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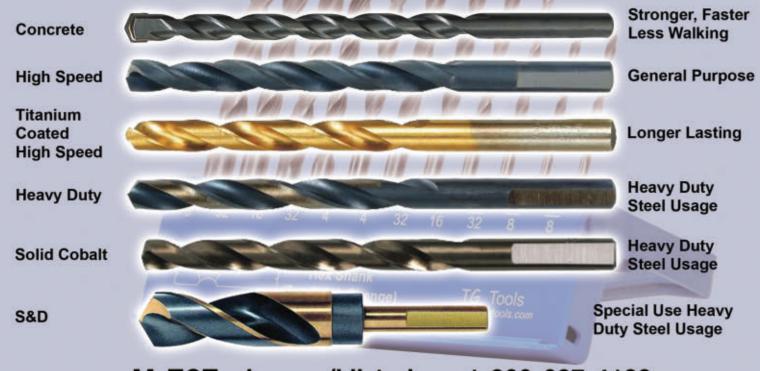
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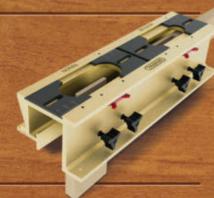




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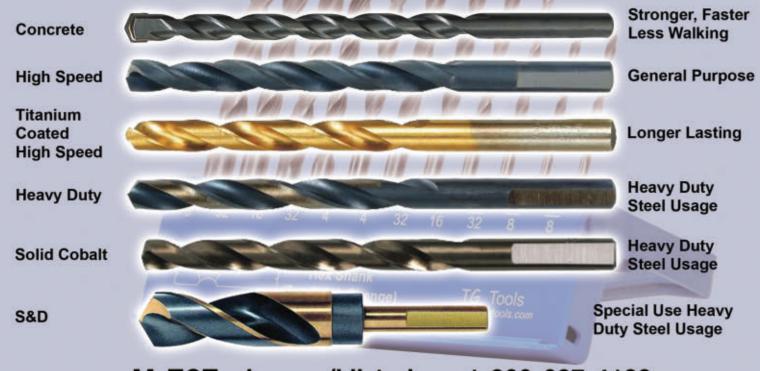
lets you make perfectly aligned dowel joints every time.

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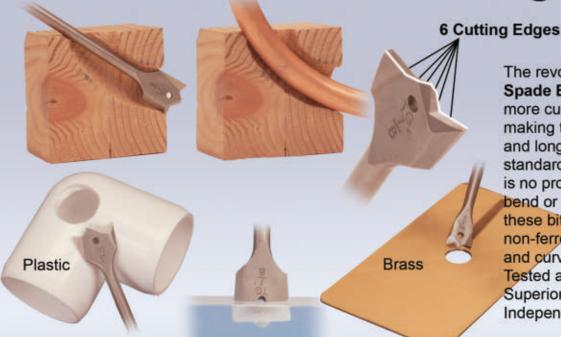
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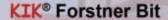
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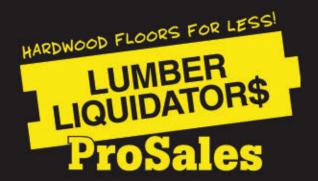
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# From The

get a sense of internal conflict when I read about the "rise of the machines." The science-fiction geek inside me would like to see a future where benevolent robots make the world a better place, like R2D2 and C3PO. But that sunny outlook is tempered every time I read one of those ominous articles about the risks that artificial intelligence pose to the future of humanity. We're already living in a world of unmanned drones and driverless cars, and when reputable tech experts like Stephen Hawking and Elon Musk continue to sound the warning bell, I pay attention.

With any luck, I'll be long gone before Skynet overthrows the earth and keeps us all as pets.

One thing is for sure: Robotics will impact the world around us in ways most of us don't yet foresee. For example, I recently stumbled across an article about the world's first fully automated bricklaying robot, dubbed Hadrian. The system first determines the location of every brick to be laid based on a 3D CAD design, then individually cuts and lays the bricks in sequence. Hadrian's 28-foot long boom manipulator sets the brick and slathers on the mortar, even leaving space for pipes and wiring.

The production advantage of the robot is fairly staggering. The machine reportedly can set 1,000 bricks an hour, which roughly equates to completing an entire house every two days.

House builders traditionally hire a crew to lay the bricks by hand, and have to work around weekends and holidays. The robot, however, can work much more quickly and doesn't need to take breaks. Hadrian can feasibly work 24 hours a day, 365 days a year, and potentially build 150 houses annually.

Again, I'm conflicted. This sounds like good news for undeveloped countries but maybe doesn't bode so well for the bricklayers of the world. I doubt the construction industry will see a major impact anytime soon, since the machines aren't yet being massproduced and they probably cost quite the pretty penny. But it's something to think about if you're grooming your child for a career

in the masonry arts.

A shrewder long-term plan may be to nudge your kid to study robotics and engineering. That seems like a flourishing industry. They can learn to build and maintain the automated replacements for America's manufacturing workforce, at least until your kids, too, can be replaced. It's all part of Skynet's master plan.



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• Is there an easy way to remove old glazing from a window? I'm afraid I'll break the glass if I chip away at the glazing with a putty knife.

• The safest way to remove old glazing is to first apply heat to soften the material. Use a heat gun to edirect heat evenly over the glazing bead. Keep the heat source in motion, though, because if you warm the glass too long in one spot, it could crack. As the glazing softens, use your putty knife to scrape rather than chip the material to remove it.

How do I know what type of polish to use on my wood floors?

• Most wood floors installed over the last 30 years will have a either a polyurethane finish or a sealer/wax finish. You need to choose a product specifically designed for the finish in question to avoid ugly, waxy buildup on your floor. To determine the existing finish of your floor, examine the surface closely in a sparsely trafficked area. You should be able to feel the woodgrain texture of the floor if it's been finished with a penetrating sealer/wax. A polyurethane finish will have a hard surface film and feel smooth. A thumb print will show on a waxed floor, and a drop of ammonia will discolor it (unlike polyurethane). Once you identify your type of floor finish, buy a matching product from a reputable manufacturer and follow the application instructions on the package.





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

• The top of my kitchen island doubles as a butcher-block cutting board. What is a sanitary way to clean • the cutting surface?

Scrub the board with lemon and kosher salt. The salt acts as an abrasive, and the acid in the lemon will
 kill the bacteria. After the surface has been thoroughly cleaned, apply a coat of mineral oil to the cutting

board to prevent the woodgrain from absorbing new stains.

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Can I mount a screw in a hollow core door?

• Since there's not much solid wood in a hollowcore interior door, screws will usually tear out of the door as soon as any weight is applied to them. This complicates mounting items such as pictures, mirrors, hooks, etc. to the door. To mount anything into a hollow door requires special Hollow Door Anchors. These plastic anchors fold flat to fit inside a pilot hole drilled into the door. Once inserted, a small key is used to open the anchor, which spreads out interior brackets to clamp the collar of the anchor against the door face, like a toggle-bolt. The screw is then driven into the anchor until tight. EHT

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## Caulk Check



By Tom Matthews

aulks are used to seal joints for a decorative finish, to seal joints to prevent water intrusion, or both. When it comes to sealing joints in crown molding or to weatherproofing windows, choosing the right caulk/sealant product is the first order of business.

## CAULK/SEALANT SELECTION

Silicone sealants have long been the staple for exterior projects where a waterproof seal is necessary. Silicone works well for use in the kitchen and bath. They can be purchased with antimicrobial additives to fight mold and mildew, and can be easily removed and replaced when the bead gets grimy.

However, standard silicone cannot be painted and is incredibly messy and sticky to use. Newer formulations of silicone-based sealants can be painted—but only if indicated on the packaging—so pay close attention when buying.

Acrylic caulk is only appropriate for interior projects and is not waterproof, nor is it very flexible and may crack over time. However, acrylic caulk can easily be painted and is much easier to tool and clean up than silicone. Standard

acrylic caulk is cosmetic and not intended to serve as a sealant, but it is also the least expensive option.

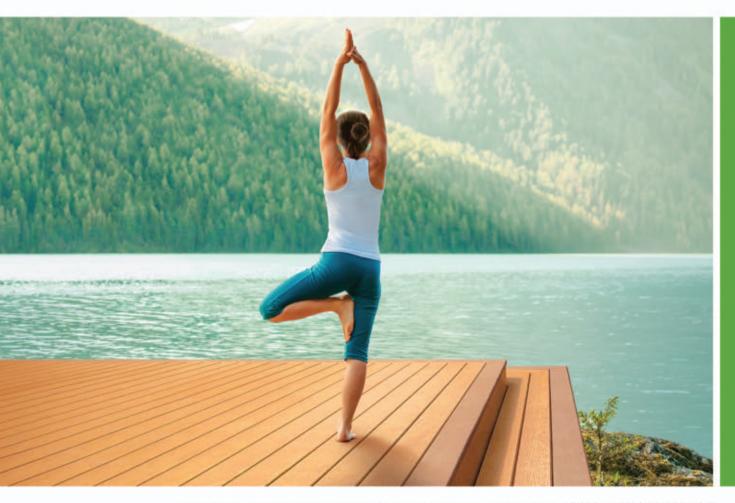
Hybrid caulk/sealant products come in formulations containing some of the attributes of both silicone and acrylic, meaning they can be cleaned or tooled more easily, remain flexible, can be painted and still retain a water-proof seal.

Pro-grade polyurethane-based sealants are ideal for siding, windows and doors, because they stay flexible and don't shrink, have better adhesion than silicone—plus, they're paintable. Lexel is a high-quality sealant that utilizes



Hybrid caulk/sealant products come in formulations containing some of the attributes of both silicone and acrylic. Pay close attention to the indications on the packaging. Whether the product is flexible, waterproof, paintable, or contains a mildewcide additive, all features should be listed prominently on the label.

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### TOOL SCHOOL

liquefied rubber that even sticks to wet surfaces. These pro-grade sealants cost more but deliver excellent results. Water-based and solvent-based caulk/sealants complicate the selection even further, offering similar hybrid properties, and many serve double-duty as adhesives.

The easiest way to parse the many options is to pay close attention to the indications on the packaging, making sure they match the job at hand. Whether the product is flexible, waterproof, paintable, or contains a mildewcide additive, all features should be listed prominently on the label.

# CRUCIAL FEATURES OF A CAULK GUN

Caulk guns are relatively inexpensive tools, so it makes sense to pay just a little extra for a gun with the right features.

Spout Cutter. Every tube of caulk will need to have its spout clipped, and there's no reason to lug around an extra pair of snips. Look for a gun with an integrated spout cutter typically located in the handle.

Seal Punch. This super-simple feature should come on every gun, but it doesn't. It's a small metal rod that flips out from beneath the gun to puncture the caulk tube's interior seal, so you don't have to monkey around with a wire coathanger or other makeshift implement.

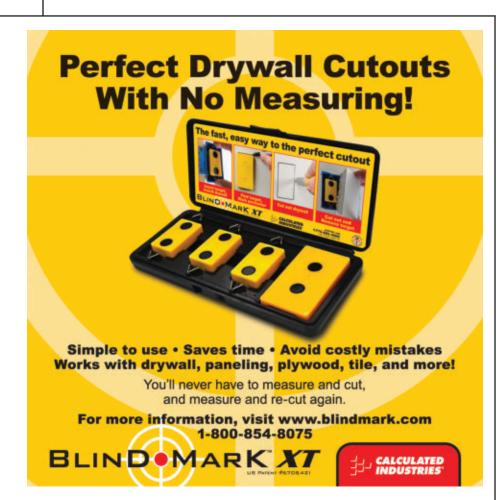
Plunger Type. Caulk guns use one of two drive mechanisms: ratchet rod or smooth rod. Ratchet rods have visible teeth that are ratcheted forward by a drive arm when you pull the trigger. Smooth rods are driven by a spring-loaded pressure bar and generally have twice the thrust for smoother bead control and less hand fatigue. The smooth-rod variety usually costs more, however, and some have a tendency to wear out and slip when the trigger is pulled.

