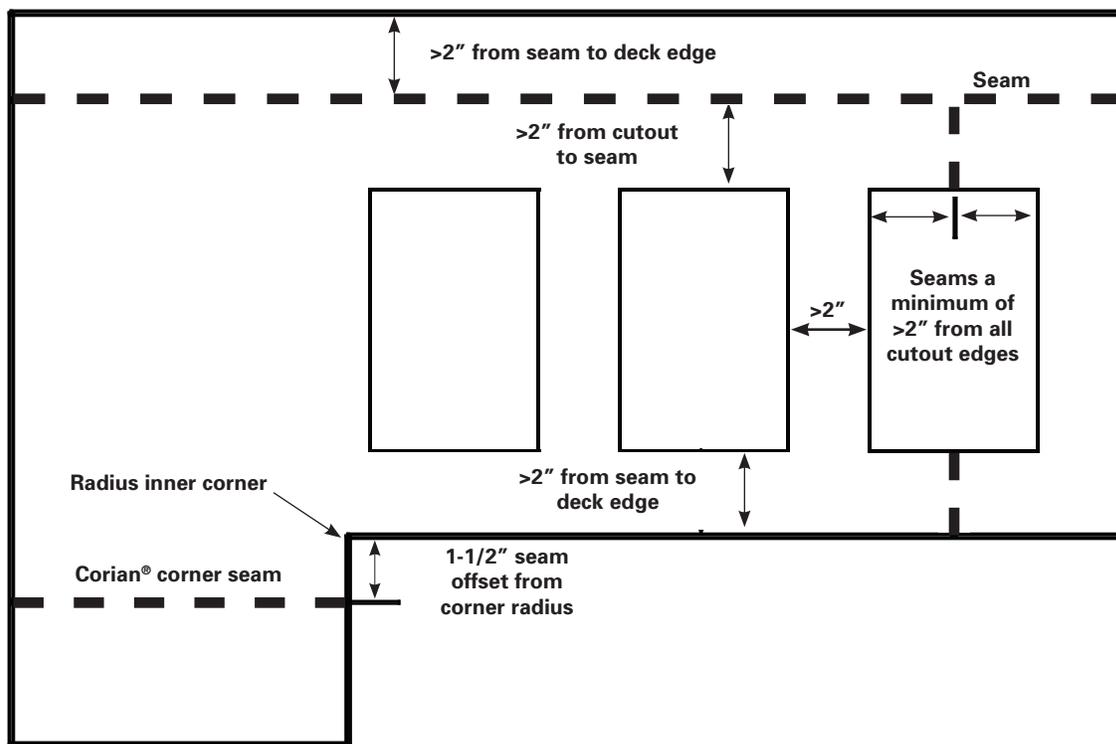
If a cabinet containing a heating element is closed on all sides, ventilation is necessary to reduce the temperature inside the support cabinet. Convection and forced air cooling are two acceptable types of ventilation. Convection cooling is done by placing vents at the top of one side and the bottom of the opposite side to promote airflow. Forced air cooling is done by installing a fan in the cabinet and installing vents at the top of the cabinet. Fans should be tied into the heating power source so they turn on automatically when the heat source is on.

G. Seams

Seam location requirements (seen in Figure 15)

- Minimum 2" from all deck and cutout edges
 - Seams may be placed inside a cutout if absolutely necessary but is not recommended. If this is necessary it is best to place the seam in the center of the cutout and must be a minimum 2" from the cutout edge
- 1-1/2" offset from all inside corner radii

Figure 15
Seam Location Guidelines



Seam Preparation

Prepare to make a seam by:

