



HOW-TO BOOKLET # 3101

INSTALLING GLASS BLOCK



TOOL AND MATERIAL CHECKLIST

- Carpenter's Level
- Jointing/Finishing Tool
- Sponge
- Cloths
- Mortar Mix
- Rubber Hammer or Trowel with Rubber Tipped Handle

Read This Entire How-To Booklet for Specific Tools and Materials Not Noted in the Basics Listed Above.

Glass block has found its let-there-be-light niche right alongside skylights, garden windows and greenhouses in today's home. But it also serves other purposes—that of security, privacy and insulation.

WHERE TO USE GLASS BLOCK

When planning where to use glass block in your home, think first about those rooms and spaces where extra light would be welcome—in a dark hallway or stairway, laundry room, or basement, for example. If the space also needs ventilation, you can build in preassembled window or vent units that replace a couple of blocks.

Among other popular usages are showerstall walls, partitions, room dividers, windowless kitchen walls (**Fig. 1**), sidelights of entry doors (**Fig. 2**), bathroom screens for toilets and bidets, and even wind and privacy screens for spas and hot tubs.

Besides admitting up to 80% of outdoor light, glass block also provides security (**Fig. 3**) and privacy. Block can distort vision as little or as much as you want depending on the type you buy. It also adds insulation value equivalent to double glazing due to its thickness and internal air space.

Another benefit includes reduction of noise by as much as 40 decibels. Also, they're leakproof and never need paint, putty or caulk.

Fig. 1

Windowless kitchens can benefit from a relatively narrow panel of glass block built into the wall. Support must be provided on all sides.

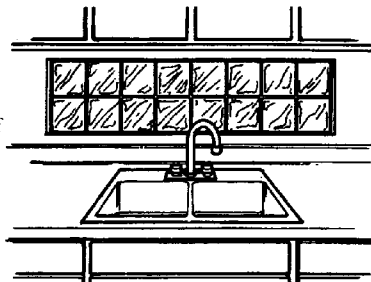
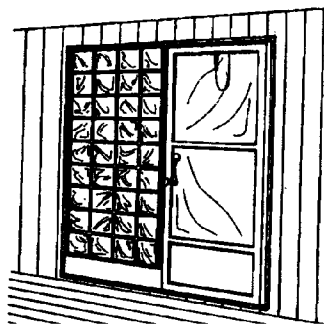


Fig. 2

A popular use of glass block is as sidelights for entry doors.



SELECTING THE RIGHT BLOCK

Three factors come into play in the selection process: size, pattern and color. Glass block is made by fusing two halves, which gives it strength and creates a partial vacuum inside.

Block is generally either 3 1/8 inch or 3 7/8 inch in thickness, called thinline and standard, respectively. Square faces—4"x4", 6"x6", 8"x8" and 12"x12"—are popular, but the rectangular sizes—3"x8", 4"x8" and 6"x8"—lend themselves better to narrow applications, such as entry door sidelights.

Note: You may want to stack a number of blocks to get an idea of appearance of size and impact before ordering.

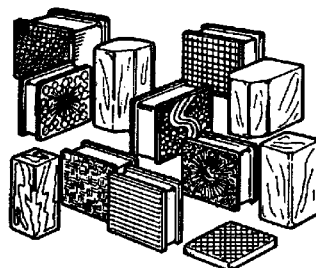
Size is also critical in terms of fitting your project. If, for example, you remove a bathroom window 30 inches wide and plan to replace it with glass block, you'll have to use 6-inch block. Squares of 8 and 12 inches simply will not fit the space.

The pattern built into glass block is functional as well as aesthetic (**Fig. 4**). The pattern can be straight lines, diamonds, hatching, basketweave, clear, or a variety of other effects. While those with high distortion value do a good job of passing light and preserving privacy, there may be instances where you'll want to be able to see through.

Glass block can be special-ordered in almost any color to complement a room's color scheme. You can also buy block specially tinted to reduce solar heat gain—an important consideration for many

Fig. 4

Glass block comes in many colors and many face designs as well as clear to distorted patterns. Also available are corner blocks for turns and end blocks.



south- and west-facing walls. Tinting, as with pattern distortions, affects translucency and transparency and helps diffuse light by controlling glare. If security is a major consideration, order block with extra-thick faces (about 3/4 inch). For ultimate protection, you can even get solid-glass, bullet-resistant block.

