



HOW-TO BOOKLET #3118

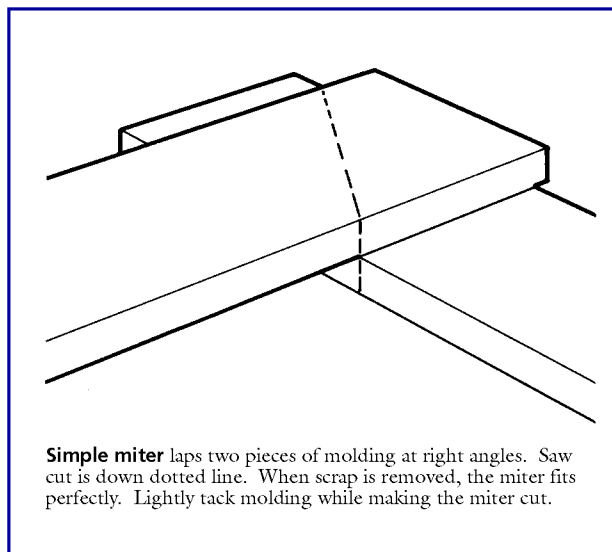
HOW TO MITER



TOOL & MATERIAL CHECKLIST

- Miter Box and Back Saw or Power Miter Equipment
- Tape Measure
- Block Plane
- Sandpaper Assortment
- Combination Square
- Assorted Fasteners

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



Fastening two pieces of wood together at an angle is a precision job that becomes easier and more accurate to do when you know a couple of tricks of the trade. Miter cuts for picture frames, molding and trim, and furniture joinery are quick to learn. You must have a good miter box and backsaw to make the cuts—or use power saws with fine-tooth blades and mitering “attachments” such as a miter gauge which is “standard equipment” on a power table saw.

SIMPLE MITERS

A miter can be any degree of angle, although 45- and 90-degree cuts are the most common. The most simple cut, requiring just a saw, is to lap two pieces of wood (molding or trim) at right angles. Then cut through both pieces at an approximate 45-degree angle. The cut will fit perfectly when the scrap wood is removed (see illustration). This type of cut works best with thin molding or trim as you would use to cover the edges of plywood on a bookcase or cabinet. In a miter box, the cut is still simple, but you have to measure the wood to be cut for size. It is recommended that you practice the cut several times before going onto finish work. Here are the steps:

1 If you own an adjustable miter box, set the saw guide to the angle at which you want to cut the wood. If you have a simple wooden miter box, you may be limited to just 45- and 90-degree cuts, although you can notch the sides of the miter box with a saw kerf at any angle that you want (see box, Anatomy Of A Wooden Miter Box).

2 Use a piece of scrap wood along the bottom of the miter box to accept the saw and keep it from damaging the box.

Set the piece of molding that will mate to an adjoining surface firmly in the box and then cut off an inch or two. You do this to get a clean, finished end.

Take the piece of wood (you may have to cut it into smaller pieces to facilitate working with it) and set it in position on the surface (such as a wall for door or window casing) at the point that you want to make the miter cut. Mark this point and mark the shape of the adjoining molding face onto the molding. What you are doing is “pre-drawing” the shape of the cut on the molding. Now, position the molding in the miter box so that when you make the final cut the saw will just follow and obliterate the drawn guideline as the saw meets the edge of the molding.

If you must cut the miter a little long, you can then trim it with a saw, block plane, or even medium-grit sandpaper on a sanding block so it fits perfectly. If you have the option, it is better to cut the molding long than too short. If the molding is cut short, you have to start the measuring, marking, and cutting procedure all over again.

3 Cut the mating pieces the same way. When all the pieces are cut, fit them together and nail them in place. Or glue and nail them together. A good tool for this is a brad driver. When the brads are driven flush, set them below the wood surface (countersink) with a nail set. Then fill the holes with wood putty, and finish the wood with paint or stain.

A shortcut to cutting miters on door and window casing is this:

1 Measure and mark the first piece of vertical molding from the floor (or opening) to the top jamb. Make this miter cut and lightly tack the molding into position along the opening.