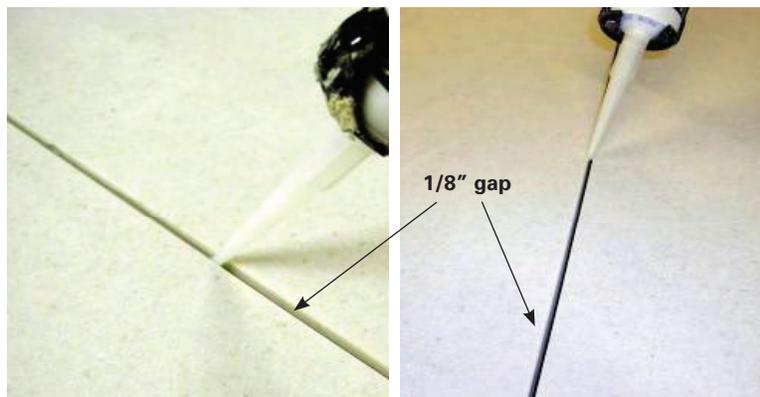
- Follow the adhesive directions to prepare and purge the adhesive
- Verify the support structure is level within 1/8" over 10'
- Check edges for fit, alignment, and color match
- Clean edges thoroughly with denatured alcohol or acetone to remove all marks and dirt. (California regulations require acetone.)

Soft Seams (Expansion Joints)

Most designs require some soft seams to allow the countertop to expand and contract with temperature fluctuations. Soft seams are also required between all adjacent hot and cold food wells to allow for the temperature differential. (It is also recommended that adjacent wells of opposite temperatures be at least of 12" apart.) Steps for soft seaming:

- Complete all seam preparation steps
- Align the seam with a 1/8" gap (Figure 16)
- Fill the gap with color matched or clear flexible silicone sealant (Figure 16)
- Remove excess adhesive
- Allow time for the sealant to set (temperature and moisture dependent, see manufacturer's recommendations)

Figure 16
Soft Seaming



When finished, soft seams may be covered with T-molding or custom Corian® molding if desired.

Hard Seaming

A hard seam creates a rigid seam that, when sanded and finished properly, is inconspicuous to the eye. This seam is created by using DuPont™ Joint Adhesive to bond the two edges of the countertop deck together.

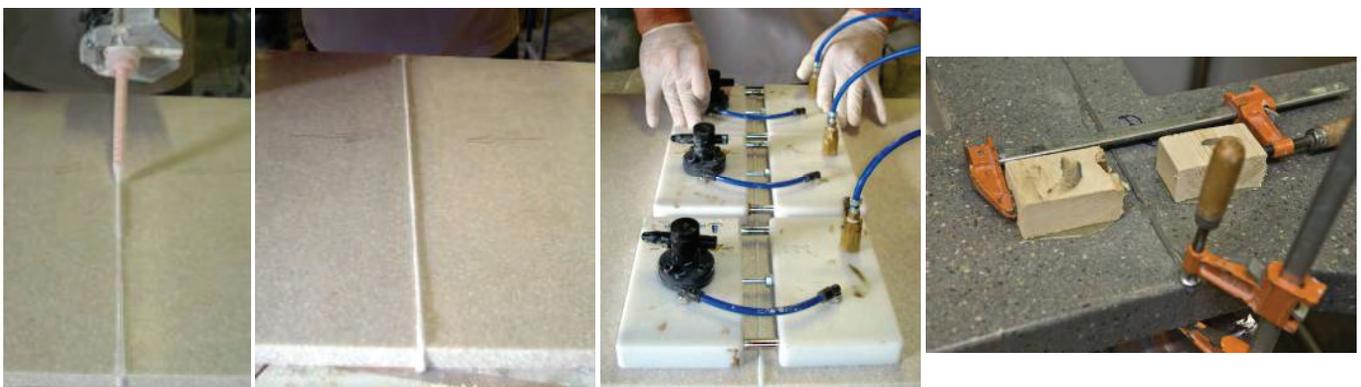
Steps for hard seaming:

- Complete all seam preparation steps
- Align seam with 1/16"–1/8" gap (Figure 17)
- Tape the edges, creating dams, to prevent dripping and ensure a good fill with adhesives (Figure 17)
- Apply DuPont™ Joint Adhesive, filling the gap 1/2–1/3 full so the seam will fill completely when pulled together (Figure 18)
- Pull together and level the seam, creating a uniform bead of adhesive at the top and bottom of the seam (Figure 18)
 - Use equal pressure along the length of the seam and avoid over-tightening which can create a dry seam
 - All-in-one seam setters, like Monument Clamps or Gorilla Grips™, are recommended
 - Wood blocks and clamps may be used, with shims to level the seam
- Allow adhesive to set, approximately 45–60 minutes at room temperature
- Finish as described in the Sanding and Finishing section

Figure 17
Hard Seam Preparation



Figure 18
Hard Seaming and Seam Setting (Tape removed for detail)