## PRO TIPS FOR CAULKING SUCCESS

Remove Old Sealant. To remove a grungy bead of silicone for replacement, cut through each side of the bead with a utility knife and pull it away by hand. If you're lucky, most of the bead will stay intact as a strip. To remove any remaining sealant, scrape it with a paint scraper held at a shallow



Any crack that's deeper than 1/2" and wider than 1/4" needs backer rod so the caulking will properly stretch, and so you use less caulking. On this repair, Sashco's Filler Rope is used to fill a joint in a concrete driveway. Sashco's Slab concrete repair caulk is applied over the rod. The bead should be at least 1/4" thick but no more than 1/2" thick to allow it to stretch correctly (too thin and it'll tear, too thick and it'll be too rigid).



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### **TOOL SCHOOL**



angle. Finish up by scrubbing the surface with mineral spirits and an abrasive pad to get rid of any residue. Once clean and dry, apply a new bead.

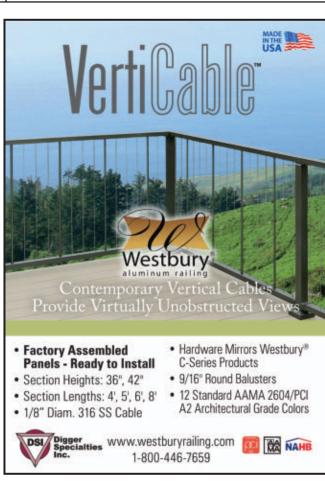
Seal Big Joints. To seal a joint larger than 1/4-in. wide, use a foam backer rod as a filler before applying the caulk. Less expensive than caulk, the rods provide a cheaper way to fill the empty space than using caulk alone.

After applying the concrete caulk, use a damp foam brush or a putty knife to tool the bead smooth and ensure the caulk is sticking to the sides of the joint properly.

Plus, when caulk is applied over a backer rod, it forms an "hourglass" shape with large surface areas of adhesion at the sides of the joint. The hourglass shape of the caulk bead withstands joint movement better than any other configuration.

Caulk a Tub. When caulking a bathtub, first fill the tub with water. The weight will pull the tub downward, maximizing the size of the joint. Apply a flexible, water-proof caulking along the edge of the tub in full contact with both vertical and horizontal surfaces. This prevents future stress and cracking of the caulk joint. Once the bead is dry, drain the water.

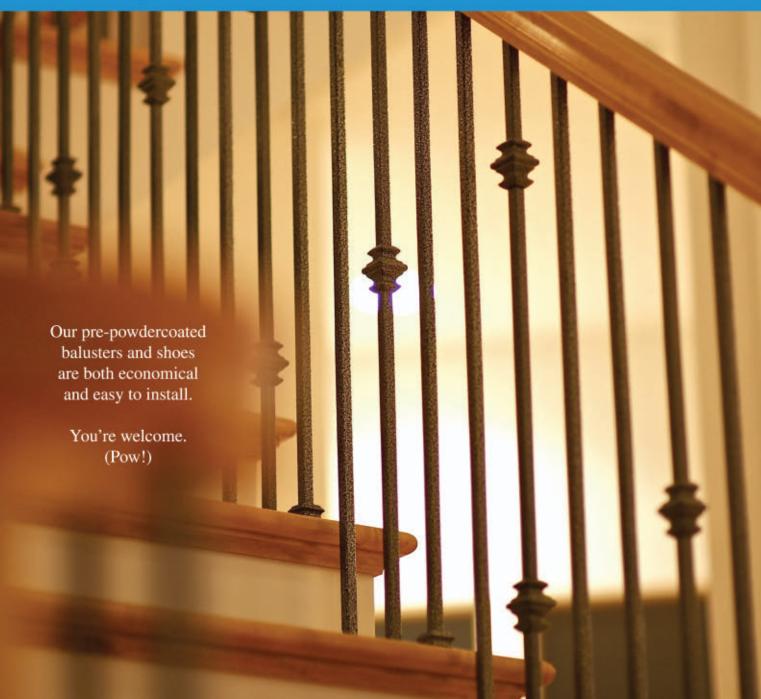
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### TOOL SCHOOL

specific to certain applications. For example, Sashco's Slab concrete crack repair caulk combines superior adhesion, elasticity and a granular texture to match the

surrounding concrete. Flame Stopper 5000 from Gardner-Gibson expands when exposed to extreme heat, cutting off the spread of fire through penetrations. Create-a-Color from Red Devil is a caulk that can be colored with latex paint to match the surrounding décor.

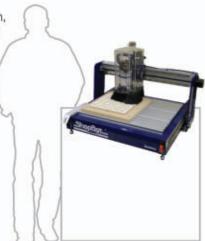
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Many caulk formulations offer special properties specific to certain applications. Flame Stopper 5000 from Gardner-Gibson expands when exposed to extreme heat, cutting off the spread of fire through building penetrations.



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# CREATE-A-COLOR CAULK KIT

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saying goodbye to plain old white, with endless possibilities. The proprietary caulk blend bonds with ordinary latex paint rather than repelling it like standard caulks. The kit includes a Standard Caulk Mixer: two tubes of specially formulated Create-A-Color Caulk, a syringe for injecting the paint and an easy-to-follow instruction guide. The system works in minutes to create the perfect color and can then be applied with a standard caulk gun. (Note: the mixer is not a caulk gun and is for mixing only). Pros can also purchase a heavy-duty metal caulk mixer separately for daily use on the job. The mixers are very easy to clean and re-use. The Create-A-Color Caulk is a quality formulation that has excellent adhesion, mildew-resistance, interior and exterior performance, low odor and water cleanup. Visit www.reddevil.com.

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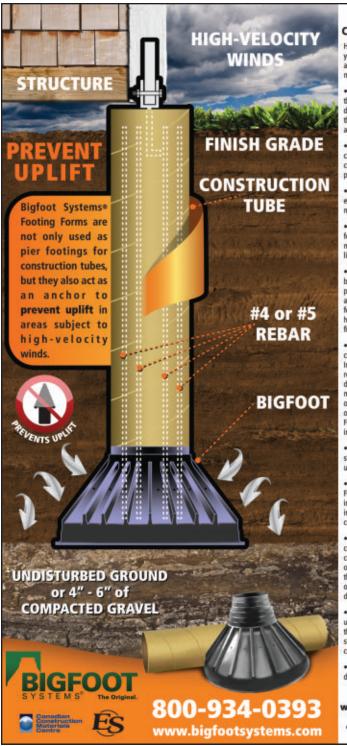




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- Select a footing form made of environmentally friendly, sturdy
- Ensure you are placing the footing form on solid ground. The more solid the ground the less likely movement will occur.
- · Install your footings 4-6 inches below the frost line to avoid potential movement. If you are in an area without frost, then the form should be back filled 2 feet to hold it in place when it is being filled with concrete.
- · Should rebar be required pour concrete into the system first. Insert three or four number 4 or 5 rebar rods into the tube. To determine the length of rebar, measure the distance from the top of the tube to the air holes located on the Biofoot Systems® Footing Form before you place the system in the excavation and backfill
- Purchase the amount of concrete stated on the form label. You will use all of it.
- Use a Bigfoot Systems\* Footing Form as a funnel to pour concrete into the system by placing an inverted Bigfoot on top of the construction tube
- For a marine application, such as constructing a wharf, pour the concrete into the footing and tube on shore and have an excavator set them in place in the water. The other option will entail using a diver and pumper truck.
- · Footing forms should always be used when installing footings as they provide added stability. strength and safety to your new construction.
- Don't risk having to redo the job, do it right the first time!

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and peeling, and the cured sealant is mold and mildew resistant. Visit www.gardner-gibson.com.

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Sashco introduces the new Clear Quart package for Through the Roof. Moving from the can quart to the clear quart, users can now see that the product inside is crystal clear. It's also easier to handle with a molded side that fits in your hand. The container can be resealed and is very durable and sturdy. The product "seals everything that goes Through the Roof." You can apply it down to zero degrees, in standing water, on wet surfaces, and it sticks to a variety of roof implements. Its easy brush-on formula lasts 20 times longer than roof cement, and it seals leaks permanently. Also available in one-gallon containers and cartridge-grade. The clear quart is not available in California, but Sascho does offer the cartridge, can quart and gallon in a VOC formula for California. Visit

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# **Upgrade your Faucet**



**By Danny Lipford** 

nstalling a new faucet in a kitchen or bathroom is an easy way to upgrade and update the space and can be great DIY project to tackle.

First step is to gather all of the tools and materials you will need for the project:

- Paper towels to absorb any remaining water in the lines
  - Teflon tape
  - Work light
  - Screwdriver
- Faucet installation tool (e.g. Ridgid faucet and sink installer)

- · Adjustable wrench
- · Protective eyewear
- New faucet with hot and cold supply lines

To get started, clear out the cabinet area where you'll be working and position a light so you can see the area clearly.

Next, you'll want to shut off the water supply by turning the hot and cold cut-off valves beneath the sink clockwise. You can use a special faucet installation tool to make the job easier. The space beneath a sink is often tight and difficult to maneuver, but this tool is designed to work in small spaces.



Turn the handles of the shut-off valves to disconnect the water supply. The Ridgid Faucet and Sink Installer Tool features an open slot for easy fit over existing supply lines, as well as the most common socket sizes for faucet and basin nuts.



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### **QUICK FIX**

At this point, it's a good idea to turn on the faucet handles to release any remaining pressure.

The next steps involve disconnecting the water supply lines,

sprayer hose (if applicable) and the nuts that hold the existing faucet in place. Remove the old faucet and clean the surrounding area to remove any debris. Scrape off any old putty from the sink with a putty knife, being careful not to scratch the sink.

The steps for installing the new faucet may vary depending on your model, so be sure to consult the manufacturer's instructions that came with it. Most faucets include a rubber gasket to seal it to the sink. If this is not the case, apply plumber's putty to the sink



Unscrew the sprayer hose and supply lines beneath the faucet.



Remove the basin nut that holds the faucet to the sink.



With all lines disconnected, wiggle the faucet to loosen it and then pull it out of the sink's mounting holes.



Refer to the manufacturer's instructions for specific assembly and installation steps for your faucet.



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### **QUICK FIX**

beneath the faucet. Feed the fixture through the existing holes in the sink then tighten lock nuts from underneath to secure it.

Apply Teflon tape to the male threads on the hot and cold cut-off

valves. Be sure to wrap the tape around the threads in the same direction that you will use to tighten the nuts.

Attach the hot and cold water supply lines to each cut-off valve.



Feed the fixture through the mounting holes of the sink.



In this case, the new faucet runs all lines through a central location. Fasten all necessary screws, nuts or other hardware to securely mount the faucet to the sink.



Apply Teflon tape to seal all threaded supply-line connections.



Reconnect the supply lines.

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Test the faucet and inspect all connections for leaks.

Screw the nuts on to the connections over the Teflon tape to ensure a watertight seal.

Turn the water back on and check for any leaks. **EHT** 

#### Today's Homeowner

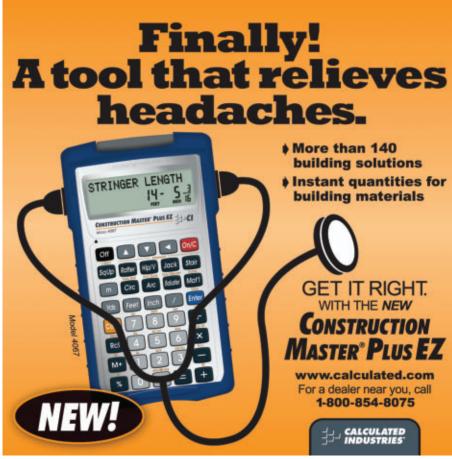
Danny Lipford is a leading homeimprovement expert, friend of Extreme How-To and fellow Alabama resident. He hosts an Emmy-nominated, nationally syndicated TV show, Today's Homeowner with Danny Lipford,



which is now in its 17th season on over 200 stations nationwide. In 2009, he became the host of the nationally

syndicated Today's Homeowner with Danny Lipford radio show. And, on top of all these activities, Danny has contributed this cool plumbing project to the latest issue of EHT. Keep up with all of Danny Lipford's home-improvement tips and techniques at www.todayshomeowner.com.





# Behind the scenes of CHANNELLOCK®



recent survey of consumers in the United States, China, Germany and France found that more than 65 percent of Europeans prefer products made in their home countries. However, more than 80% of those surveyed in the U.S. and 61 percent in China said they would pay a premium for American-made goods over products made in China.

Why is that? The survey revealed that quality was the primary influencing factor. Eighty-five percent of consumers in the U.S. and 82 percent in China believe American-made products are higher in quality.

