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July/August 2016 | ExtremeHowTo.com





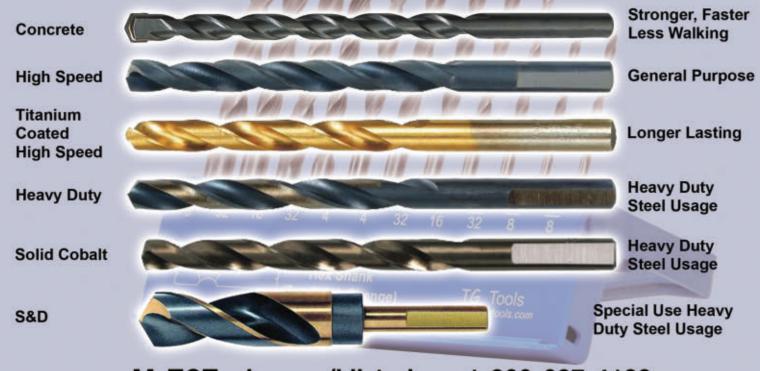
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GARAGE GEAR 2016

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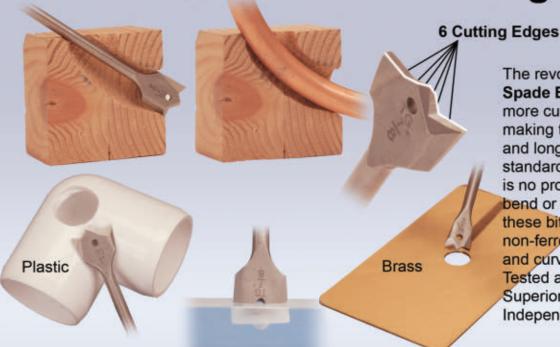


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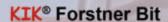
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FEATURES

32 Build a Solid Surface Kitchen Countertop

A Step-by-step DIY Guide to Building with DuPont™ Corian[®].

58 Create an Environmentally Friendly Backyard

Using natural materials and local resources can help you help the environment.

68 How to Build a Pergola

Add a stylish enhancement to your back yard.

EVERY ISSUE

- **6** From the Editor
- **87** Advertisers Index

COLUMNS

- 8 Q&A
- **Tool School**Garage Gear 2016

DEPARTMENTS

84 Hot Products



Cover photo courtesy Formica of Bianco Mineral



From The Editor-In-Chief

recently toured the ROXUL manufacturing factory in Marshall County, Mississippi. The new 600,000 sq. ft. facility was built in 2012 to produce a variety of the company's insulation products. Unlike fiberglass or other insulation products, the ROXUL product is made of stone wool that is formed into batts. The material has a number of performance advantages compared to fiberglass: It's easier to cut, doesn't sag, absorbs sound, installs between studs with a "friction fit" that requires no fasteners—plus, it's resistant to water and fire. But in the end, it's designed to insulate your home to maintain comfort, reduce utility bills and conserve energy—which helps the environment.

And, it's this last attribute that seems to be a value held fast by the company at large. Not only was I impressed with the insulation products, but I was impressed with the way the company produced the products. By building a new, modern manufacturing plant, ROXUL was able to incorporate certain aspects of the manufacturing process that mitigate the company's environmental impact.

For example, forty percent of the material used in the manufacturing is recycled material (recycled steel slag). The plant also requires a lot of water to function, so storm water is collected on site to help fill the production need. Furthermore, the heat generated through the manufacturing process is reclaimed at the factory and used to heat the facility and its warehouses, rather than wasting that heat and drawing more resources from local utilities.

These efforts probably save ROXUL money in the long run, but they also represent a smart and conscientious way to conduct business in a

new community. It's good to see companies that not only make innovative building products, but do so in a responsible manner that shows respect for the environment we all share.





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S. Got-

Questions About Home Building, Remodeling? Have Your Own How-To Tip? Visit our blog at **blog.extremehowto.com** and click on Ask Our Experts.

How do I patch an aluminum gutter? I had to relocate a downspout,
and now there's a hole where it used to be.

• For sectional gutters, you may be able to cut out the damaged gutter and replace the repair section using aluminum seamers to connect the edges. For continuous, seamless gutters, you might need to cut a patch from aluminum flashing material. The patch should extend a few inches beyond the hole in every direction. This generally requires bending the patch to match the profile inside the gutter, which can be the trickiest part of the repair. Measure carefully, and bend the patch over a sturdy straight edge to achieve the right shape. Scrape away any old sealant or grime around the hole. Clean the area thoroughly with a wire brush. Glue the patch over the hole using high-quality roofing or gutter sealant. Cover the top side of the repair, spreading sealant over the edges of the patch. The entire repair should not raise the gutter more than 1/8 inch. Observe the patch during rain. You may have to apply additional sealant to small leaks.

How do I cut a quartz backsplash?

• Currently popular for countertops, quartz is an attractive but very hard material. Its density and durability • against moisture are the characteristics that make it suitable for use it wet areas of kitchens and baths, but this also makes it difficult to cut. The best tool for making a very accurate, straight cut is to use a wet saw equipped with a diamond blade. The cutting action will generate a great deal of heat, and the water will be needed to cool down the blade. If you don't want to purchase a wet saw, most rental outlets have them available.











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S. A Got's

Questions About Home Building, Remodeling? Have Your Own How-To Tip? Visit our blog at **blog.extremehowto.com** and click on Ask Our Experts.

• I read about the wonders of rubber-based sealant as an alternative to silicone, but are there applications where this type of product would not be a good choice?

• A co-polymer rubber-based sealant such as Lexel offers superior adhesion that creates that 100-percent • watertight seal, can even be applied to wet surfaces, and it readily accepts paint. For watertight applica-

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tions it makes an excellent choice. However, for paint-grade finish carpentry applications where the caulk bead might need to be sanded into shape, the sealant's high adhesive properties and rubber consistency make it very difficult to sand smooth once it has dried.

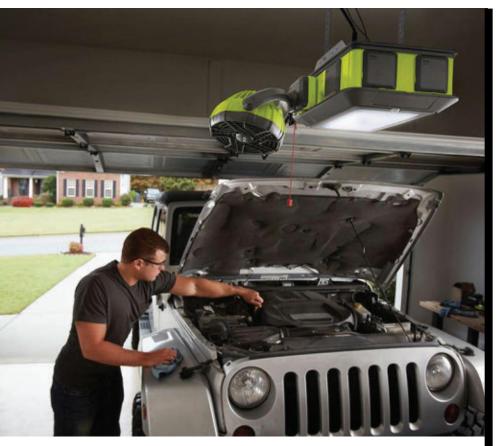
• The dishwasher leaked • at my mother's house and damaged the flooring. She has adhesive vinyl floor tile, and I can't find a match. Is there any way to make a repair without replacing the entire floor?

• Water-damaged sub• flooring that has swollen, warped or rotted will have to be replaced. The good news is that with adhesive vinyl tile, you might be able to re-use the same finished flooring after replacing the damaged area of the subfloor. Unlike a wood floor subfloor, vinyl holds up to water, so try using a heat gun to reactivate the adhesive on the back of the tiles, and piece them back over the repaired subfloor. EHT



KING ARCHITECTURAL METALS

Garage Gear 2016



By Matt Weber

he garage: built to shelter vehicles but used for a little of everything. Whether your garage serves as a mechanic's workshop, a storage shed, or your home-improvement headquarters, there is plenty of equipment to help you decorate the place, organize the area, and work more efficiently. Check out all the new products we've come across.

ULTRA-QUIET GARAGE DOOR OPENER GD200

The Ryobi Ultra-Quiet Garage Door Opener has a powerful 2HP motor that will quietly open and close large doors with ease due to faster openings. With a motioncontrolled overhead LED light, the opener has a selectable duration control so you are never left in the dark. Even in power outages, this unit is compatible with the Ryoby ONE+ system, and is battery-back-up ready for over 100 openings using a Ryobi ONE+ 4Ah Battery (sold separately). For added



control, the Ryobi opener is compatible with HomeLink and is Wi-Fi connectable. It comes with a multifunctional wall control, wireless keypad, two remotes, safety sensor and a downloadable app to control and monitor you garage door remotely. You can also optimize the Ryobi Garage Door Opener Module System. Add any of the great plug and play modules to power, cool, alert, park assist and rock out. Visit www.homedepot.com.

GARAGE LASER PARK ASSIST MODULE GDM222

Building upon the company's Garage Door Opener Module System, Ryobi introduces the Park Assist Module compatible with the Ryobi Ultra-Quiet Garage Door Opener (GD200). Two ultra-bright, Class Two lasers activate when



your garage door opens to help guide you to park the right distance from the wall or other amenities in your garage. Get more control over your unit by downloading the Ryobi Garage Door Opener App to program personalized settings. The module is easy to install to the GD200 Ryobi garage door opener. Visit www.homedepot.com.





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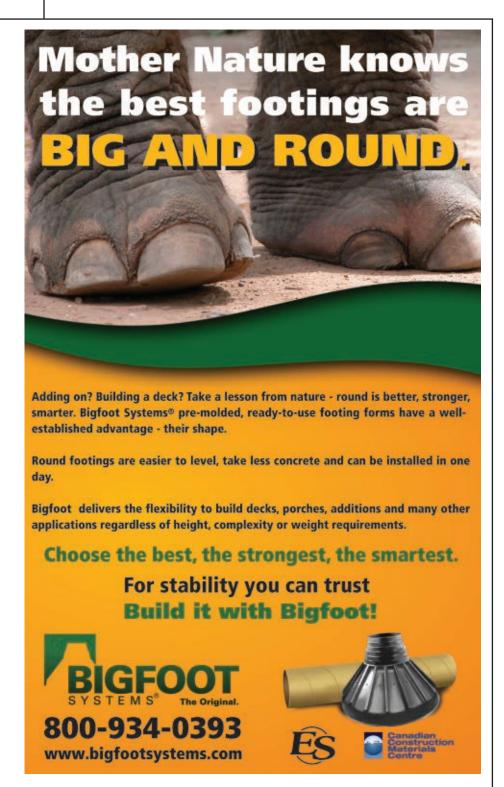
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won't rust, and the galvanized line is magnetic. AlligatorBoard has special reinforced dimpled holes, and will hold up to 90 lbs. when mounted on studs. The built-in

5/8-in. flanges let you mount directly to any wall with clearance for tool hooks. Plus, open corners make it easy to run speaker wire or extension cords behind





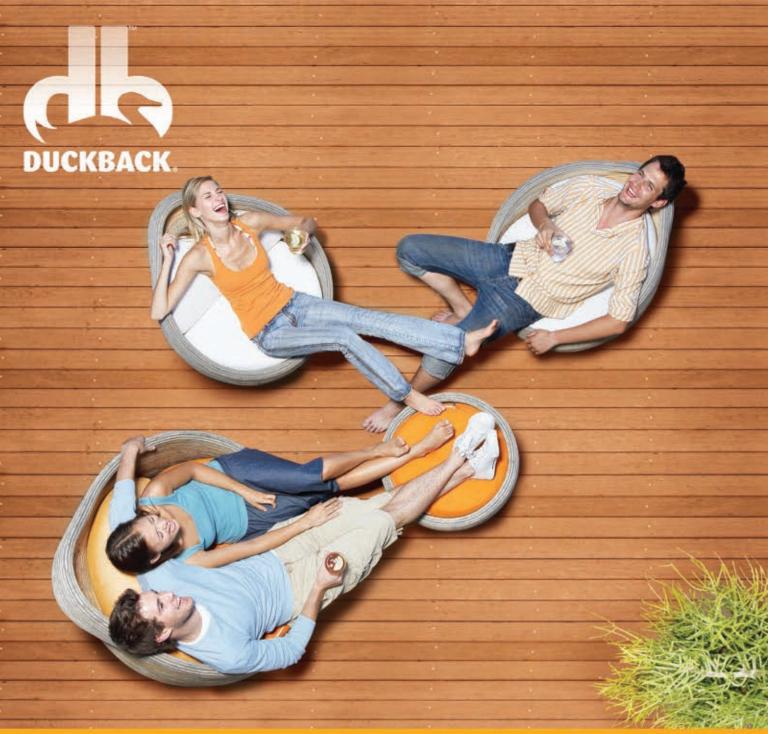
mounted panels. AlligatorBoard is available in several finishes—galvanized steel, eight powder-coated steel colors and stainless steel, and the finish even includes such details as color-coordinated mounting screws to match the paint finish. Visit alligatorboard.com.

