



Hollow-Wall Anchors

When you're installing a towel bar and solid blocking is just a rumor, this inexpensive hardware will do the trick

BY CHARLES BICKFORD

Let's cut the suspense. The best hollow-wall anchor is a 2x block that's nailed horizontally between two studs at the exact height you need it. There is nothing better.

The problem is that five years after you've installed drywall, you'll discover that you need blocking to support that 90-lb. picture frame whose true position on the wall, perfectly equidistant between framing members, has now been determined by your spouse, who obviously has telepathic links with a global positioning satellite. If you had only known.

When faced with a similar problem, professionals and do-it-yourselfers alike reach for the next best thing: hollow-wall anchors. However, there are scads of anchors out there, and although most cost less than 50¢, who wants to buy something that doesn't work? I've used my share of hollow-wall anchors, usually whatever was handy, and always wondered how well they really worked. To research this article, I tried out as many anchors as I could find, talked to their manufacturers and talked to the tradesmen who use them, all in a quest to find out which ones work best in drywall. What I learned is summed up in the reviews that begin on the facing page.

How does a wall anchor work?

When you drive a nail through drywall into a 2x4, the friction between the nail and the wood holds the nail securely. Hollow-wall anchors depend on the tenacious grip of drywall to hold a fastener and are used almost exclusively with screws. Anchors work either by expanding inside the wall material or by flaring out behind the wall,

creating a mechanical stop that prevents the fastener from being withdrawn. Plastic plugs and augers fall into the first category, and toggles and expansion anchors form the latter group. Wall anchors are designed to work in plywood, fiberglass, hollow bricks and concrete block, but their most common application is in drywall.

Although most anchors should be used only to supplement existing blocking—one end of an 18-in. towel bar whose other end is securely screwed to a stud, for instance—an anchor's strength is an important issue. Manufacturers test their products' ability to hold weight in two ways: tensile (or pullout) strength, the ability to withstand a force pulling out in line with the fastener; and shear strength, the force pulling down on the anchor. (Shear strength is almost always greater than tensile strength.) The anchors are tested in different thicknesses of drywall, plywood and hollow block; hydraulic force is applied until anchor or drywall gives out. (In almost all cases, the drywall fails first.) The manufacturers then assign each type of anchor a weight rating that's based on the failure point. For example, an auger-type anchor is rated for 70-lb. shear strength if it pulls out of the drywall with shear loads of more than 70 lb. For safety's sake, most manufacturers recommend that you apply only one-quarter of an anchor's ultimate load capacity. An anchor that's rated to resist 40 lb. of shear force, for instance, should be used to carry only 10 lb.

I was surprised to find out, then, that many manufacturers list only the ultimate pullout load on their packaging ("This anchor is rated for 40 lb.") and don't bother to list shear capacity or safety recommendations. Some manufacturers publish good product information

PLASTIC ANCHORS RELY ON FRICTION

Plastic anchors are direct descendants of the first wall anchors, hollow plugs carved from wood or lead that were used to increase a bolt or screw's purchase in a masonry wall. The family includes lead shields and various plastic anchors; the latter are commonly used as the lightest-duty drywall anchors and have a safe capacity of 10-lb. to 20-lb. tensile strength and 20-lb. to 30-lb. shear. (The fluted kind are meant to be used for masonry only and don't work in drywall.) All function as a shim between the screw and the wall material and have ribs or barbs that keep the anchor from spinning or pushing too far into the hole. To work properly, each plastic anchor needs a specific screw size and pilot hole, information that's usually printed on the package. Plastic anchors and their kin are inexpensive and easy to install; they are also distressingly easy to remove and should be used only for light items such as thermostats and small pictures. Although plastic anchors are often packaged in household products such as smoke alarms, most manufacturers advise that you never use them overhead.



A newer-variety anchor that falls somewhere between this category and the next one is known by the trade names Legs or Wall Grabb'r (photo above), and is made of two flat steel leaves. Meant to be hammered into drywall, the anchor is secured when a screw forces the leaves apart. Although they supposedly don't need pilot holes, these anchors seemed to break up the drywall too much when I tried them out.

Reviews continue on the next page.

that discusses their products' capacities, but the information is usually available only by contacting the manufacturers (see the list of manufacturers at right), not when you go to the home center to buy a handful of anchors. In the following discussions, I've reduced all anchor capacities by a factor of four as per industry safety standards to avoid misconceptions.

