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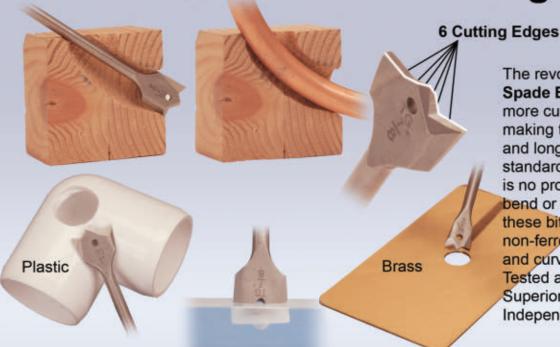


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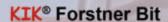
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9 Cutting Edges 3 on Each Blade



Proven Superior by an Independent Lab Cleaner Entry and Exit

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## From The Editor-In-Chief

he *EHT* staff spent a week in January at the International Builders Show (IBS) in Las Vegas, Nevada. Each year one of the most popular exhibits is the New American Home, which is the premier show home of the National Association of Home Builders. Now in its 33rd year, the show house is essentially a laboratory of new construction technologies that demonstrate the most cutting-edge trends in the industry. The mission is to show that "housing performance" is equally important as aesthetics.

Among the notable design features, the home breathes mechanically, not passively, with energy recovery ventilators and a MERV 13 system to filter out pollens and dust. The unvented and air-sealed attic has blown-in insulation in the roof and walls. The windows and doors have a low-e coating and argon gas fill to limit solar heat gain and ensure air tightness. The Energy Star-rated roof helps keep the home cool, and the light-colored exterior and low overhangs assist in reflecting the sun. The HVAC system centers on a 19-20 SEER heat pump with a minisplit system, and the air-conditioning components are located entirely within the conditioned space. A natural gas-fueled Bosch tankless water heater provides the hot water.

The Energy Star appliances are networked for whole-house automation, including lighting control. The bathrooms conserve water with low-flow faucets and showerheads and dual-flush toilets. The specialty doors and window glass maximize the view, and two multi-slide doors disappear into hidden pockets, connecting the living spaces by opening the floor plan. Many of these doors are automated, so occupants can enjoy unobstructed views at the touch of a button.

A state-of-the-art kitchen features the latest energy-efficient appliances. The kitchen boasts a 30-inch double oven, an electric induction cooktop, and two 30-inch built-in refrigerator/freezer units that integrate flush with the sleek UltraCraft cabinetry. The countertop surfaces are made of Dupont Zodiac Quartz, and the fixtures showcase the latest top-of-the-line stainless steel selections from Kohler.

The master suite overlooks a pool with expansive glass to capture the outdoor view. An "entertainment style" media room includes sliding doors with access to an outdoor courtyard with a wet bar. Plus, the space automatically transforms into a dark media room with a dropdown movie screen.

Each year we attend IBS, I make a point to visit the New American Home to see a real-world demonstration of the latest concepts in architecture design, construction techniques, new products and trends in the marketplace. However, since we can't all make the trip to Vegas, you can

take a virtual tour of this year's home online. Visit www.tnah.com to explore photos and videos, and even download a brochure that details all the features and amenities that will soon define the homes of tomorrow.





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# 8. 4 Got-2

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

What is shapeable concrete?

• A new product from Sakrete, called Shapecrete, is an easy-to-use, high performance, shape-able concrete • mix that can be rolled, molded, pushed or poured into any shape imaginable. Just add water to the dry mix



to get clay-like concrete, which can be used to create everything from garden objects and home decor to crafts and everyday repairs. It's fun and versatile vet becomes rock-hard and durable in about 24 hours without oven-baking or kiln-firing. In fact, ShapeCrete is stronger than ordinary concrete, and using reinforcing mesh, wire, fiberglass, and rebar will further strengthen your projects. Simply match the scale of the reinforcing to the scale of the object being made. ShapeCrete is a Portland cementbased product and is medium gray in color, but it can be pigmented, stained or painted just about any color. Break up any small clumps of dry pigment until the mix is a uniform color. Then add the dry mix to the water. Learn more at www.sakrete.com.

• I'd like to get an early • start on my garden this year. What plants are appropriate to sow in April?

• Unless you experience • a very mild spring, planting outdoors in April can be risky because the temperatures may not be high enough to ensure the seeds germinate. It may be wiser to sow just a few seeds in pots and keep them indoors (on a windowsill or in a heated greenhouse) to start them, then plant them outside as the weather warms up. For sowing indoors in April, you can plant broccoli, cabbages, celery, peppers, cucumbers, corn, eggplants, tomatoes, runner beans and kale.









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What are the advantages of stone veneer?

• Rather than thick, heavy stones that require additional structural support and mortar between the joints, • stone veneer is cut thin so it weighs less and is suitable for an easier DIY method of installation. The

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www.finpan.com 800-833-6444 material can generally be used indoors or outdoors. Depending on the product, stone veneer can often be adhered to a Sheetrock wall over a sheet of 15-lb. felt, wire mesh and a thin bed of mortar. However, some products require no mortar at all, and rather than installing as single veneer pieces the material comes in interlocking panels, so several panelized stones can be installed at once to the wall using screws, which simplifies installation even further.

• What bit should I use to drill a hole in glass?

• You'll need a diamondcoated or carbide-tipped glass bit. The glass will have to be held very securely so that it cannot spin or flex when drilling. Avoid direct metal-to-glass contact when clamping. Place paper or gaffer tape over the intended hole location and drill through the tape to prevent the glass from chipping. Heat buildup from the drill will quickly crack the glass, so use a spray bottle to cool the bit throughout the drilling operation. Don't press down; let the drill do the work. To remove shards from the completed hole, use wet sandpaper that has an extremely fine abrasive. **EHT** 



## **New Yard & Garden Equipment**



**By Matt Weber** 

hen the days grow longer and the grass turns green, most people are eager to welcome spring and its warmer, sunny weather. But with the green season comes all the responsibilities of maintaining your outdoor environment. To get you geared up for the months to come, here's a roundup of new yard and garden equipment.

#### RYOBI 14" 40V BRUSHLESS CHAINSAW

The new 14-in. 40-volt Brushless Chainsaw delivers Ryobi's trademark Gas-Like Power without the hassle of a gas engine. Equipped with a brushless motor, this saw produces higher torque and faster chain speed to provide better performance than previous models. The unit has a 14-in, bar and chain to help with larger cuts and yard cleanup. The lightweight design reduces user fatigue over extended use, and as an added convenience, the saw also features an automatic oiler and a comfortable wrap-around handle. The lithium-ion battery offers fadefree power and is compatible with more than fifteen Ryobi 40V outdoor products. The company's 40V tools range from trimmers to snow blowers to cultivators, and all the tools are covered by a 5-year limited warranty and a 90-day money back guarantee. Visit www.homedepot.com.

#### EARTHWAY S15 SPRAY-PRO HOME

The S15 Spray-PRO HOME is a light-duty, homeowner-friendly version of the revolutionary S25 Mark III Commercial Sprayer. The S15 is a fully-assembled ground-driven push sprayer that will take the work out of spraying your lawn, sidewalk, driveways, paths and



gardens in spring, summer, fall, and for winter ice control. It has a spray width of 2 to 5 feet/0.6-1.5 meters, and up to a 8,800 sq.ft. coverage. The S15 will make quick work when spraying herbicides, pesticides, fungicides, liquid ice control products, or fertilizers. The New adjustable height nozzle will reduce the spray width for narrow banding operations or to increase application rates. The standard two-mode valve allows for either Transport or Spray operation and



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is selected high on the handle. While in Transport mode, the S15 pump continues to operate agitating the material in the tank for a desired mixture. In addition, with the Optional Hand Sprayer, those spot treatments around your home are done in a snap. The S15 includes three different nozzle tips of fine, medium and coarse, for controlling your application rates within your spray coverage. Having a 5-gal/22-liter capacity self-agitating tank, the S15 will do the job of several tank sprayers and without the pain of carrying them in hand or on your back. Featuring a ground-driven pump with no battery to charge or maintain, the S15 operates at walking speed and pushes no harder than a small spreader. Visit www.earthway.com.

#### SURECAN GASOLINE FUEL CANS

SureCan offers the 2.2- and 5.0-gallon gasoline fuel cans, which are ideal for everyone who refuels their lawn and garden machines, ATV's, generators or any other machines that require gasoline to run. According to the EPA, each year 17,000,000 gallons of gasoline are spilled while using gas cans. The SureCans are designed with a patented rotating nozzle and thumb-release trigger to fix this problem. The design allows users to control the flow of fuel by depressing the trigger while at the same time being able to see into their machine's fuel tank, preventing overfill and spills. Other features of the Surecan fuel cans include a trigger safety lock, self-ventilating system,



comfortable hand grip, durable design and two child-proof caps. In May 2014, the 2.2-gallon SureCan received multiple national awards from the National Hardware Show in Las Vegas, Nevada, proving that the industry is ready for the next generation of fuel can. Surecans have been awarded EPA and CARB certificates, which make them legal in 50 states and environment friendly. Visit www.surecanusa.com.

#### HUSQVARNA 536LIHD60X 36V HEDGE TRIMMER

The new 536LiHD60X is a quiet and battery-powered hedge trimmer designed for commercial use with a 24-in. long double-sided cutter bar, ensuring greater reach and more productivity on the job. The trimmer weighs only 10 pounds for easy transport and maneuverability. The pivoting rear handle makes it easier to cut both vertically and horizontally, and an intuitive control keypad ensures no-hassle startup. A new proprietary motor and new 36-volt battery provides equally high power,





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#### WORX 56V CORDLESS MOWER

The Worx WG772 19-in. 56V Li-ion 3-in-1 Cordless Mower with IntelliCut is part of the new Worx Power Share 56V Platform, The Worx 56V lawnmower features a 19-in, steel deck with premium mulching capabilities. The mower provides gas-like power to mow 8,500 sq. ft. on a single battery charge. In perspective, a full-size regulation tennis court is 7,200 sq. ft. The 3-in-1 56V MaxLithium push mowers give homeowners the option to mulch, bag or sidedischarge grass clippings. The all new NutriCut system features dual-edge mulching blades to help provide natural lawn fertilization. Also, the Intellicut feature is a torque-on-demand system that monitors the mower's need for torque. No more bogging down when mowing tall or thick grass. Homeowners simply set the dial to POWER when conditions call for more torque, or switch to

ECO mode for everyday use. The durable steel mower decks feature 10-in. high rear wheels and 7-in. front wheels. The mower also has a quick connect washout port that makes is easy to keep the underside of your mower nice and clean. Includes a 3-year warranty and 90-day money-back guarantee. Visit www.worx.com.



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commercial-grade steel landscape edging, which is available in green (standard), brown or black powder-coat finish. American-made for more than 50 years in the landscape business, Col-Met has served its customers with the utmost care, ensuring that quality isn't just a buzzword—it's a mission statement. Visit www.colmet.com.

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spigot and Oasis becomes a fullpressure water outlet. Placed in a convenient location, the Oasis Garden Hose Tap can eliminate trampling on flowerbeds and reaching around shrubs. Add an extra long "permanent" hose below the frost line, and the Oasis can be placed in remote locations near faraway gardens, plants or lawns. The Oasis Garden Hose Tap is available in light or dark granite, red brick or sandstone colors, made of BPA-free polyethylene making it impervious to weather and heavy impacts. Made in the USA, the all-weather Oasis comes with a 1-year manufacturer's warranty, and comes with a brass spigot with complete hose assembly and four impact stakes to anchor the unit deep into the soil. Visit www.goodideasinc.com.