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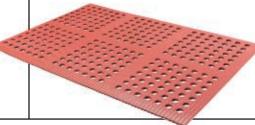






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Sashco's 80 years of delighting the customer with a better way continues to win over pros and DIYers alike



n June 15, 1936, Donald J. Burch, just 29 years old at the time, registered his own business as the Colorado Steel Sash Company. His journey would bring new ideas and new products and set the course for his life's legacy. Two themes emerged quickly and continue to define the company today: innovation and integrity.

Don started by making windows out of steel. It wasn't long before he noticed that there was a great need for material to glaze steel windows, and do it neatly. (Like organic peanut butter, the oil in the window putty at the time

would separate, creating a huge mess when applied.) As an English major from UCLA and the University of Denver, Don was an unlikely candidate for the chemistry lab. Nonetheless, he taught himself enough to turn out that first five-gallon batch of steel sash putty. Through continuous learning and experimentation, Don created a formula where the oil didn't separate and would provide the neat appearance and easy application the other putty makers thought impossible. Throughout the next few years, Don expanded his product line to include both putty and caulking

and, in 1941, began turning out both products in 100- and 200-gallon batches.

In the same vein as Don's putty formula, the caulking product was a first for the industry. Named Plastic-Sele, the formula was tough but flexible, a unique combination in a market filled with hard, brittle competitors. It was so flexible, in fact, that thin sheets were cast and dried and a message was typed on them (using a roll-it-through mechanical typewriter!) and sent out as samples.

Much of Don's success can be directly attributed to his high degree of foresight. He had an uncanny ability to anticipate and meet the needs of the future. One example: Besides being a self-trained chemist, Don was also a well-respected pilot. He used that skill to create an "airborne" sales force. Each salesman was trained to fly, enabling them to cover a multitude of distributors efficiently.

The other part of Don's success was due to his innate curiosity. (After all, how many English majors are self-trained chemists and successful pilots?) It was in his nature to invent and find a better way. In 1944, Don filed patents and copyrights on a navigational circular slide rule and plotter, which he later used as a navigation instructor at the University of Denver during World War II. Various other patents and inventions were par for the course for Don. His desire to discover a better way continues to inspire invention and innovation at the company today.



Don's integrity and commitment to making products that work earned the company a reputation that quickly broadened. Unfortunately, his was a story that ended far too soon. On June 20, 1954, at just 47 years old, Don died in a private airplane crash. He left behind his pregnant wife, Alice, a four-year-old boy, and a thriving business.

Don once told his wife Alice that if anything ever happened to him, the company would continue to grow by sheer momentum for five years and then begin to decline unless new visionary leadership was quickly identified. His prediction came true. By 1964, the company was nearly bankrupt.

Alice was alerted to the difficulties by her nephew Gary Schneider, who had joined the company a few months earlier as production manager. Upon his warning, Alice took over company management. At the close of 1964, the company had lost 25% on \$240,000 in revenue and barely clung to life.

But Alice would not accept defeat. Her determination and common sense breathed new life into the company. Within two years, Alice erased all red ink and the company was profitable once again.

While Alice worked diligently to fight for the company's survival, she did not go it alone. Alice had the support of her family along the way. Besides her nephew Gary, Alice's sister Lavone and daughter Alyson worked in accounting. Her son, Les, and another nephew, Steve, worked in production over the summers, making the rebuilding years a true family effort.

Alice revived Don's innovative legacy by updating product packaging and testing new concepts.

One of her first attempts to differentiate products was the introduction of pink putty pails. Unfortunately, the predominately male glaziers weren't as thrilled with pink as Alice was, so the pink putty buckets only lasted a few months. But it showed that she was not afraid to try new things. Alice knew that the path to successful innovation meant missteps were inevitable and necessary.

Also during her tenure, the company began producing Acrylic

Sealant, its first water-based sealant that would become one of its flagship products. That product is still sold today under the name Big Stretch® and is a recognized leader in high-performance acrylic sealants.

Alice's achievements did not go unnoticed. In 1976, she was recognized by the Rocky Mountain Paint and Coatings Association, where she was one of only five women awarded for her leadership and contribution to the industry.



MANUFACTURER SPOTLIGHT

As Alice's tenure began to wind down, Les Burch came to work for the company full-time. It was 1972 and he had just graduated from the Colorado School of Mines with a degree in Chemical Engineering. The company officially changed its name to Sashco, Inc. that year and, just one year later, named Les president. Les found himself in the unusual role of leading the company and continuing to build his family's legacy just one year out of college. While Les's education in chemistry prepared him to design and formulate the products, it didn't quite prepare him for company leadership. But he was an ambitious young man. He brought a fresh, vibrant energy to the company, reminiscent of Don's early leadership. Today, after more than 40 years as Sashco's president, Les has assembled a dedicated staff of over 100 employees with the same energy, ingenuity, and customer care that has long characterized Sashco.

In the mid-1970s, the company renamed Acrylic Sealant to Acrylic Rubber Sealant and launched a brand new retail display. Called the AcryColor display, it broke new ground by featuring a colored nozzle that matched the color of the caulk inside the tube, a first in the industry and now the industry norm.

Then, in 1976, Wayne Summons, Les's classmate at college, joined the company. Les recognized Wayne's superior talent as a chemical engineer. Wayne's penchant for innovation and invention was a natural fit. (In fact, Wayne is the inventor on record for several U.S. patents, including that of Lexel® and eXact color®.) Twelve years later in 1988, Wayne was named vice president of research and development and technical director, a role he still serves in today.

For many businesses, the 1980s posed one of the most difficult economic climates since the Great Depression of the 1930s. For Sashco, the 1980s proved to be one of the most innovative decades in company history.

First up: Les's Alyster stop-flow plunger. Introduced in 1982 (and still used in all 10.5 oz. cartridges today), his was the only plunger to stop the flow of product after pressure had been released from the caulking gun. The clever design resulted in less waste and less mess (and happy customers).

Until the mid-1980s, Sashco produced sealants solely for conventional home construction. It was during this time that the company discovered people using Acrylic Rubber Sealant to seal their log homes. Sashco's high-performance products were particularly suited to the unique rigors of log homes, so the company introduced a full line of high-performance, specialty log home products. Sashco quickly became the standard for product performance for this niche market.

In 1986, Sashco experienced another milestone in the company's road to success when they introduced Lexel®, a product that would forever change the sealants market. Lexel® was the first-ever clear sealant in a clear cartridge. The clear cartridge was a first for the industry and was exclusive to Sashco for several years. Lexel® outperformed the industry-giant silicone with superior clarity, paintability, and adhesion to almost any surface and won over scores of loyal users. Lexel® single-handedly took Sashco from a solidly growing regional company to the national stage, tripling the company's size in less than three years.

Innovation at Sashco during the 1980s also applied to strategic thought. Throughout the years, Sashco would often introduce a product just to match competitors. By 1990, the decision was made to focus on doing what Sashco does best-making high-performance products. The company eliminated 75% of its product line in this massive strategic shift and narrowed its offering to just two niche products-Lexel® and Acrylic Rubber Sealant. Much of the staff was downright afraid that the company would go under. Instead, Sashco's sales increased. Since that time, Sashco has focused exclusively on making high-performance products that work right the first time.

In mid-1990, the idea that product names and packaging should be more about important customer benefits, and less about the product technology, was taking hold inside the company. In conjunction with the new strategic focus on high-performance products, a major name and packaging makeover took place. Acrylic Rubber Sealant was transformed into Big Stretch®. In a market where manufacturers were still using chemical names for products, this was certainly risky, and far ahead of the curve. The new name and redesigned packaging now told users that this door, window, and siding sealant would do exactly what they needed-stretch! The concept was overwhelmingly successful, and Big Stretch® drove new company growth.

In the mid-1990s, Sashco saw the opportunity for further growth in the log home market and introduced a high-performance semitransparent stain. Sashco took sealant technology and applied it to log home stain with their Capture® Log Stain and



Cascade® Clear Top Coat system. This water-based stain system combined the elasticity of a sealant with the beauty of a semi-transparent stain to create a hardy, durable finish. To this day, representatives with some of the biggest stain manufacturers uphold Sashco's Capture® and Cascade® as the standard in high-performance stain technology.

Sashco moved to a new manufacturing facility just outside of Denver in 1995. In the 20 years since, new products have been launched, technology has evolved, and Sashco continues to be a performance front-runner in the sealant and log home products industries.

THE KEY TO OUR SUCCESS

Fact: 50% of businesses fail within the first five years. So how does a business avoid becoming a statistic and succeed for eight decades? Popular wisdom says it's innovation, reinvention, and adaptation. While these are important, they aren't foundational. A culture of integrity is foundational and this culture has kept Sashco alive and thriving since 1936.

A culture of integrity goes beyond just telling the truth. It forms a values base of fairness and consistency and is evidenced in our everyday actions and beliefs. When integrity slips, handshakes give way to long legal documents, promises become lip service, and people look more for what they can get and not what they can give.

Sashco has thrived because integrity was its foundation from the moment Don registered the company and throughout the rebuilding that Alice led. Our five core values of truth, trust, care, forgiveness, and respect reside in the hearts and convictions of

each person at Sashco. These values underscore every new product created, every hallway conversation, every business decision.

Our message is not that we are so much better than other companies, but we do enjoy great clarity about who we are. We aim to Live Our Values and, through that, Impact Our World.

