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Tool Tip... **Page 1**

Star Cutting Tools

Figure 1: A loaf box with rammer.

Figure 2: Various common tools that can be used for cutting stars.

Figure 3: Making holes in rammer to fill with lead.

Introduction:
Cut stars are one of the fastest methods of producing stars, and several methods of making them exist. The tools shown here are used for the commercial method described here, also called the loaf method.

There are three tools required for making stars using the loaf method (so named because a thick loaf of comp is produced in the process): a loaf box, a packing rammer and a thin blade for doing the actual cutting.

The Cutting Tool:
A variety of objects can be used for the cutting tool, such as drywall blades, thin knives and any thin piece of metal that is not overly flexible. You do not need to make your own knife, although some builders do make some pretty nice star cutting knives using the thin metal from old hand saw blades. In fact, a thin kerf Japanese type hand saw with the teeth ground down makes an ideal star cutting knife. Figure 2 shows some examples of star cutting knives you can use.

The Ramming Tool:
The ramming block used to compact the comp can be any square block of wood or metal with a handle on it. The one pictured in Figure 1 is made from rock maple, with a handle turned down on a lathe. A piece of 2x4 with a dowel rod glued into one end for the handle can work as well, or even notching out a handle with a band saw or saber saw, then whittling the corners down with a knife.

However you go about making your ramming block, it needs to be pretty heavy to assist in the ramming process. If you make one out of a block of aluminum, then it will be heavy enough as-is. Wood rammers tend to be too light and result in more work required to tamp down the composition into the loaf box. An easy way to make wood rammers heavier is to drill large cavities in the sides and then fill them with lead. Figure 3 shows a 1" hole being bored into the side of a rammer on the drill press. Care must be taken that the tip of the spade bit does not break through the other side of the rammer, otherwise the lead will leak out the hole when poured.

Figure 4 shows how two separate lead cavities are arranged in opposing directions in order to balance the weight of the rammer.

Lead can be melted in a small stove pan using a Coleman propane burner that screws onto a propane can. This arrangement should be surrounded by bricks or cinder blocks such that there is no way the pan can be knocked off the burner. Lead tire weights, flashing or other scraps are placed into the pan and melted, then a metal ladle is used to pour it into the cavities in the

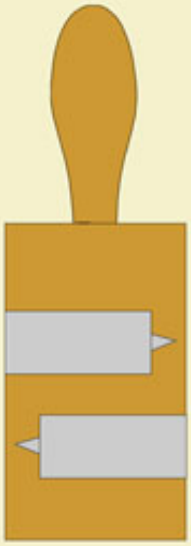

Figure 4: Two cavities drilled in opposing directions for balance.

rammer. Extreme care should be taken when working with molten lead! A respirator should be worn to avoid breathing lead fumes, and protective goggles, long pants, long shirt sleeves and gloves should be worn. Molten lead can sometimes bubble due to air pockets in the mold or mixing with water, so be prepared!

The lead should be poured in two increments, allowing the first one to cool and shrink before pouring the second. The second pour should fill the hole completely to almost overflowing, such that the rounded surface area extends just barely beyond the edge of the hole.

It helps to cool your lead down with water after it solidifies so that the hot lead will not start to burn the wood. Once the lead is cool, flatten the ends down with a hammer so that the lead spreads flush with the sides of the rammer. This helps lock the lead in place as well as remove any cavities for powder to get stuck in.

If you do not wish to deal with molten lead, you can also drill your holes all the way through and press-fit steel rods into the rammer. This will not add as much weight as lead will, but it is still better than nothing. The rods must fit tightly so that they do not slip out over time.

Figure 5: Lead is poured into cavities and hammered flush with sides.

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Figure 5: Side pieces prior to cutting side angles.