If that is not reason enough to buy American-made products, consider this: Every American product bought helps to pay the salary of an American worker. And, if each consumer spent just \$64 on American-made goods this year, it would help create more than 200,000 new domestic jobs.

Buying American-made products just makes good sense. And with American-made products, buyers can feel good about purchasing something that was made by American workers. In a competitive world economy, production costs and price matter, but for many American companies, quality matters just as much, if not more. Channellock Inc. is one of those companies. A family-owned and -operated plier and hand tool manufacturer, Channellock Inc. manufactures many of its products, including the iconic Channellock® tongue-and-groove

plier, in Meadville, Pennsylvania.

"By manufacturing our pliers in Meadville, we're able to fully control the quality of every plier we produce-from design to production to inspection and even to shipping," said Jon DeArment, president and C.O.O. of Channellock Inc. "In addition to the high-quality product Channellock customers receive, American manufacturing also employs workers and supports families from local communities, and that's something we are very proud of and believe our customers appreciate as well."

Channellock pliers and tools can be found in hardware stores, retailers, toolboxes and workshops around the world. But before their tools can get into the hands of professionals and serious DIY'ers, they have to be forged, shaped, polished and fitted with their famous Channellock Blue® grips.

To begin, every Channellock plier starts as a billet of high-carbon, North American 1080 steel. With thousands of pounds of force, their massive air-powered, computer-controlled die forgers precisely hammer the heated steel into component parts. Excess material is then removed on a trim press.

From the forge, each tool element is precisely ground, drilled, counter-bored, channeled, broached and polished to exact specifications. At almost every step along the way, there are skilled steel craftsmen inspecting every component to ensure each part is tested to ensure exceptional strength. Since steel is an unpredictable material, the process includes precautions to make sure the tools are heated properly because heating steel too much can make it hard and brittle, while not heating it enough causes it to remain relatively "soft" and easily fatigued. The unique heat treating processes used by



Channellock ensures a very controlled, uniform tempering that makes the steel strong enough to withstand great force, but flexible enough to resist breakage under load conditions.

The next step is to use proprietary laser hardening techniques that make it possible to achieve the unique characteristics featured in the pliers. The laser hardening allows the jaws and

teeth of the pliers to be incredibly durable, while the handles maintain flexibility for excellent control.

After laser hardening, the tongue and groove and slip joint products receive Channellock PermaLock® fasteners, which eliminate the problems associated with traditional nut and bolt fastener failures. Associates check and adjust each fastener to ensure that every plier works smoothly. In the final step in the manufacturing process the tools are cleaned and given a rustinhibitive coating. Then, it's time for a dip in the large pool of Channellock Blue coating that forms the famous grips.

Making quality American-made tools is not easy. Each step of the process involves precision and quality checks by American workers who take great pride in what they do.

Buying American-made products, especially tools, is a great way to support the economy and to ensure that the product is quality that will last. **EHT** 











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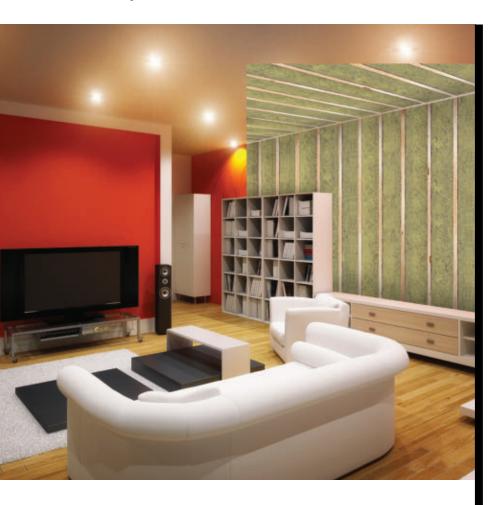
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## **Stone Wool Sound Insulation**

Insulate your walls for sound control.



e live in a louder world today. Modern life is noisier, due in part to increased traffic congestion, electronic technology and other intrusions of unwanted sound into the home environment. Think hightech entertainment rooms, pinging computers, blaring stereos, ringing phones, washer/dryer rumblings. And let's not forget about your son's band practice in the garage. This cacophony of noise contributes to a form of sonic pollution, a growing problem that can rattle nerves and affect sleeping

habits and quality of life. Most people cherish a quiet environment to think, work and rest. Noise reduction is now a growing trend in today's homes.

Ceilings and walls acoustically perform better when fitted with stone wool insulation. Stone wool is a rock-based mineral fiber insulation comprised of basalt rock and recycled slag. Basalt is a volcanic rock, which is abundant in the earth, and slag is a by-product of the steel and copper industry. The minerals are melted and spun into fibers that are made into batts.

The high density of stone wool insulation helps dampen airborne noise transmission.

For sound control, Roxul offers Safe 'n' Sound stone wool batt insulation designed specifically for interior wall and floor/ceiling applications. Suitable for residential wood and steel stud construction, this non-combustible, lightweight product has excellent acoustical dampening properties. The batts are also dimensionally stable which makes them ideal for easy friction-fitting into walls, ceilings and floors.

Because Safe 'n' Sound is designed for interior applications, it has not been engineered as a thermal insulation but as a fire barrier and for soundproofing. Stone wool in general has excellent fire ratings, does not burn and can add valuable time for evacuation in the event of a fire. Its higher density properties also make it an ideal solution for reducing sound travel between rooms.

The material is also chemically inert, so it it will not promote



Safe 'n' Sound insulation from Roxul is sold in batts to fit into the stud bays of walls and ceilings.



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#### **MATERIAL MARKET**

corrosion, plus it's resistant to water, rot, mold, mildew and bacterial growth.

The Safe 'n' Sound insulation is denser than standard stone wool thermal insulation, and the batts are manufactured to an approximate 3-inch thickness. Stone wool is ideal for sound-deadening in bedrooms, home offices, bathrooms, entertainment rooms and laundry rooms. The material has a unique flexible edge that is designed to compress as the batt is inserted into walls, attics, ceilings and floor frames, requiring no fasteners for installation. The spring-back aspect of this insulation expands the batt against the frame studs to completely fill the wall cavity and prevent the insulation from sagging. The batts can be cut precisely with a serrated

blade and trimmed for the best possible fit around electrical and plumbing.

#### **CONTROL THE NOISE**

All sounds come from energy made by vibrations travelling through air, water or solids. When a sound source (e.g. a crying baby) vibrates its vocal chords, it causes air particles to radiate out in all directions. These radiating air particles continue to exert force on other air particles, causing more vibrations, which in turn, collide with more air particles. The density of stone wool material helps block this airborne noise.

Properly insulating your walls and ceilings with stone wool will make your home more peaceful and quiet because it will help



The batts compress to friction-fit between framing members for easy installation that requires no fasteners.





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#### **MATERIAL MARKET**

ensure that sounds won't travel from the outside—or to and from—other rooms.

Before soundproofing a ceiling or wall, consider the kind of noise problem you're trying to solve. Is the problem airborne noise, impact noise, or both?

Airborne noise refers to the sound travelling from outside (aircraft, cars, lawnmowers) or inside (voices, music and appli-

ances) from the above floor, or from adjacent rooms. In this scenario, reduce the transmission of airborne noise by adding sound-deadening elements such as Roxul Safe 'n' Sound insulation and an air space in the wall or ceiling assembly.

Impact noise, on the other hand, refers to the sound made when one object strikes another object on a hard surface. In the home, impact noise can come from the sound of footsteps, the slamming of doors, furniture dragging or items dropped onto the tile or hardwood floor above. These low frequency sounds can be a major source of annoyance. Adding extra sound-dampening mass such as carpeting can help alleviate the problem.



The batts can easily be cut with a serrated blade to fit around obstructions. Simply take careful measurements and trim the insulation as needed with a knife.



To help dampen impact noise transmission, install horizontal resilient channels over the wall study and insulation.



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Screw drywall panels into the resilient channels between the studs to de-couple the wallboard from the framing.



Further enhance the sound-dampening properties by installing a second layer of drywall, orienting the panels at right angles to the first layer. Finish the installation by sealing all seams with acoustical caulk.

Another option is to install metal resilient channels over the wood framing to de-couple the drywall from the studs. The resilient channels act as a shock absorber. After installing the Safe 'n' Sound installation, fasten the resilient channels at 90 degrees to the framing members every 16 inches (for walls) or every 21 inches (for ceiling and floors). Then screw the drywall panels into the resilient channels between the studs.

Enhance the sound-proofing performance by installing a second layer of drywall over the first, orienting the panels at 90 degrees to the first layer and screwing the top layer into the resilient channels. Caulk all seams with acoustical sealant.

De-coupling methods such as this can help to diminish the

transfer of impact noises from one room to another. **EHT** 

For more information on stone wool sound insulation, visit www.roxul.com.



# SOUND?

By Rob Robillard

hen I think of soundproofing my mind immediately wanders to the Buffalo Springfield lyrics: "Stop children, what's that sound, everybody look what's goin' down." You can't escape noise. It's everywhere, both inside and outside the home, distracting you from work and disturbing your leisure.

While we can't escape noise we can certainly muffle or reduce it. On a recent project a client asked us to install a ceiling and wall system using Kinetics Wood-Frame Ceiling Hanger (Model ICW), IsoMax Sound Isolation Clips, and resilient channel beneath the drywall.

This project intrigued me, so I reached out to a local sound proofing expert for some advice and background information. Here is what I learned.

#### **CONTROLLING NOISE**

The first step in soundproofing ceilings, interior walls and floors is identifying what your sound issues are and where they are coming from. Is noise bouncing around the room making it hard to hold a conversation? Is there an echo? Do downstairs neighbors complain about the noise you make?

Soundproofing Methods for Walls and Ceilings



# WHAT'S THAT SOUND?



Shown here is the exposed framing of the room that needed soundproofing.

We enclosed all of the drainpipes in the ceiling and wall cavities with Mass Loaded Vinyl.

Controlling noise can be an active or passive means of reducing sound emissions, most people want to achieve this for personal enjoyment, whether it's to reduce internal noise from a home theater, child's TV room, a band rehearsal space or to reduce external environmental noise such as adjacent neighbors, traffic, train or airplane noises.

The first step in noise control is to identify the source of the noise. The best course is to reduce the noise as close to the source as possible. This is why many apartment or condominium complexes build fences around their units. Ever wonder why businesses put AC units up on roofs?

When dealing with loud air conditioning compressors, fans or other HVAC mechanical equipment, enclosing them often significantly reduces noise.

When thinking about reducing noise inside a home you need to reduce reverberation. Reverberation is the echo that sound creates as it bounces off surfaces in a room rather than being absorbed.

I'm not advocating bringing back the shag carpet, but it did help absorbs sound.

You can reduce reverberation by installing the following:

- Double- or triple-pane windows designed for noise reduction
- Acoustical wall and ceiling board
  - Carpeting
  - Additional insulation
- Commercially available coverings designed for noise control
  - · Double-wall framing
- Double layers of 5/8-in. drywall, seams sealed with silicone

• Commercially available vibration isolation systems, rubber sheets, panels and baffles

## FOUR BASIC PRINCIPLES OF NOISE CONTROL

If you want some peace and quiet in this noisy world, the best approach (besides moving to the country) is to understand four basic soundproofing principles:

- Mass
- Sound absorption
- Vibration dampening
- · Mechanical decoupling

#### **MASS**

Mass impedes sound transmission—period. Materials such as



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# WHAT'S THAT SOUND?

brick, thick glass, concrete and metal all have high-density disrupting properties.

We followed the mass principle by increasing the thicknesses of our wallboard, adding mass, double layers of 5/8-in. thick drywall, to the walls and ceiling. A simple rule of thumb says that doubling the drywall layers will yield a 4-5dB reduction in the transmission of sound.

#### SOUND ABSORPTION

Adding insulation helps absorb the transmission of noise (reverberation) and lowers the resonant frequency of decoupled walls by providing a mass barrier to soak up and disrupt the noise. Sound that transmits through the drywall on one side of a wall can be reduced by insulation absorbing some of its energy before reaching the opposite side. The insulation acts as a sound absorber, not a sound blocker.



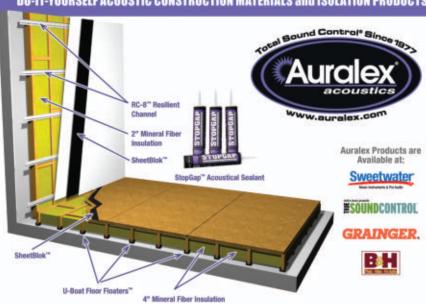
Exterior walls cavities were filled with spray foam insulation.