HOME IMPROVEMENT PRODUCTS

At Sashco, we're driven by a passion to make products that

work right the first time. Like you, we get frustrated by the screwdriver that bends, or tires that wear out too soon. That's why we only make high-performance products designed to work best for their applications. You won't find a good-better-best mindset at Sashco. Why? To help prevent needless frustration and redoing the same project again and again because the product wasn't up for the job. (Hint: your caulk shouldn't crack!) We like to call it "delighting the customer with a better way." 🛦



The (Unofficial and Incomplete)

History of Caulking

B.C.

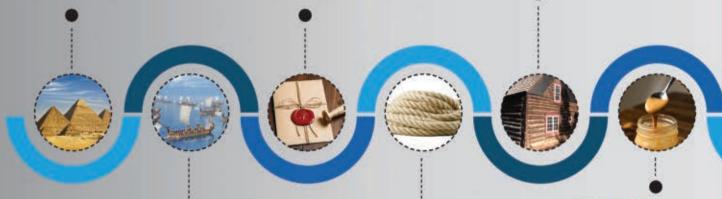
Mud and clay are used to make bricks, as well as seal between them. (The Great Pyramids were caulked!)

1500s

Sealing wax (the kind royalty use on their official letters) is first used as caulk.

1880s

Portland cement mixed with horse hair and gravel makes Daniel Boone's log cabin nice and cozy.



50 A.D.

Stuppators in ancient Rome stand on scaffolding to caulk ships with fibers and cotton cloth soaked in wood sap.

1750s

Oakum (untwisted rope) is soaked in pine sap and "glued" in between the boards on ships.

Early 1900s

Putty is used to seal window panes. It oil separates (kind of like organic peanut butter), which means it's hard to mix and makes a mess when applied.

Not interested in caulking history, only how it will work on your project?

Hop on over to www.sashco.com to check out how-to articles and Sashco's full line of high-performance, do-it-once-and-be-done caulking products.



1941

Don Burch, founder of Sashco, Inc., perfects his window putty that won't oil separate. Window installers everywhere rejoice.

1960s

Water-based acrylics are introduced (including Sashco's Acrylic Sealant, today known as Big Stretch®).

2000s

Custom color caulk that users can mix themselves is introduced. (Sashco's eXact color® is one.)











Silicone caulking is introduced.

Silicone meets its nemesis in Sashco's Lexel®, a co-polymer rubber that outperforms silicone in adhesion, clarity, and paintability.

TODAY

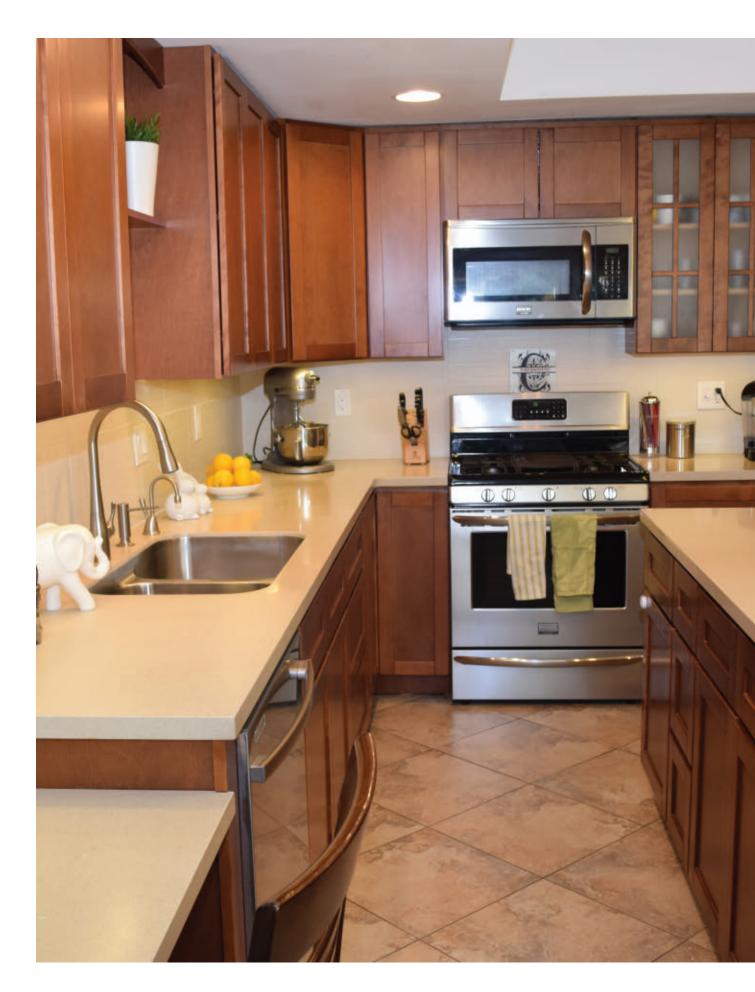














BUILD A ITCHEN COUNTERTOP

Bv David Hugh

uilding your own kitchen countertops can be a very gratifying project, as they are often the centerpiece of a home, and make for a heck of a DIY project you can be proud of. I know this because I recently finished my own kitchen countertops using Corian® solid surface material, and my family and I are thrilled with how it came out, not to mention the cost savings by doing it myself. Fortunately, I photo documented most of the construction stages of my new top, and now I have the opportunity to share my experience and process with you in this guide.

I did my best to follow the detailed how-to guides at SolidSurface.com and, as you will read, in some cases I didn't always have the best tool for the job. But, hey, part of any DIY project is being resourceful and the joy of problem solving, and in the end it all worked out for me. Throughout this guide, I try to inform you if there is a more appropriate tool or technique than what I may

have used to "wing-it".

SOLID SURFACE VS. STONE

I selected solid surface because of its characteristics as a countertop material and its fantastic workability and versatility. Regular woodworking tools can be used to cut and shape the material, unlike working with granite or engineered stone. One of the best and unique features of solid surface is that it can be glued together to appear seamless, depending on the material pattern and correct color-matched adhesive used. Other appealing features include it being non-porous, making it more hygienic, easily renewable and repairable, warmer to the touch, and no sealing is ever required.



HOW MUCH WILL YOU SAVE?

You could expect to save from \$20-\$30/sq ft by doing it yourself. An average 12-ft. long kitchen (~25sq-ft.) on the highend that might cost \$3,750 would cost more like \$1,169 as DIY, a savings of \$2,581. Not bad. This of course completely depends on what material you select and which tools you need to buy, but overall the savings can be pretty significant.

The savings for my larger-thannormal job were calculated at around \$3,875. The material cost of my five sheets was \$2,000 (note: shipping was delivered for free to a local freight terminal, and I just rented an hourly Home Depot truck to pick it up) plus \$366 for a sink, and another \$425 for tooling and accessories (adhesives, adhesive dispensing gun, router bits and sanding discs all purchased from SolidSurface.com) for a grand total of \$2,791. Had I hired professionals to do it, the cost would have been around \$6,600. That is an estimated savings of \$3,809!

Again, this was a fairly large project but had it been smaller, the savings would have scaled with the size of the job.

SHEET MATERIAL AND TOOLING REQUIRED

I had a decent size job made up of a main countertop, an island, and an add-on work desk, which measured to require five sheets of material at 30"x144"x0.5" per sheet. After much spousal deliberation we ultimately selected the color of Delta Sand, which was on overstock special at SolidSurface.com, but there are a handful of sources online that offer material.

I already had most of the tools for cutting and shaping and what I didn't already have I was able to get online. If you do any seaming, which you most likely will, you will want to make sure to purchase an adhesive gun and matching adhesive, as noted by the asterisk below.

• 5 sheets Delta Sand "Overstock" Material (30"x144"x0.5")

- Seamless Undermount Karran Edge E-350 Stainless Steel Double Sink
- Adhesive dispensing gun*
- 2 tubes color-matched adhesive*
- 20 extra adhesive mixing tips (strongly recommended)
- Circular saw (corded or cordless 18v with extra batteries or track saws are great)
- Long straight edge/fence (used for saw and router)
- Router and router bits (router bits I used are explained in appropriate section)
- Random orbit sander and sanding/finishing kit (multiple grits required for optimal finish)
- Counterbalance (for island overhang supports)
- * required for seaming

Tough Rugged, Rip it, Stick it, Done Tape









With its double-thick adhesive, heavy-duty cloth backing and rugged outer shell, Gorilla Tape sticks to rough, uneven and unforgiving surfaces. It's Gorilla Tough, every time.

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BUILD A SOLID SURFACE KITCHEN COUNTERTOP

PLANNING THE LAYOUT

I won't go into details of designing a kitchen, but I do recommend putting the time into planning, you won't regret the future time and effort savings. For our kitchen, which included all new cabinets, I used one of the many online tools to design the layout in 3D using standard cabinet sizes.

Whether you are working with existing cabinets or putting in new cabinets, it's very important to measure and remeasure the cabinet layout to ensure you are ordering enough countertop material, including all edge buildups and backsplashes.

BUILD A TEMPLATE

Before making any cuts to my new countertop, I took the



You could create smaller templates and place them on the material to be cut, but it is nice to have one large template to just place and go. The corner gussets help keep it all together and maneuverable.









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Mike Payne invented Add-a-Handle® because he had a hard time holding the quart size paint can due to hand cramping from Raynaud's Syndrome. With the ergonomic design and Easy to Pull Tab Velcro® Straps holding, carrying and hooking anything under 30 lbs just got a whole lot easier and safer for all!



@addahandle

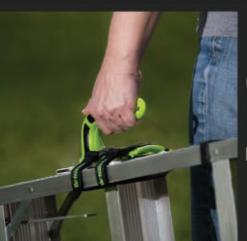














For more info and ordering visit add-a-handle.com





If your fingers, toes or other extremities turn color and feel pain when exposed to cold temperatures or stress, you may be suffering from a medical condition called Raynaud's phenomenon. Learn more at: www.raynauds.org



BUILD A SOLID SURFACE KITCHEN COUNTERTOP



The notes written on the templating cardboard provided needed detail at particular locations.

important step of building a template. A template is helpful because most kitchens are not perfectly square, and with longer countertops being out of square can cause problems. Templates make the overall fabrication process much easier, and the result is you'll have the exact size and shape of each countertop section to build.

Creating a template as a guide is an easy way to transfer the intended shape of the top to the material that is being used for the new top. You can use the template as a guide to mark where to make all of your cuts.

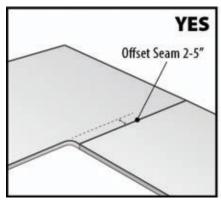
Tape was used to fasten the cardboard strips together, and the corner gussets were added to increase their stability when moving the template about. Using hot melt glue and Luan strips is another method that is often used for creating templates.

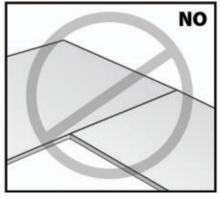
Tip: Allow for expansion and contraction by leaving a 1/8-in. gap for every 10 feet of countertop anywhere there are walls or other permanent obstructions at both ends of the countertop. Also, leave 1/4-in. gap per 10 feet anywhere the countertop will be exposed to heat from sunlight or where it is within proximity to heat-emitting appliances.