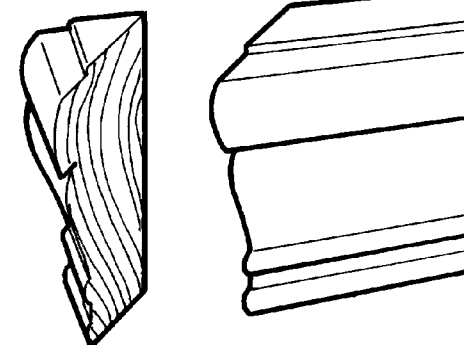
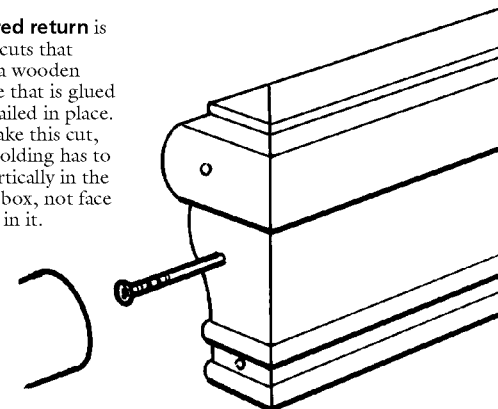
2 Measure and mark the horizontal piece of trim that goes across the top of the opening. Cut this miter and mate it with the miter on the vertical piece. Then measure and mark for the opposite miter cut and cut the miter. Lightly tack this piece in position so it is butted tightly against the miter on the vertical trim.

3 Measure and mark the opposite horizontal trim piece and cut the miter. Now mate this miter into the horizontal miter. Leave this piece a tad long at the bottom in the event that you have to recut it or trim it to fit. Lightly tack it into position and mark any trim cuts. Make these cuts.

4 The miters should fit perfectly. If so, final nail on the trim pieces. If not, make any adjustments with a block plan or sandpaper.

What you are doing in this procedure is “going” around the opening on a “piece-by-piece” trim basis. You will get a better fit by doing this than by pre-cutting each miter and then trying to fit the pieces together. The first two cuts—vertical and horizontal—will always fit perfectly. The third miter cut to mate horizontal with vertical trim is where the problem starts.

Mitered return is three cuts that form a wooden wedge that is glued and nailed in place. To make this cut, the molding has to set vertically in the miter box, not face down in it.

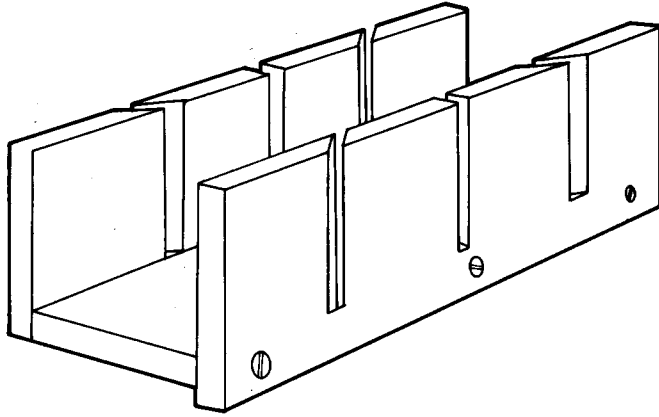


“Wedge” in mitered return looks like this. It has a 45-degree cut on the side that mates with the molding, and a 90-degree cut on the side that fits against the flat (usually wall) surface.

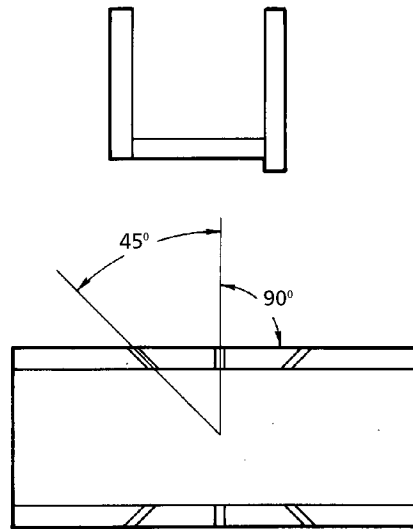
MITERED RETURNS

Moldings for ceilings and chair rails often require “returns,” which involve miter cuts. Since these moldings are patterned (not flat), the moldings have to be cut “standing vertical” in the miter box, i.e., you don’t lay the molding flat in the box like picture frame molding or edge trim. The illustration on page 4 shows this configuration. To make this cut:

ANATOMY OF A WOODEN MITER BOX



Wooden miter box looks like this. Slots for backsaw are cut at 45- and 90-degree angles.