H. Seam Reinforcement

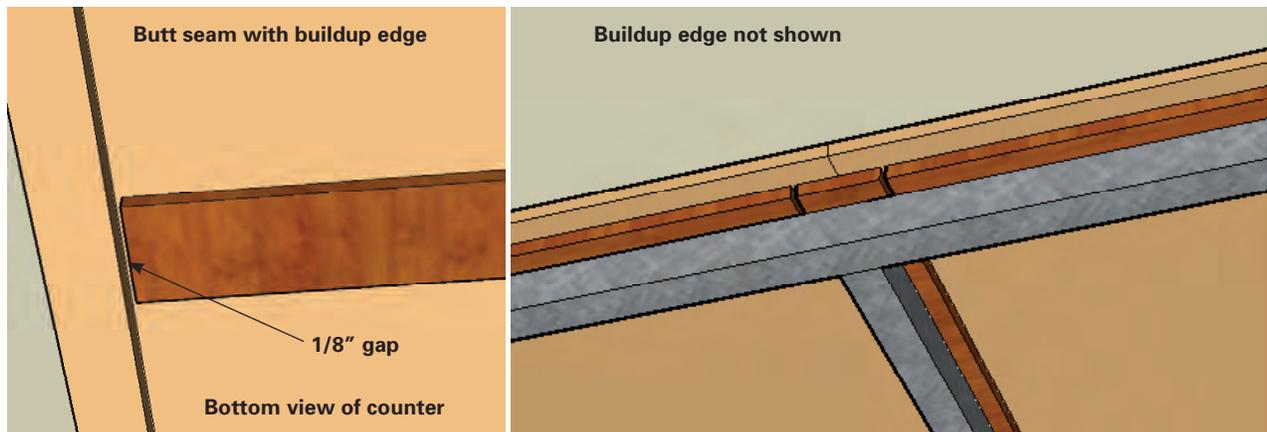
Seams are not as strong as the un-seamed Corian® sheet and, therefore, must be reinforced and supported. Hard seams and soft seams both require a reinforcement strip below the seam that must be supported from the main support frame. Full length reinforcement strips (as seen in Figures 19 and 20) are required.

Soft Seam Reinforcement

Soft Seam Reinforcement provides support and allows for thermal expansion and contraction to reduce sheet stress as shown in Figure 19, Secure support strips made of MDF or plywood (at least 3/4" thick and 2" wide) to the countertop with flexible adhesive. Support reinforcement strips from main support frame. Provide:

- Full support front to back if possible and
- Cross supports every 12" to 18" (Short seams, less than 12," require only one support strip in the middle.)