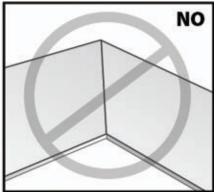
SEAM PLACEMENT **AND CORNERS**

Taking care in where to place seams and corners can be important to the overall layout and how much material will be needed. Here are some general guidelines to follow:

- · Seams should be no closer than 3 inches from the edges of sinks and rangetops.
- · An inside corner seam should not be on a diagonal, like a picture frame corner, but rather it should be placed perpendicular to one of the front edges at a distance of 2 to 5 inches from the start of the inside corner radius.







Offset corner seams by 2-5" from the corner to reduce the risk of cracking along the seam.

 Inside corners should have a radius of at least a 1/2 inch, or more

MAKING THE CUTS

There are three primary types of cuts: a straight cut, a curved cut, and a mirror cut.

Straight Cuts

Straight cuts come in two types; straight and rough. The first is straight enough to go against a wall and can be done with a circular saw and a rip fence and a willingness to sand away any saw blade tooth marks. The second is a really rough cut that can be done freehand and then made straight with a router like would be expected on the front edge of a countertop. Both can be done with a circular saw with a carbide-tipped blade. The more teeth on the blade, the smoother the cut and the less sanding.

Curved Cuts

Curved cuts can be freehanded with a reciprocating, jig or saber saw so long as all blade marks are sanded away. Or, use a template and a router. Draw the pattern on the template material and then carefully

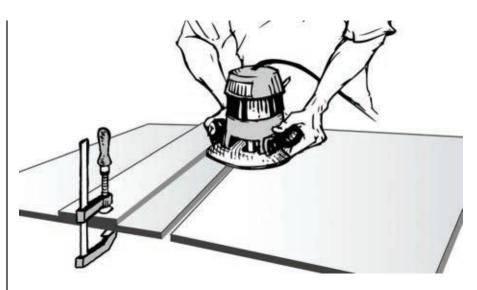
remove all material up to the edge of the pattern line. This edge must be smooth, true and accurate, because any bumps will be transmitted to the material when routed. The easiest way to

guide the router against the template is to use a router bit with either a top or bottom bearing that is the same size as the cutting diameter of the bit.



BUILD A SOLID SURFACE

KITCHEN COUNTERTOP



MIRROR CUTTING

Mirror cutting is a technique recommended for producing the most invisible seam when preparing two pieces of material to be glued together. The two surfaces to be joined are fastened securely to the workbench with 1/4-in. gap

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Mirror Cutting provides perfect edges for invisible seams. Make sure to wear the appropriate eye and breathing protection.

between them. A straight edge is clamped parallel to the 1/4-in. opening and a 1/2-in. router bit is passed through the gap so it removes a small amount from each of the two pieces. So long as all pieces remain fixed in place during the procedure, the two surfaces will come together with enough precision that the seam will be barely visible.

My island countertop, being more than 30 inches wide and longer than 72 inches, required three large sections of solid surface to be glued together. I made all my seams using mirror cuts with my router, a 1/2-in. straight router bit, and a fence.

GLUING THE SURFACES TOGETHER

One of the hallmark features of solid surface is the ability of the material to hide seams and imperfections during the seaming process. Each solid surface color has a corresponding adhesive color that allows this disappearing act to take place.

Once the material is prepared for seaming, the two pieces have clamping blocks affixed to their surface with hot melt glue. The seaming adhesive is applied and



Clamping blocks affixed to the surface with hot melt glue.



More than 30 years of experience in the spray foam industry.

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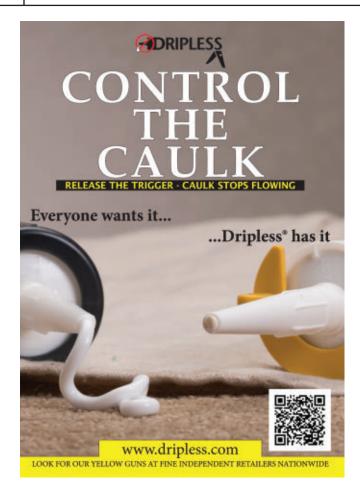


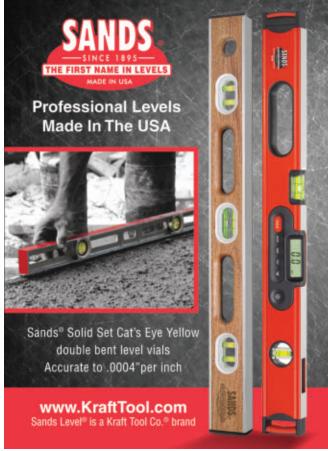
Two 1/8" beads of seaming adhesive are applied, one to each edge. There is a very slight possibility that a short section of adhesive can be dispensed with catalyst not being mixed in properly. When two beads are used, the chance that this would happen in the same spot is even less. Therefore, all the seam will come in contact with with a mix of adhesive and catalyst when the surfaces are brought together.



then they are squeezed together using bar clamps. Apply enough pressure so only a small amount of adhesive remains in the joint and the rest is squeezed out to be sanded away later. Too much pressure will create an adhesive-starved seam that will lack strength.

One additional step to the seaming process is required, and that is the addition of a seam plate. These plates, which are 4 inches wide and should run the length of the seam, are glued in place with seam adhesive. Their purpose is to resist the differential effects of heating





THE FORGIVING NATURE OF SOLID SURFACE

Sometimes accidents happen during the countertop installation, such as when the rip fence moves while routing the edge. The next two images show the aftermath, and the fix, of a mirror cut gone awry. In some cases, the fence can be repositioned so the divot can be routed away. However, there was not enough extra material to allow this, so the divot was filled with color-matching adhesive during the seaming procedure. The damage all but disappeared after the repair.

Left: The white strip of solid surface being used as a router guide slipped during the mirror cutting procedure resulting in the divot being cut away from one of the two edges to be joined. Note that even before the seam is glued, the seam is not very visible.





Right: Can you find the repaired divot? This image is taken from a different position so the divot is not where it was in relation to the edges in the previous image. Also the seam, which was visible in the previous image is now invisible. The repaired divot is the elongated white spot that is appearing as part of the normal fleck pattern in the lower left part of the image.



BUILD A SOLID SURFACE KITCHEN COUNTERTOP

The seam plate is typically the same color or a scrap of a lighter color, is 4" wide with a 45-deg. angle cut on both sides to minimize the starting of a crack. Sand/scratch the two surfaces with a coarse grit, add the seaming adhesive, and apply over the seam with some clamping or downward pressure from weighted objects.

and cooling that in rare instances can cause a seam to delaminate.

BUILDING UP THE EDGE

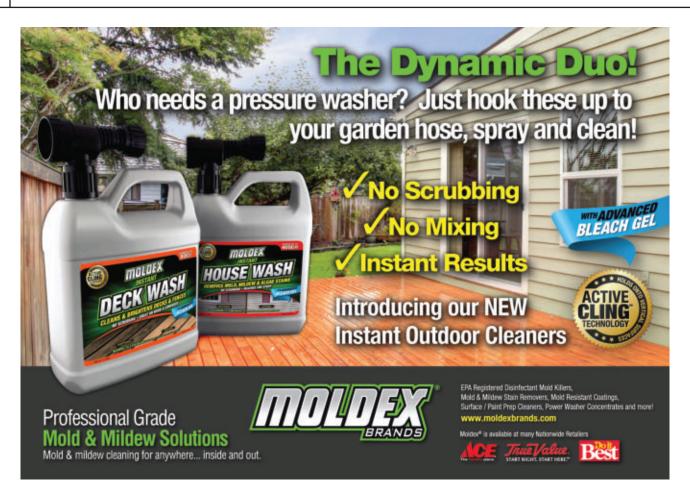
The majority of solid surface material comes in 1/2-in. thick, so to achieve a thicker looking edge, like 1.5 in., you'll need to build-up the edge with multiple layers of



strips, typically three layers for kitchen countertops. Once the edge is built up, you can apply whatever decorative edge suits your taste using the appropriate carbide router bits.

Long Straight Edges

Two 1-in. wide strips are cut from the solid surface sheet in preparation to gluing them. The strips are stacked one on top the other and attached to the



My Car AC is Not Blowing Cold Air!

Summer isn't over yet, especially if you live in the southern portion of our country or other hot climates. You are well aware that, although fall is approaching, the days at the beach or lake are not quite over! The summer sun actually stays quite hot well into the fall in most parts of the country, and even if you've had some cooler evenings lately, temperatures are likely to stay warmer for a few more weeks before the leaves change and fall really settles in.

With the warm temperatures still around it is important to keep your air conditioning system in good working condition. Your air conditioning system in your vehicle is an important part of keeping you comfortable but it also important to your safety. Most new cars automatically turn on the air conditioning system anytime you have your front window defroster on. The air conditioner in your vehicle cools the air your vehicle draws in from outside which also causes the moisture in the air to condense. That is why you see your car dripping water from near the firewall when the air conditioner is running on a warm humid day. When this cool air is reheated by your vehicle's heater core it is warm and very dry which makes it ideal for removing condensation from the inside of your windshield. Having a properly working air conditioning system is important for your comfort, but also for your safety and ability to clear your windshield even in cooler months.

If you find your AC is not blowing cold air it is important to identify the problem with your AC system and fix it quickly for your comfort and your safety. One of the best indicators to help you discover the problem with your air conditioning system is whether it started blowing warm air quickly or if your air conditioning system started working less and less and overtime. In the fall, since you are likely not using your air conditioner every day, it can be difficult to tell if it stopped working all of the sudden or over time. Even if you don't know the duration of the problem with your air conditioning system, the most likely cause for your air conditioning system malfunction is a refrigerant leak. The refrigerant used in cars and trucks today is a gas at atmospheric temperature and pressure and can leak out through even the smallest of openings or cracks. Also, since the air conditioning system in your car is mounted to a moving, vibrating vehicle that is exposed to the elements and road debris, it is not unusual for hoses and lines to come lose or 0-rings may start to leak over time.

With the complexity of your air conditioning system along with the location of all the lines, hoses and equipment, it can be difficult to discover where your refrigerant is actually leaking from. One option is to go to your local auto parts store and pick up an ultraviolet dye, an injector to get it into your air conditioning system and an ultraviolet light. You can inject the ultraviolet dye into the AC system and let the AC run for a few minutes. Then park your vehicle in a dark garage with all the lights off. Use the ultraviolet flash light to inspect all the connections, hoses, lines and all sections of the AC condenser and evaporator. The UV dye should have leaked out at the leak point and shown up under your flashlight. Now that you've discovered where the leak is you can go about replacing the damaged components.