#### THE GARDENER'S HOLLOW LEG

The Gardener's Hollow Leg is a handy harvesting and cleanup tool created from polyester fabric made of recycled water bottles. The patented GHL is a waterresistant fabric sack that is attached to an adjustable belt. The sack has a ring opening at the top for easy loading. It functions as a hands-free debris holder that is a "must have" for all pruning, weeding, harvesting and general cleanup tasks. In the fall and winter, it's perfect for clearing debris out of gutters and the landscape. Once spring and summer come, it helps take the hassle out of daily weeding, dead-heading, pruning and harvesting, saving time and energy throughout the peak season. Each large GHL is made from the equivalent of three and a half 16-ounce plastic





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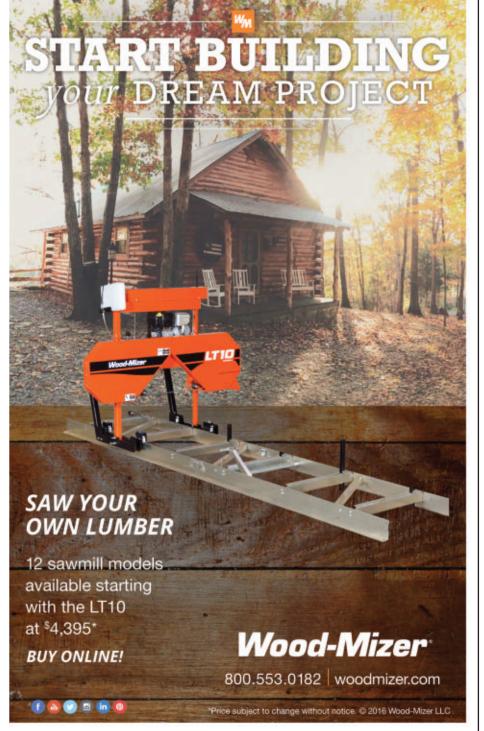
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bottles, keeping them out of landfills. The smaller GHL Junior puts two 16-ounce plastic bottles to good use and out of the trash. The original GHL features a 23-in. deep bag that is compact and comfortable to wear. It features a 10-in. diameter opening and can hold more than five gallons. The GHL Junior is a 12-in. deep bag that holds one gallon and features a 6-in.opening. Both styles of the

GHL can be worn on either the right or left side. A strap handle on the bottom of the sack makes it easy to empty. The bag even features a handy pocket that's great for storing your cell phone, iPod or other necessities. Visit TheGardenersHollowLeg.com.

#### THE GROUNDSKEEPER II

Raking up leaves is a traditional lawn-care activity for virtually every homeowner. When deciduous trees start losing leaves, the trusty rake gets a lot of use. But even though rakes see a lot of action during yard cleanup, the design of the basic rake has changed very little over the past 100 years. In response, the Groundskeeper II is designed to be the most effective rake a homeowner or landscape professional can have in their arsenal. The unique wire-like tines are adept at grabbing and gathering leaves with a single pass, and the head is a full 21 inches wide for quickly cleaning a large yard. Because of the aggressive angle of the tines, using the rake requires little or no downward pressure. You can stand straight up while using the rake, thereby





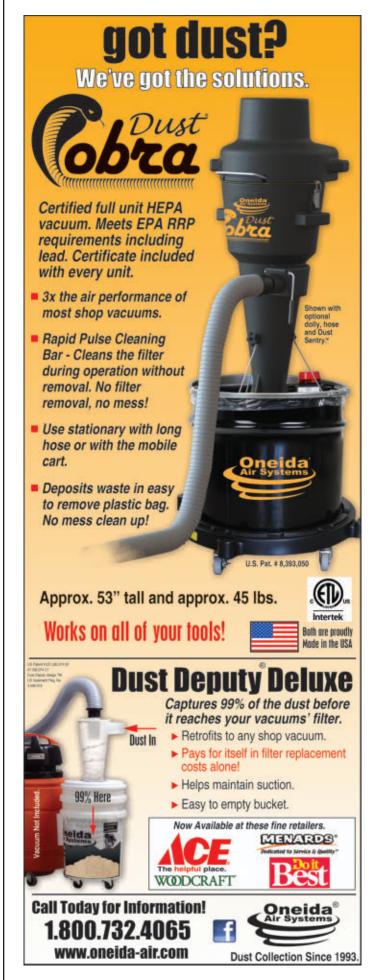
reducing the pressure on your back and making the job easier. The rake weighs less than two pounds, and it is as durable as it is lightweight. The no-break co-polymer head and fiberglass handle make this rake almost impossible to destroy. Test results from the field with landscaping professionals show a reduction in raking labor time by as much as 33 percent. The Groundskeeper II Full-Size Rake sells for only \$29.99 at www.best-rake-ever.com.

#### TURFEX DETHATCHER ATTACHMENT

TurfEx offers the Thatch, Groom 'N' Sweep Package, an attachment system designed especially for zero-turn mowers. Providing unmatched versatility, the attachment can be converted from a sweeper to a dethatcher without having to purchase additional equipment. Available in both 48- and 60-in. widths (models MT480 and MT600, respectively), the Thatch, Groom 'N' Sweep Package uses a universal mount that easily fits the form of most major manufacturers' zero-turn mowers. The attachment includes two rows of brush sections, which can be replaced with spring-mounted tines to turn the sweeper into a



dethatcher in just a matter of minutes. To switch between the two, the operator simply removes a containment plate, and then slides the brush or tine sections in and out of the housing. As a sweeper, the attachment is popular for grooming and debris cleanup applications. The durable, resilient polypropylene brushes work equally well in forward and reverse, helping to clean out tight spots that a zero-turn mower is capable of reaching. The dethatcher



version contains special tines for keeping turf damage to a minimum, whether the mower is driving forward, backing up, or conduct-ing a tight turn. It also includes support wheels with adjustable height in order to optimize control while dethatching. To minimize turf damage and eliminate gouging, the attachment package features TurfEx's exclusive Flex Hitch design. This system allows the attachment to automatically pivot on the hitch as the ground elevation changes from one end of the unit to the other. Visit www.turfexproducts.com.

#### **ECHO SHRED 'N' VAC**

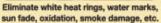
A power tool like the Echo Shred 'N' Vac does a great job of turning mountains of fall leaves into organic mulch. The powerful engine and patented shredding mechanism reduces a volume of yard debris by a ratio of up to 12 to 1. The bag has a large twobushel capacity, so it won't have to be emptied as often. The versatility of the Echo Shred 'N' Vac (model ES-250) lets you convert it from a handheld shredder/vacuum to a handheld blower with the included blower pipes. This flexibility makes it an ideal tool for suburban yards and large homesteads-and even commercial properties. The Echo Shred 'N' Vac features a powerful

pro-fessional-grade 25.4 cc engine, a 4-blade shredding mechanism, a fully adjustable throttle lock and a cruise control feature. The bayonet-style 35-in. long intake tube provides easy reach for shredding applications. When used as a blower, the unit's unique pipe shape reduces the effort required to keep the blower from rotating in towards your legs. Visit www.echo-usa.com. **EHT** 











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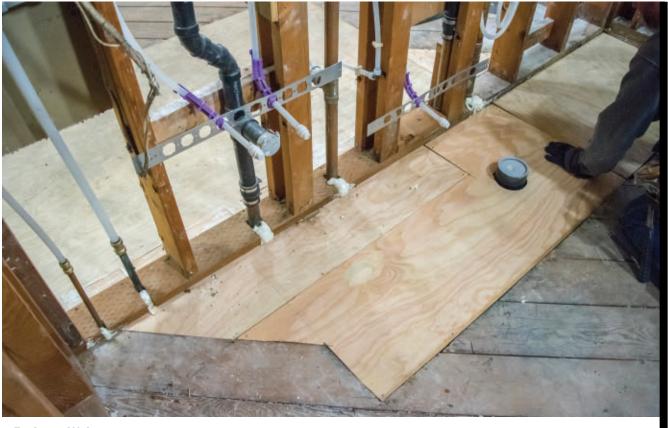
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### **Radical Surgery**

Repairing a Severely Rotted Subfloor



**By Larry Walton** 

Stepping through the floor was not the first hint that it had rotted out, but it sure moved the floor repair up on the priority list for a house with plenty of remodel projects to do. Other clues about the floor damage included discolored flooring, mold along the wall and lots of opportunity for water leaks with washer, toilet and water heater all in the vicinity.

If you want to make a distinction between dry rot and wet rot, this was quite wet, which means that the fungi that caused this wood damage were the types that prefer a wet environment. Dry rot

involves less water, but the destructive fungi that cause dry rot still need some moisture to do their wood fiber-eating thing.

The homeowner had recently completed some plumbing upgrades, which took care of the water source for the rot, but the floor damage was already done. The demolition stage of repairing a rotted section of subfloor is like cancer surgery. Once you get started, you must keep following the path of the water-born destruction until you reach the full extent of the damage. You don't always know where the surgery will take you. Sometimes it extends along

subfloor framing for some distance. It can also damage the wall framing around it.

This project has all of the above, which makes it ideal for demonstrating subfloor repairs. The damaged area was large, it involved subfloor framing, it extended into two rooms and there was damage to the partition wall, which happened to be full of plumbing. We dealt with most of the worst-case components you might run into in a subfloor repair.

Subfloor repairs can seem very radical, but keep in mind that the original construction process was just putting boards together. Not



#### **PROJECT NEXT**

going deep enough to address the full extent of the problem may seem easier at the moment, but covering it up will come back and bite you. The wood destroying fungi will continue to grow if not removed, and anything the subfloor system supports will be vulnerable. So do the radical surgery and put it back together better than new. Here's how we did a recent subfloor repair.

#### STEP BY STEP

The worst of the subfloor damage was found with a foot going through the floor. It didn't take much to dig up some of the flooring, plywood underlayment and the 3/4-in. shiplap that served as the subfloor.

Pulling back more of the underlayment revealed that the water-





fueled damage spread more than eight feet along the wall. Further exploration uncovered additional water damage in the adjacent room.



The damage to the subfloor extended under the wall and up into the bottom plate on this plumbing wall. To properly eradicate the damage, the repair would need to include the floor under the wall and at least the wall plate.

After marking the floor plate with a square, our carpenter Chad cut it with a reciprocating saw so the bad section could be replaced



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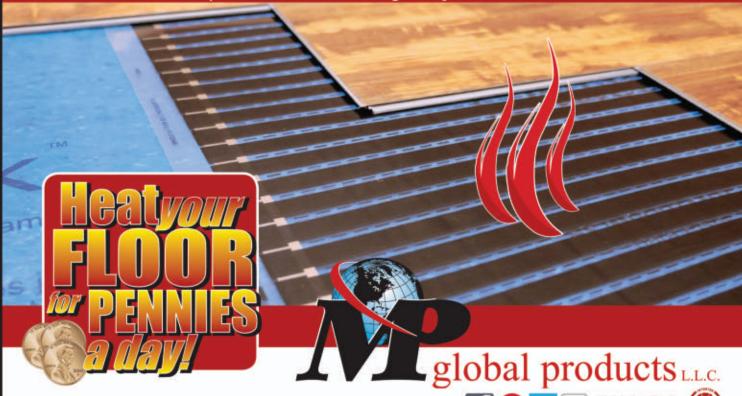


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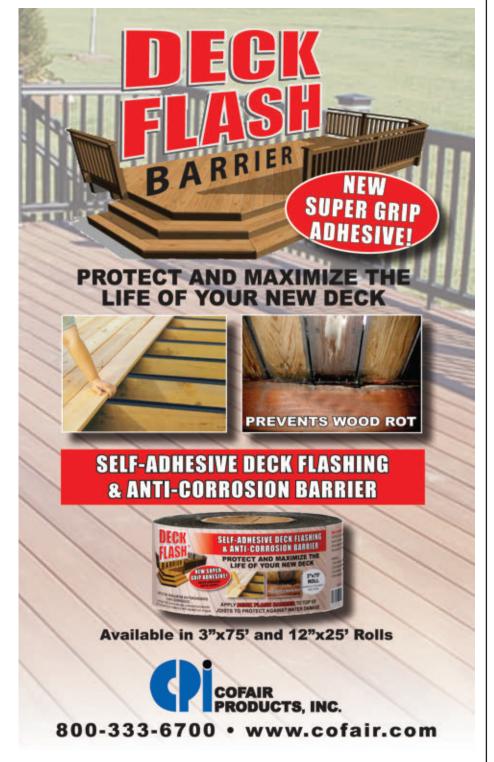


#### **PROJECT NEXT**

and so the subfloor underneath could be removed.

He used a reciprocating saw with a bi-metal blade to cut through the nails where the studs were connected to the plate.

He cut the plate up into sections for removal because this plumbing wall had lots of pipes to work around.