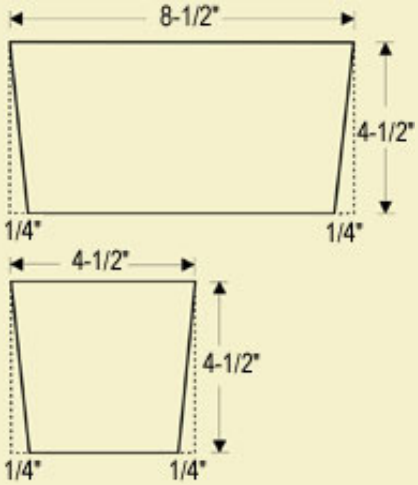

Figure 6: Wood sides with taper trimmed 1/4" from each end.

Figure 7: Using bar clamps to glue the pieces together before strengthening with screws.

Making A Loaf Box:

The next thing you will need is a special box with slightly tapered walls to form the loaf in. It is important that the walls have a slight taper so that when the box is inverted the loaf will fall out. The taper should be minimized however, since it is desirable to have the loaf as close to being square as possible.

While it is possible to use the aluminum bread pans available in most kitchen supply stores for making your star comp loafs, bread pans tend to have too much of a taper, have patterns on the bottom that imprint into the loaf and are not as deep as an ideal loaf box for cutting stars. Making your own box allows control of the exact shape and size of the loaf so that you can match it with the batch sizes you commonly work with. The dimensions of the loaf box shown here will hold a maximum of 2 Kg (4.5 lbs) of comp per loaf. If you do not have the tools or skill to fabricate the box shown here, then the aluminum bread pan makes a useable substitute.

The loaf box will be about 4" tall with an inside cavity of 4-1/2" x 7." Start by ripping a 28" long board to a width of 4-1/2" on your saw. From this board, cut two pieces that are 4-1/2" long and two more pieces that are 8-1/2" long. The extra 1/2" on the height of the walls is to compensate for material that will be lost when the top and bottom of the assembled box are trimmed. Trim each side so that there is a taper that moves in 1/4" from the bottom on both sides of all pieces. This gives you two sets of pieces that should look like Figure 5.

Once the four sides are prepared, glue is applied to the edges of the two shorter pieces and the box is held together with bar clamps while it dries, as seen in Figure 7. Two 1-1/4" #6 wood screws are then used to reinforce the butt joints at each end (8 screws altogether). These should be counter sunk so the screw heads are flush with the wood.

Now that your box is assembled, you will notice that the angled sides has resulted in the top and bottom edges not being in a flat plane. There are a number of ways to level off both sides of the box. My favorite way is to use a radial arm saw with the motor locked in a horizontal position as seen in Figure 8. The box is simply slid against the fence (keeping your hands below the cutting plane) for all four sides. The blade is then lowered slightly and the process repeated for the other side. All four sides will then be trimmed to the same height and horizontally level.

Other ways to level the box include using a hand plane or belt sander. One easy way would be to hold the box down against a wide horizontal belt sander until it was flattened. While the top isn't as important, you will need to level the bottom to that bottom of the box will fit flush.

Lastly, you need to measure the bottom of your box and cut a piece of thin plywood to fit over it. I used 1/4" Luan underlament sold in most home

Figure 8: Using a radial arm saw in the horizontal plane to trim top and bottom edges of the box.

Figure 9: Thin luan plywood is glued flush to the bottom and held by small screws.

improvement stores. The bottom will be held on by both glue and screws, so you will need to counter sink the screw holes so that the screws don't stick out and scratch up your table when ramming comp into the box. Figure 9 shows the bottom edges glued and the bottom pre-drilled with the counter sinks prior to attaching the bottom.

Once your box is complete, you will need to water proof it so that you can hose it off after each use. Spray-on acrylics, polycrylics or polyurethanes like Krylon or Minwax work good for this. Using just an oil stain will cause problems during use, since masking tape will need to adhere to the sides of the box and oil stains do not allow the tape to stick.

Well, I have a feeling everyone just rushed to the store to buy a bread pan, but if there are any wood workers out there then this would probably be a quick-n-easy project for you.