Kinetics Model ICW Wood Frame Ceiling Hangers were installed to decouple the ceiling drywall from the framing.

Sound absorbers reduce the reverberation time, as well as echoes. Sound absorption "sucks up" the noise like a sponge.
Common sound-absorption materials include decoupled lead-based tiles, open cell foams, fiberglass insulation, "acoustical" insulation or recycled cotton insulation. Roxul





Auralex Acoustics offers a number of products to help with sound isolation. Sound isolation is the reduction of sound transmission from one space to another. Auralex experts can answer any of your sound control questions and offer a FREE Personalized Room Analysis as well as step-by-step instructions at Acoustics101.com.

- . Mineral Fiber: Insulation offers superior acoustic performance with a NRC of 1.00 (2") and 1.05 (4").
- SheetBlok\*\*: Sound Isolation Barrier useful for decoupling (i.e. floating) floors and walls in isolation construction applications.
- RC-8" Resilient Channel: Acoustically decouples drywall from supporting studs and reduces structural vibrations.
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Safe'N'Sound stone wool insulation is designed for soundproofing and has some of the best low and high frequency ratings (and is very cost-effective).

For the project shown, we used R13 batt insulation in the walls, and R19 in the ceiling.

#### VIBRATION DAMPENING

Vibration dampening refers to vibrating surfaces. A common material is sound-deadened steel or Mass Loaded Vinyl, which works great as a sound-transmission blocker on ductwork and plumbing pipes located in ceilings and walls.

Mass Loaded Vinyl is a dense PVC sheet, loaded with Barium Sulfate or Calcium Silicate to add weight. It's a heavy product and weighs one pound per square foot, which it is effective at reducing airborne noise.

We used it to enclose all of the drainpipes in the ceiling and wall cavities.

#### MECHANICAL DECOUPLING

Mechanical decoupling prevents transmission of vibration energy from a source to a receiver by introducing a flexible element or a physical break.



When mounted on the joists, you can position the ceiling hanger to optimize ceiling height.



Drive screws through the bracket into the joist to mount the hanger.



# WHAT'S THAT SOUND?

Common mechanical decouplers are staggered wall studs, doubled wall studs, resilient channel, springs, cork etc. We often see these items on AC units and other types of HVAC mounted to rafters in residential buildings. Mechanical decouplers are also used in many types of household items on pumps, motors, HVAC systems, washing machines and high-end audio equipment.

## USING VIBRATION ISOLATION SYSTEMS

On this project the owner specified that we use a commercially available noise control system. We used resilient channels mounted with Kinetics wood-framed ceiling hangers [Model ICW] and IsoMax resilient sound isolation clips. This system separates the drywall from the studs, which helps eliminate





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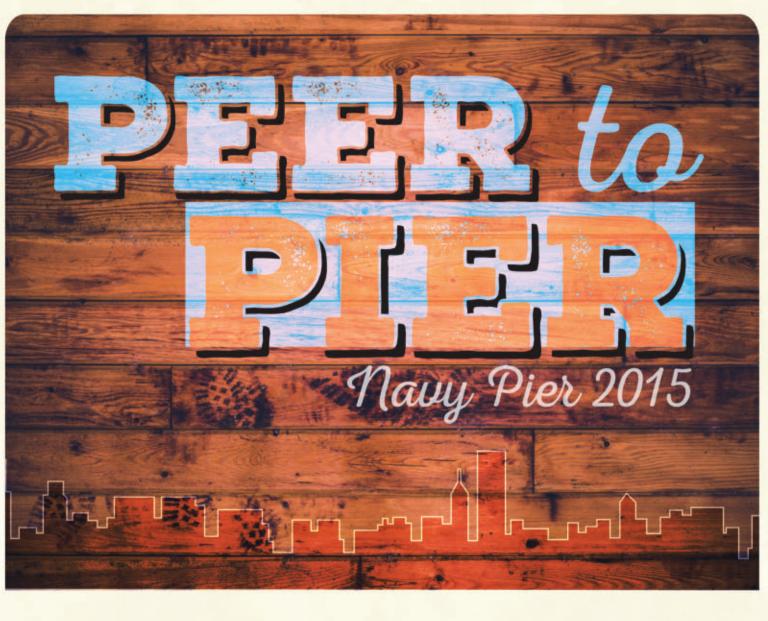
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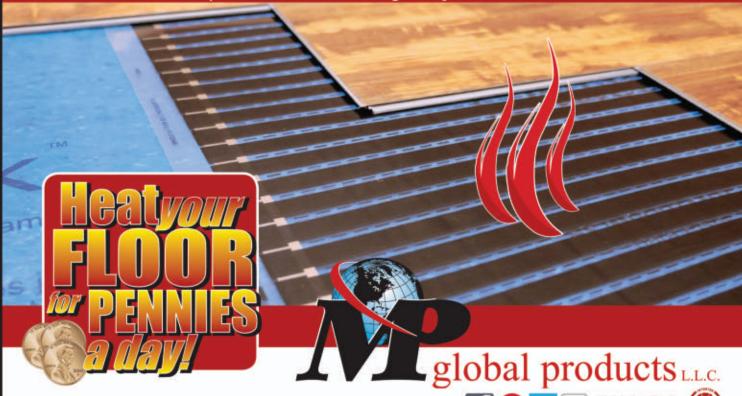


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# WHAT'S THAT SOUND?

vibrational noise and further reduces the sound transmitted through the walls.

#### **CEILING SYSTEM**

The Kinetics ICW wood-frame ceiling hangers secure to wood-frame construction (e.g., joists, trusses), and have a one-inch deflection spring in series with a neoprene cup to resiliently support one or more layers of gypsum board. The bracket design allows the isolator to be installed on the joists to optimize ceiling height.

A channel clip and threaded leveling-rod assembly are designed to carry a single piece of 1-1/2-by-1/2-in. 16-gauge steel carrying channel. Drywall furring channel is then attached to the carrying channel 16 inches on center to take the place of ceiling board strapping.

The end result is a ceiling that is isolated from the house frame, providing vibration isolation. On this installation several factors necessitated us to install the brackets and run our carrying channel perpendicular to the joists. Either direction will work with this ceiling system.

According to the manufacturer, the ICW ceiling with two layers of drywall plus 3-1/2-in. fiberglass batt allows a maximum natural



The ICW hangers can be installed 48 inches apart

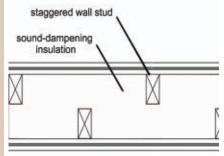


Resilient channel is then installed over the carrying channel.

#### FRAMING WALLS FOR NOISE CONTROL

The walls and doors of our project house were already framed, but if I had my way I would have followed the "old school" method of soundproofing and constructed a staggered stud wall at the staircase and bathroom wall of this room. Staggered walls are basically two walls built very close together. Drywall is only attached to the outward-facing





side of each set of studs, and high-performance soundproofing insulation is used to fill the void between them. This is more economical than actually building two walls, and achieves similar performance in a narrower profile.

frequency of 4.4 Hz under lightest typical load conditions. The reason for the 3-1/2 inch insulation is to create an air cavity. The air cavity helps increase sound isolation.

The ICW hangers can be installed 48 inches apart and no more than 16 inches from the perimeters of the room.

Screw the resilient channel into the 16-gauge steel, overlapping the ends to join separate segments.



A band saw can be used to cut resilient channel to length without distorting its shape.

One or more layers of drywall can be hung from the furring channels using common construction practices.

#### **WALL SYSTEM**

For soundproofing the walls, the IsoMax clips are designed to

carry a resilient furring channel, commonly referred to as "Hat Track," with one or more layers of drywall attached.

The installation of the IsoMax Sound Isolation Clips is easy and requires two screws each. They can be spaced a maximum of 48



# WHAT'S THAT SOUND?



inches and the furring channels spaced 24 inches apart. The top row should be maximum 6 inches to the center of the channel from the ceiling and the bottom row maximum 3 inches to the center of the channel from the floor.

When using this system on walls, make sure the first layer of drywall

seams align over the center-line of the horizontal furring channels.

All potential sound leaks—gaps around outlets, window, or door-frames; pipe penetrations and the like—should be sealed with a non-hardening acoustical sealant or resilient putty.

On the walls, the resilient channels were held in place by isolation clips.

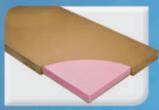
#### **DOORS AND VENTS**

Doors, lights and HVAC vents are other ways sound will find its way in or out of your room and should be considered part of your plan. There are commercially available products for treating all three, such as insulated ducts, dead vents, special caulking, weather-stripped and insulated doors, air-lock double doors and recessed light backer boxes.

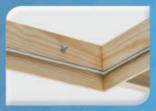
On this project the doors were the weak link; there were no soundproofing measures applied to them. The architect, however, designed these doors with an outer foyer that also had doors. If the homeowner truly wants



# PINIACLE PINISHED PIN



Insulated door with R-10



Weather stripping seal

The new PINNACLE SERIES
ATTIC LADDER features
a R-10 extruded foam
insulated door and a durable
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ALSO FEATURING: Advanced cylinder design; slip-resistant crosstread steps, ergonomic T-handle; adjustable shoes; a wider clearance for easy access.

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# WHAT'S THAT SOUND?

soundproofing they will need to close both sets of doors and add weather-stripping and sweeps.

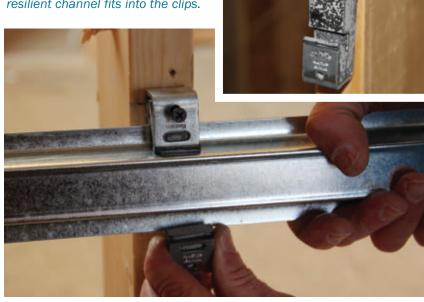
#### IMPROVEMENT "SOUNDS" LIKE A PLAN

Soundproofing products often come with a Sound Transmission Class (STC) rating. STC is a measure of how many decibels of sound reduction a product provides. The higher the STC rating, the better. A change of just 10 STC will result in a massive improvement.

Whatever you decide, attack noise using all four principles to reduce the transmission from inside and outside your home. After limiting or eliminating noise makers, utilize sound-absorbing materials and decoupling systems to lessen the effect of noise. **EHT** 

Align the IsoMax in a level layout along the wall and screw them to the face of the studs.

The hat-shaped profile of the resilient channel fits into the clips.









Join separate lengths of channel with sheet metal screws.

Continue covering the wall with resilient channels spaced 16 inches on center. Gypsum wallboard will be installed over the resilient channel to reduce vibration between the drywall and the wall framing.





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Dynamite caulks are known for superior performance, gunability and paintability. Now they are known by their family name, **Gardner®**. Look for Gardner® caulks at your favorite paint supply store. Same great Dynamite product on the inside, Gardner® on the outside.



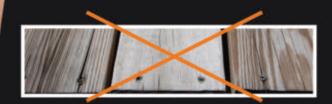
Visit **gardner-gibson.com** for more about Gardner caulks, sealants and other quality products.



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Say goodbye to cracking, ugly boards and splinters by installing your deck screws on the edge. This innovative system delivers a fastener free surface that's easy to install, affordable and beautiful.

LE SCREWS



# P





#### **MARKSMAN PRO-X1**

- For use with treated, cedar or hardwood
- · Automatic 1/16" spacing
- · Dual screw guides



#### **MARKSMAN PRO**

- · For use with composite / PVC
- · Automatic 3/16" spacing
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#### MARKSMAN PRO-NB

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with treated or cedar | Attaches to any drill

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# REMODELING SHOW/DECK EXPOPREVIEW

ach year the *EHT* staff attends the Remodeling Show/Deck Expo to learn about the latest design trends and tool technology available to the home-improvement industry. We're heading to Chicago, Illinois, this September 30-October 2, and here's a sneak peek at some of the exhibits that will be on display.

