



# Durasein

## Avoiding Stress Problems

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Avoiding Stress Problems\_0125

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Avoiding Stress Problems

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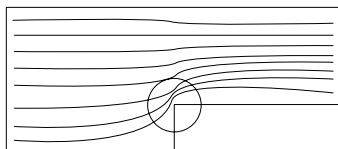
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### Introduction

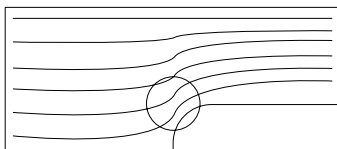
Solid surface is a very durable material, but when exposed to enough stress, it can crack. Stress can be caused by heat, expansion and contraction, high impacts, or excessive unsupported weight. While the force of stress is felt throughout the entire piece of material, it is concentrated in places where the shape changes. This can cause the countertop to crack. However, with the proper fabrication techniques, you can eliminate the weak points where stress concentrates, preventing cracks from forming and spoiling the countertop. This guide will discuss five areas of special concern to countertop fabricators.

### Focus Area #1: Inside Corners

When a material is stressed, those forces are highly concentrated along inside corners. As the following diagrams show, the shape of the corner makes a big difference in how much stress is concentrated in that area.



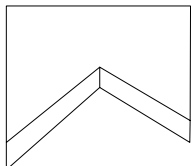
Tight Radius: Stress lines crowd at corner.



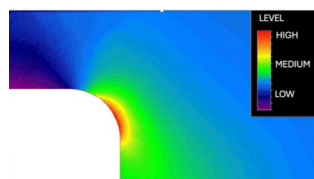
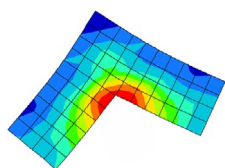
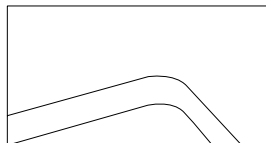
Larger Radius: Stress lines are less crowded at the corner. Lower stress concentration.

To prevent corner cracks in, Durasein® solid surface requires a minimum inside radius of ½". The larger the radius, the better. Note how the larger radius greatly reduces the size of the area where peak stresses occur, as shown in the stress maps below:

Tight Inside Corner



½" Radius Corner



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The finished edge of the countertop isn't the only area that can be affected. Small chips and tooling marks also create tiny inside corners where stress is concentrated, so it's important to avoid these errors during every step of fabrication.

### Focus Area #2: Other Stress Risers

Any area of localized stress concentration is known as a "stress riser." These can happen when there are differences in the size or shape of materials used to support countertops. To prevent these issues, pay close attention to the following areas:

#### Corner blocks and edge build-ups:

- Rout or sand away all sharp corners, smoothing all edges including the back face of the build-up pieces and the exposed outside corners of the build-up.

#### Build-up joints:

- Use build-up pieces that are consistent in size.
- Make all joints in the edge build-up flush.

### Focus Area #3: Countertops

Countertops need proper support from below to reduce the up-and-down flexing that can lead to cracks. Typically, this means framing the cabinet tops that the counters will rest on with front, back, and cross supports, leaving open spaces in between for air circulation. Avoid full underlayment in any area that may be exposed to high temperatures.

#### Approved substrate materials for this framework include:

- MDF
- Moisture-resistant MDF
- Plywood
- Solid wood
- Tubular steel (for applications with seams, cutouts, and overhangs in the same top)

Countertops that overhang cabinets by more than 6 inches may need additional support as follows:

| Length of overhang | Support recommendation        |
|--------------------|-------------------------------|
| 6-12"              | 1" plywood and/or corbels     |
| 12-18"             | Plywood with support brackets |
| Over 18"           | Plywood with legs or columns  |

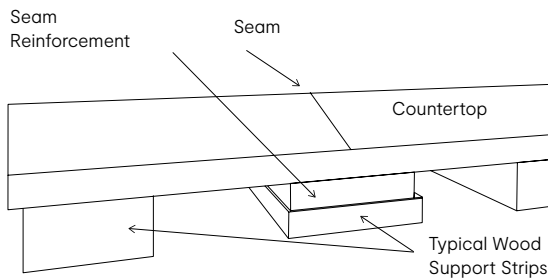
Countertop cutouts also need additional supports placed within 2-3" of all edges.

[info.ca@durasein.com](mailto:info.ca@durasein.com)

#### Focus Area #4: Seams

Learning how to plan and support seams is another key step to prevent countertop cracks. Use following tips to create a robust support system that minimizes stress risers:

- Keep seams at least 3" away from corners.
- Avoid running seams through cooktop or sink cutouts.
- When applying adhesives, cover 100% of the countertop, since any voids can become stress risers.
- Reinforce each seam with another piece of material that runs the full length of the seam, fastening it to the back edge of the build-up with seam adhesive.
- Support seams at both ends with continuous wood or metal support beneath the reinforcement piece.



#### Focus Area #5: Cutouts

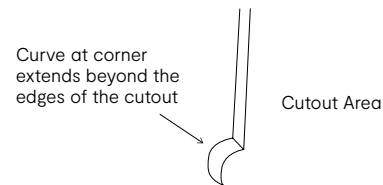
Many countertops have cutouts for sinks, cooktops, or other features.

To create cutouts for sinks or other non-heated appliances:

- Use a minimum radius of 1/2" on all inside corners.
- Round over the edge corners to a minimum radius of 1/16" and sand smooth.

When planning cutouts for cooktops or slide-in ranges, which have extra requirements, use the following checklist:

- Make cuts with a router, creating a 1/8" minimum clearance on all sides to allow for expansion and contraction, while providing an air gap to release heat.
- Use a minimum radius of 1/2" on all inside corners.
- If necessary, enlarge corners as shown below.



- Round over the edge corners to a minimum radius of 1/16" and sand smooth.
- Reinforce the corners with high-strength corner blocks measuring at least 4" x 4" (no bevels needed).
- Line the cutout with reflective tape.

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