For smaller jobs, preassembled panels, which are mortared together in any size you stipulate, may be the way to go (**Fig. 5**). All you need to do is to secure the panel in your opening. A number of such preassembled panels can be stacked atop each other to fill larger openings, but each panel should be anchored and reinforced.

CAUTION: Most of the projects described in this booklet require no building permit. However, if in doubt or unsure about how much latitude you have, check your local building code before proceeding.

INSTALLATION PROCEDURES

One point must be emphasized when considering the pros and cons of glass block: It is NOT load bearing. This means there has to be structural support above, below, and on both sides of the glass block assembly plus provision for expansion and anchoring.

Other types of support are permitted, however, for freestanding and peninsular panels such as room dividers and partitions, which have no load-bearing function.

There are three basic methods of building a glass block unit, panel or wall: 1) the standard mortar method, 2) the mortar method with use of plastic spacers or connectors, which perform the same function as spacers do when setting ceramic tile and 3) the mortarless channel method, an easy approach for do-it-yourselfers. Each method is described below.

🏠 **The Standard Mortar Method.** Begin by coating the sill on which your block will rest with a thick coat of water-based asphalt emulsion and let dry for at least two hours (**Fig. 6**). Affix expansion strips (polyethylene foam or fibrous glass) to the headers and jambs. Set a full mortar bed on the sill and lay the first course (a horizontal row) of block. Tap each into position with a rubber hammer or a trowel fitted with a rubber-tipped handle.

Note: Do not shift block once it's placed.

Fill all joints and maintain a set mortar joint width of 1/4-inch or 3/8-inch between all blocks. Do not furrow the mortar.

You can save much time and effort by buying premixed bags of mortar specially compounded for glass block. To make your own, blend one part white Portland cement, one part hydrated lime, and four to six parts of mason sand, mixed to a stiff consistency with water.

Fig. 3

Below-grade basement windows benefit from glass block, which provides light while deterring forced entry.

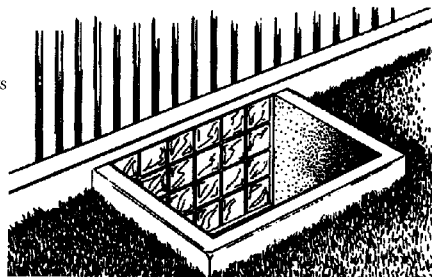
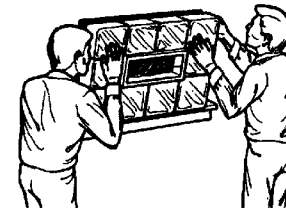
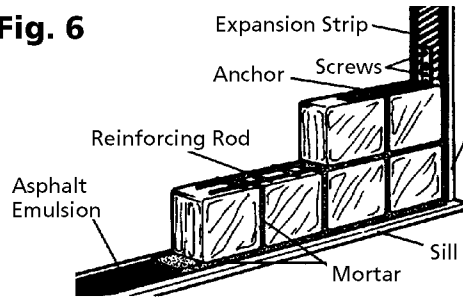


Fig. 5



Preassembled glass block panels are installed as a single unit. They are special-ordered to size and can come with a built-in vent window on one side and a screen on the other. Before insertion, line the opening with 15-pound felt and 3-inch wire lath to assure solid bonding.

Fig. 6



Standard Mortar Method. Sills should be coated with water-based asphalt emulsion and allowed to dry before mortar bed is spread. Reinforcing rods and anchoring provide internal support.

Another mortar bed may now be spread atop the first course of block, again watching thickness to keep a set joint width. Set blocks and fill joints as before.

Be aware that as you build higher, the increasing weight of the panel could begin forcing mortar out of the lower joints. Watch for this since it could happen after only four or five courses depending on the size and weight of the block. At this point, you must stop work and let the mortar set before continuing. The other two methods avoid this problem.

For stability of a tall panel, reinforcement must be added every 24 inches. Use reinforcing to run right across the panel along with strips of panel anchors that secure the panel to the jambs and headers. If you're using solid-glass block or the thinline variety, these items must be added every 16 inches.