These same manufacturers suggest testing the anchors on site; drywall, for instance, can be weakened by excessive humidity and might require a different type of anchor. Although this advice is probably more than the weekend handyman wants to hear, it's not a bad idea for a crew installing dozens of hollow-wall anchors in a condominium complex. One final word of manufacturers' advice: Keep an interval between anchors equal to about 10 times an anchor's diameter, thereby not weakening the wall. Drywall that looks like it was machine-gunned won't hold much weight.

The best anchors are strong and easy to install

Knowing what I know now, if I have a project that requires hollow-wall anchors, I'll grab a handful of auger types for light duty, auger toggles for medium duty and nylon-and-metal toggle bolts for heavy-duty loads. Each is easy to install, doesn't destroy the drywall and won't pull out easily. And I'll try to be more conscientious about blocking the next time I build a wall. □

Charles Bickford is an assistant editor at *Fine Homebuilding*. Photos by Scott Phillips.

Hollow-wall anchor manufacturers

By no means comprehensive, this listing includes manufacturers whose products are mentioned in this article.

ITW/Buildex (E-Z Anchor, E-Z Toggle)
226 Gerry Drive
Wood Dale, IL 60191
(630) 595-3500
www.itwbrands.com

Cobra Anchors (Wall Driller, Driller Toggle)
504 Mt. Laurel Ave.
Temple, PA 19560
(610) 929-5764
(800) 824-7717

Mechanical Plastics Corporation (Toggler products)
P. O. Box 554
444 Saw Mill River Road
Elmsford, NY 10523
(914) 347-2727
www.toggler.com

Grabco Inc. (Wall Grabb'r)
3950 Industrial Ave.
Rolling Meadows, IL 60008
(847) 253-2501

Hilti/USA (Kap-Toggle, hollow-wall anchors)
P. O. Box 2148
Tulsa, OK 74121
(800) 879-8000
www.hilti.com/us

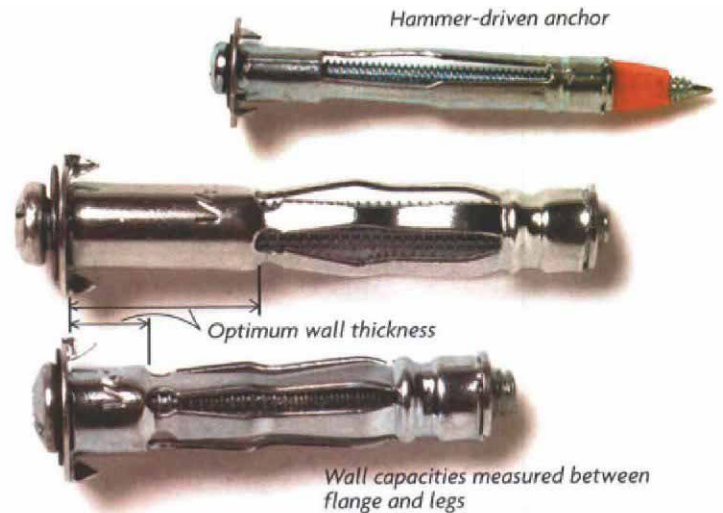
Plasplugs Inc. (Plas-Toggle)
780 Vassar Ave.
Lakewood, NJ 08701
(732) 901-1400
www.plasplugs.com

Powers Fastening Inc. (Rawl products)
2 Powers Square
New Rochelle, NY 10801
(914) 235-6300
www.rawl.com

EXPANSION ANCHORS-MOLLIES-ARE TRADITIONAL AND SOLID



In the 1940s, machinist Fred Crossent invented these anchors after his wife, Molly, complained about a loose toilet-paper holder. A flanged metal sleeve houses a machine screw that's turned into the sleeve's threaded end, compressing the sleeve behind the wall surface. Once the anchor is set, the screw can be removed. Although some mollies require pilot holes, others can be hammered into the wall (photo top right). I've found that these nail-point models tend to blow out the back of the drywall, so I drill a pilot hole or avoid them altogether.



Rated for 20-lb. to 50-lb. tensile and 40-lb. to 50-lb. shear capacities, expansion anchors can be installed in ceilings or walls. I've used them to install towel bars and to help hang lone kitchen cabinets; I like their solid feel when they tighten on the wall. On the downside, they often come with slotted-head screws, require a pilot hole and are impossible to remove without leaving a gaping hole. Also, expansion anchors are designed for specific wall thicknesses. If the package isn't labeled, match the distance between collar and legs to the thickness of the wall.