## DUXXBAK WATER SHEDDING DECKING

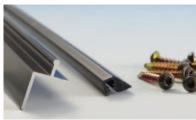
DuxxBak water-shedding decking by Green Bay Decking is designed for raised decks and offers everything that you expect in a deck and more. The simple but effective interlocking installation method creates its own hidden fastener system that is secured with trim-head screws. The system's ability to shed water from the edge of the deck results

in a protected outdoor activity area beneath the deck that can be enjoyed even during times of rainy weather. There is no need for an underdeck drainage system as the decking forms its own watershedding system. The decking's unique brushed finish provides a surface that has the look and feel of quarter-sawn lumber with natural color variation in the grain that looks like real wood. Superior color retention, strength and durability combine to ensure many years of outdoor enjoyment. Available in six colors, DuxxBak is ideal for use over walkout basements or for second-story decks. This makes your deck only the beginning, as an additional outdoor living area can be created under any raised DuxxBak deck. Visit GreenBayDecking.com or booth 2519.

#### **SCREENEZE**

Installing screen panels just got easier for do-it-yourselfers, thanks to ScreenEZE. This innovative cap system works great for installing fiberglass or specialty screen, and it's available in two styles. The Base Channel Kit includes a standard extruded channel for straight, flat applications. The Flat Bar Kit is designed for arched openings or other custom openings. ScreenEZE can be used for screen panels as large as 10-by-15 feet, and it is





easy to cut with a 10-inch miter saw to create the right size sections for your application. The company's latest product allows you to install large panels without mitering the corners. It is available for both corner and flush mount installations, saving you time, labor and money. Visit screeneze.com or stop by booth 228 to check it out.





**DECK** 



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Every job can be transformed into something spectacular. However, only the stunning appearance of TimberTech's Earthwood Evolutions Legacy® Collection can turn a client into a really happy client. With a variety of colors to choose from, and the beautiful look of artisan hand-scraped hardwood with the low-maintenance ease of a quality capped composite, there really is an option for everyone. To see how our complete line of innovative decking, railing, lighting and fastening products can help you transform your business, visit www.timbertech.com/for-pros

DECKING | RAILING | LIGHTING | FASTENING

## REMODELING SHOW/DECK EXPO PREVIEW

#### **WINBAG**

The WinBag is truly a new kind of tool. It may look like a doctor's instrument for checking blood pressure, but it's actually a powerful hand-operated inflatable air cushion made of fiber-reinforced material. It is designed to provide a maximum pressure of up to 220 lbs. and can be used to replace shims and wedges in a wide variety of applications. It gives the user infinite adjusting possibilities



when installing windows, positioning heavy doors, leveling furniture, kitchen cabinets and household appliances. Simply slip in the deflated WinBag into position, then pump the bladder to blow up the cushion and move the object that is pressed against it. Visit www.winbagusa.com or booth 1632.

# SPLITSTOP HIGH PERFORMANCE SCREWS

Titan Metal Werks offers the SplitStop High Performance Screws. Titan's patented wood screw design eliminates splits and the need to pre-drill, even in dense hardwoods like ipe. It also diminishes drive-torque, resulting in less screw breakage, reduced user fatigue and longer cordless-drill battery life. Similar patent-pending features enhance the performance of the non-mush-rooming Titan III man-made decking screws, making them excellent



for use in dense composite or capped-stock-cellular deck boards. SplitStop TIII screws are available in three sizes and five ACQ-rated colors: Cedar, Grey, Hickory, Redwood, Dark Brown and Stainless, too. Collated TIII screws are also available. Titan also offers the DeckEase Hidden Deck Fasteners for the concealed fastener appearance that has become so popular among homeowners. Visit www.splitstop.com or booth 2507.

#### **C80 VERTICABLE RAILING**

Digger Specialties, Inc., also known as DSI, is a manufacturer of low-maintenance vinyl and aluminum railing and fencing systems. The company has released the latest line of Westbury Aluminum Railing—the C80 VertiCable. New to the industry, the 1/8-in. vertical 316 SS cables offer virtually unobstructed views, accompanied by 9/16-in. round balusters for durability. Cable tensioners are gone, and no unsightly fasteners are required. The VertiCable sections are factory-assembled and shipped on pallets ready for quick installation. Level sections are offered in 3-in. and 42-in. heights, including 4-, 5-, 6- and 8-ft. lengths. The full line of Westbury "C" Series standard posts, crossover posts, caps, flairs, and time-saving brackets complement C80 VertiCable. All 12 standard AAMA 2604/PCI A2 architectural-grade colors are offered with VertiCable. Visit www.diggerspecialties.com or booth 1125.







### STABILIZED TREATED WOOD

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- ✓ Reduces CRACKING and CHECKING by up to 50%
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#### SURE DRIVE DECK FASTENERS

Sure Drive USA manufacturers a wide variety of deck-fastening solutions. The hidden deck fastener line includes the Mantis Clip for grooved boards, a favorite with decking contractors and DIY homeowners that's been voted the easiest hidden deck fastener to install. The Eliminator RCS with Slide attachment is a pneumatic

MANTIS

installation tool for installing the Mantis Clips using pneumatically driven screws to fasten grooved decking up to 70 percent faster than conventional methods.

The Hidden Link for solid-edge decking is available in two varieties. One offers 1/8-in. deck board spacing while the other provides a 1/4-in. spacing. The Hidden Link has been approved

and recommended by several leading decking manufacturers.

Sure Drive USA has also just introduced a new Fascia Board fastener that requires no predrilling. Multiple colors are available to match most decking projects. Stop by booth 2125 right next the Deck Clinic or visit www.suredrive.com.

#### **MAZE NAILS**

Maze Genuine Double Hot-dipped galvanized ring-shank coil roofing nails are 100-percent made in the USA. The nails are also approved by Miami-Dade County to withstand the strong winds associated with hurricanes. Both plastic- and wire-collated 15-deg. nails are designed to fit a wide range of roofing nailers, including Bostitch, Hitachi, Senco, Max, Fasco, Porter-Cable and more. Visit www.mazenails.com or Booth 1229.



#### SKILSAW 10-1/4" WORM-DRIVE SAW

The new Skilsaw 10-1/4-in. worm-drive saw (SPT70WM-22) offers the same powerful performance and hardworking character that has made worm-drives a jobsite standard. Dubbed "Sawsquatch", this is the only 10-1/4-in. worm drive saw designed to cut 4-by material smoothly and cleanly in one pass. From fence posts to framing to ripping or cross-cutting, the new 10-1/4-in. version will get the job done with fewer and faster cuts. The new model has the largest Dual-Field

motor, which uses a unique copper winding pattern resulting in increased surface area that keeps the motor cooler. A cooler motor increases the durability of the saw. Its magnesium components decrease the weight while increasing durability, and the well-balanced design makes it easy to handle. The saw includes a Freud Diablo 40T carbide blade and the Stay True Guarantee, in which pro users have 180 days to test out the saw and receive a full refund if not satisfied. Visit www.skiltools.com or booth 2001.



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## REMODELING SHOW/DECK EXPO PREVIEW

#### **GRK FASTENERS**

GRK Fasteners designs its product line for speed, quality and confidence. In terms of speed, the GRK Zip-Tip and W-Cut threads are specifically designed to bite instantly with less torque for effortless fastening and no predrilling. This allows for almost

twice as many driven screws per battery life, especially with larger diameter screws. Ouality products eliminate wasted time, and GRK's recessed stardrive screws prevent stripping when used with GRK bits, GRK Fasteners also provide contractors confidence, with screws that have been evaluated for structural values in compliance with

tions, and Climatek-coated screws are approved for use in treated lumber. At this year's Remodeling and Deck Expo, GRK Fasteners

IBC and IRC specifica-

highlights new White Cabinet Screws for new and remodeled kitchens. The screws have a durable white coating that blends in with white cabinets, allowing them to hide in plain sight. They can also be used for other interior applications such as closet and shelving systems. Visit grkfasteners.com or booth 2321.

#### **NYLODECK**

Lightweight and easy-to-use, NyloDeck contains no wood or PVC, giving it strength and durability superior to that of other decking composites. Made using 100 percent recycled carpet fiber, NyloDeck is impervious to moisture, mold, mildew and termites, making it the ideal decking product. A builder's dream, the product spans up to 24 inches O.C. and is available in lengths up to 24 feet. Its patented three-dimensional embossing process creates a beautiful and unique finish to each of the available six colors. Visit www.nylodeck.com or booth 1511.



## TYTAN PROFESSIONAL SEALANTS & ADHESIVES

Selena USA offers Tytan Professional foam, sealant and adhesive products for a wide variety of building and remodeling



applications. The line includes traditional sealants and adhesives and polyurethane foam sealants and adhesives featuring Smart Foam Technology. A new line of Tytan High Yield Adhesives feature specially formulated collapsing gel (for horizontal applications) or semi-collapsing gel (for vertical applications) adhesive technology for high-performance air and moisture sealing. The Tytan Professional products save time

and money while creating more energy-efficient residential and commercial buildings. Visit tytan.com or booth 426.

#### **TOUCH 'N FOAM**

Convenience Products manufactures premium polyurethane spray foam insulation, sealants and foam adhesives under the Touch 'n Foam brand. These products expand to fill gaps, creating a barrier against the loss of heated (or cooled) air and are great for blocking moisture, dust, sound and insects. For more coverage and precision for pros, try the allpurpose foam sealant, a low-pressure formula for window and doors, and landscaping foam for exterior projects. Also available are portable and disposable lowpressure spray foam kits for larger



## REMODELING SHOW/DECK EXPO PREVIEW



air sealing/insulating projects. Use three sizes to air-seal touchups to rim joists, wall cavities and crawl-spaces. It dries in 60 seconds to reduce energy loss. The company's all-weather gel-foam construction adhesives yield 10 times the coverage of caulk adhesives for use with drywall, wood assemblies and glued floor systems. Visit touch-n-foam.com or booth 329.

#### WOLMANIZED OUTDOOR WOOD

Now with BARamine, Wolmanized Residential Outdoor Wood is real wood with all of the appearance, environmental and construction benefits of real wood. It's backed by a limited warranty, the Good Housekeeping Seal, is certified by the NAHB Home Innovation Research Lab, and has recieved the Ecospecifier Global **Environmental Verified Product** certification. BARamine is an ingredient added to Wolmanized wood treatment. This new highpowered copper azole improves protection against common fungi, resists certain aggressive coppertolerant fungi, and penetrates better for added protection. Visit wolmanized.com or booth 2405.

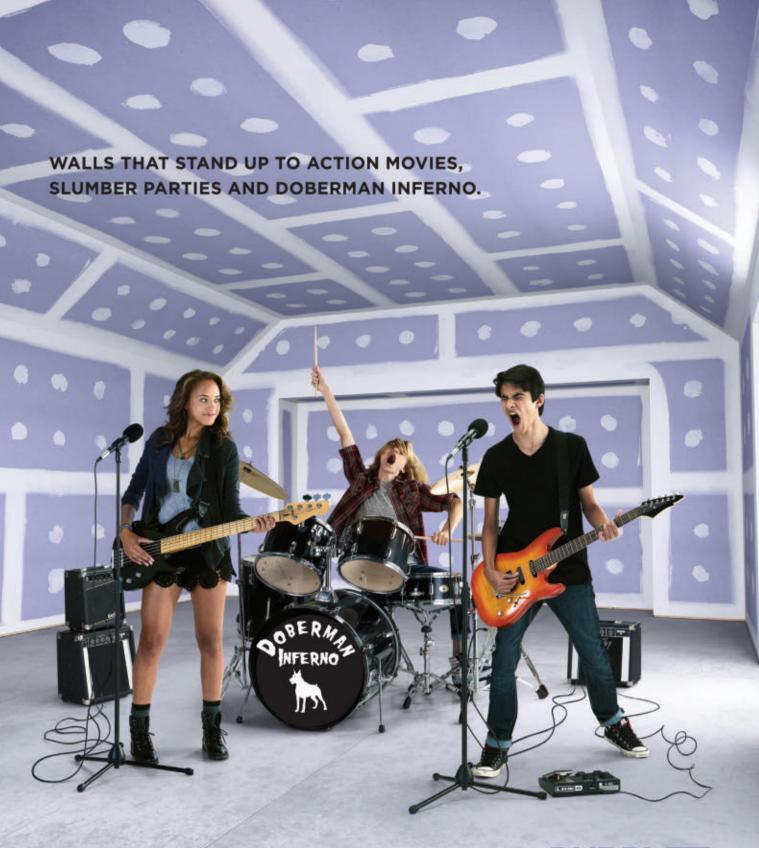


#### MURO AUTO FEED SCREW-DRIVING TECHNOLOGY

Muro, the originators of Auto Feed screw-driving technology, have been building tools and collating screws for 25 years. Muro tools professionally drive collated screws in lengths from 3/4 to 4 inches long and have been designed to simplify most fastening applications while also improving job quality. Users work while standing up, so there's no



bending required. Enjoy the benefits of the adjustable T-handle by setting it to your optimal height and driving screws in a fraction of the time. Many contractors still believe that fastening Brazilian hardwoods, like Ipe & Green Heart, without pre-drilling is simply not possible, but Muro's patented Ejector Screws have been completing these decking jobs for years. For a test drive, stop by booth 1332 or visit muro.com.