To install panel anchors and reinforcing, lay a thin (about 1/8-inch) bed of mortar on the top of your block and press the reinforcing rods lightly into the mortar. Place anchor material on top of the rods; size the anchor material so that it overlaps the jambs on each side and can be screwed down on the jambs. At least one foot of panel anchor material should extend from the jambs into the mortar joints. The second half of the mortar bed (another 1/8-inch) covers both of these materials.

Anchoring in this manner isn't necessary if you have chases or channels to provide support within the opening. On courses not requiring anchoring or rod reinforcing, simply lay a full bed of mortar. Do not furrow.

Before your mortar sets, strike all joints smooth and clean out those perimeter spaces that will be filled with sealant. Remove excess mortar from the faces of the blocks and wipe clean with a damp sponge or brush. Tool all joints to make them smooth and concave. These steps must be taken before the mortar hardens and creates a cleaning problem.

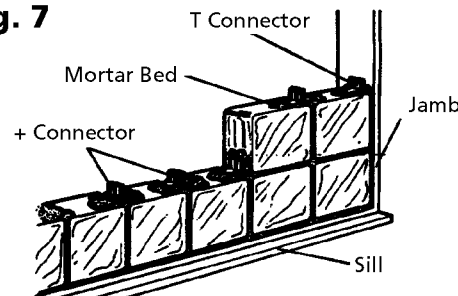
When the glass block panel is complete, let the mortar harden for at least a day. Now insert packing material between the blocks and jambs and header, leaving a space for sealant, which is applied now.

The final step is to wash the block faces with plenty of clean water and a soft cloth.

CAUTION: Do not use steel wool or a wire brush to remove pieces of mortar from the glass as this may cause scratches. Also, do not use harsh cleaners, acids, abrasives or alkalines.

📌 **Mortar with Plastic Connectors.** All of the standard procedures for mortaring glass block as described before apply here with one important difference. Plastic connectors, made of high-density polyethylene, are used to reinforce

Fig. 7



Standard Mortar with Connectors Method. Glass block rests on plastic connectors, which allow the mortar to remain in the lower joints and not be squeezed out by the weight of the block above.

the panel of glass block and to add some structural rigidity. The connectors also ensure uniform alignment and spacing of blocks, which give an even, professional look (Fig. 7).

Since all blocks rest on connectors, this means that the accumulated weight of upper courses cannot squeeze mortar out of the lower courses. As a result, you're not limited in the number of courses that can be placed in one day or by having to wait for mortar to set.

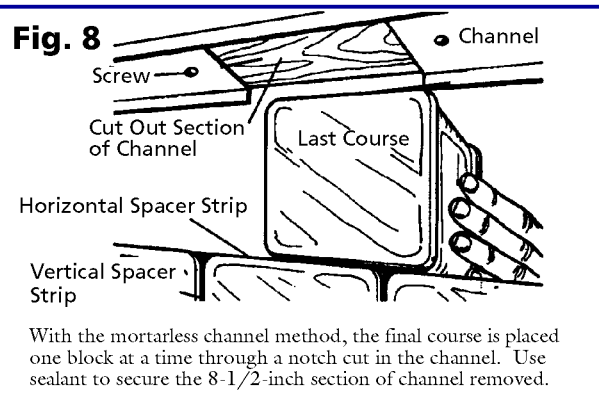
The plastic connectors generally come in two shapes: one looks like a T and is designed for use around the perimeter of the glass block panel; the other is shaped like a plus (+) sign and fits into internal joints. All are buried in mortar as the panel is assembled and cannot be seen. In addition, the T connectors are nailed or screwed in place serving as anchoring devices. Tapered connectors are available for those who want to build a curved or serpentine wall of glass block.

Plastic connectors are designed to fit all sizes and thicknesses of glass block producing a 5/16-inch joint for standard block and 1/4-inch for thinline. They do not replace or prevent insertion of reinforcing or panel anchors wherever needed; follow the standard method rules for spacing of reinforcement.

T connectors placed beneath the first course of block should be mortared in place to prevent slippage. Once the first course is in place, install T and plus (+) connectors in joints and mortar them down as you lay the bed for the next course. Proceed with courses, being sure to fill and tool joints and to clean away residue before the mortar hardens.