A much simpler and less expensive option would simply be to seal the leak, no matter where it is and without having to find it first. Start by adding Red Angel AC Stop Leak to your air conditioning system either using the aerosol can with supplied coupler or the liquid stop leak and our AC oil injector. Once Red Angel AC stop leak is in your air conditioning system it will circulate with your refrigerant until it reaches the leak. The temperature differential at the leak will cause Red Angel to form a chemical weld at the leak sealing your air conditioning system quickly and permanently without any more effort from you! Once your leak is sealed simply top off your AC system with the proper amount of refrigerant and your vehicle is back to being safe and comfortable.

To learn more about Red Angel A/C Stop Leak Aerosol visit our product information page at www.gobdp.com





BUILD A SOLID SURFACE KITCHEN COUNTERTOP

underside of the countertop to serve as the built-up edge. I am fortunate to have a cordless tracksaw, making long rough cuts a little easier and faster to make, but setting up a fence to run your saw against works just as well.

When adhesive is applied to the edge strips, they become very slippery and hard to clamp and hold in place with the spring clamps. To solve this, the edge strips are dry

fitted, and small backing blocks are hot melt glued into place to provide a backstop for the edge strips. Wood blocks will work as backing, but I happened to have some excess Corian I cut up into blocks.



Sheet material comes 30" wide and countertops are generally 25" wide leaving 5" that can be used for edge strips.

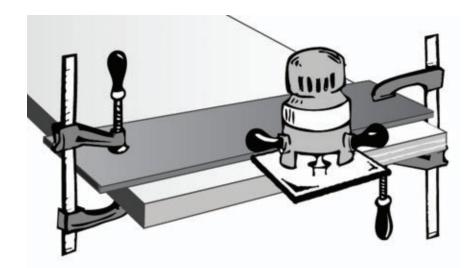


Dry fit the edge strips prior to gluing, and set backing blocks in place. Note that one end of the backing blocks is chisel pointed. This fine edge provides less surface area for the glue that squeezes from the seam to adhere to the backing block.



The seaming adhesive dries in 20 to 40 minutes depending on temperature and humidity.





slightly eased edge achieved with an 1/8-in. radius bit.

Follow the manufacturer's instructions for setting up and using the color-matched adhesive. To obtain the best adhesive joint, apply a 1/4-in. bead near the front of the edge strip so it will squeeze out and fill any gaps, and a 1/8-in. bead near the rear of the strip, for added strength.

Tip: While clamping the edges down, position the spring clamps so that the lower jaw is a slight bit further under the top than the upper jaw which will cause the edge strips to slide against the backing blocks.

Once the adhesive is hard, in 20 to 40 minutes depending on temperature and humidity, remove the spring clamps. The backing blocks can be dislodged with a tap from a hammer. Scrape off any remaining hot melt glue.

The edge can then be routed to provide a smooth surface ready for the final sanding. With the top of the counter facing up, clamp the router guide strip into place and use a straight bit long enough to route the edge from top to bottom in one pass. Once the surface is smooth, the edge profile can be routed in place using the profile of choice. I like the boldness of a straight,

Inside Corner Edge

Inside corners can be a potential source for cracks, so it is important

Set up a fence for your router to trim the glued edge.

to do your best to build the corner so that seams are offset and edge build-ups are stacked in an overlapping fashion.

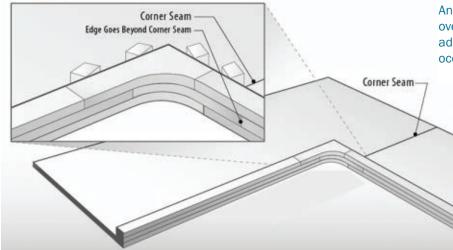
There are a number of ways to rout out the corner. I constructed a template so the outer edge of the router's round base plate would run against the template. As a testament to "winging-it", the template I used is made from a piece of Masonite held in place by clamps holding down pieces of solid surface.

Alternatively, an exact size template could have been made for a straight flush trim router bit



BUILD A SOLID SURFAGE

KITCHEN COUNTERTOP



An ideal example of multiple overlapping corner pieces, which add resistance to any cracking occurring in a corner.

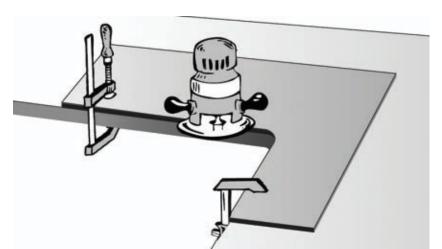
with a top bearing. Presumably, this template would have been easier to construct, but since I did not have the right bit when it was time for this step, I improvised.

The result of my effort was a little disappointing since the inside radius is not very smoothly rounded. The unevenness is primarily the result of my template not being a perfectly smooth radius. Fortunately, the forgiving nature of solid surface allowed me to fix the uneven curve. This was accomplished with some elbow grease, wood rasps, files and sanding. The end result is a respectable inside corner.





To build-up the edge for my corner, I used 1" strips and squares at the radius. (left). Top side view after the edge buildup is glued which will be routed off in the next step (right).





Examples of different template methods for routing out the final inside corner.



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BUILD A SOLID SURFACE

KITCHEN COUNTERTOP



The imperfections in the radius of my template were magnified considerably on the routed surface (left). I was able to apply a little elbow grease by hand filing and sanding to smooth the radius (right). I give credit to the renewable and repairable nature of solid surface.

INSTALLING THE SINK

There are a number of different sink types often requiring different installation techniques. For this kitchen, a Karran Edge stainless sink was chosen. The "Edge" designation indicates the rim of the sink is created at the factory with a layer of solid surface attached at the top so that solid surface

adhesive can be used to affix it to the underside of the solid surface counter in a seamless fashion.

The location of where the sink is to be glued is surrounded by backing blocks that are hot melt glued to the underside of the countertop. This allows the sink to be placed exactly where intended while the seaming adhesive dries. This adhesive should be the same color as the adhesive used to glue the seam.

To put pressure on the the sink while the adhesive dries, I used both clamps and whatever heavy garage items were sitting around to place on the sink, showing off my extreme inner DIY'ness. A more professional technique would be to use threaded rods, wood blocks, and wingnuts.

Preparing the Sink Opening

Flip the countertop so the top is facing up. Routing the sink is a two-step process, and two different router bits will be used to remove the material from within the bowl opening and provide the edge to the sink. The first pass, using a 1/2-in. 2 Straight-Flute bit with an oversized nylon bearing at the bottom, is intended to remove the bulk of the material and will leave a slight lip to be removed in the next step.

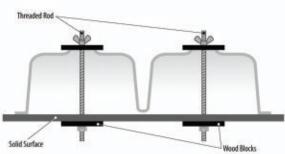


The white rim around the sink is actually solid surface material that is applied by the sink manufacturer. The edge of the material is flush with the top of the stainless sink wall providing a seam-free transition to the counter surface.

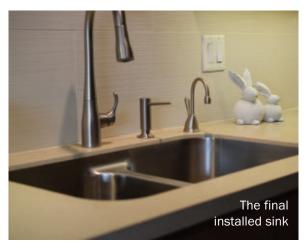


Next, use a bevel bit with an 1/8-in. oversize nylon bottom bearing (Amana Bit #57169). Carefully set this bit so it will cut a small amount from the overhanging edge of the countertop and almost come in contact with the sink. Carefully rout around the sink, then lower the bit slightly bu still not coming in contact with the metal of





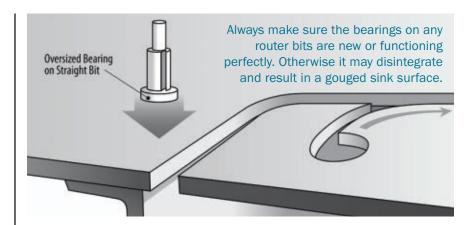
To apply enough pressure to hold down the sink, sometimes you just use whatever weight is handy to apply the necessary pressure (top). A preferred approach would be to use threaded rods with wingnuts and wood blocks as shown in the drawing.





BUILD A SOLID SURFACE

KITCHEN COUNTERTOR



the sink, and make another pass around the sink. Do the same thing again if there is still material to be removed.

Finish the bevel edge with a random orbit sander held at the same angle as the bevel. If you do blemish the metal sink edge, you can reestablish the grain in the metal with a 180 grit non-woven flap

wheel chucked into a drill. Move the wheel horizontally and not up and down.

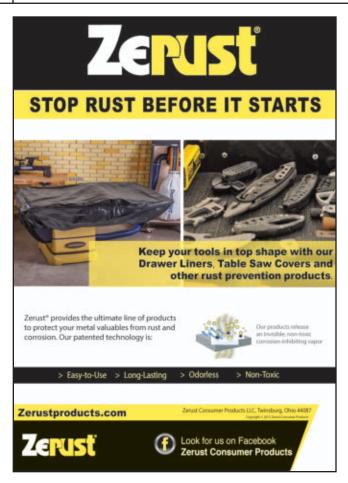
I recommend reviewing the more detailed fabrication instructions found on the Karranwebsite under "Edge Sinks in Solid Surface" in the "Fabricator Resources" section, www.karran.com.



The front of the sink is a good place to start/test the routing with this bit because that area is not as easily seen when standing at the sink. Image courtesy Karran Sinks.



A successful installation of the sink is simplified by the added solid surface ring applied to the top of the sink by the manufacturer.







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FINISH SANDING THE COUNTERTOP

One of the final steps before installing your top is to sand the surface and edges to the desired

finish, or sheen. The most common finishes are matte, satin, semi-gloss and gloss. I use a 5-in. random orbit sander in conjunction with a semi-gloss small finishing kit from SolidSurface.com, which contained all the required grits

To give an idea of the two extremes, a matte finish provides a good finish for high-use areas such as a countertop because it will be the least likely to show wear. A high-gloss finish can lend itself to scratching more easily and is best used in an area with less expected wear. Keep in mind that darker colors will generally show scratches more apparently than lighter colors, particularly in a high gloss. I chose a satin finish for my countertop, because it is a lighter color and I like a little sheen.

First, use 180-grit to sand away any remaining hardened adhesive and any areas with heavier scratches. Try to keep the sanded area to a minimum with this coarser 180 grit. Wipe the area clean of any remaining dust and grit particles and sand again with 280 grit. With this grit, increase the area sanded so as to feather out the sanded portion. Finish the area with 400 grit and cover an even larger area.

Next, sand the entire countertop by working in sections of about 2 feet by 2 feet. Move the random orbit sander from side to side and front to back in the 4-sq-ft. area, and when done move to the next area with some overlap with the area just completed. If you don't sand the entire top with 400 grit, there will be a difference in the finish from area to area. Stopping at 400 will give you a satin finish.

For a slight enhancement to the satin sheen, follow the 400 grit with a gray colored non-woven pad. Once the entire top has the same sheen, you're done and it is time to prepare the cabinets and install the new top.





A satin finish was achieved with 400-grit sandpaper followed by a gray colored nonwoven pad being used as the final finish. No other treatment needs to be done to solid surface like sealing or waxing.