PURPLE® drywall products like SoundBreak® XP® are specially designed to keep the concert contained and the noise level at a minimum. Whether it's a man cave, home theater or a place for the band to jam, go ahead and crank it up to eleven. PURPLE walls are ready for life.



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## REMODELING SHOW/DECK EXPO PREVIEW



## TIMBERTECH IN ASHWOOD COLOR

TimberTech offers a new, warm gray color called Ashwood for its Legacy Collection of deck boards. The subtle, earthy and aged look of Ashwood mimics the look of hand-hewn lumber with a richness that makes it nearly indistinguishable from tropical hardwoods. New Ashwood joins the ageless options of Mocha, Pecan, and Tigerwood. The Legacy Collection is the only line of capped composite decking to offer a handscraped interior flooring look for outdoor living spaces. The Legacy Collection delivers strong aesthetics, along with scratch, stain and fade resistance, and the product line is backed by a 25-year fade and stain warranty. Visit www.timbertech.com or booth 1411.

#### NATIONAL GYPSUM PURPLE PRODUCTS

No matter how careful you are, an active family can take its toll on the interior of a house, especially on the walls. Depending on the season, your family may come home toting cross-country skis, throw off wet raincoats, or bang football gear against the wall. The average buyer stays in a home for 13 years, which is long enough for kids, pets and the rough-and-tumble of everyday life to scuff, scratch and dent even the best of walls. National Gypsum's Purple high-performance products provide





unparalleled resistance to moisture, mold, mildew, scratches and dents, and can even reduce the noise heard between rooms. The Purple family of products includes XP, Hi-Abuse XP, Hi-Impact XP, SoundBreak XP drywall products, select ProForm drywall finishing

products and PermaBase cementboard products. These products are all made in the USA, naturally fire-resistant, GreenGuard-certified for indoor air quality, and are as easy to install and finish as standard drywall. Visit AskForPurple.com or booth 713.

#### **NAILBOSS**

Celebrating more than 150 years of quality manufacturing, Mayhew Tools will exhibit the NailBoss deconstruction tool for all restoration and recycling projects. It makes quick, safe work of removing nails, screws or staples up to 1/4 inch in diameter while minimizing damage to the wood. Lightweight,

powerful and easy to use, the NailBoss is ideal for professionals and DIY'ers alike, and is available in pneumatic and handheld versions. Visit mayhew.com or booth 2129.

# FASTER, THINNER FLOOR-WARMING INSTALLATION

Floor warming systems have become a popular way to make tiled floors even more desirable. The frequent fluctuations in temperature, however, create greater movement stresses in the floor



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Broadcast Spreader System
with interchangeable material
application trays. Includes the
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and increase the need for an effective uncoupling system. Most existing installation methods require two separate systems—a floor-warming system and an uncoupling system. DITRA-Heat

is the first electric floor-warming system that directly incorporates essential uncoupling technology to provide heated floors that are not susceptible to cracking. The heating cables easily snap into place

on top of the uncoupling mat with no clips or fasteners. The installer has complete flexibility on where the cables are placed so every installation is customized to suit the exact requirements of the room. Because they are held securely within the DITRA-Heat mat, there is no need to use self-leveling compounds to encapsulate the heating cables. Once the cables are in place, the floor is ready for tiling. The end result is a faster, flatter, thinner installation. The system is available in 120V and 240V versions with a programmable or non-programmable digital thermostat. Visit www.schluter.com or booth 701.

**EHT** 

#### 10 REASONS TO CHOOSE REAL WOOD DECKING

Most of us enjoy the glories of outdoor living: grilling in the backyard, playing football in the early evenings, taking walks along the water and simply enjoying the beauty of nature all around you. Backyard fun is the base upon which many memories are built. It's been said that the heart of a backyard is a good, solid deck. Viance, maker of Ecolife Stabilized Weather-Resistant Wood, offers 10 reasons why that backyard heart should be built with beautiful, genuine pressure-treated wood.

#### 1. RENEWABILITY.

Wood is a naturally renewable building product. In maintaining managed forests, the forest industry plants more trees than are harvested each year. This means that wood, as a renewable resource, will be around for generation after generation.

#### 2. TRUE GREEN.

The USDA recently recognized wood as a true "green" material in green building design, because of its environmental benefits. Ecolife Stabilized Weather-Resistant Wood was also the first decking product of any kind to receive Green Certified Product recognition by the NAHB Home Innovation Research Labs as a NGBS Green Certified Product for Resource Efficiency.

#### 3. BEAUTY.

Many composite decking products have embossed surfaces to "look" like real wood. But guess what? It's not real wood. There's only one product that offers those pretty whirls, grains and knots—real wood. Whether it be stained, painted or left natural, the beauty of real wood is hard to mimic.

#### 4. APPEARANCE.

Composite decking may fade and scratch. Treated wood on the other hand, can be refinished and look new again. Wood decking can regain its original look with effective refinishing—even after years of frequent use—provided there is the right attention to detail and care.

(continued on next page)





#### 10 REASONS TO CHOOSE REAL WOOD DECKING

#### 5. EASY TO USE.

Treated wood requires no special tools, no special skills or special safety requirements. It's also easy to cut and easy to install—can't get much simpler than that. Replacing surface-mounted deck boards is easy, compared to replacing interlocked pieces or deck boards with hidden fastener systems. If one of those boards needs replacing; you may have to remove many. Additionally, wood decking can span longer spaces than composites, and if you're going to resurface your deck, check to make sure you don't need to spend more and install additional joists to support composite decking.

#### 6. AFFORDABLE.

Composite decking will cost three to five times more than treated wood decking. *Remodeling* magazine's annual Cost vs. Value report for projects states that wood decking retains more value than composite decking, and a leading consumer product evaluation report lists wood decking as a best buy.

#### 7. EARTH FRIENDLY.

Most composite decking products use finite resources—oil, gas, petroleum—in their production cycles, and when these elements are gone, they're gone. Trees, however, are planted and grow every year, creating healthier forests than we had 100 years ago. So which product is better for the environment?



#### 8. PERFORMANCE.

Simple maintenance is all that's required to preserve treated wood, but also note that all treated wood is not the same. Ecolife Stabilized Weather-Resistant Wood is an innovative wood-stabilizing preservative system that protects the natural beauty of above-ground exterior wood from the harmful effects of weathering, termite attack and decay. Ecolife's built-in water repellency is pressure-treated throughout the wood, making the structural framing of every deck or wooden deck surface more stable. Ecolife has up to 50 percent less surface cracking and checking as compared to ordinary treated wood.

#### 9. EASILY PAINTED OR STAINED.

Whether you like it natural, a little bit darker or even barn-red, your wood decking will hold a good quality water- or oil-based stain for years. With the multitude of beautiful stain options available for wood decking you can choose the best color to match your outdoor decorating theme. Ideally a good penetrating stain designed for outdoor wood is best for foot traffic vs. film or paint products that can wear off much quicker from decking surfaces.

#### 10. THE NATURAL CHOICE.

Did you ever walk barefoot onto a paved driveway or plastic surface in the hot summer sun? Wood decking has a much more natural and cooler feel than other decking options. Your backyard probably includes beautiful green grass, perhaps a few trees, flowers, plants—everything natural. A wood deck is a complement to these components, and can be a natural accent piece to an environment of hardscapes. Go real, go wood, and don't burn your feet.

For more information about treated wood, visit www.treatedwood.com or stop by booth 1928.



## Sometimes it's what you don't see That makes a deck beautiful.



Performance,
Durability,
Easy to Install,
Versatility . . .
A Strong and Secure
Concealed Deck
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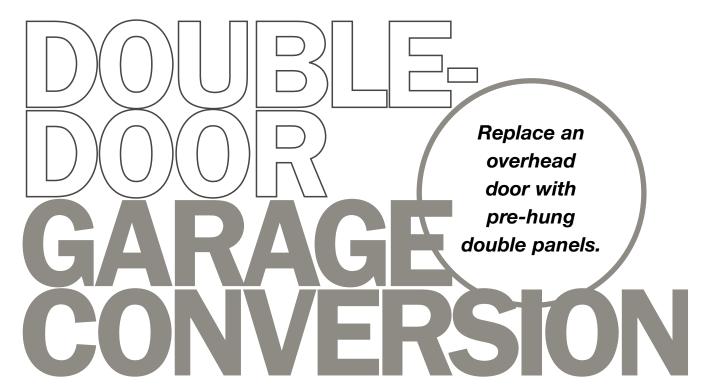












#### **By Matt Weber**

o increase the finished living space in a split-level home, we removed a garage door and replaced it with a double door to remodel the interior into a family room. This insulated fiberglass door was smaller than the garage door opening, which required us to frame the new opening. Replacing a door usually presents the challenge of installing the door snugly and securely into the existing rough opening. In this case, however, we built the rough opening to fit the door. Here's how we tackled the project.

#### NON-LOAD-BEARING FRAMING

It's important to note that we framed this door as a nonload-bearing wall. Most exterior doors require a load-bearing header installed directly above the jamb. Headers are structural framing members made from doubled 2x lumber that bridge the rough opening of a door or window to distribute the overhead weight that would otherwise fall on the missing studs. The size of the header depends on the span of the opening and whether or not it is a load-bearing wall.



First step is to remove the door-opener mechanism, including the chain, tracks and motor.

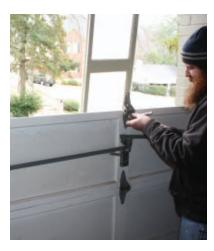
In this case, we removed the existing garage door, which had already been constructed with a substantial header, and left the structural framing in place to carry the load. We then constructed a secondary wall just inside the framed opening to house the new double door. Because the existing header satisfied the loadbearing requirements, the secondary wall serves only to define the rough opening, enclose the sides of the door, and provide a nailing surface for wallboard and sheathing. Since the new, secondary header was not a load-bearing component, we built it with doubled 2x4 lumber.

## DETERMINING PLACEMENT

First step was to take a few measurements to center the double door in the opening. We calculated the proximity of the new wall to the existing frame by accounting for the thickness of the sheathing that would be installed between them. We then snapped a chalk line on the floor to guide placement of the door jamb and new wall.

To disassemble a garage door, unscrew the individual panels one at a time, working from the top downward.

At least two people are required to move a double door. Placing the pre-hung door and jamb into the opening, however, enabled us





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#### DOUBLE DOOR GARAGE CONVERSION

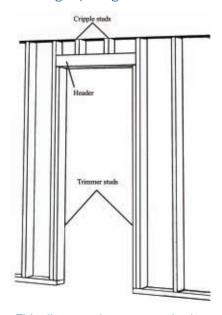
to easily make accurate measurements and layout marks to build the surrounding frame.

Sometimes when installing a replacement door the jamb is a little too small for the opening,

requiring shims or trim-boards for adjustment. When framing around a door, though, you can construct the frame with as tight a surround as you want—just leave enough fudge room to allow maneuvering the door into the rough opening. Building around the door also enables you to eliminate the out-of-square framing errors associated with the house settling (or poor carpentry). Always make sure to build the rough opening plumb, square and true for doors and windows, ensuring no studs are bowed.



For this project we were able to position the new door and build the rough opening around it.



This diagram shows a standard door frame. Because of the garage door's existing header, the new, secondary door frame was a nonload-bearing wall so we built the header from doubled 2x4. For a load-bearing wall, the header would need to be larger and supported by trimmer studs.





Anchor the wall's sill plate to the slab with concrete screws.



Cut the top plate to span the opening and allow studs spaced on both sides of the door. The top plate is fastened to the ceiling joists.

#### **BUILDING THE FRAME**

We constructed the wall with a typical sill plate, bottom plate, and studs spaced 16 inches on center. We anchored the sill and installed a top plate with two studs on each side of the door. We then removed the door and set it aside while we continued construction of the wall.