After removing all of the affected wood, Chad made up a strong bleach solution in a spray bottle to kill any remaining mold or fungi.



#### **PROJECT NEXT**



He measured and marked out a 4x8 sheet of plywood to replace the damaged subfloor.

He snapped a chalk line to connect the layout marks, which were centered over a floor joist.

Following the cutline on the subfloor, Chad used a cat's paw bar to pull all nails that might be hit with the circular saw blade.

After removing all of the nails along the cut line, he set the blade depth on the circular saw to cut







about 1/16 inch deeper than the shiplap subfloor before cutting along the line.



He removed the subfloor out to the floor joist beyond the damaged area.



A shop vac helps to clean out sawdust and other debris in the area under the subfloor.



Chad placed a pressure-treated 2x6 scab along one of the damaged floor joists to add strength and to provide a solid fastening area. The scab also provides more area for the new subfloor joints.





# **PROJECT NEXT**

# USING A CAT'S PAW

A cat's paw bar is a nail-pulling tool with chisel-like claws designed to dig into the wood surrounding a nail just below the nail head. Striking surfaces for hammer blows are located so the claws can be driven through the wood to the nail shank. A rounded heal acts as a pry bar fulcrum so nails can be pried out as you pull back on the bar shank.





He nailed the scab to the existing joist with nails approved by the manufacturer of the treated wood, which has specific fastener requirements.



Chad positioned the subfloor plywood to go under the wall so he could lay out notches for the pipes in the wall.

After cutting the notches for the



pipes, he positioned the new under-wall subfloor piece to reach the floor joist scab and to leave enough room for the full sheet of plywood subflooring.



At this point, most of the new subfloor was installed. Since the under-wall subfloor piece was notched for the pipes to slide in from the far side, the plan was to notch the new bottom wall plate so it would slide in from the near side to minimize the notch openings from lining up.



Chad used a level as a straight edge to mark the edges of new



wall plate, in this case a 2x6, to replace the water damaged plate.



He used a framing square to mark the plate locations for both sides of each pipe.



He bumped his tape to each pipe and measured to the plate layout line to determine the depth of each pipe notch.



Chad used one of my jigsaws to cut out the plate notches. I didn't even know he had my jigsaw.



After notching and fitting the new bottom plate, he nailed it to the new subfloor.

He positioned the studs, which were turned sideways in this plumbing wall, and toenailed them into the bottom plate.





# **PROJECT NEXT**

On the longer diagonal subfloor splice, Chad predrilled for a plywood gusset.

He fastened the gusset under the existing subfloor so it extended out to support the edge of the new subfloor piece.

Wrapping up the subfloor in the adjacent bathroom required an interesting puzzle piece to bridge





the floor joists, to match the diagonal shiplap of the existing subfloor, and to accommodate a toilet drain.

Chad completed the subfloor repair by "nailing it off" and sealing the gaps at the pipe. **EHT** 

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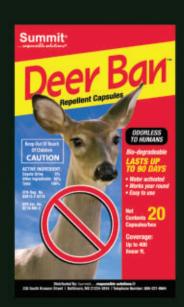
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# CHANNELLOCK Celebrates 130 Years of Excellence



merica was built on manufacturing and innovation. In the tool manufacturing industry, there are few companies who can claim to have a track record of over a century. However, Channellock Inc., a family-owned and -operated plier and hand tool manufacturer, can make that claim. This year they are celebrating their 130th anniversary.

Although 13 decades have passed since George B. DeArment founded the company in 1886, CHANNELLOCK® has remained committed to high-quality products and to domestic manufacturing.

"To be able to say that our world-famous pliers are still made in Meadville, Pennsylvania, USA is a source of pride to everyone at Channellock," says Chairman and CEO Bill DeArment. "Our company was founded in 1886 in northwest Pennsylvania on the principle of making the highest-quality tools, and nothing has changed."

CHANNELLOCK® has long been known for high quality and craftsmanship, and its product line is the preferred choice of professionals and the serious DIY'ers who want to get the job done. Since its founding as the Champion Bolt & Clipper Co., the company has also led the industry through innovation. In 1932, chief engineer Howard Manning developed and patented the tongue-and-groove plier, dubbed "Channellock" at the time. The company now offers more than 140 types and sizes of hand tools that bear the company's signature CHANNELLOCK BLUE® color.

Throughout the years, Channellock Inc. has taken pride in its tradition of innovation. The company has made many improvements in its manufacturing practices, including site-specific laser-heat treating operations for more durable products and the implementation of robotics in the forging, polishing and machining arenas.

Other areas of innovation in recent years include 3-D printing, which has allowed Channellock Inc. to develop prototypes for new tools and potential improvements to existing products.

"It has been a welcome addition to our tool design process because it allows us to see how an idea would actually function before advancing too far along the process," said Jon DeArment, president and COO of Channellock Inc.

DeArment said the company looks forward to many more years of innovation, best-in-class quality and a continued commitment to American Manufacturing.

"In addition to the high-quality product CHANNELLOCK® customers receive, American manufacturing also employs workers and supports families from local communities," Jon DeArment said. "That's something we are very proud of and believe our customers appreciate." **EHT** 



DaVinci roofing tiles have all the appearance and beauty of natural slate or shake, but with a higher level of durability from the proprietary-engineered polymer roofing formula. The tiles are designed for easy installation, while protecting against the elements for decades to come. DaVinci offers the discerning homeowner a level of style and beauty previously unattainable, backed by a lifetime limited warranty and made in the United States.





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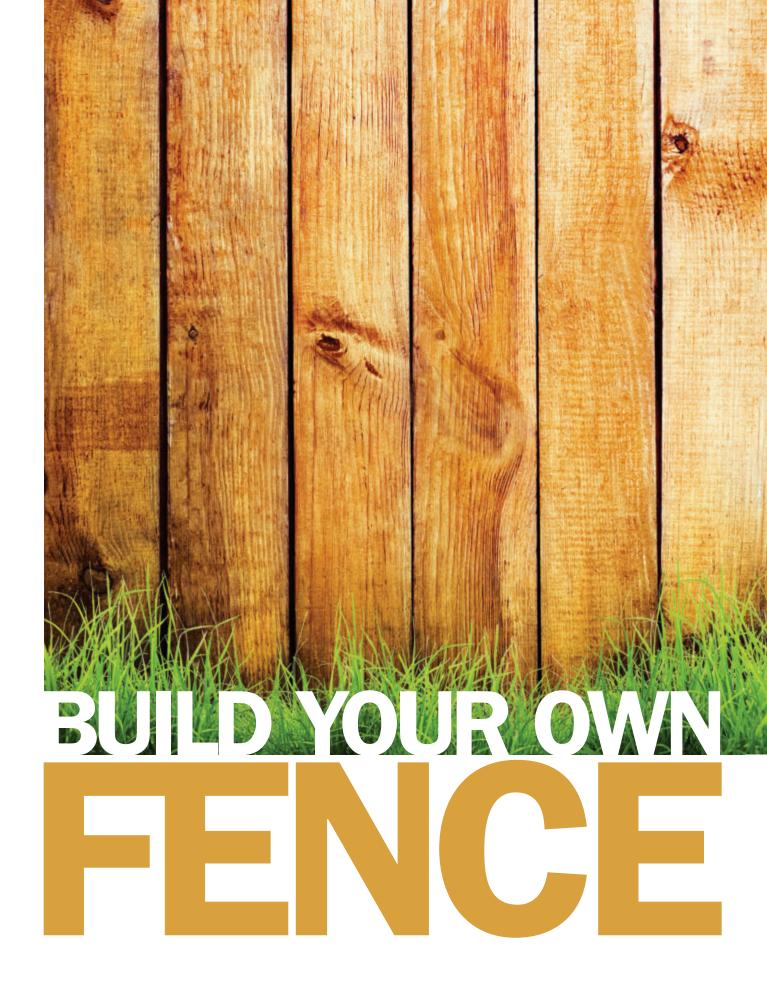
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fence can add a lot to a landscape. A fence can divide property lines, boost home equity, add to the outdoor décor and safely contain animals.

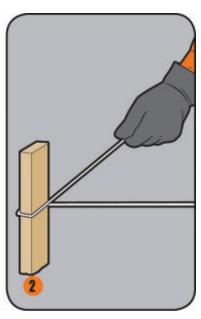
When it comes to constructing a fence, you have a lot of options to consider for materials and design. Fence materials range from metal and wood to vinyl and wood-plastic composites. For an easy-to-build fence, you might consider using pre-assembled panels, which can dramatically reduce building time.

However, if your yard is sloped, then to keep the panel tops level you'll have to stagger the panel heights where they fasten to the posts. If the yard has a significant grade, the staggered panels will create gaps at the bottom of the fence, through which a family dog can escape.

The alternative is a privacy fence built to closely follow the grade of the yard. The pickets can install along one side of the fence, or you can install a shadowbox style fence, which alternates the position of

# FENCE





Mark off your fence layout with stakes and twine.

he pickets from one side of the stringer to the other.

For the framing, treated lumber is often used. Posts can be made from 8-ft. 4x4 posts, and the horizontal stringers (also called fence rails) can be made from 8-ft. 2x4 boards. The treated posts should be approved for ground contact.

For the fence boards or "pickets," you can use treated wood or a species such as cedar or cypress that have natural preservative oils to resist insects, decay and chemical corrosion.

Use fast-setting concrete sold in ready-mix bags to set the posts. Simply pour in the mix dry, straight out of the bag into the post hole. Once the post base is buried, pour about a gallon of water per 50-lb. bag over the dry mix, which then cures in about 30 minutes. Use roughly 1-1/2 bags per post.

Fasten all connections with hotdipped galvanized nails with ringed shanks for extra holding power. Make sure your fasteners are approved for exterior use in chemically treated lumber.

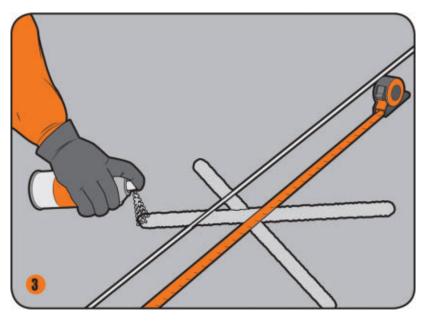
#### PLANNING THE LAYOUT

Check with local officials regarding building codes and any necessary permits. Some neighborhoods may also have certain architectural guidelines or "covenants" that restrict design. Also, double-check that the location of your proposed fence is not

on a neighbor's property. And before digging, always dial 811 nationally to get underground utility lines, cables and pipes marked for free.

Within local code limitations, the height, décor and trajectory of your fence are up to you, and may be dictated by other obstacles in your yard, such as trees and sheds.

Mark the fence location with stakes and string, then walk the perimeter with a tape measure and spray paint a large "X" to pinpoint the precise placement of each fence post. Fence posts are usually spaced 6 to 8 feet on center. The closer the fence posts, the stronger the fence. (Note: This measurement is also crucial for the sake of your materials, because dimensional lumber is sold in standard sizes. So, if your posts are accidentally spaced 8 ft., 1 in. apart, then an 8-ft. board will be too short. In such a case, you would have to purchase a 10-ft. board and cut off 1-ft., 11 inches to create a stringer long enough, which is a waste of material.)



Stake the line intermittently to keep the string tight and straight, and then mark the post locations with spray paint.



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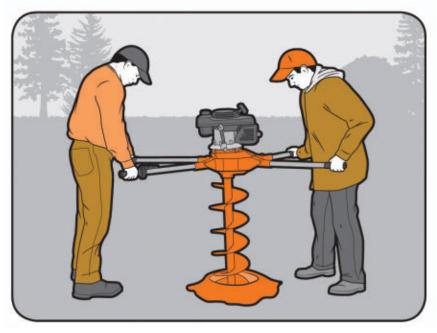
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# FENCE



Rent a two-man auger to speed up the job of digging post holes.

#### **SETTING THE POSTS**

A good rule of thumb is to dig holes for fence posts deep enough to bury 1/3 the overall height of the posts (2 ft. deep at a minimum). Dig deep enough to set the post below the frost line, which will help prevent frost heaving. Additionally, dig an extra 4 to 6 inches deeper than the desired post depth to place a gravel bed beneath the post for drainage.