End view of box (above); top view (below).

HOW TO MAKE A MITER BOX

If you have lots of miters to cut, it is recommended that you buy a miter box that has a metal adjustable saw guide. This is a very accurate piece of equipment. If you are really into cutting miters, you might want to consider a miter power saw (chop saw) which is similar to a radial arm saw but not as costly. Professional trim carpenters and cabinetmakers use this type of power equipment. If you cut miters only occasionally, you may want to invest in a plain wooden miter box, which is not costly. Or, you may opt to make your own miter box, detailed here.

Use 3/4-in. thick hardwood boards (maple is a good choice) for the miter box. The length and width of the box are optional, and you may size the box to fit the type of work you intend on doing.

The minimum inside width should be 4 ins.; minimum length is 16 inches. The height of the sides above the bottom of the box can't be more than the width of the backsaw blade measured from

the bottom of the teeth to the steel spine. Note that one side of the box extends about 1 in. below the bottom, so that the box may be gripped in a vise or braced against the edge of a workbench or sawhorse.

Assemble the box with glue and wood screws. Use a combination square to mark the 90-degree line and two 45-degree lines (one in each direction) across the top edges of the wood. Then scribe these lines down the sides of the box. The 45- and 90-degree angles are the most common cuts made in a miter box. However, you can cut any angle by simply marking that angle on the box. With a backsaw, carefully cut along the lines down the sides to the base. Easy does it. The saw will tend to wander off the lines (you have two to watch on each side of the box) as you cut down to the bottom or base of the box. The initial cuts must be perfectly accurate, since all other cuts made in the box will follow the same angles.

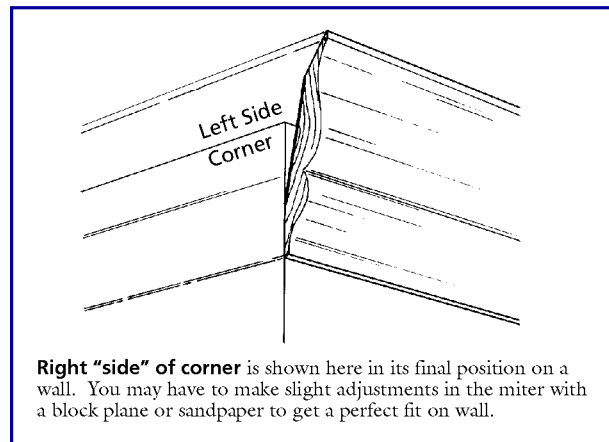
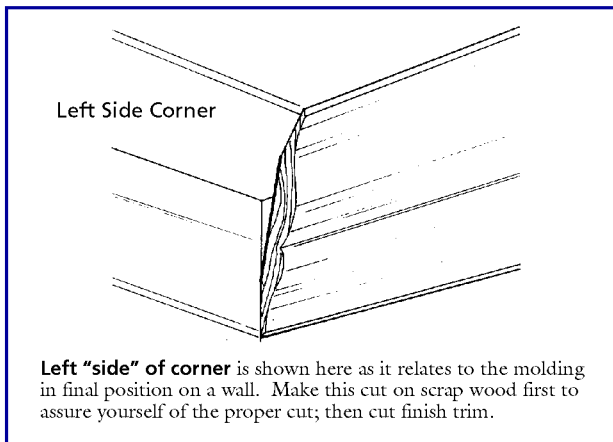
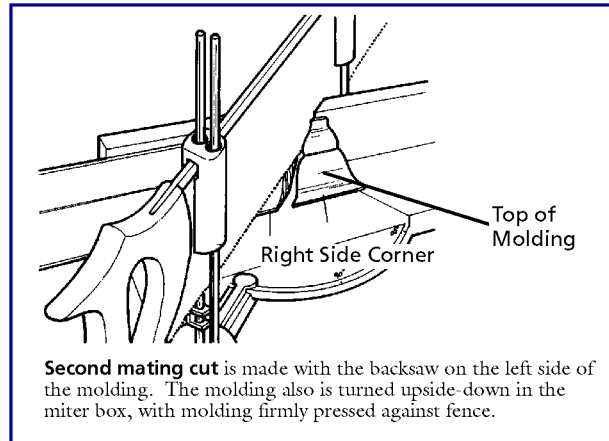
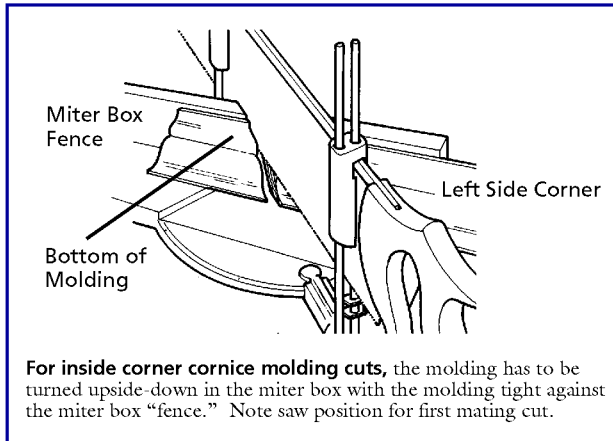
MITERED RETURNS