As blocks are placed, use a rubber hammer to tap them down until they fit tightly on the connectors below.

Follow the general rules of procedure for the standard method to complete your project.



🏠 The Mortarless Channel Method. Though quick and easy, this method of assembling a panel of glass block with channels, spacers and sealant requires some extra tools including power drill and bits, fine-toothed hacksaw, screwdriver and 1-inch, flat-head, wood screws, utility knife, putty knife and white latex paint. These instructions are for small residential glass block panels of no more than 85 square feet in area for interior use and 25 square feet or less for exterior use.

You can buy kits containing 20 feet of spacer material, a finishing tool and a tube of silicone sealant. In addition, you will need enough channeling to reach around all four sides of the opening. Measure the rough opening carefully to determine (a) how much channeling to buy (it's usually sold in 4-foot or 10-foot lengths) and (b) whether your size of glass block will exactly fit the space inside the channels. If you come up a bit short, shims can be placed under the channeling.

Channels are constructed of plastic that's easy to cut and mortise for corners. They come with predrilled screw holes for easy attaching to sill, jambs, and header. Drill weep holes through channel flanges every 24 inches and

as close to the base as possible. This must be done for drainage on the bottom channel on sides exposed to moisture.

The ends of channels also have predrilled screw holes. If you have to cut off an end for fit, drill new holes to replace them.

Cut channel material to fit all the way around the opening and screw it in place on both sides and the bottom. If you wish, put white latex paint (or silver) on the screw heads to hide them. In the channel cut for the top, cut out an 8 1/2-inch section (Fig. 8) with a hacksaw exactly 7 3/4-inches from one end and extending to the center line of the channel. This notch will enable you to place the last course of glass block. Now screw the top channel to the header. Set the notched piece aside to refasten later.

Place the first course of block in the sill channel and put strips of vertical spacers (7-3/8 inches long for 8-inch block) between blocks. The fit should be snug (Fig.9).

Note: No spacer material is placed under the first course.

Put a precut strip of spacing right across the first course. Place blocks for the second course, inserting spacers between blocks and atop the course. If you have to use more than one piece of spacer for the top of a course, make sure the pieces butt at least 2 inches from the nearest joint.

Proceed in this manner through the next-to-last course keeping joint lines straight. Use a carpenter's level to check and watch for bowing one way or the other.

The final course is placed by inserting each block through the notch cut in the top channel and by sliding blocks into the correct positions with a spacer between each. Like the bottom, the top of the panel takes no

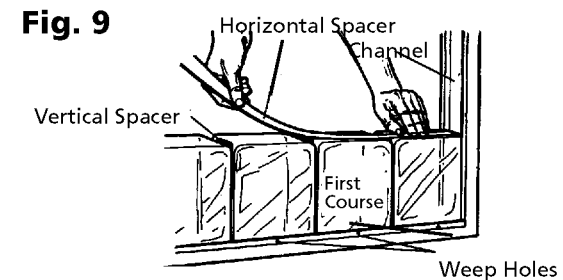
horizontal spacer material. Use a putty knife to realign any vertical spacers that get out of place.

The panel is now ready for sealing with silicone, which goes on quickly with a caulking gun. Fill all joints to full depth as you go across a course or up and down. Skip over all joint intersections; these will be filled and smoothed with your finishing tool. Limit application to areas of about 15 square feet at a time. Silicone begins to form a skin and to harden in 20 minutes or less. Before that happens, you want to have your joints finished with a smooth concave form and the excess wiped off. When finished with one area, go on to the next, not forgetting to seal in that section of top channel you cut out.

Both sides of the panel must be sealed in the same fashion. If one side of the glass block faces outside or is exposed to moisture, that side must also be sealed all around the perimeter where the block meets channel.

CARE AND MAINTENANCE

One of the beauties of glass block is its ease of maintenance. Inside, an occasional wiping with glass cleaner or soapy water and a soft cloth will do the trick. Outside, simply wash off with a garden hose. No painting, caulking, or puttying is required.



Mortarless Channel Method. Glass block fits snugly into channels that are screwed to sill, jambs and header. Weep holes are for drainage.