Installing sheets of rigid foam insulation with a moisture barrier helps to weather-proof the building envelope of the new frame. We nailed the foam sheets over the face of the frame and cut it to fit. Apply flashing tape to seal the edges of the rigid foam to the surrounding frame. Use a sill plan to

ensure moisture protection at the bottom of the door jamb.

#### **INSTALLATION**

We applied beads of sealant along the bottom of the opening,

including the seams at the lower corners, and inserted the pre-hung door frame from the outside of the house. Don't slide the door in place, however, which messes up the sealant beads. It's best to tilt



#### DOUBLE DOOR GARAGE CONVERSION

it into position and then make adjustments.

Refer to the manufacturer's instructions for specific steps to install your door, because methods may vary among models. In general you should center the jamb in the door frame, then drive one 10d finish nail or 3inch screw through the midpoint of each hinge jamb into the framing studs. The nails or screws are used to hold the door in place while you plumb and square the jamb, using shims if necessary. Place the shims at the hinge locations between the jamb and the studs. Use shims in other locations as needed to square the opening. Check for square by measuring the diagonals of the jamb in an X pattern (corner to corner) to confirm they match.



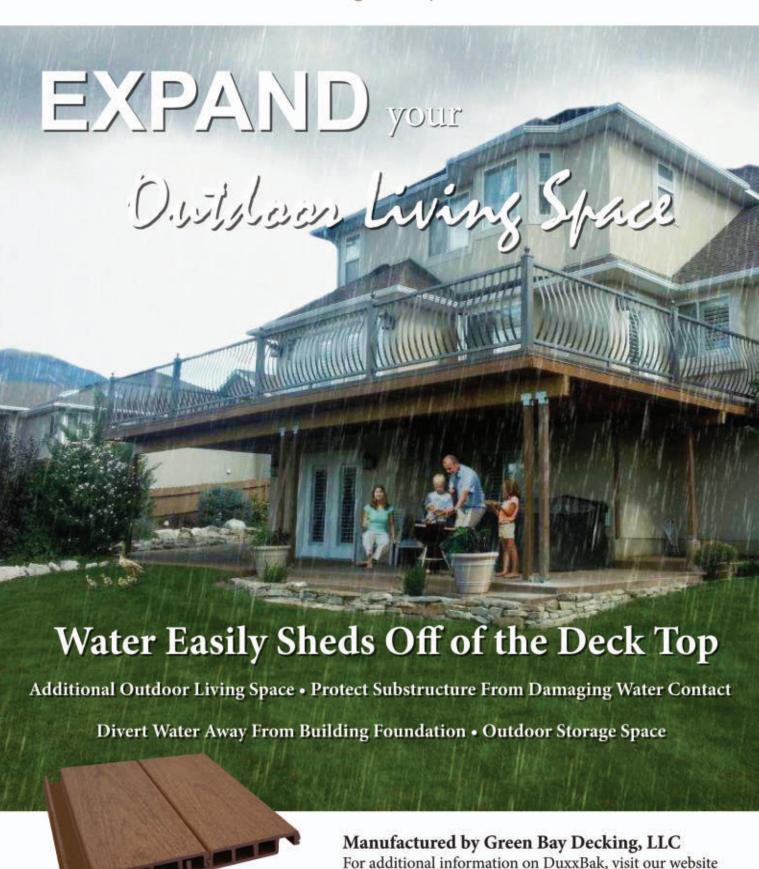
Install studs cut to fit between the sill and top plate, framing the sides of the rough opening.



Make sure the studs are installed square, plumb and true and that the boards are straight and not bowed.







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#### DOUBLE DOOR GARAGE CONVERSION

On double doors, it's important to make sure the door panels are even across the top and bottom and that the reveal between them is even.

Pre-hung doors often include long screws that insert into the open holes of the door's hinge(s) once the door is in final position. When driving the screws, make



Toe-nail the studs in place at the top and bottom.



We installed the nonstructural 4x4 header.



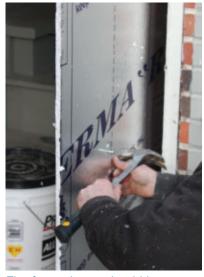
Rigid foam sheets helps to insulate the wall.

sure not to bow the sides of the door jamb.

After checking to make sure the door opens and closes properly, continue fastening the jamb to the frame with 10d finish nails or predrilled 3-inch screws.

#### **FINISHING TOUCHES**

As with any new door installation, the edges and air gaps should be insulated and sealed with spray foam and caulk.



The foam sheets should be nailed to the wall studs.



Use a utility knife to cut the foam sheet to fit the wall.

Pro Tip: Insert a foam backer rod around the brick-mold of the door as deep as it will go to provide at least 3/8-inch clearance from the surrounding siding. Caulk over the backer rod with a bead of quality exterior-grade sealant, and tool the caulk bead smooth. This method creates a flexible



Apply adhesive sealant to the bottom of the rough opening.

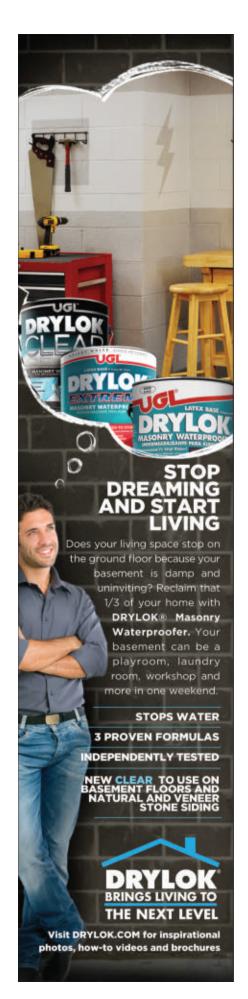


Refer to the manufacturer's instructions for specific steps to install your door. They often come with long hinge screws that are driven through the hinge locations of the jamb, through shims and into the stud framing. Make sure not to bow the sides of the door frame.



Confirm the door functions properly before installing additional fasteners to hold the jamb in place.





#### DOUBLE DOOR GARAGE CONVERSION

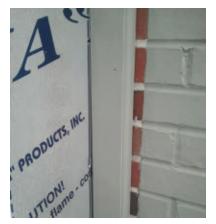
sealant line around the door that is capable of expanding and contracting.

For this project, we finished the exterior wall with cement siding, trim boards and a new coat of

matching paint. Two decorative outdoor wall fixtures wired into the new wall gave the new double doors a finishing touch that greatly added to the curb appeal of the home. **EHT** 



Short cripple studs fit between the header and top plate. Doubled wall studs frame each side of the door jamb. The wall is then insulated with fiberglass batts.



Baseboard trim hides the transition between the new wall and the garage opening.



Make sure each course of cement siding is level and install according to the manufacturer's fastening instructions.

The project was completed with two wall-mounted light fixtures and a matching coat of paint.

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**AFTER** 

## **Preserving Outdoor Wood**



**By Matt Weber** 

hether it's pressure-treated, cedar, cypress, redwood or even a high-end exotic hardwood, the right care and maintenance will protect exterior wood and keep it in good shape for years. Staining and sealing outdoor wood is among the best ways to protect it from the elements.

#### **KNOW YOUR COATINGS**

The most common outdoor wood coating is an exterior-grade

penetrating stain. These water-repellent preservatives include a mildewcide, and some products contain ultraviolet light absorbers that protect from sun exposure. Available in both oil- and water-based formulations, the resins penetrate wood pores to provide pigment and block out the damaging effect of weather while allowing the natural woodgrain and texture to shine through.

The second category is a filmforming sealant that bonds to the Staining and sealing outdoor wood is among the best ways to protect it from the elements.

surface of the wood like paint or shellac. These products provide a high-gloss furniture look, while still allowing the natural grain to show through. Available in oil- or water-based finishes, they form a durable beautiful, satin surface, but they can only be maintained with another coat of film-forming sealant. Pigments are added to change the wood color and add UV protection. Film-forming sealants should be avoided in areas exposed to foot traffic. because the abrasion can wear through the film coating.

Outdoor wood coatings are typically formulated with either water or oil. Most water-based stain/sealants have tiny particles of pigment and resin that adhere to each other very tightly as the finish dries, similar to a patchwork quilt. With oil-based finishes, the tiny particles actually fuse together chemically into one large sheetlike substance, which achieves a harder finish and is less likely to develop an amber color tone. Examine the product's label for clues to the coating's quality, looking for any reference to "nonyellowing" properties.

Water-based finishes are generally heralded for their ease of use. Compared to oil-based formulas, they're easier to clean up, have a lower odor and are often less expensive. However, most water-based coatings require more coats and still don't last as long as their oil-based or "alkyd" counterparts,



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#### **PROJECT NEXT**

which generally provide more longterm, wood-preserving durability.

#### **NEW WOOD**

Allow new pressure-treated wood to dry before staining or sealing. The treatment of lumber with waterborne preservatives leaves moisture in the wood. This is why fresh PT lumber often arrives wet from the supplier, and the moisture can impede



Film-forming stain/sealers create a smooth, glossy finish that allows the wood grain to show

through.

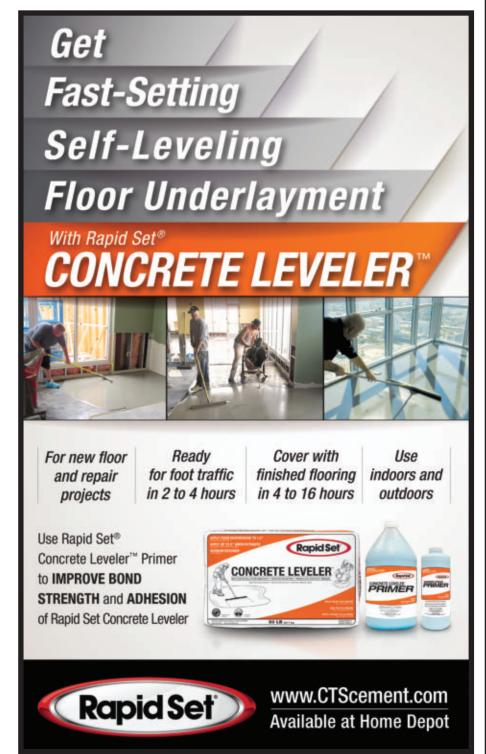
the penetration of stains and paints. For best performance of paint and stain coatings, allow the treated wood to dry for 2 to 4 weeks prior to application. Estimating exactly how long treated wood will take to dry is difficult, and a lot depends on how much time has elapsed since the treatment, the lumber's exposure to the sun, ambient weather, etc.

Wood with natural preservatives, such as Western Red Cedar, cypress and redwood, do not require as much drying time because the wood was never pressure-treated with a preservative.

Contrary to popular belief, new wood still needs to be cleaned to remove any "mill scale", which is a compression of the grain during the milling process that can cause the stain to float or run off without absorption. Clean the surface with an oxygenated bleach.

#### **WEATHERED WOOD**

When wood is exposed to the sunlight the ultraviolet rays can damage the wood fibers over time, causing the surface to turn



gray. The most direct way to renew the appearance is to sand or pressure-wash the surface. However, sanding can be very difficult and time-consuming, and pressurewashing can remove the gray but cause the surface to fuzz or splinter, posing a "touch" hazard for areas such as deck surfaces where people may walk barefoot. When using a power-washer, limit your pressure to no more than 1,000 or 1,200 PSI.

Some individual board may be heavily weathered. Replace them completely, clean the existing boards, then stain them all to match.

#### **WOOD WITH OLD STAIN**

In general it's best to remove old stain before applying new stain, especially if changing products or colors. Old stain will usual-

ly show through the new stain, leaving blotchy spots in the finish. "Film-forming" stains must be completely removed before applying a penetrating stain. However, if you plan to stick with the same color and type of stain (and your deck is in decent condition) then you can probably get by with a thorough cleaning and a fresh maintenance coat. As always, refer to the manufacturer's recommendations for best practices.

If there is a buildup of old stains on the deck, then you may need to remove it with something stronger than an oxygen bleach cleaner. Stain strippers are more caustic, but they remove most weathered stains in a single application. Small, stubborn spots of stain can then be removed with a hand sander once the deck has dried.

#### RESTORING OUTDOOR WOOD WITH READY SEAL

It's summer time and we know you're ready for that backyard BBQ with all of your friends. The last thing you want is an old, weather-worn deck ruining the fun. With Ready Seal's wood stain and sealant you can spruce up your wood and give it some new life and luster. Using a single product, you can beautify your backyard landscape and protect your deck from all outdoor elements, including the scorching sun rays of summer.