Be prepared for a lot of digging. A traditional way to dig a post hole is with a manual clamshell digger and a trench shovel. To speed up the process, enlist some help and rent a two-man powered auger to dig the holes.

**Pro Tip:** While digging, soak the base of the posts in water sealer. The best method to do this is to use a tall bucket and place about

once. Their mass displaces the water, which rises to the top of the bucket, soaking the bottoms

4 posts upright in the bucket at

about an hour, rotate four new posts into the bucket to soak.

of the posts. After soaking for

Set all the corner posts first. Have a helper hold the post upright while you use a hand level to make sure it is plumb on top of the gravel bed. A post level is also helpful, because it frees your hands by strapping around the post while placing level vials on two adjacent sides.

Once you've established that the post is plumb left to right and back to front, brace the post in place. If you have a helper, they can hold it in position while you add the concrete. Otherwise, you'll need to nail scrap lengths of wood that extend from the post to the ground to act as moveable braces, with the nails serving as their pivot point for adjustment. Plumb and square the post, adjust the braces to hold it plumb, and then add the concrete. Use a sledge hammer to





Plumb, square and brace the corner posts then set in concrete.



# BUILD YOUR OWN FENCE

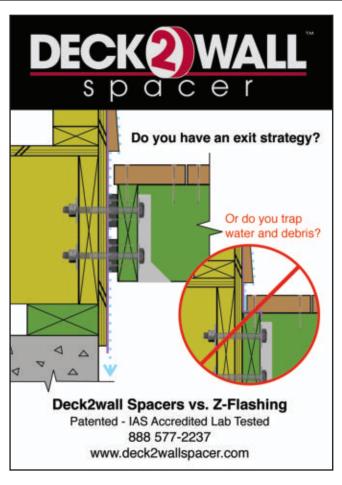


pound the posts into the ground once they're surrounded by concrete, then recheck for plumb and adjust if necessary. Leave the braces in place while the concrete sets.

Once the corner posts are set, fasten a new string line between them to line-up the other posts. Keep the line on the outside face of the posts and secure it tightly. This string will guide placement for each post between the corners. Set the remaining posts in the same manner, making sure the outside faces of the posts are plumb and line up exactly with the string to keep the fence straight.

Pour the dry fast-setting concrete mix into the post holes. Then add water; no mixing is required. Note: If you're using standard concrete that should be premixed, you can mix small batches with a wheelbarrow and shovel

Fasten a string between corners to align the remaining fence posts.





or hoe, following the manufacturer's instructions for the required amount of water.

Allow the posts to set. Once the concrete is hardened, cover it with dirt and slope the earth away from the post to divert water.



Fill each post hole with 4" to 6" of gravel to allow drainage. Brace the post then add fast-setting concrete.

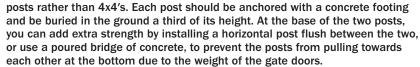
# FENCE GATE DESIGN

A fence can have multiple gates, such as a single-door gate and a two-door gate for a pickup truck.

It's a good idea to purchase the beefiest hinge hardware available at the hardware store, because gate hinges are notorious for failure over time. Install according to the manufacturer's instructions. To construct the doors, fasten all pickets on the same side of the stringers to provide a solid plane to mount the gate hinges.

When constructing the gate doors, use ample bracing. For large doors, skip the conventional "Z" shaped bracing in favor of a "double Z." Build each door with three 2x4 cross braces perpendicular to the fencing and two diagonal braces connecting them, with the fence boards nailed into each brace they cross.

Correctly constructing your gate's support posts is also critical. You'll get more stability from 6x6









# FENCE











# INSTALLING THE STRINGERS

For a standard 6-ft. tall fence, position the bottom stringer 10 inches up from the ground. Space the other two stringers evenly apart. You may need to alter placement, depending on the height of your fence.

**Pro Tip:** To prevent repetitive measurements, make a story pole from a scrap piece of wood. Mark the position of each stinger height on the pole with masking tape. Place the pole alongside each post and use the tape to determine each stringer location, marking it with a pencil.

You have many options for attaching your stringers, such as face-nailing, mortise and tenon joints, or toe-nailing. For a shadow-box fence, the stringers are often toe-nailed between posts. To toenail, drive at least two nails into the side and one nail through the top of the stringer and solidly into the post.

If you're toe-nailing stringers that follow a slope, they should be cut at a miter to fit flush between the plumb posts. First, butt the square end of one uncut stringer against the penciled location on your left-hand post. Hold that end firmly against the post while you position the other end of the stringer so it overlaps the right-hand post at the pencil marks. Mark the stringer using the post as a pencil guide. Remove the stringer and take to the cutting table.

Use an angle finder to transfer that angle to the left-hand end of the stringer. Before cutting the miters, recheck the post-to-post measurement to make sure you don't cut it too short, and remember to account for the 1/8-in. wide blade kerf of a circular saw.

When it comes to nailing the fence together, expect a lot of it. A framing nail gun will be a huge help, either air-powered or cordless. Use 3-in. hot-dipped ringshank nails for all framing members.

With all stringers in place, use a reciprocating saw to cut the tops of the posts so they're all the same height. Cut the posts in a manner that diverts water from standing atop the posts, which

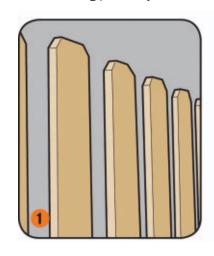
could contribute to rot. You can cut pyramid-like crowns, cover them with post caps, or just slice them off at an angle.

#### **INSTALLING THE PICKETS**

Attach the pickets (also called fence boards) securely against the stringers. For a shadowbox installation, cut a spacing block slightly narrower than the width of the boards, so there is a slight degree of overlap among the alternating pickets.

Place the first board along the corner post and use a 4-ft. level to find plumb. Nail it home, using two nails per stringer location. Place the spacing block next to the first picket and position the second picket against it. Drive in one nail at the top stringer. Use that nail as a pivot while you find plumb, then nail that picket home as well. Follow suit down the stringer, spacing each picket with the block. In case your fence boards vary somewhat in height, keep an eye on the tops so they line up consistently and adjust their placement against the ground if necessary

For shadowbox installation, once you reach the next post, return to the first post on the opposite side of the stringer. Center a picket across from each space provided by your spacing block to achieve the alternating picket style. Install



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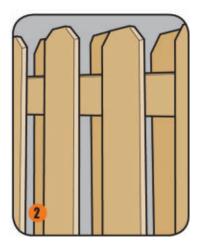
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the boards in the same manner, spacing, plumbing and nailing.

If you prefer the picket tops to follow a straight line between posts, walk the fence and locate the high and low spots before installing. Tack a picket (preferably at posts) to each of those high or low points. Start a nail in the top of those pickets and string a line between them to guide picket alignment as you go.





### **FINISHING TOUCHES**

The fence should be protected with a waterproof sealer. Although time constraints and inclement weather doesn't always allow, it's much easier to pre-apply the finish to the fence components before construction. Prefinishing the boards also grants access to all



sides of the pickets and stringers that might otherwise be inaccessible once built. Use a stain/sealer product from a reputable manufacturer to protect against rotting, water damage and UV rays. **EHT** 

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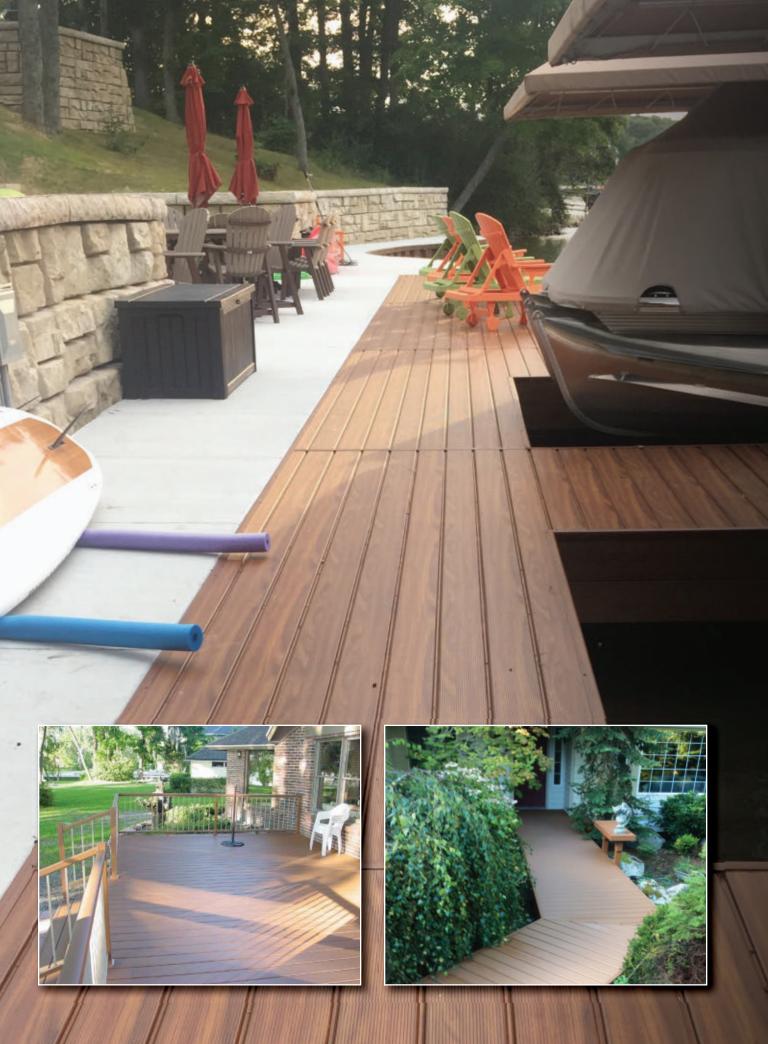






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# BUILD A WINDOW BOX

By Rob Robillard

here is much to say about the humble window box. As a low-tech garden and home beautifier, it is peerless! Fill it with a few bright flowering plants from your local nursery and, voilà, you look like a gardening wizard.

Window boxes can add an array of seasonal color and enhance the curb appeal of almost any structure. Window box gardening can be a fun and relaxing way to express your creativity or create a small garden in a cityscape.

> I even know a guy in my neighborhood who grows his medicinal marijuana in a 3rd floor window box.

> > For the landless city dweller, window boxes provide a way to garden and even provide a source for seasonal herbs and vegetables.

Of course there are a few details to consider. It's not simply a matter of getting any old box and nailing it to the window-sill. As with all home improvements, decisions must be made and certain materials and techniques are better than others.

### **HISTORY OF THE WINDOW BOX**

The use of window boxes dates as far back as the first century B.C in ancient Rome where they were used to keep small gardens for cooking herbs, medicinal herbs, and flowers for rituals and decoration.

They were also seen among the lower classes, in small villas where peasants had little gardening space. Many people used window boxes to grow plants for food, medicine and religious uses.





Window boxes come in all shapes and sizes, from traditional wall-mounted window boxes to freestanding boxes and even indoor window boxes.

#### **BUILD YOUR OWN**

This article will explain how to build a cedar window box and customize the dimensions to fit your desired window space. Window boxes are relatively easy projects. Because our boxes were extra large, we added some features to the design that some folks may

choose not to do. Either way, the project requires only a few tools to complete.

Before you get started here's a few things to ask yourself:

- What materials do you want your window box be made of?
- How big does your window box need to be?
- What height and depth is best for the plants that you want to pair with your home?

For repetitive production cutting, set stop blocks for the workpieces on your miter saw.

#### **MATERIAL CHOICES**

Name a construction material and no doubt someone, somewhere out here has made a window box out of it. Wood, plastic, zinc, copper, iron, tin, ceramic, terra cotta, wire, rubber tires, fiberglass—you name it, it's been used. After you've selected the style you want, take a look at the materials available. If your windows get bright sun all day, it's a good idea to avoid dark-colored or solid metal boxes, which could heat up and dry out your plants.

For my project, I chose 1x8 Cedar, mostly because the species is inherently insect and rot resistant. Additionally Cedar is lightweight, paints well, and has an attractive natural color if left unpainted.

Pine, Fir and Poplar all work, but simply do not last long in the

The walls of the planter boxes feature a rabbet or groove to hold the bottom panels.