- 1 Set the molding vertically in the miter box, after you have measured and marked it for the cut.
- 2 Make the cut at 45-degrees so the cut is toward the back of the molding.
- 3 On a second piece of molding, make the miter cut in exactly the opposite cutting direction as the first piece, running the saw from the back to the face of the molding.
- 4 Now, make a 90-degree cut on the molding where the miter cuts meet the back. You now will have a 45- and 90-degree wedge.
- 5 Use carpenter's glue to fasten the wedge to the first mitered piece of molding that you cut. You can add strength to this joint by nailing it, but be sure to drill pilot holes for the nails to prevent splitting the wedge or molding. Let the adhesive set several hours before you drill and nail the molding on.

CORNICE MOLDINGS

There are usually two different cuts to be made: inside corners and outside corners. Here's the way to make an inside corner, using the drawings as guidelines:

- 1 For an inside corner, measure the molding from corner to corner. Mark it on the back of the molding as the molding will be fitted to the wall surface.
- 2 Turn the molding upside down in the miter box; the bottom of the molding should be pressed against the side of the box that will receive the pressure from the sawing action (fence).



- 3** For the cut, the molding must be on the opposite side of the saw from its position as it relates to the wall (or ceiling). For example, a left-hand corner should be on the right side of the saw, and a right-hand corner should be on the left side of the saw.

If you have a movable saw guide on the miter box, set the saw for a 45-degree cut to the right to make the left-hand corner cut. Then reset the saw guide to the left 45-degree position for the right-hand corner cut.

If you are using a wooden miter box with the angles cut in the sides, you may have to lift the molding out of the box to “switch” the right and left cuts.

Outside corners that will be mitered are cut this way:

- 1** Measure and mark the molding to be mitered.
- 2** Put the molding into the miter box upside down, with the face of the molding tight against the fence or back of the miter box.

- 3** The miter for the left-hand side of the corner will be to the left of the saw blade. Make the cut.
- 4** The miter for the right-hand side of the corner will be to the right of the saw blade. Make the cut.

MITER CLAMPS

Whenever possible, use some sort of clamping device to hold miters while the components are fastened together. Since miters are considered “weak” joints, they need all the support they can get.

You can purchase metal corner clamps (illustrated below) to assemble mitered picture frame corners and other light materials. Also available are cloth straps with clamps that can be wrapped around the mitered assembly to hold it firmly while the adhesive sets.

You also can buy special hardware to reinforce corner (mitered) joints, and the hardware includes flat T and L mending plates, corner “braces”, “wig-gly” nails (corrugated fasteners) and flat “scotch” fasteners that go across the mitered joints.