Whereas most wood treatments involve two applications of a stain and protector, Ready Seal offers a beautiful stain and durable seal in one easy step. Ready Seal has created the perfect blend of treatments to provide the best preservation for all outdoor wooden structures. Ready Seal stains penetrate deep into the interior fibers of the wood and create a protective boundary, unlike other stains and sealants that create rigid exterior films that lead to peeling, cracking, chipping and flaking.

The outdoor 2-in-1 product is available in 7 different shades: Natural Cedar, Golden Pine, Light Oak, Pecan, Dark Walnut, Redwood and Mahogany. It may



be used to reclaim and protect your old and worn decks, fences, gazebos, outdoor furniture and any other exterior wood projects. Using a roller, paintbrush, or pump sprayer, Ready Seal is a limitless product that can be used to turn any backyard eye sore into a flawless masterpiece. Learn more at www.readyseal.com.



#### **PROJECT NEXT**

#### CONDITIONING

An often overlooked step for outdoor staining projects is the application of a wood brightener. These chemical agents open the woodgrain to improve penetration of the stain and help restore the appearance of weathered wood to a like-new condition. The product can simply be sprayed onto the wood surface, given a few minutes to work its "magic" and

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Applying the stain/sealer with a brush is the best way to work the product into the wood grain.

then rinsed off, requiring very little labor.

After using any chemical treatment to clean and prepare the wood, use plenty of water to completely remove all traces of the products—and then allow it to dry prior to stain or sealer application.

#### **APPLICATION**

Always thoroughly mix the stain to evenly blend the solids and ensure a consistent color tone throughout the project.

For both horizontal and vertical structures, brushing is the best method for stain/sealer application because the bristles push the product evenly into the woodgrain to increase absorption. Using a sprayer or roller can apply the stain more quickly, but both of these methods leave much of the stain on the surface without adequate penetration into the pores. This superficial product can wear away unevenly, so you should still back-brush it into the woodgrain for the most consistent appearance and best protection. EHT

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## **Big Sound, Better Performance**

Corsa's Subaru exhaust system improves sound and adds power.



**By Larry Walton** 

ention Subaru's STI to auto enthusiasts and the reaction is often the same: "That's a fun car to drive." Iconic rally images of this car tearing up stages in international competitions fuel the imagination of Subie enthusiasts, but owning one is not just a dream for many, because a reasonable price makes the WRX STI one of the best values in a performance car.

The turbo-charged STI features solid low-end torque and plenty of top-end kick with the turbo spooled up. It also has upgraded brakes and good quality suspension right off the showroom floor.

What's missing is that classic "Subaru rumble," because the stock exhaust is a bit too tame. This calls for an aftermarket exhaust to improve performance and to get that classic Subie exhaust note. Enter Corsa's excellent cat-back upgrade for the STI.

#### PERFORMANCE EXHAUST SYSTEM

Every Corsa Performance Exhaust System we've tested has provided a solid blend of performance, great exhaust note under acceleration, and droneless cruising sound. We expect this Subie version to live up to the Corsa standard for sound engineering and quality build.

The numbers this stock STI produced on a dynometer were definitely in line with other stock STIs from this generation tested on the same dyno.

I noticed from the comments
I heard at the garage that the
exhaust arrived in better-thanusual packing materials. Some
exhaust systems are simply thrown
into a box and arrive pretty beat
up. The Corsa system was well
protected, and components were
kept separate in foam.



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#### **EVERYTHING AUTO**

Typical of most cat-back installations, after removing the connection between the catalytic converter and the resonator, the rest of the stock system came off by simply releasing the exhaust hangers. We could then compare the two exhaust systems.

Yes, in this case, bigger is better. Once the stock exhaust was on the shop floor with the new Corsa system, it was easy to see that the difference in pipe diameter was going to mean better exhaust flow.

The Corsa system went on without a problem. Clearances, clamps and hanger positions worked flawlessly, and the tips look great with subtle Corsa logos visible in the right light.

#### **INSTALLATION**



Before doing any wrenching, we strapped the STI on the AWD Dynojet at Garage 808 for some baseline numbers. This is the best way to find out if a performance upgrade produces results. Under these controlled conditions, it's pretty easy to see the numbers, especially for clients viewing the read-outs of the flat screen in 808's comfy dyno observation room.

Removal of the old system was straightforward. After supporting the pipe, my son Tim removed the nuts and bolts at the connection between the catalytic converter and the resonator.

He used this specialty tool to disconnect the exhaust hangers





from the exhaust hanger posts on the stock exhaust, but you can get it done with a screwdriver and some trial-and-error effort.



Tim got an extra set of hands to help support the mufflers as he removed the last exhaust hanger.



You can really see the difference in exhaust size with the stock exhaust up next to the Corsa System.

We had to remove this stock donut-shaped gasket, which did not get used in the Corsa installation.





We found something to support the section behind the resonator before lifting the first section of exhaust.



With the rear end of the resonator section supported, Tim lifted the front end into place while inserting the flange gasket that came with the Corsa kit.



He put the supplied bolts and nuts in the flange connection and hand-tightened them.

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#### **EVERYTHING AUTO**



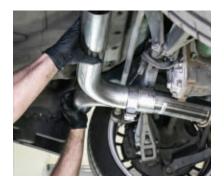
We shot some silicone spray into the hanger holes before installing each section of exhaust.

Tim put the clamp on the axle pipe (aka S-pipe) before sliding it onto the resonator outlet and rolling it up into position to align the hanger components.

We left the clamps somewhat loose to be tightened and torqued to spec after final alignment and clearance checks.







Next on was the Y-pipe with the longer section to the passenger side.

Tim took the rubber exhaust hangers off the car and installed them on the rear muffler assemblies before lifting them into place.

After getting all of the components in place and checking clearances and alignments (including how much exhaust







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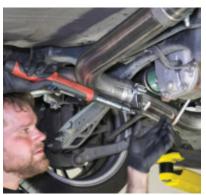






#### **EVERYTHING AUTO**





tip protrudes past the bumper on both sides), we torqued the clamps to spec.

The completed Subaru exhaust system provided enough extra flow to produce 10 more horsepower on the dynometer.

Polished stainless exhaust tips hint at an upgrade that is much more than cosmetic. The owner loves her new exhaust, but she says her fuel economy may suffer for a while as she gets into the throttle to hear that powerful new sound. **EHT** 







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# PRODUCTS

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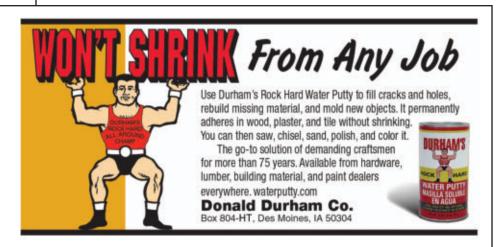
#### **PAINT PIRANHA**

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#### **DEWALT JOBSITE LED SPOTLIGHT**

DeWalt introduces its new 20V MAX Cordless Jobsite LED Spotlight (model DCL043), offering three LED lights and one Red LED light to illuminate dark jobsite work areas. The spotlight is IP54 rated with a water- and dust-resistance seal to help protect it from water or weather damage. The LEDs are encased in an over-molded, non-marking lens cover, and the spotlight features two lumen settings. On the 1,000 light output setting, the spotlight provides maximum brightness for up to 508 yards or 1,525 feet. The 90-lumens red light setting preserves battery life even longer.

The red LED light provides night vision when using the spotlight outside or in dark buildings. The pivoting head pivots 0 to 90 degrees for directing light where it is needed most, and a hanging hook and belt hook allow the spotlight to hang in multiple locations hands-free. Visit www.dewalt.com.





## What are the symptoms of a Blown Head Gasket?

There are some makes or models of cars that have a reputation for blowing head gaskets. One vehicle I owned had such a bad reputation for head gasket problems that there was a group of owners trying to get the manufacturer to have a recall on them. If you happen to own one of these vehicles, don't worry... it does not mean that you have a bad car or that you are going to spend lots of money.

The head gasket forms a seal between the engine block and the cylinder head. This seals both the combustion chamber and the coolant passages in your engine. This means your head gasket has to seal both extremely hot high pressure combustion gases as well as engine coolant which can be anywhere from cold ambient temperatures to the normal operating temperature of your engine. Due to the wide range of temperatures and relatively large surface area, it is not unusual for head gaskets to develop leaks over time.

Since the head gasket seals the coolant passages both from the atmosphere and the combustion chamber, you can't see or get to much of the head gasket on a vehicle. Because much of the gasket can't be seen without disassembling the engine, it can be very difficult to diagnose a head gasket leak. Since a visual inspection usually will not prove a head gasket leak, it is important to know the other symptoms so you can accurately diagnose a head gasket problem.

Blown Head Gasket Symptoms:

- Coolant leaking externally from below the exhaust manifold
- · White smoke from the exhaust pipe
- · Overheating engine
- · Bubbles in the radiator or coolant overflow tank
- · White milky oil
- Significant loss of coolant with no visible leaks

The only externally visible sign of a blown head gasket would be coolant externally leaking from the head gasket. The head gasket will be below or inboard of the exhaust manifold. Most head gasket leaks will be between the combustion chamber and the coolant passage in your engine. On the intake stroke of the cylinder closest to the leak, coolant will be drawn in under the vacuum created along with the intake air charge. Upon combustion, the high pressure will force exhaust gases past the head gasket into the coolant passage. This process will repeat itself for every revolution the engine makes.

As coolant is pulled into the combustion chamber it will cause your engine coolant level to drop. This can cause a low coolant light and overheating if the cooling system on your vehicle is not continually topped off. Also, once your engine is turned off the coolant still left in the engine cylinder will seep past your piston rings into your engine oil. Coolant mixed with oil will make a white milky substance. You may see this on your engine oil dip stick or on a ring around your oil cap.

If your engine is running the small amount of coolant that is in the combustion chamber will turn into steam and white smoke upon combustion. If you are checking your exhaust pipe for signs of white smoke, make sure your vehicle is fully warmed up and idling during a warm part of the day. A cold engine on a cool day will produce a small amount of water vapor which will look like white smoke from your exhaust pipe. If the exhaust has a sweet smell to it then it mostly likely is a head gasket problem.

Lastly, during the combustion process the high pressures in the cylinder can push exhaust gases past the head gasket into the engine cooling system. The exhaust gases will be trapped in the cooling system and will be circulated through your engine and into the radiator. During normal operation your engine's cooling system remains under pressure, so never remove the radiator cap while the engine is operating or still warm. If your vehicle has a coolant overflow tank you can check that for the presence of bubbles. To be certain you can purchase a test kit from your local auto parts store that will chemically check your engine coolant for the presence of exhaust gases.

Usually one of these symptoms by itself is not enough to prove you have a head gasket leak, but if you have multiple symptoms at the same time it is likely that you have a head gasket leak. It is important to drive your vehicle as little as possible if you have a head gasket leak. The hot gases and cold coolant moving through the hole in the gasket can quickly erode or warp the metal head or engine block leaving you with costly machining bills or even having to purchase new heads or a new engine.

To quickly and permanently seal your blown head gasket, go to your local auto parts store and pick up a bottle of BlueDevil Head Gasket Sealer. Installation requires the removal of your vehicles thermostat and a complete cooling system flush but is guaranteed to fix your blown head gasket!

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!



STOP LEAKS PERMANENTLY. MAXIMIZE PERFORMANCE.



# PRODUCTS

#### **CRESCENT FLIP AND GRIP WRENCH MULTITOOL**

Crescent's new Flip and Grip Wrench Multi-Tool consolidates multiple tools into one. The collection of six handy tools includes a ratcheting wrench with an adjustable jaw that fits over 40 fasteners from 3/8- to 5/8-in. capacity. The spring-loaded jaw design ratchets hex, square, eyebolt and wing-nut fasteners quickly without slipping. The ratcheting wrench's collapsible head folds neatly into the handle, allowing for compact storage and pocket portability. The collection of six useful tools also includes a No. 2 Phillips screwdriver and 3/16-in. slotted screwdriver, which means you don't have to carry a set of tools for simple tasks around the house. The Flip and Grip features a knife with both smooth and serrated blade edges. The combination bottle opener, can opener and







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