AUGER-TYPE ANCHORS MAKE INSTALLATION FAST



Nearly everyone I talked to preferred auger-type anchors because they're fast to install and easy to remove. In drywall, they don't require pilot holes and are driven in using the Phillips-style slot on their head. They also work in thick walls such as structurally insulated panels, whose rigid-insulation infill prevents the use of toggles. Available in plastic, brass, nylon and zinc alloy, augers come in a couple of different sizes and load capacities; the materials, however, have little effect on load capacity. Dan Kenney, head of technical-services at iTW/Buildex, said the load capacity of augers (15 lb. to 20 lb. tensile in $\frac{1}{2}$ -in. drywall) is mostly a function of thread size; larger threads have a greater



surface area in contact with drywall and carry more weight. Kenney also said that tests showed drywall will fail before an anchor fails. Augers are not rated for overhead use.

Cobra Anchors and iTW/Buildex both make a combination toggle auger (photo above right). After the anchor is screwed into the wall, a machine screw driven into the anchor flips a toggle over, securing it against the back of the wall. In $\frac{1}{2}$ -in. drywall, it has a tensile capacity of 20 lb. to 30 lb. and a shear capacity of 50 lb. to 60 lb., and can be used to hang mirrors, picture frames and small cabinets. They cost about \$1.75 for a package of two.

TOGGLES SUPPORT THE GREATEST WEIGHT

Toggles represent all that's good and bad about hollow-wall anchors. They're the strongest anchor out there and can safely hold 40-lb. to 100-lb. tensile loads and 45-lb. to 110-lb. shear, more than three times the load carried by any other anchor. They're standard issue in microwave-installation kits, for instance. Toggles are also a royal pain to install.

A traditional toggle consists of a single long machine screw that's threaded into a folding spring-loaded wing assembly (top photo) that expands once it's behind the wall. Because the large pilot hole needed for the wings will swallow the machine-screw head, you have to use whatever fixture you're installing as a washer. After unthreading the wings from the screw, you insert the screw through the fixture and rethread the wings. Then, holding the fixture steady with one hand, insert the folded wings into the hole. Once the wings have expanded behind the wall, you pull back on the screw with your second hand to keep tension on the wings while tightening the screw with your third hand.

The newer generation of nylon toggles (photo right) is easier to install. Once inserted into the pilot hole, collapsible wings unfold on the back of the wall with the aid of a small plastic pushpin. A wood screw threads through both sides of the wings; when tightened, the screw pulls the wings up snug against the back of the wall. Like expansion anchors, nylon toggles are designed to grip a specific wall thickness. They're rated for 30 lb. to 40 lb. tensile and 40 lb. to 55 lb. shear, but I'm leery of them. If you don't stop the screw exactly when it comes in contact with the collar, you begin to strip the nylon threads. But the nylon toggles will remain in the wall without a screw, unlike their steel cousins, and can be removed with only minor damage to the drywall.

Plasplug makes an anchor that does have a positive stop; called the Plas-Toggle (photo above right), its plastic wings thread onto the screw and firmly grip the back of the drywall. I couldn't get this anchor back out of its pilot hole without breaking the gypsum. Plasplug doesn't provide any information on load capacities except to say that the Plas-Toggle is "powerful"; I'd use it for light to medium applications. These anchors are not as readily available as the steel or nylon types.



There is a better toggle bolt that's made of metal and nylon (photos below). Sold under the trade names of Toggler Bolt and Kap-toggle, they have load capacity of 50 lb. to 65 lb. tensile and 60 lb. to 75 lb. shear, and can be used for ceiling-mounted fixtures and cabinets. Paul Althoff, a grab-bar specialist from Minnesota, told me he doesn't use anchors unless he's working with metal-studded walls. He likes these toggles because they're strong and quick, and installs them in metal studs to ensure good support. Relatively pricey, they cost about \$1.35 a piece.

METAL/NYLON TOGGLE BOLTS ARE EASIER TO INSTALL, ADJUST TO DIFFERENT WALL THICKNESSES

Like a traditional metal toggle bolt, the newer metal/nylon hybrids require a large pilot hole. The metal toggle is inserted into the drywall (1); a collar slides down the nylon straps (2) and

secures the toggle to the drywall (3). Once the straps have been snapped off, the machine screw then can be threaded into the toggle (4).