CABINET PREPARATION

Before installing the finished countertops, the cabinet tops need to be elevated by 3/4 to 1 inch. This is so that the countertops' built-up edge, which hangs down 1 inch, does not get in the way of opening any cabinet doors or drawers. This can be accomplished by using strips of wood or plywood that are 2-1/2 to 3 inches wide and 3/4 to 1 inch thick. Using strips, rather than solid sheets of plywood, allows the solid surface to dissipate heat and cold away from the top, which minimizes stress that can be caused from expansion and contraction.

These strips are placed on the cabinet tops front to back every 18 inches or less, except where there are obstructions such as sinks, and can be affixed to the top of the cabinets with screws, glue or daubs of silicone sealant. As an alternative, the wood strips can be pre-adhered to the underside of the countertop with daubs of silicone. Just make sure the

wood ends up resting on the cabinet's top edge.

Next, I applied the underlayment for my kitchen island which also contained an overhang, requiring additional supports. The island is made up of five cabinets fastened together to form the island base.

Three-quarter-inch plywood was used to elevate the top, with much of the area cut away, rather than using the wood strips discussed in the previous section. I used strips on the remainder of the main cabinets (not shown). Best practices might argue that the large overhanging area of the plywood should have had more cut away to allow for heat and cold dissipation. The overhang area has supports underneath that allow for it to extend out away from the cabinet wall support.

INSTALLATION

Assuming all the other steps have been followed, your countertop is complete and ready for placement on the cabinets. All you



The island base was composed of 5 separate cabinet sections that formed a large rectangle with electrical run to it through the floor before the tile was placed.

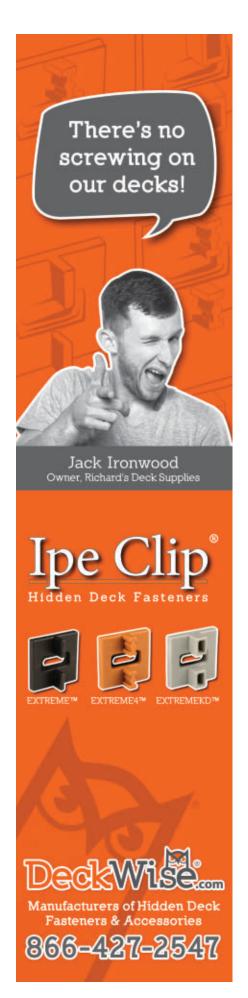


Much of the plywood is cut away to allow the solid surface to dissipate heat or cold to minimize differential expansion and contraction. To be safe, I should have also done this for the overhang section.



Counterbalance supports are shown under the plywood.

Overhangs greater than 6" need such additional support. This style support, as opposed to corbels, is less likely to bang knees or get in the way of stools.



BUILD A SOLID SURFACE KITCHEN COUNTERTOP

need to hold the countertop in place are thumb-sized daubs of silicone sealant at about 12" to 18" intervals (or between the strips and the cabinet tops if the strips are glued to the bottom of the top). Do not use more than that, and do not use hard adhesives or screws, because you want the top to be able to expand and contract without a lot of restriction.

GET COOKIN'!

That's it, you're done! Now you begin to enjoy your new countertop for many years to come. You can also rest knowing that no matter what happens, such as

when 3-year-olds manage to color on it with permanent marker, that it is easy to wipe clean with a little Soft Scrub® and a wet paper towel.

Friday nights is pizza night for our family, and we like to roll out our own pizza dough right on our island top knowing that it will not absorb moisture or support the growth of mold and bacteria, and cleanup is a cinch. We treat cookie dough the same way.

I hope this article gives you the confidence and know-how you need to take on building your own top. Until then, it's Friday, and I have some pizza dough to roll out! **EHT**

THE BENEFITS OF A TILED COUNTERTOP

A kitchen counter is one of the first things to be noticed in a kitchen. It is also a work surface that is used daily, so it needs to be beautiful, functional, and easy to maintain. Tiled countertops are an option well worth considering. They provide durability and practicality, and come at a fraction of the cost of marble, granite or quartz countertops. With the evolution of both tile and installation systems, tile countertops provide the ideal combination of beauty and practicality.

Ideal for the style-savvy, cost-conscious consumer, tiled countertops are resistant to staining, scratching, high heat, and are easy to clean with standard household products. Today's tiled countertops incorporate beautiful, large-format tiles to practically eliminate grout lines, and with endless tile options, it's easy to complement any kitchen style.

The Schluter®-Countertop System provides a simple way to build a tile countertop. Instead of using plywood, which can absorb moisture, a level substrate is created using KERDI-BOARD, a multifunctional waterproof building panel that is ready for tile. KERDI-BOARD is lightweight, dimensionally stable, impact-resistant, and rigid. Because it is easy to cut with a utility knife, the substrate can be made to suit the dimensions of the tile, so full tiles can be used and tricky tile cuts eliminated. These building panels are available in different thicknesses so one can be chosen to suit the desired thickness of the countertop.

When it comes to finishing details, there are many options. Ceramic tile trim pieces and bullnose tiles have become much more difficult and expensive to source. Readily available profiles and corner pieces produce stunning sink rails, elegant and easy-to-clean countertop backsplash transitions,



and practical tiled-under sinks. Profiles are available in a wide range of finishes, colors, and textures so there is something available to suit every design. The bonus from using profiles is that caulking can become a thing of the past; profiles can be quickly wiped clean and never need to be replaced. Visit www.schluter.com.



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CREATE AN ENVIRONMENTALLY FRIENDLY BACKYARD

By Charlie Jourdain

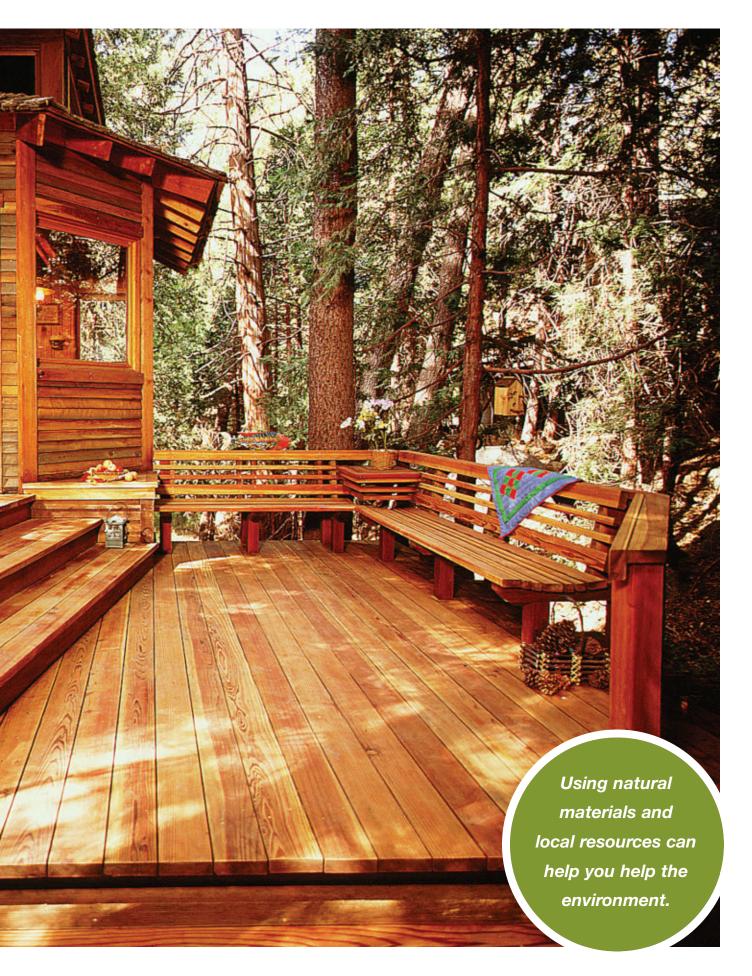
omeowners today pour a lot of energy and study into ways they can make their homes more environmentally friendly. Yet when it comes to maximizing the features that make the most of their environmental opportunities, many forget about the yard space surrounding their homes.

Maybe it's the assumption that "green" takes care of itself in the great outdoors, or maybe that the average-size yards aren't big enough to make a difference. While not everyone can step outside a set of patio doors and set foot in a national park, that shouldn't stop homeowners from creating a yard that is inviting, soothing ... and very friendly to the environment.

CREATE A PLAN THAT HIGHLIGHTS YOUR YARD'S NATURAL BEAUTY

Planning is the logical first step for any landscaping project, but when planning for a more environmentally friendly yard space, this step is even more important. Take time to consider all the natural features in your yard and how they can be featured in your new designs. What existing structures, if any, could continue to be used?









Working with rather than against the natural features in your yard space not only helps promote the native environment, it is also more cost-effective. The materials and labor needed to manufacture a natural scene can send any budget spinning wildly out of control.

THINK GLOBALLY, BUY LOCALLY

Inspiration for your yard space may come from around the world, but making a conscious effort to source your materials from local companies is another way to boost the environmentally friendly features of your redesigned yard. Think about it: If the items you order travel a shorter distance to your yard, then less nonrenewable energy is consumed.

Your local lumber yard or home improvement store should have

information on where their stock is shipped from. There's an amazing selection of products and raw material—such as redwood lumber—that are American-grown and -made and will fit your plans better than anything shipped from overseas. For homeowners who want to know their products were also responsibly sourced,

certifications like the Forest Stewardship Council (FSC) offer assurance that the company offering the product paid careful attention to how it was made, beginning to end.

This is just part of what makes redwood one of the most environmentally-friendly woods to work with. In addition to FSC certification, some of redwood's naturally sustainable features include:

- Redwood trees are carbon negative, as they consume carbon dioxide from the atmosphere, converting it to wood and then storing more carbon than emitted in manufacturing. This is far less than any plastic composite product that puts a ton of carbon dioxide into the atmosphere.
- Redwood can be refinished a number of times and is also biodegradable. Other materials can spend thousands of years in landfills.
- Redwood is also naturally resistant to decay, termites and even fire. This means redwood will last much longer in use than other common wood species.

The same mindset applies for any plant life you want to include in the design. Local nurseries



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will have the knowledge and experience to help choose the best plants to thrive in your yard's unique habitat—whether shady or sunny, wet soil or arid ground.

CHOOSE WITH THE FUTURE IN MIND

Many consumers today have gotten used to a "throw-away" mentality. With inexpensive products available in abundance.

discarding something before the end of its useful life sounds okay, but is a landfill really the best option?

Some products that are made from recycled products, such as composite lumber that features recycled plastic, cannot be recycled again. They're a one-time-use product. Natural wood products such as redwood, though, can be refinished and even repurposed for other items: a deck can become a bench or planters.

DON'T REBUILD OR TEAR DOWN WHAT YOU DON'T HAVE TO

Much like future-proofing your purchases, don't discount existing structures immediately. In many cases, something that looks rundown like a pergola or patio still has a number of useful years of service left. A thorough cleaning and refinishing not only helps protect but also prolongs its usefulness.