The side panels all have the same groove.





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# BUILD A WINDOW BOX



The front corners are mitered, and the miters include slots cut with a biscuit cutter.

The slots in the corners hold wood biscuits to strengthen the joints.

elements, especially when you consider window boxes receive water almost daily.

### SIZE AND DEPTH

Window boxes can be constructed big or small, and both sizes have their advantages. Bigger boxes hold more soil and tend not to dry out as quickly, allowing you to plant perennial or more delicate plants. They also hold more plants, allowing you to create layers of color.

Shallower boxes are lighter, easier to lift, do not overpower a home's architectural features,



and are better suited for droughttolerant plants. Window boxes this size are an excellent choice for planting annuals, herbs and artificial plants.

Once you've decided what types of plants you will use in the window boxes it's time to measure your windows. Sometimes when determining box size, using a cardboard cutout taped in place can be a useful visual aid.

Generally speaking, window boxes are the same width or slightly smaller than the window they will be mounted beneath. If your home has shutters or wide exterior trim pieces, you may want your window boxes to run under those architectural features or sit slightly inside them. You may also choose to go smaller and center the box under the window. It depends on your aesthetical eye and the house décor.

Choosing a length that spans the full inside width of your window should give you a window box that looks right.

As far as height is concerned, you can follow a rule of thumb: the window box should be about 25 percent of the height of the window or 20 percent if the windows are very tall. It's a good idea to measure your windows and run the numbers.

Window boxes should be a minimum of 8 inches in depth and 8 inches from front to back to have enough room for a selection of plants. Larger boxes, such as 12



The biscuits are glued into the slots and bridge across each corner.

inches in depth and width, are particularly better if you want to include a lot of plants, and want them to fill out enough to overflow the box.

### **MOUNTING METHODS**

During the design phase your should think about how you will mount your window box. There are several methods of mounting, which include but are not limited to:

- · Using structural screws
- · Small lag bolts
- · Combination of screws and brackets
- · Window box holders

### FRENCH CLEAT HANGER

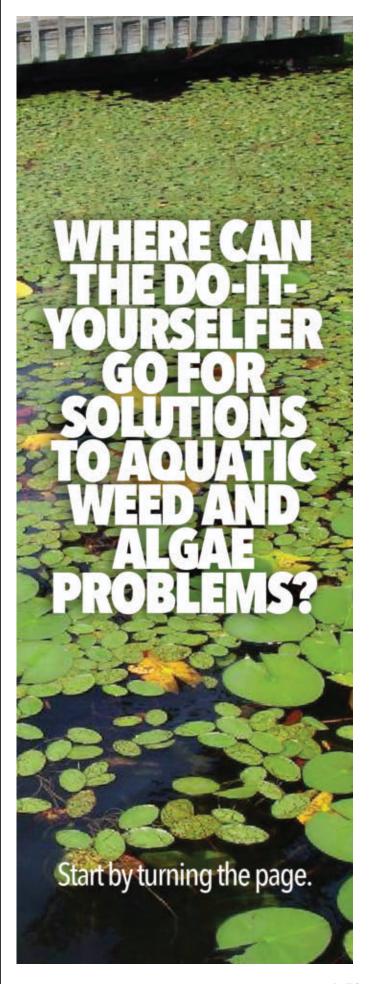
A French cleat is way of securing window boxes and involves using two "cleat" boards, each with an opposing 45-degree bevel. One cleat is mounted to the wall and the other to the window box, which is lifted onto it. A French cleat typically adds an additional 3/4 inch to the depth or projection of the window box.



Assembly begins with one long wall and two side panels for each window box.



Dry-fit all the panels before final assembly.







**Tip:** If the wall cleat is left slightly shorter than the window box cleat, you will have some left or right adjustment, after it is hung, for perfect positioning.

On the project shown we were able to mount securely to MDO plywood and pine trim with GRK structural screws. Paired top and bottom, and spaced approximately 16 inches apart, these screws are plenty strong to hold a fully loaded large window box.

#### **DETERMINING JOINERY**

Prior to building your boxes you need to think about how you will assemble them. Many simple



Apply quality wood glue to all corner joints.

boxes are constructed with butt joints and nails or screws.

You can choose this simple method or you can miter your corners to eliminate and hide the boards' end grain. Mitering is a more refined finished carpentry look but should include some mechanical fastening in the form of biscuits or tenons.

#### **CUTTING MATERIALS**

If you're lucky, all of your window boxes will be the same size, and cutting will be a matter of production-cutting repetitive size pieces.

For each window box you will



Carefully assemble the corners tightly.

The bottom panels are cut from rot-resistant PVC.

need to cut two long parts, the exact length of the window bow, two side parts and a bottom. Each box has 5 parts to assemble plus your mounting preference.

Measure each 1-by-8-inch board twice, and mark the required lengths. Cut all required sections. If all of your window box parts are the same, consider setting up and using a stop block. Stop blocks allow you to make accurate, repetitive cuts time after time, eliminating the need to measure each piece of wood. This saves time and ensures consistency when many of the components need to be the exact same size.

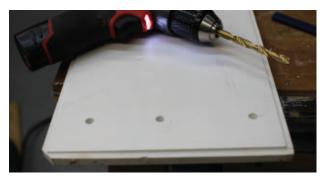
#### **BOTTOM PANEL**

Most people simply fasten the front, back and sides to the bottom panel, which is a simple and completely acceptable way to build a window box.

On our project, however, we used a dado cutter and cut 3/8-in. grooves in the front, back and two



Check each corner for square.



Drill drainage holes in the bottom panels.



The bottom panels are held loosely inside the groove of the surrounding panes to allow for expansion and contraction.

side panels. We chose to use a 1/2-in. PVC board as our bottom panel for rot-resistant longevity. The panel was routed with a rabbet bit so that it fit into and floated inside the cedar panel grooves. We left 3/16 of expansion room on all sides for expansion and contraction of materials. We liked this approach, because there are no mechanical fasteners holding this bottom panel in place that can rust.

### ASSEMBLING THE WINDOW BOX

If you're assembling butt joints, simply assemble your front and back boards to the side pieces using galvanized or stainless steel 1/2-inch wood screws in pilot holes predrilled through the sides. If you prefer, you can use a countersink and fill the holes later with cedar wood plugs. To do this you will need a countersink bit and matching plug cutter. Plug cutters will work in a power drill but for consistently better results, use a drill press.

On our window boxes we mitered the front two joints. We used a biscuit cutter to cut matching biscuits in each piece of wood, inserted the biscuits







Use plenty of clamps to hold the assembly together while the glue sets up.

Finish nails help close the corners during glue-up.

with waterproof glue and then clamped the boxes tight overnight. I also added some 16-gauge stainless steel nails to the mitered joints.

We used a tenon cutter to secure the back board to the two sides of our window box. Tenons are extremely strong and are used to join two mating mortises. These parts were also glued, clamped and pinned with finish nails. All nail holes were later filled and sanded.

If you decided on using a French cleat, this would be the time to install the cleat to the rear of the box.

#### DRAINAGE HOLES

It's absolutely necessary that a window box have drainage holes so plants do not sit in soggy soil. We drilled 3/8-inch drainage holes in several places along bottom board of each window box. The number or pattern is up to you, but drill one hole roughly every six square inches to give water plenty of room to escape.

Watering Tip: Water plants in the window box until you see water dripping out the bottom drain holes.

### **FINISHING**

We filled all nail holes, then sanded and primed all exposed wood with a quality oil primer. The window boxes were finished with two coats of latex top paint.

#### **MOUNTING**

As mentioned earlier there are several ways to mount a window box, from fasteners, cleats or a pair of window box brackets.

The first method is direct mounting, where the back wall of the window box is pre-drilled with holes and permanently secured in place with a fastener. The second is cleat mounting, where you attach a long, sturdy cleat to your wall and then hang the window flower box from the cleat. The advantage to using a cleat is you can easily lift the window box off for replanting or winter storage. The third is using brackets, which usually involve a combination of direct mounting and bracket support. This is a useful (and many times necessary) method when the window box is large and heavy.

The best choice will depend on the materials, design and construction of your window box and mounting needs of your house.

On our project we predrilled holes and mounted our window boxes and used 6-8 RSS structural screw fasteners from GRK Fasteners. The RSS Screws are weather-resistant and made from case-hardened steel with high tensile, torque and shear strength.



Here are the assembled window boxes, awaiting finish and installation.

# PLANTING IN A WINDOW BOX

Fill the window box with a 1- to 2-inch layer of gravel in the bottom of the window box to allow excess water to drain. Cover the gravel with potting soil, filling the box to about an inch from top.

We purchased plastic planters for our cedar window box rather than planting directly. If you do this you may want to buy the



planters first to determine your window box depth, width and length. The plastic liners we purchased ended up being smaller than our window boxes.

The advantage of using plastic planters is so you can lift the planter out of the box to change soil or plants. This method is best for second-story windows or any window too high to get to from the ground.

Choose plants that are tall and spiky for the center, surround them with round and full plants that cascade around or over the window box edge. Place larger flowers or plants in the rear of the box. Plants in window boxes, like

those in any container garden, are subject to more dryness and heat than plants in the ground, so it helps to purchase nursery packs of young plants that will adapt directly to the box and suffer less transplant shock. Replant your window boxes seasonally.

From simple to ornate, traditional to contemporary and rustic to elegant, window box planters cover a large range of materials, sizes and styles that will fit your home's décor or your personal style.

Why be ordinary when you can be extraordinary? Get building and start planting a small place to grow! **EHT** 

These window boxes were mounted with RSS Structural Screws from GRK Fasteners, which include a washer-style pan head for reliable holding power.



# MAKE AN ARCHED DOORWAY

By Clint Thomas, Photos by Zoe Thomas

ow many of us asked at least once, and probably multiple times during our academic careers, "Why are we learning this? I'm never going to use this."

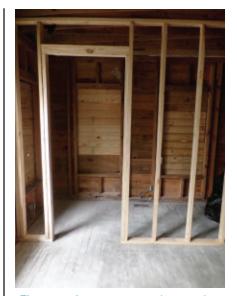
I asked the same question quite often in math and geometry classes throughout my schooling. However, it is ironic how often we end up eating those bold words of youth once we enter adulthood and have to deal with the realities of life. This experience recently happened to me while framing an arched doorway for my daughter's new closet. Framing a door opening, in and of itself, is relatively simple. It requires two king studs, a couple of jack studs, a header, and most importantly, every angle is a right angle. See, we just started with that math stuff that we didn't need to know—right angles, acute angles, etc.

An arched doorway is simple to frame out once the archway is made. The difficult part of framing an arched opening of any type is drawing out the archway so it will be on the same radius throughout its span. This process involves an excessive amount of geometry to accomplish. Simply put, we have to draw out a rectangle that will serve as the circumference of our arch, then mark out an isosceles triangle inside that rectangle. We then use the sides and the apex of the triangle to determine points beneath the rectangle, strike lines through certain of those points in order to establish the final point that will serve as the base pivot point for the arch. Sounds complicated, right? In actuality, it is quite simple because, just as our high school math teachers tried to explain to us. many mathematical concepts involve formulas. If we know the formula then we can work the problem with ease. The same is true in this case.





# MAKE AN ARCHED DOORWAY



First step is to measure the rough opening (R.O.) of the doorway. Mark its width on the plywood workpiece from which you'll cut the arch.



With the top of the plywood representing the top of the R.O., measure down to the desired top of the arch and mark its "thickness" along each side.



Decide on the height of the arch and make a second mark along each edge to indicate the bottom of the arch.

## MULTIPLE MEASUREMENTS

To frame an arched opening, begin by taking an exact measurement of the rough opening from left to right. In my project, the rough opening measured 37 inches from left to right. Be sure to measure along the top of the opening in case the studs are not exactly plumb. What might measure 32-3/4 inches at the top may only measure 32-1/2 at mid-level.

Next, it is necessary to determine how "thick" the arch is going to be. In other words, determine the measurement from the top of the rough opening to the top of the finished arched opening. If the archway is too thick, meaning that it hangs down too far, then a tall person will hit their head on it. Most rough door openings are framed to be 6 ft., 8 in. inches high. I framed mine so it is 77-1/2 inches tall. Given the height of the rough opening and taking into account the height of the average person, I decided to

design my arch to be four inches thick.