Figure 19
Soft Seam (Expansion Joint) Support Illustrations

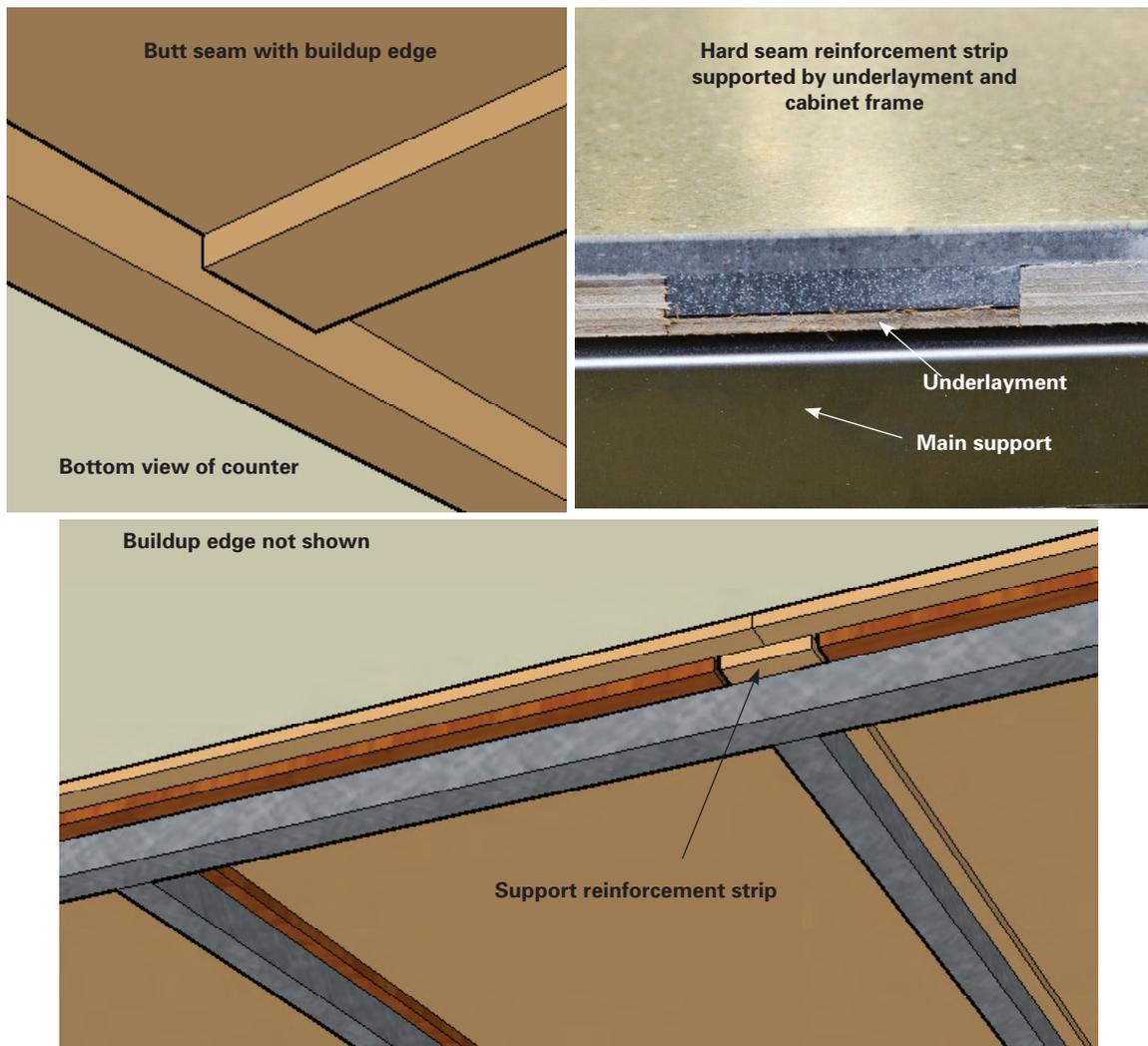


Hard Seam Reinforcement

Reinforcement strips for hard seams (as illustrated in Figure 20) must be:

- 2" wide and as thick as the countertop, made from the same color Corian® as the countertop or lighter to eliminate potential shadowing
- Attached to the bottom of both sides of the seam and the countertop buildup edge with DuPont™ Joint Adhesive
- Supported with reinforcement strips from the main support frame
 - Full support front to back is preferred
 - Cross supports every 12" to 18" are acceptable. (Short seams, less than 12", require only one support strip in the middle.)

Figure 20
Hard Seam Corian® Reinforcement Strips and Support Illustrations



I. Sanding and Finishing

Sanding and finishing is required for all hard seams to create an inconspicuous seam appearance.

Sanding and finishing steps:

- Remove clamping devices and tape carefully after the adhesive has cured
- Remove wood blocks (if used) with denatured alcohol or acetone and a putty knife
- Remove the excess adhesive with a router on skis, a block plane, or a sander with 100 micron or 180 grit sia Abrasives sandpaper (Figure 21)
- Use Table 3 to determine the sanding and finishing progression steps for a matte or semi-gloss finish specified by the customer
 - Matte is the typical surface finish for lighter colors
 - Semi-gloss is the typical surface finish for darker colors

Figure 21
Methods to Remove Excess Adhesive



Table 3
Corian® Sanding and Finishing Progression Table

Steps	3M™ Micron Papers		sia Abrasives Papers	
	Matte	Semi-Gloss	Matte	Semi-Gloss
Sanding 1	100 micron	100 micron	180 grit	180 grit
Sanding 2	60 micron	60 micron	280 grit	280 grit
Sanding 3		30 micron		400 grit
Finishing Pad	Maroon Scotch-Brite®	Gray Scotch-Brite®	Red siascuff®	Gray siascuff®

Sanding tips and techniques:

- A 5"–6" random orbital sander preferred, but larger sanders are acceptable
- Blend the seam finish to match the surface finish
 - Clean the surface thoroughly
 - Load sander with a hard backer pad and sand paper for Step 1 in Table 1 above
 - Sand the seam and the surrounding 6"–12" area to blend the finish
 - Clean the surface thoroughly after each sanding step
 - For Step 2 and all subsequent steps, load the sander with a soft or foam backer pad and the papers in the progression shown in Table 3.
 - Random motions, such as figure 8 or circular motions, may be used to further reduce surface patterns that are visible in some lighting conditions
 - Polish may be used to enhance the shine, but will likely require frequent re-applications

J. Additional Guidelines and Resources**Heat Lamps**

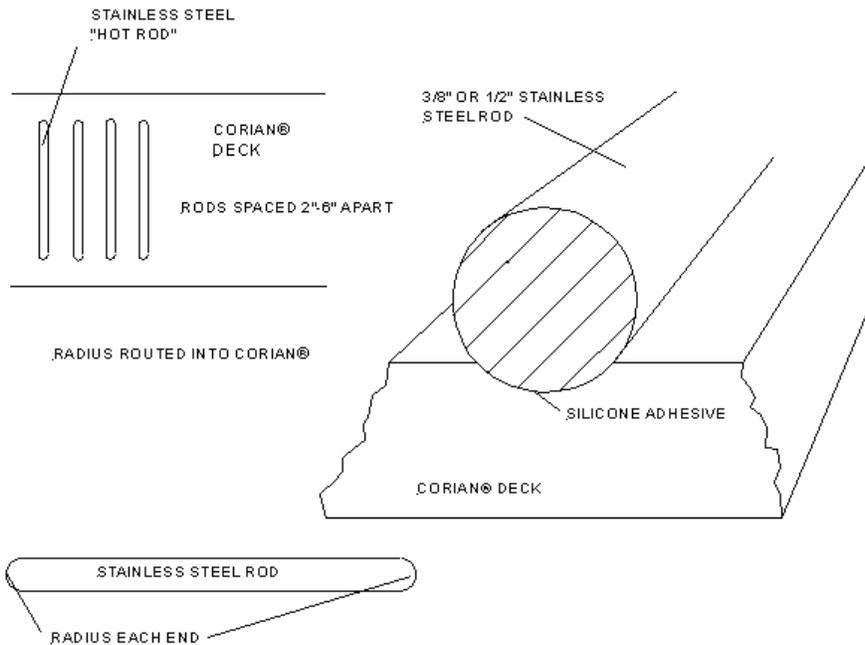
Mount heat lamps in a way that allows for expansion and contraction of the Corian® surface. Heat lamps can generate extremely high surface temperatures. They are designed to heat items on top of a surface and should never be used to heat a Corian® surface. The heat lamp (rod, wire, etc.) should be at least 20" (508 mm) above the Corian® surface, unless actual field measurements prove that a lower position will not heat the surrounding Corian® surface in above 150°F (66°C). Do not put any seams in the area under heat lamps.

Note: Do not allow the temperature of the surface to exceed 150° F.

Hot Pads

If desired, steel rods ("hot rods"), may be installed to prevent hot food pots from resting directly on Corian® surface. See Figure 22 for details.