MAKE A GREENER SPACE WITH LESS GREENSPACE

Many assume that designing a backyard "oasis" means investing heavily in plant life, and committing to the work it takes to keep that plant life alive and thriving. With some parts of the country facing limited water resources,



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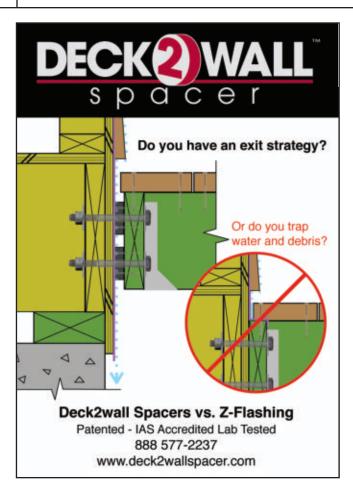




and a trend among homeowners who prefer enjoying their leisure time instead of working on their leisure space, consider the beauty found in plantings that require less water, and landscaping designs that minimize the presence of grass.

PLANT WITH A PURPOSE

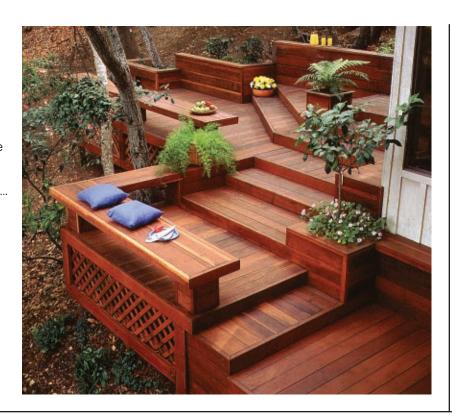
Even if you are limiting your green space in your back yard, get the most out of your plantings and incorporate plants that serve a dual purpose, such as herbs or fruit-bearing plants and trees. Not only does it add visual variety to your space, but helps the yard work harder for you—and isn't that what we'd like our home-improvement investments to do?





With a little time spent planning and considering the full potential of your space, anyone can make their back yards greener, more welcoming, and enjoyable in every season. From making the most of what is already there to layering in naturally sustainable materials like redwood, it's easier than most think.

Editor's Note: Charlie Jourdain is president of the California Redwood Association. Founded in 1916, the California Redwood Association is one of the oldest trade associations in the lumber industry. From the very beginning, the association's primary mission has been to promote redwood products and educate builders. Contact charlie@calredwood.org or (888) CAL-REDWOOD.



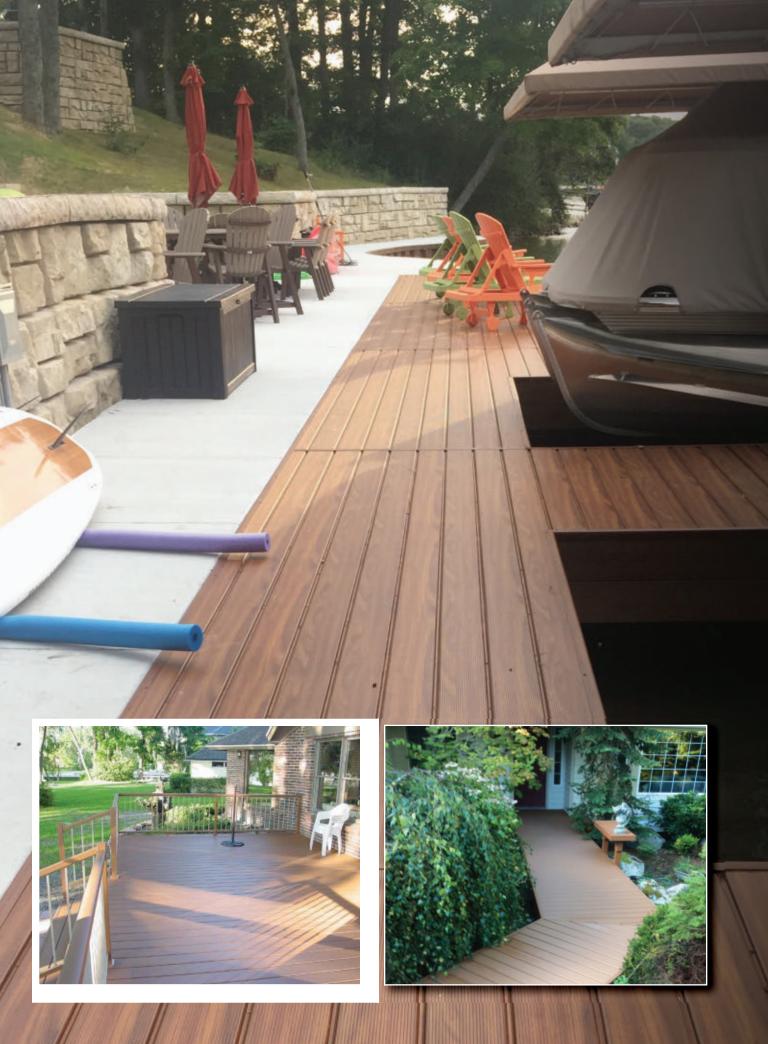
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HOW TO BUILD A DFRCAIA

By Matt Weber

Pergolas have long been popular additions to a home because they add style and character to the outdoor living space. They can vary in size and design to fit different landscapes, and have the added benefit of breaking up the sunlight (but not too much) in areas of the yard where people like to relax and entertain.

That was Steve and Blakeney's reason to add a new pergola to their back yard. The rear patio of the home made a nice place to congregate, complete with a fire pit, ample seating and even a hot tub. The hot tub was exposed to direct sunlight, however, which can get overbearing at the height of a sweltering Alabama summer. A pergola offered a good solution to decorate the patio and mitigate the heat and brightness of the shining sun.

Pergolas are generally constructed with four support posts connected at the top with rafters and decorative cross-members. Typically built of treated lumber, cedar or redwood, they are fairly simple structures in design, but you should keep some basic

Add a
stylish
enhancement
to your
back yard.

building practices in mind to ensure costruction of a pergola lasts for years to come.

SUPPORT POSTS

To adequately support the lumber overhead as well as give the pergola a sturdy look, you'll probably need to use 6x6 for the support posts. For a very small pergola with only 4 to 6 feet between posts, 4x4 supports will work. For anything larger, though, the 6x6 stock will not only offer a beefier look and greater carrying capacity, but 6x6 also resists the twisting associated with the more spindly 4x4s. Make sure the post material is rated for ground contact.

To integrate a pergola into the existing landscape, they're usually built square to the house or the nearest structure. Lay out the post locations with stakes and string using the 3-4-5 method to ensure square corners.





Most pergolas are constructed square to the nearest building structure.

The posts are made of 6x6 treated lumber rated for ground contact.

Dig the post holes according to the depth determined by your local building codes to get beneath the frost line in your area. Compact the soil at the bottom of the post holes, add gravel for drainage, then secure the post bottom with concrete while ensuring the posts are plumb and aligned perfectly square with the adjacent post locations. Double and triple check your measurements during installation. Using

string along the face of the posts can help guide a square layout.

Setting a tall 6x6 post is a twoman job. It helps to have one man plumb and align the post while a second worker secured the bottom with concrete and attached the brace boards that hold the post plumb while the concrete dries. The braces are made of 2x4 boards nailed to two adjacent sides of a post and angle down to the ground to prop up the posts.



Once the post is plumb, the braces can be fastened by staking them to the ground (nailing the stakes to the brace bottoms).

Repeat this procedure for all four ground-supported posts.

The pergola shown in this article covered an existing concrete patio, and one of the support posts sat on the patio and was fastened to the wall of the house.

Realize that even after the posts are plumb, square and set in concrete, they can still shift out of position. To help ensure a square, plumb and rigid assembly throughout construction, take a cue from pro framing contractors and brace everything with temporary 2x4 cross-braces to bridge the posts (nailed into the sides). Spend a little time on any roughframing jobsite, and you'll see all manner of temporary bracing and blocking at play. Follow this lead and use whatever bracing you need to assist the project during construction.

LUMBER SIZE

The key to designing a pergola is its visual proportion. With 2x6 posts, the girders and cross-members will need to be larger, otherwise the top of the structure will look undersized and anemic. You also have to consider allowable span, based on the size of the pergola you're building. A 12-foot span is much too long for a 2x6 board, for example. Not only will it look weak to the eye, but it will sag over time. Most builders use a minimum of 2x8 for the upper framing members, and that's for a small pergola.

Damp soil conditions required the builders to fortify this post footing with extra gravel and concrete.

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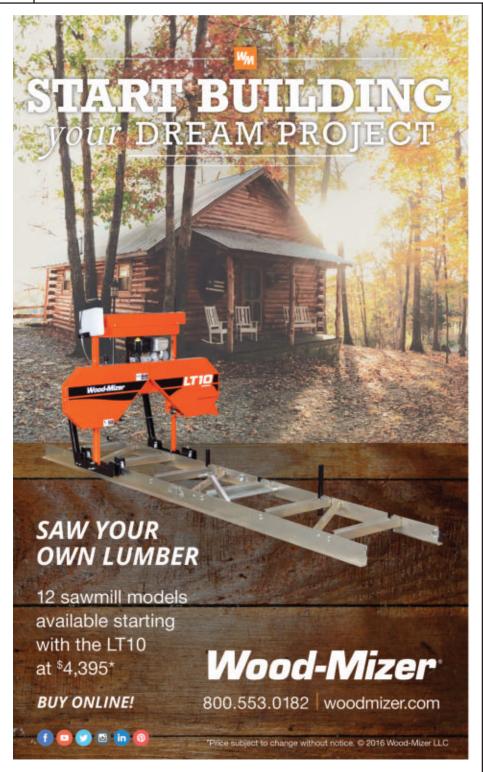


HOW TO BUILD A Pergola

On this pergola, the builder Ricky Chavez used 2x12 for the girders, 2x10 for the rafters, and 2x4 for a layer of decorative purlins fastened atop the rafters.

TAIL DESIGN

Typical to pergola design is to have the tails of all of the horizontal boards cut with a decorative pattern. The tails impart the





Setting the posts square and plumb is a two-man job.



Stake the the post braces to the ground to hold the posts in place while the concrete dries.

pergola with its signature elegant design, and can be cut to a curved scalloped profile or a more angular geometric design—or anything in between. The longest edge of the boards should always be positioned at the top, but aside from that rule of thumb, the pattern is completely up to you. Experiment with the design on a paper template until you've arrived at a look you prefer.



After deciding on a rafter-tail pattern, cut the first rafter and use as a template to mark the others.

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Cut the pattern using a combination of handheld circular saw and jig saw (for making tight curves and to connect intersecting cuts). After cutting the first girder, use it as a template to

cut the tails on each matching girder. Do the same for the rafters and purlins. The girders, rafters and purlins can have different tail designs, but each type of board should match.