With these two measurements in-hand—the width of the rough opening and the desired thickness of the arch—the next step is to lay out the pattern for the archway on a sheet of plywood. Half inch BC-grade plywood works best. Always be sure to work off a factory edge, as you know for certain that they will be square. From one corner of the plywood, measure out the width of the rough opening and put a mark. Using a T-square, or chalk line, draw a straight line from the mark parallel with the opposite side of the plywood. (A piece of plywood is 48 inches wide; you may be reducing this down to 37 inches.) This mark, and the line that you

Snap a chalk line between the upper marks and a second parallel line between the lower marks.

extend therefrom, will be the outside edge of the project.

From the top of that outside edge-line, measure downward the desired thickness of your arch and put a mark. In my case, I measured down both sides 4 inches.

With the width and the thickness of the archway marked we now must determine what



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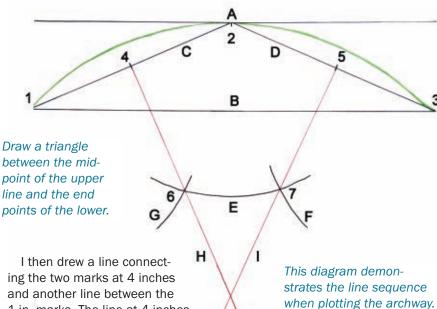


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# MAKE AL ARCHE



circumference that will be used for the arch itself. There is no exact formula required here. It is simply a matter of personal taste. In my case, I decided the opening should arch downward ten inches on each side. Therefore, I measured an additional 10 inches down from my first 4-in. mark on each side, for a total of 14 inches from the top edge.



ing the two marks at 4 inches and another line between the 1-in. marks. The line at 4 inches will be Line A and the line at 14 inches will be Line B.

Find the center of Line A and place a mark. This is Point 2. Using a straight edge, draw a line from the beginning point of Line B, which is Point 1, to

Point 2. This line will be Line C. Draw another line from the endpoint of Line B. which is Point 3. to Point 2. This line will be Line D. We now have both the rectangle and the triangle laid out.

Next, mark the midpoint of Line C (Point 4). Do the same for Line D, which will be Point 5.

### TAPE MEASURE **AS COMPASS**

For the next several steps, it is necessary to insert a screw in the corners at Point 1, 2 and 3. Tighten the screws until only the head remains above the plywood to hook your tape measure. These screws will serve as pivot points for your tape.



A screw can be driven into the pivot points so a tape measure can hook onto it and be used as a compass.



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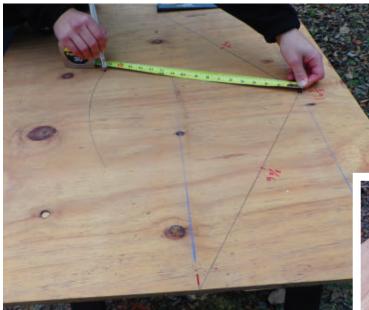
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#### MAKE AN ARCHED DOORWAY



The first arc drawn is Line E.

Carefully align your pencil with the tape measure to trace the line.

Begin by hooking the tip of a tape measure on the screw at Point 2 and extend it straight down past the bottom of the triangle to any length that is more than half the length of Lines C or D (which are the same length). For example, if Line C and D are 19-3/8 inches long then the halfway point is 9-5/8 inches. Therefore,









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#### MAKE AN ARCHED DOORWAY



we would extend the tape measure from point 2 to any measurement past 9-5/8 inches. I prefer to go several inches beyond and used 17 inches as my marking point.

Hold a carpenter's pencil precisely at the desired measurement point (17 inches for me) and slowly rotate the tape measure, pivoting on the screw while marking a curved line as you go. This is Line E. Repeat the same process off Points 1 and 3 to make two new curved lines that intersect Line E: Line G (from Point 1) and Line F (from Point 3).

#### **CONFUSED YET?**

At the intersection of Line G and Line E, mark a point that will be known as Point 6. At the intersection of Line E and F, mark Point 7. Using the straight edge again,





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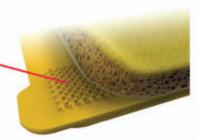
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#### MAKE AN ARCHED DOORWAY

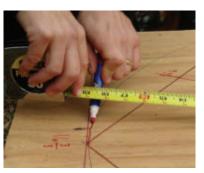
draw Line H between Point 4 and 6, making sure to extend it well past Point 6. Next, strike Line I from Point 5 to 7, also extending it past Point 7. The intersection of Lines H and I, is Point 8.

Insert a screw into point 8.

The final arch is scribed onto the plywood by hooking a tape measure onto Point 8 and extending it up to Point 2. Place a carpenter's pencil at the



The arch should follow without variation from Point 1 to 2 to 3.



Darken the line for easier visibility when cutting.



Use a jigsaw to cut the curve.

measurement for Point 2 and then rotate the tape measure to Point 3 while dragging the pencil to make a line. Repeat the same procedure from Point 2 to Point 1 for the remaining side of the arch. If all of the measurements and corresponding geometry are correct, the circumference of the arch will curve exactly from Point 1 to 2 then to 3 with no variation.

Use a jigsaw to cut out the archway. Before proceeding, take this





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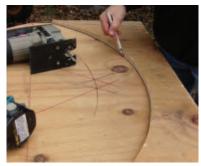
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#### MAKE AN ARCHED DOORWAY



Use the cutout as a template to make a second matching archway.

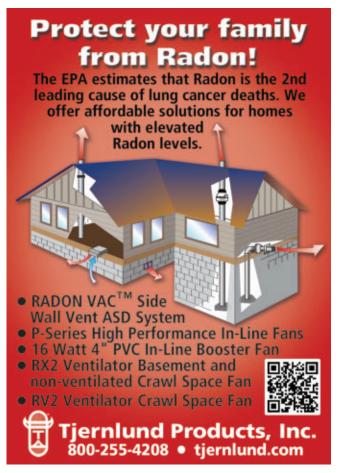
one piece of plywood and dry-fit it in the rough opening to ensure it is the correct size. It is much easier to trim off any excess wood before it is assembled into a form. Once the correct sizing has been verified, the archway that was just cut out can be used as a template to cut out a second matching archway. Arched openings are made by building a plywood form to fill in the top of a right-angle doorway, requiring two arched plywood panels, one for each side with filler pieces in between. Two pieces of 1/2-in, plywood make up a full inch and door openings, if framed with 2x4's, are actually 3-1/2-in. thick. Therefore, one inch of plywood will leave a 2-1/2-in. cavity that has to be filled with pieces of wood. Filler pieces can be made out of scrap 2x4 studs that are cut down to 2-1/2 inches and then screwed or nailed into place.

I used 1-1/4-in.drywall screws to build the entire form and then used 3-in. drywall screws to attach it in place. Be sure to leave out the end pieces of filler to have room for inserting insert a screw-gun to



The two pieces will be combined to match the thickness of the wall.





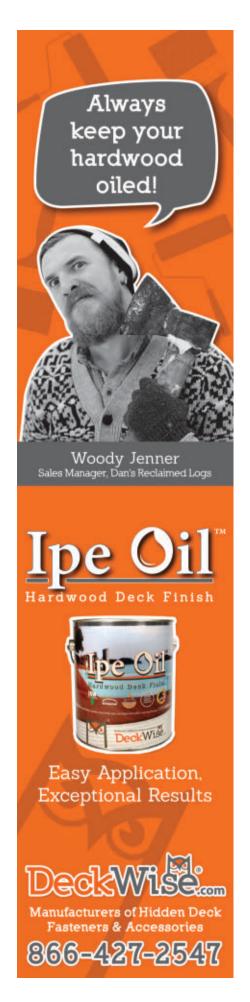
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#### MAKE AN ARCHED DOORWAY

hang the arched form. Once it is secured in place the remaining two filler blocks can be attached.

Unless this formula is used to determine the layout of an archway, it is difficult to get a uniform and even circumference, making any attempt at an arch end up crooked or lopsided. As much as we may not like admitting it, our teachers were correct and also wise to give us the knowledge that they did, because we do end up using it later in life. **EHT** 



Fasten the panels with blocking between them.



The blocking will have to be trimmed from 2x4 lumber to fit between the panels.



Screw the blocking in place but leave out the end pieces until the archway has been installed.



Fasten the archway to the framing with 3" drywall screws.



Shown is the fully installed archway before finishing.



During the drywall phase, multiple sequential cuts were made in the corner bead so it would bend around the curve of the archway.



The doorway was then finished with joint compound, primed and painted.



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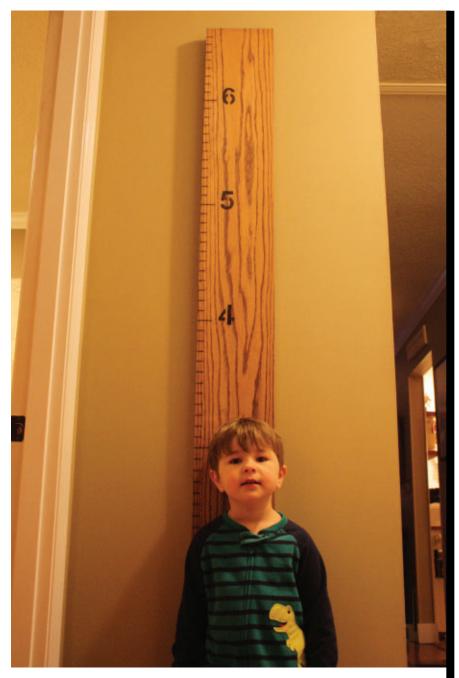
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#### Make a Growth Chart for Kids



**By Matt Weber** 

made a growth chart for our son to impress him with how tall he gets, or depress him with how short he stays. It's basically an oak board that looks like a giant yard-stick and is used to decorate a

wall. This is a neat and easy project if you have young kids, but if you make it the way I did, by burning the markings into the wood, then prepare to invest a couple hours in the engraving process.

I custom-sized the growth chart based on the height of the wall I planned to hang it on, accounting for the size of the baseboards and crown molding. Keep in mind, the marked measurements of the board must correspond to the actual height measurements from floor to ceiling. For example, you don't want make your chart start 2 inches from the floor if you have 5-in. tall baseboard trim.

I decided the lowest point of my chart would be 9 inches from the floor. I terminated the top at 6 ft., 9 in., assuming my son won't grow that tall (or that he'd lose interest in marking his progress if he did).

I used oak for the wood, expecting the hardwood to withstand the bumps and bruises it's destined to suffer over the years.

I taped down a straight-edge ruler to the board and pencilmarked each inch with a 1-1/4" line, using a combination square to keep the lines square to the board's edge.



An art stencil purchased from the Hobby Lobby helped me to outline the numbers marking every foot.

I then used an electric woodburning kit to darken the lines and fill in the numbers. The stylus of the kit plugs in a wall outlet and heats up like a soldering iron. It comes with a few different tips for



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#### **QUICK FIX**



fine lines, thick lines, etc. The wood-burner cost only about \$15 from Hobby Lobby.

Lay on your stain/sealer of choice. I used a combination of ipswitch pine tone, followed by

dark walnut. If you coat with polyurethane, I'd suggest using a matte finish so you can easily mark the board as the kids grow up.

I screwed on 2 D-hook picture hangers on the back of the board to keep it hanging straight on the wall. Hang the board so its measurements align exactly with the actual height measurements from floor to ceiling.