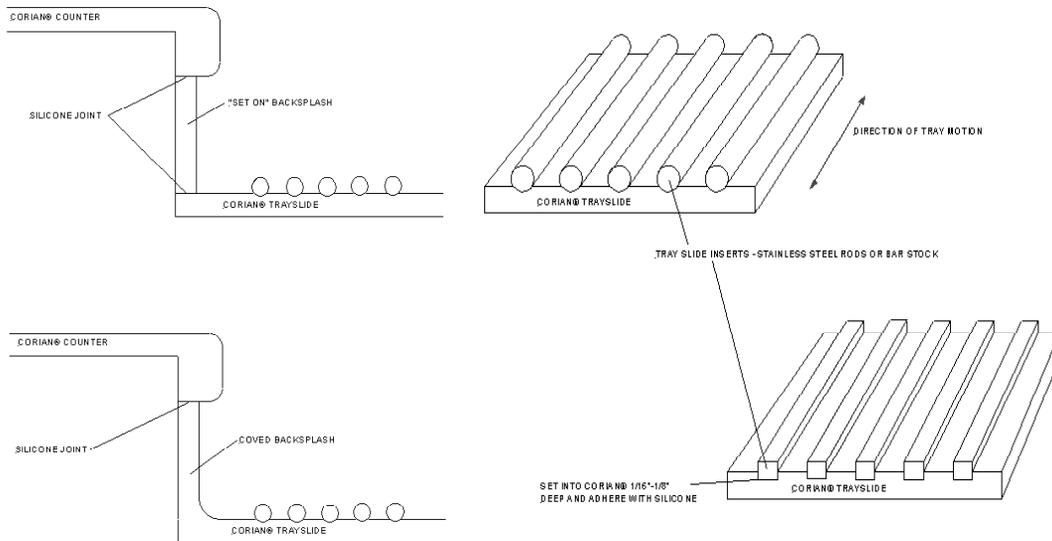
**Figure 22
Hot Pad Assembly**



Tray Slides

Tray slides can be made of the same or a complementing Corian® color or metal rods (stainless steel, brass strips, etc.). The Corian® surface is typically routed so that the bottom side of the slides fit into the surface and the top sides protrude to facilitate sliding. Slides are to be adhered with flexible silicone adhesive so they can expand and contract as needed. Examples are shown in Figure 23.

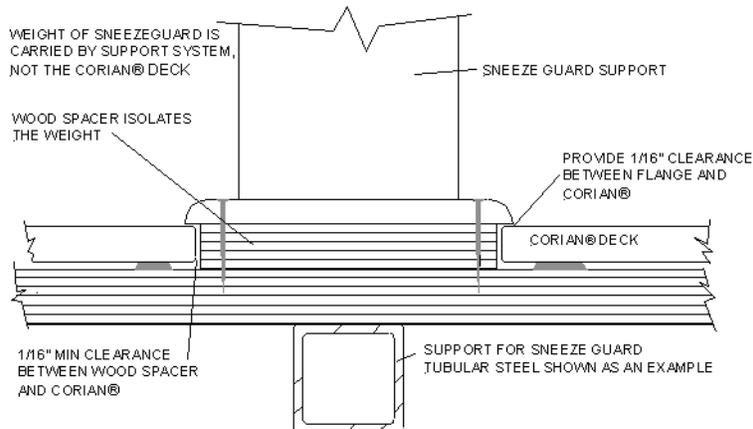
Figure 23
Tray Slide Assembly



Sneeze Guards

Like heat lamps and tray slides, sneeze guards should be mounted a way that allows the Corian® surface to expand and contract. Never bolt directly through Corian® into the support frame; this will prevent movement and can cause the countertop to crack. Use the pass-through method, allowing a 1/8" perimeter clearance around the penetration (Figure 24) and do not secure clamp the countertop surface in any way. The sneeze guard can be attached directly to the support frame, provided the correct perimeter clearance is allowed. Seal the gaps with silicone sealant to allow expansion and contraction.

Figure 24
Sneeze Guard Assembly (one version)



Other Design Considerations

Corian® is a beautiful material that has been used for many beautiful designs. The following guidelines will enhance design success and durability.

1. Avoid stress risers such as square inside corners and abrupt changes in thickness or width of the Corian® assembly.
2. Avoid direct contact between Corian® and hot water or steam. Never under mount hot wells, which cause Corian® to become part of the steam tray. Corian® will whiten and crack.
3. Always allow for expansion and contraction. Ensure that overhanging edges have 1/8" (3 mm) minimum clearance, so they do not bind if shipped or stored in cold weather or if metal casework expands faster than the Corian®. Provide 1/8" (3 mm) clearance between the Corian® and columns or brackets penetrating through the surface. Clearances can be filled with silicone if desired.

Additional Resources:

- The Corian® Food Service Installation Summary Checklist is a quick reference guide to many of the steps covered in this bulletin.
- We recommend that a copy of the DuPont™ Corian® Care In Use Guide be left at each installation to help people use and clean their new surfaces and keep them looking new.

Both of these documents are available from local distributors and www-surfaces.dupont.com. If you have additional questions please contact your nearest distributor Fabrication Service Manager or call DuPont at 1-800-436-6072.

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