The thin blade of a jigsaw cuts the curved profile.



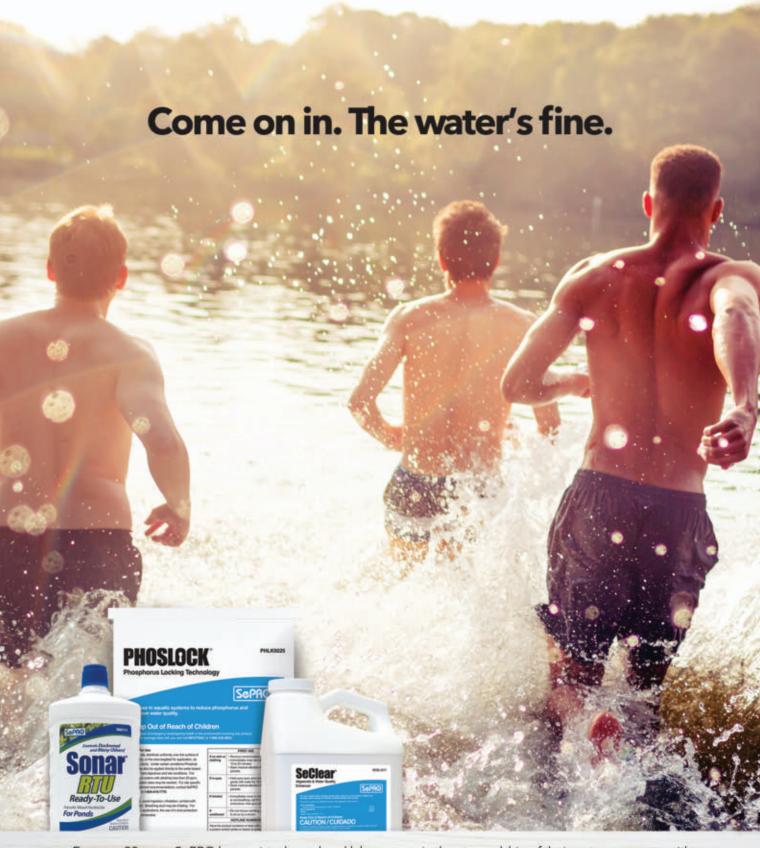
Sand the profile to prevent splintering.

GIRDERS

The next step in construction is installation of the girders. The double girders are attached near the top of the pergola and connect the side posts to each other. Again, installation is a two-man job requiring two ladders. Once you've aligned a girder at the proper elevation on the support posts, ensure that it is perfectly level and tack it to the post with some framing nails to hold it temporarily in place until you can make a proper lag-bolt connection. Attach a matching girder to the opposite side of the two posts.

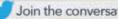
Repeat for the opposite side of the pergola.

When determining the height of the girders, keep in mind that these will be the lowest horizontal members of the structure, so be sure to leave adequate headroom below. The rafters and purlins will sit on top, and the entire structure



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should be designed to integrate in a logical aesthetic fashion to any nearby structure (a roof, in the project shown).

When all girders are tacked

completely through the girders and posts at each connection and secure each corner assembly with two 1/2-in. lag bolts. Tighten a washer and nut over the end of

Available at Home Depot





Install the girders level across the side posts.



Make the final connection by drilling two 1/2" pilot holes through the posts and double girders.



Fasten each corner assembly with two 1/2" lag bolts, washers and nuts.



Use 2x4 braces to hold the support structure plumb and square while building the pergola.

The two pairs of girders will support the weight of the pergola's rafters and purlins.

RAFTERS

Usually the rafters are slightly smaller than the girders and are installed vertically, bridging over the girders at 90 degrees and



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HOW TO BUILD A Pergola

overhanging each side with the decorative rafter tails.

Spacing of the rafters will vary according to your visual preference and the size of the pergola. Spacing the rafters 16 to 20 inches apart is common. The most important rule in spacing is to keep the distance consistent between all the rafters. Install the front and rear rafters first, fastening them to the face of the support posts above the girder.

With the top and rear rafters in place, use a reciprocating saw to cut the top of the support posts off flush with the top of the rafters.

Install all remaining rafters spaced evenly between the front and rear rafters. Install each rafter perfectly square and vertical to the girders, and toe-nail the rafters onto the girders (two nails at each joint).





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PURLINS

The final layer of lumber on this project was the 2x4 purlins that were installed vertically over the rafters at 90 degrees, essentially forming a grid. Toe-nailed over the

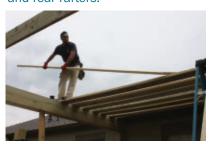
rafters, the two outermost purlins on the sides of the pergola are fastened so they align on top of the outermost girders. The remaining purlins are installed with equal spacing between the two side purlins. Note that the purlin layer is an optional decorative enhancement that works best on large pergolas. Smaller pergola designs often forgo the purlins, or in some cases smaller 2x2 purlins are used as decoration.

PRESERVATIVE FINISH

Staining and sealing the wood with a waterproof finish is a smart way to add your color tone of choice while also protecting the wood from water and insect damage. Cedar and redwood have natural preservative oils that help protect from insect infestation and rot, but treated lumber is notably



Mark rafter locations so they're spaced evenly between the front and rear rafters.

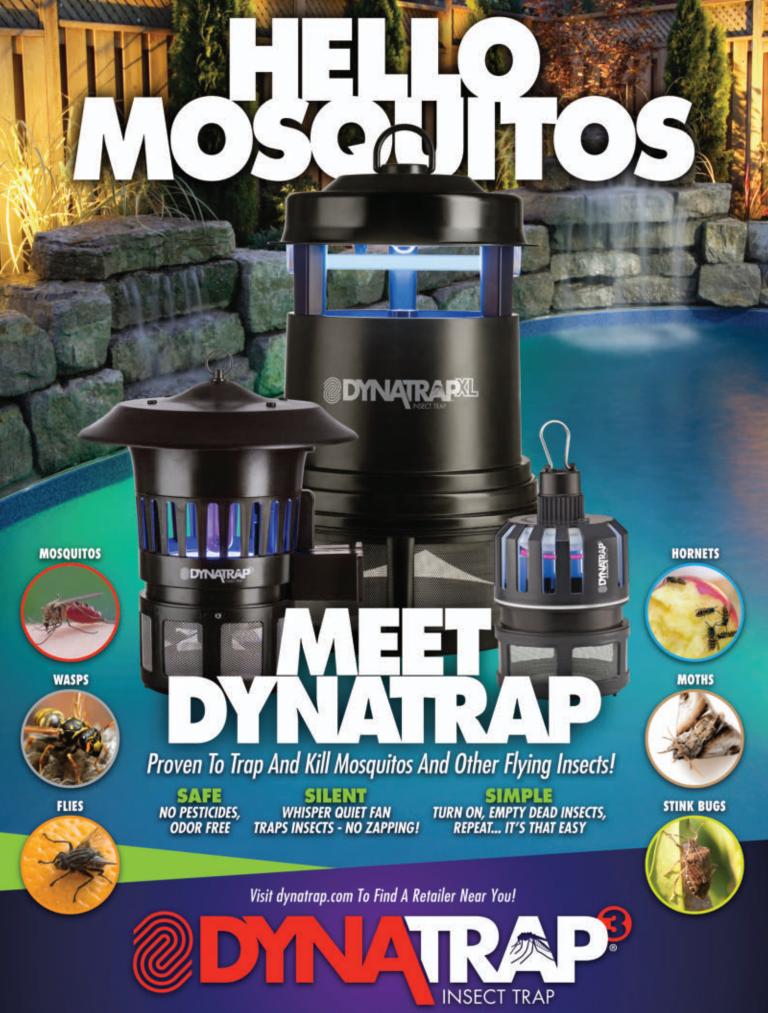


The rafters are made of 2x10 on this project, one size smaller than the2x12 girders.



Toe-nail the rafters to the girders using two nails at each joint.







On top of the rafters, a layer of 2x4 purlins are installed at 90 degrees to the rafters and fastened in the same manner.

less expensive. Treated lumber, however, should definitely be covered with a protective finish. The question then concerns when to treat lumber, and the answer lies with how wet the lumber is.

The treatment of lumber with waterborne preservatives leaves moisture in the wood. This is why fresh PT lumber often arrives wet from the supplier, and the moisture can impede the penetration of stains and paints. For best performance of paint and stain coatings, allow the treated wood to dry for 2 to 4 weeks prior to application. Estimating exactly how long treated wood will take to dry is difficult, and a lot depends on how much time has elapsed since the treatment, the lumber's exposure to the sun, ambient weather, etc.

FINAL THOUGHTS

Although simple in design, building a pergola does require carpentry experience, some reliable power tools, and smart decisions in the planning stage. Take time to carefully plan every aspect of the project, especially making specific notes on how to attach the pergola to an existing structure, if that's what is required with your project. Thinking ahead and mentally walking through every phase of the project will help ensure success, longevity, and a backyard enhancement you can proudly show off to your neighbors. **EHT**

THE RIGHT MATERIALS

For this project the homeowners chose lumber from the Everwood Treatment Company, which uses Wolmanized copper azole preservative treatment. This No. 1 grade hand-picked wood was treated with micronized CA-C for **Ground Contact, meeting** all building code requirements. It's a great building material for docks, decks, pergolas, retaining walls, fences, picnic tables, planter boxes, walkways, sill plate and structural members. The lumber's S4S designation means it's sanded on four sides for a finished, professional look, Wolmanized Outdoor wood has earned the Good Housekeeping Seal, has been certified by Home Innovation Research Labs as meeting requirements for termite-resistant materials in the National Green Building Standard, and has been verified by the internationally recognized EcoSpecifier. It comes with a limited warranty for most residential applications and, to top it off, it costs less than alternatives such as tropical hardwoods and artificial wood. Visit www.everwoodtreatment.com.





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Arke	Muro	. 74
Armstrong-Clark	Nexan Building Products83,	IBC
Atlas Roofing61	Oneida Air Systems	51
Better Than Logs	Perma-Boot	85
Bigfoot Systems	PostShields	64
BlueDevil Products	Quickscrews	78
Calculated Industries	Rainhandler	50
Can Gun 154	Rapid Set	76
Channellock	Ready Seal	36
Cox Wood	RHH Foam Systems, Inc.	41
DaVinci Roofscapes	Sakrete	88
Deck2wall Spacers64	Sashco	ВС
Dripless	SePRO	75
Duckback	Sheet Metal Caps	62
Dynamic Solutions Worldwide	ShopBot	14
Floe International	Slant/Fin	. 8
FrogTape	Soil Retention	73
Gardner	Starrett	18
Gorilla Tape	Summit	79
GRK Fasteners5	T-Rex Tape	47
Healthful Home10	TG Tools2	2, 3
lpe Clip56	TimberTech	. 9
Kaddies	Tjernlund Products, Inc	43
King Architectural Metals11	UGL Drylok	24
Kraft Tool42	Viance	71
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