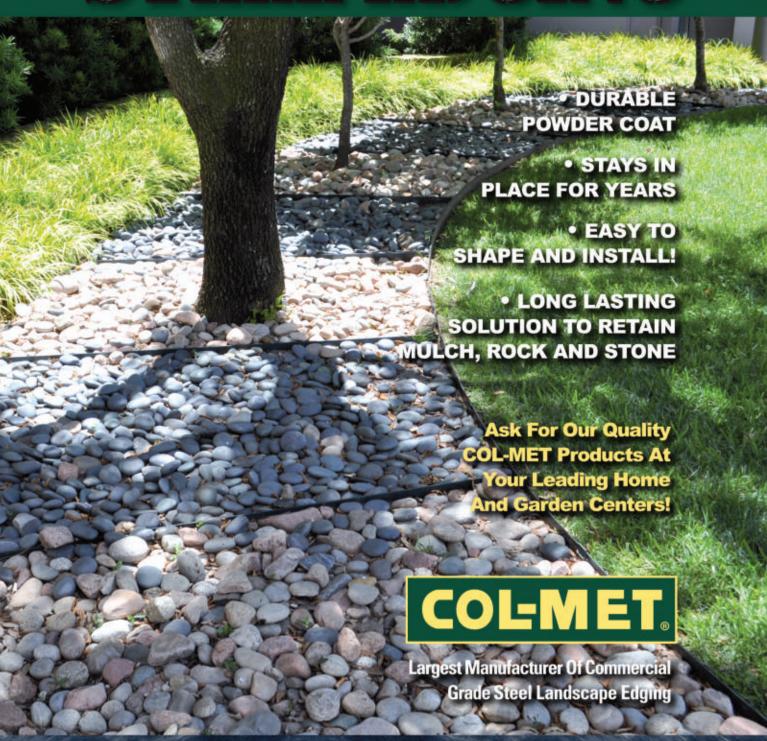








# Create Clean Lines In Your Yard With STEEL ED GING



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#### **QUICK FIX**

With such a long, narrow wall hanging, the slightest discrepancy in placement of the picture hooks makes it easy to see how out-of-plumb the board hangs on the wall. To fine-tune the hanging,

I cheated. I wrapped thin strips of duct tape around the D-hooks to serve as "shims", adjusting the way the hooks were seated into the picture hangers until the board was perfectly plumb.







And that's all it took to complete a simple project that we plan to use for many years to come. **EHT** 





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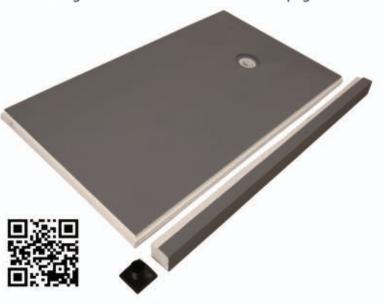
New in our line of convenient tile installation products are our new PreFormed® Niches Shelves. Four colors of natural stone and marble will compliment most any tile! Sized to fit PreFormed Niches, they are ready to install.





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ProPan® Is a ready to install shower pan, presloped and waterproof. As one option in the PreFormed® family of products, there are many stock sizes as well as CUSTOM shower pans. Complicated configurations are no problem and most ship with a 10 day lead time. ProPan® and PreFormed® shower pans are UPC rated. For a complete listing of sizes and models visit our web page.



#### Air Flow to Go

Installing a New Intake in a Dodge Challenger



**By Larry Walton** 

Seeing the rebirth of the American muscle car has been a cool thing, especially because the manufacturers picked up some important style cues from back in the day. When Chevy styled the new Camaro after the 1968 version, they really caught my attention, and Ford did a great job on the new Mustang. Best of all these machines are real performers that can even go around a corner.

The Mopar guys also got their wish list in duplicate with the new Dodge Charger and Dodge Challenger. Almost synonymous with American muscle is the drive

to make them faster, and the new technology built into these machines makes them well suited for aftermarket upgrades.

When Performance expert
James McCoy at Garage 808 talks
to a client about what they want to
achieve with their new-generation
muscle car, his first questions is,
"How much do you want to spend?"
Entry level modifications on a
stock car cost a couple of thousand dollars to get the first tier of
bolt-ons, starting with aftermarket
intake, exhaust and a tune (including the necessary software, which
can be used in conjunction with all
of the future mods as you build

the car). On one of the new-gen muscle cars these initial mods should get you about 25 additional wheel horsepower as measured on a chassis dyno.

The next step up would be a super charger, which is more common for the muscle car crowd than turbo chargers. The aftermarket is building some pretty cool super charger kits, which are relatively simple installations. This would get you an additional 75 horsepower for a total gain of 100hp over stock.

If you are going to do some of the work yourself, it's a good idea to start with a high-flow intake kit.

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#### **EVERYTHING AUTO**

You won't see significant power gains with this first upgrade, but it's the necessary first step that makes power gains possible for further projects.

Here's how the guys at Garage 808 installed K&N's AirCharger High-Flow Intake Kit on one of the coolest new muscle cars, the 2015 Dodge Challenger.



The stock intake box is mostly enclosed, which is different from the K&N kit that uses a heat shield to create a partition in the corner of the engine bay.



The K&N Kit requires some assembly, but it comes with everything needed for installation. The cone-style air filter is in the box.



After disconnecting the ground cable from the negative battery post, our mechanic Tim disconnected the temperature wires.



He then removed the driver side ignition coil cover, which pops off by lifting.



Next step is to disconnect the crank case vent hose from the valve cover.



Loosen the clamp securing the intake tube to the throttle body.



Remove the bolt that secures the air box to the core support.



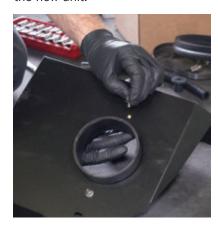
The intake boot pulls away from the throttle body.



Lift the air box out of the corner of the engine bay.



Before storing the stock intake box, Tim removed the air temperature sensor so he could use it on the new unit.

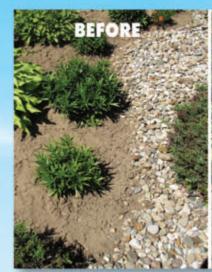


Install the filter adapter into the heat shield.



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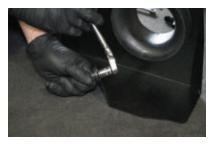
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#### **EVERYTHING AUTO**



The L-bracket and spacer attaches onto the heat shield.



Install the rubber insert onto the heat shield. The insert aligns with the stock mounting point.



Install the edge trim around the perimeter of the heat shield and cut off the excess with aviation snips.



The included hump hose installs onto the filter adapter. This hose section attaches the intake tube to the filter adapter.



Install the stock air temperature sensor into the air intake tube by first installing the provided grommet in the sensor opening.



Thread the 90-degree vent fitting into the NPT fitting in the tube.



Tim cut the 1/2-in. silicone vent hose to 9-in. long and cut the 5/8-in. vent line to 2-1/2 inches long, then connected them together with provided hose mender.



The heat shield installs by inserting the rubber mount into the air-box mounting hole of the inner fender.



After attaching the step hose to the intake tube, position the tube between the throttle body and the heat shield while sliding on the hump hose at the filter end and the step hose at the throttle-body end.



Arrange the tube so the logo faces the core support and the fittings are headed in the right direction, then tighten the hose clamps.



Snap the temperature sensor harness onto the connector.



Install the vent hose between the intake tube and the valve cover port.

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#### **EVERYTHING AUTO**



Fasten the heat shield bracket to the core support using the original air box bolt.

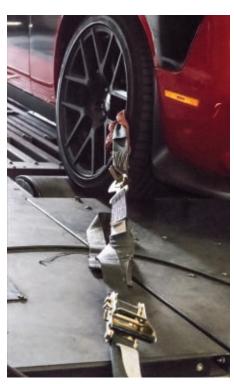
Attach the air filter to the filter adapter inside the heat shield and secure it with the provided hose clamp.

Tim reinstalled the coil cover and double-checked all hose clamps, hose connections and mounting bolts before starting the engine for the "after" dyno pulls.

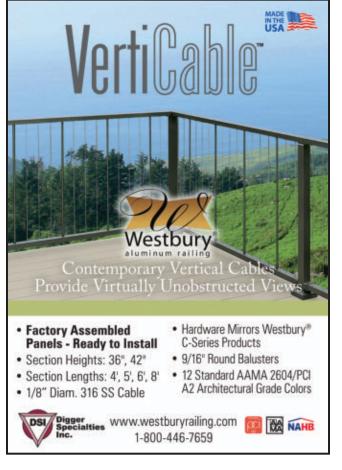


The new high-flow intake system fit the car perfectly. It looks cool in the engine bay as well.

The iconic rear-wheel drive Challenger was strapped down on the Garage 808 dyno for before and after testing. We noted only slight gains in horsepower on the dyno with the new system, but the real gains would come later with the addition of the new exhaust and a tune. **EHT** 







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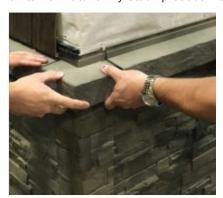


#### TIMBERTECH TROPICAL COLLECTION

TimberTech's new re-designed Tropical collection features rich colors and textures inspired by beautiful, reclaimed wood. In recent independent consumer testing, the new Tropical Collection colors were preferred nearly 4:1 over the competition. Designed to provide builders and homeowners with best-in-class finishes, the Tropical Collection showcases a stunning array of color options, including Antique Palm, Caribbean Redwood, Antigua Gold, and Amazon Mist, a contemporary mid-tone gray with warm undertones of soft blonde and deep brown. TimberTech decking is the only premium wood composite decking that is capped with a protective polymer on all four sides. This means that even the board's back side resists staining, rotting, cracking and moisture absorption. All TimberTech decking is highly durable, easy to maintain, and comes with a 25-Year Limited Residential Warranty and 25-Year Fade & Stain Limited Warranty. Visit www.timbertech.com.

#### **NOVIKSTONE DRY STACK STONE INSIDE/OUTSIDE CORNER**

Novik is a premier manufacturer of shakes, stones and accessory products that replicate the natural beauty and texture of wood and stone materials. The company now offers a convenient way to offset the luxurious look of its NovikStone Dry Stack product with a unique, multi-functional inside-outside corner. NovikStone is a natu-



ral-looking stone product that offers easy installation and is impervious to moisture; therefore, perfect for ground contact. NovikStone products create the same intricate depth and shadow lines of natural stone. Novik's Dry Stack Stone offers the sophisticated detail of precision-laid dry stack stone, creating a modern look for countless applications. The inside and outside corner easily installs together in both directions, offering the perfectly matched look of the Dry Stack Stone, with the versatility to navigate both the inside and outside corners of any project. Visit www.novik.com.

#### DAVINCI ROOFSCAPES SLATE TILES WITH ENHANCED PROFILE DESIGN

Following the successful introduction of a new Single-Width Slate 12-inch tile with an enhanced profile in early 2015, DaVinci Roofscapes now offers the more realistic profiles on the company's Multi-Width Slate and Bellaforté Slate polymer roofing tiles. All three durable slate composite roofing profiles now boast a truly authentic quarried



look, with more realistic profiles that accurately replicate real slate. Deeper impressions in the tiles make them appear thicker, even though they're the same weight as the previous tiles. Low-maintenance slate tiles from DaVinci resist algae and moss growth, come in 50 standard colors and are rated for installation in areas experiencing high winds, hail and wildfires. DaVinci Multi-Width Slate tiles come in five different widths, from 12 to 6 inches, and are available in a number of different color blends. Single-Width Slate and Bellaforté Slate tiles from DaVinci are available in a 12-in. tile width, also in a variety of color blends. Visit www.davinciroofscapes.com.

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ProGUARD® is a light-weight, durable, ready to finish, insulated sheathing that attaches directly to steel or wood studs. Thermal efficiency of the wall system is significantly increased by putting the insulation on the outside of the studs. Significant labor savings are available since the insulation and sheathing are installed in a single unified product. ProGUARD® is Class "A" non-combustible and provides: Mold/Mildew Resistance, Wind Resistance, Impact Resistant Surface and Insect Resistance. To meet new insulation codes, ProGuard® is contious insulation.





#### THERMADRY®

THERMA**DRY**® Insulating Drainage Panels produced from 2" extruded or expanded polystyrene will protect your foundation From freeze-thaw cycling in addition to providing high drainage rates and a long-term insulation value.

THERMADRY® has vertical and horizontal channels cut into the panel and a factory-applied filter fabric adhered over the channels to prevent clogging during backfill. Compressive creep deformation is limited to less than 5% over 20 years!

#### **WALLGUARD®**

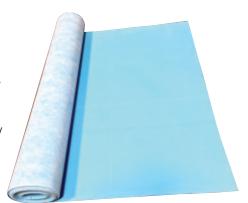
WallGUARD® protects areas from just below grade to where your heat loss begins. The exposed area of your foundation can account for 10% or more of your total heat loss. WallGUARD® s tops that heat loss and a provides a durable latex concrete finish that can stand up to accidental impact. WallGUARD® can be coated on-site to provide color or texture to meet your exterior design finished look. Your energy savings can start immediately upon installation. WallGUARD® can be installed on new or retrofit applications.



## PRODUCTS

#### **SOUND BUFFER**

MP Global Products introduces Sound Buffer, a high-performing universal acoustic underlayment made from 100-percent virgin latex rubber for use under luxury vinyl, laminate, engineered wood and hardwood flooring. It can be floated, nailed, stapled, or single- or double glued. Providing excellent value, the competitively priced Sound Buffer has strong physical properties including 1.2mm thickness, a density of 25 lb/ft<sup>3</sup>, and a compression set of 16 percent—a carefully engineered combination that helps minimize impressions and indentations that can occur with luxury vinyl flooring. It also has a thermal resistance of 0.205, anti-microbial properties, and excellent sound-reduction ratings. Visit www.mpglobalproducts.com



#### **TYTAN OUTDOOR & LANDSCAPE HIGH YIELD ADHESIVE**

The new TYTAN Outdoor & Landscape High Yield Adhesive makes bonding and sealing landscape block wall-top caps fast and easy. It features a revolutionary polyurethane collapsing gel adhesive technology that provides superior yield, strength and gap-filling properties compared to leading traditional landscape adhesives. The polyurethane technology can withstand extreme movements, traffic and weathering without losing adhesion. It is naturally water resistant, extremely strong, and benefits from wet blocks due to the moisture-curing properties



of polyurethane. It is so strong that it can withstand the vibration and drilling when a fence post is attached to the top cap. In short, it is an ideal solution for securing the top cap on a retaining wall. This new adhesive dispenses like a foam, but collapses into a gel, and then re-expands to fill gaps. This is an important benefit, as water pooling between blocks in a retaining wall can cause considerable damage. Because of its "high yield" formulation, one 12-oz. can replace one case of traditional 10-oz. landscape block adhesive. When used as directed, one can's capacity is 90 linear feet. Visit tytan.com.

#### HANDY PRO PAIL

The new HANDy Pro Pail is designed to accommodate up to a 6.5-in. mini-roller or 3-in. paintbrush and will hold more than a quart of paint or stain. To deter hand fatigue for painters tackling tough projects, the new HANDy Pro Pail includes a comfortable adjustable strap, as well as a handle rest for a mini-roller or paintbrush.

Like many of Bercom's popular painting accessories, the HANDy Pro Pail has a custom-fit liner available for purchase. Manufactured in the United States from 100-percent recycled materials, HANDy Pro Pail Liners are solvent-resistant to allow painting contractors to work with any paint or stain. The liners make color changes a breeze while eliminating unnecessary cleanup time. Visit www.bercomincorporated.com.



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## PRODUCTS

#### FORCEFIELD AIR AND WATER BARRIER SYSTEM

Introduced by Georgia-Pacific at IBS 2016, the ForceField Air and Water Barrier System is designed to keep potentially harmful water out of a structure during construction (and for the life of the building). ForceField consists of engineered wood sheathing panels laminated with a proprietary air and water barrier. Once ForceField wall sheathing is installed on a structure, the panel joints are taped with ForceField seam tape,



creating an integrated air and water barrier system and eliminating the need for house wrap. The seam tape helps prevent air infiltration and leaks. ForceField panels are installed like standard plywood or OSB sheathing panels. Perfect for residential or light commercial applications, ForceField panels are available in 7/16 category thickness, and sizes of 4x8, 4x9, and 4x10. ForceField comes with a lifetime limited warranty for the homeowner and a two-year pre-installation warranty for the builder. Visit www.gpforcefield.com.

#### WILTON AMERICAN-MADE VISES CELEBRATES 75TH ANNIVERSARY

This year, Wilton celebrates its 75th anniversary and its American-made Bullet Vise. In 1941, company founder Hugh W. Vogl designed a 4-in. machinists' vise shaped like a bullet. The patented American-made Wilton Bullet Vise features a fully-enclosed design which keeps lubrication in and contaminants out for smooth operation. The horizontal spindle nut creates an even central pull, which eliminates dead motion and unnatu-

ral strain on the nut. This safe, durable, long-lasting vise was considered a leader in its class. Today, the Wilton Bullet Vise is still proudly made in the U.S. and available in several configurations and sizes, maintaining the same high-quality, structural integrity that it did in 1941. The Wilton Bullet Vise continues to be a mainstay in most manufacturing facilities throughout the U.S. These vises are used routinely in the automotive, construction, metal fabrication, service and MRO, tradesmen and utility industries. Wilton will honor the brand throughout the year with promotions and giveaways taking place through social media and the company's website, www.wiltontools.com.



#### SKILSAW SIDEWINDER SAW FOR FIBER CEMENT

Cutting fiber cement material can be tough on both the user and their saw. The Skilsaw 7-1/4 in. Sidewinder Circular Saw for Fiber Cement is not only engineered with optimal power for greater efficiency on the jobsite, but also funnels harmful silica dust away from the tool motor for a longer life and a cleaner

focus on the job at hand. Visit www.skilsaw.com.

work space. What's more, the saw is designed with the same high standards of every Skilsaw to ensure maximum performance and durability for pros. The saw includes a Diablo fiber cement blade (SPT67FMD-22) or a Skilsaw blade (SPT67FMD-01) and features a unique dust-collection system that includes a blade guard extension and dust channel that funnels dust into the included vacuum hose, where it's then collected in a jobsite vac. The saw's no-mar cord and hose sleeve keeps these items protected from the cutting surface and makes handling the tool more convenient so users can



## PRODUCTS

#### **AZEK SIDING**

AZEK's newest product line is advanced polymer composite siding made from a state-of-the-art, proprietary formula. The new AZEK Siding is lighter and stronger than the competition. Constructed with reinforced polymer composite, this patent-pending design offers best-in-class installation, integrated water management, superior aesthetics and durability. AZEK Siding weighs up to 40 percent less than most fiber cement siding. At just over six pounds per board, this makes it easy for installers to handle and transport—even with a one-man crew. AZEK's siding is an ultralight 12-foot long board designed to offer hands-free mobility when fastening



and does not need additional installers or clips, special tools or blades. Gravity Lock Technology increases the speed of the installation and ensures that each piece is locked in place. Three pre-finished colors are available along with a primed option that can be customized onsite. All finished colors are chemically bonded to planks for enhanced performance that will look rich for years. Visit www.AZEK.com/siding.

#### **WEATHER SHIELD MULTI-SLIDE DOOR**

Expanding its already broad selection of sliding and hinged doors, Weather Shield Windows & Doors has introduced its new multi-slide door in the Premium Series and the Contemporary Collection to accommodate openings as large 50 feet wide and 10 feet tall in high-end custom homes. The new multi-slide door is available in single and bi-parting configurations, and a 90-degree corner configuration, and can either nest at the end of the track or recess manually or with the push of a button inside a wall cavity for full-width passage. Available in the Premium Series or the Contemporary Collection (5-1/8- or 3-1/4-in. bottom rail), the multi-slide door has an extruded aluminum clad



exterior and wood interior. It features a standard or high-performance sill, and corrosion-resistant adjustable rollers. The flush handle is available in brushed nickel, oil-rubbed bronze and black. The automated, recessing door configuration can be controlled by a discreet push-button panel on the wall or can be connected to most smart-home systems, including Wink, Z-Wave and others. The system also includes sensors to prevent the door from closing on a person or object. Visit weathershield.com.

#### KLEIN ELECTRICIAN'S HEADLAMP

Klein Tools launched its new Illumination line, including a headlamp (No. 56220) designed specifically for electricians. It features an anti-slip silicone strap that comes pre-adjusted to fit a hard hat. The lamp has a 45-degree tilt, and can be used in spotlight mode (150 lumens, six run hours) or floodlight mode (50 lumens, 10 run hours). It is also impact and water-resistant. Most headlamps used on jobsites now are designed for activities like camping and hunting. They often include extra features like colored LED's or strobe lights that electricians don't use. Klein designed this one to include

include extra features like colored LED's or strobe lights that electricians don't use. Klein designed this one to include essential features used daily by electricians and uniquely secured it with a silicone strap which stays put and won't

stretch out. Visit www.kleintools.com.

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The secret to the Accubrush is a roller which lays down the paint, combined with a small brush that takes paint right up the very edge. You get a clean, straight line, every time!



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The professional pole-mountable version has a threaded handle which allows the edger to be mounted to any standard paint pole. While your feet remain firmly planted on the ground, you can get a neatly painted edge at the top of the wall.

Accubrush paint edgers can be used around doors, windows, ceilinngs (including orange peel and knockdown), baseboards, crown molding, and chair rail.



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#### How Can I Fix My Coolant Leak?

Before we get to how to fix your leak, let's talk about why it is important to fix a coolant leak quickly. If your car is leaking coolant, it will run normally until the coolant level gets too low. Once it is low, there will not be enough coolant to keep your engine at the normal operating temperature and the engine will over heat.

Fixing your coolant leak quickly will ensure your vehicle has the proper coolant level to stay cool and safe. Coolant leaks can come from a variety of places in your vehicle and where the leak is will dictate the best solution. Possible coolant leak locations include hoses, thermostat, the heater core, a radiator or the head gasket

There are at least 4 hoses associated with the cooling system in your vehicle, but possibly many more. There will be a hose that carries coolant from the bottom of the radiator into the water pump and another hose that carries coolant from the top of the engine back to the radiator. There will also be hoses that carry coolant to and from the heater core, which is most likely located under your dashboard so the hoses will travel from the motor back to the firewall, or the rear of the engine bay. Overtime due to heat and age the ends of those hoses can become brittle and begin to crack where they are attached causing small leaks. In this case, the best thing to do is purchase a new hose and clamps and replace the broken hose.

The thermostat is usually on the top on the engine, but in cases, as in many Subarus can be located on the bottom of the engine. It's likely near the water pump and is closed in a housing that is near one of the hoses going to the radiator at the front of your vehicle. This housing is usually bolted on so that it can be easily removed if you need to replace the thermostat. It is possible that the thermostat housing can develop a leak where it is bolted together. In this case, consider replacing the thermostat housing gasket. Since you already will have it apart, consider replacing the thermostat as well since it is a relatively inexpensive

As discussed above, your heater core is located under your dashboard near the cabin ventilation fan. Warm coolant from your engine is pumped through the heater core, then your cabin ventilation system uses that to heat the air in the cabin of your vehicle. If the heater core is leaking you will find coolant on the floorboards of your vehicle, most likely on the passenger side. Removing the heater core can be an expensive and tedious job requiring the removal of a significant portion of the interior of your vehicle. To repair the leak in your current heater core use BlueDevil Pour-N-Go Head Gasket Sealer. BlueDevil Pour-N-Go is a non-particulate chemical based leak sealer that reacts at the temperature differential created at the leak point in your cooling system. BlueDevil Pour-N-Go will create a chemical weld at the leak permanently sealing the leak in your heater core without expensive removal.

If you discover a radiator leak you can repair it by using BlueDevil Pour-N-Go to seal that leak in just the same way. Since your radiator is in the front of your vehicle and a relatively fragile piece of equipment it is no unusual for it to get holes from rocks or road debris. BlueDevil Pour-N-Go can save you from the costly repair of purchasing a new

You can tell if you have an external leak from your head gasket if you discover coolant leaking from below your exhaust or intake. External head gasket leaks must be sealed very quickly as they will expand overtime if they are left untreated. If you have an external head gasket leak use BlueDevil Head Gasket Sealer. BlueDevil Head Gasket Sealer can seal the head gasket leak even in vehicles with large cooling capacities, like V8 engines or truck engines, and is powerful enough to stop even large leaks.

BlueDevil Pour-N-Go Head Gasket Sealer is guaranteed to seal your cooling system leak easily and permanently without costly replace-ments or mechanics bills. BlueDevil is a permanent repair, Guaranteed

Don't risk getting stranded or damaging your vehicles engine by driving with a blown head gasket. Stop by your local auto part store today and pick up the quick and easy solution from BlueDevil Products!





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