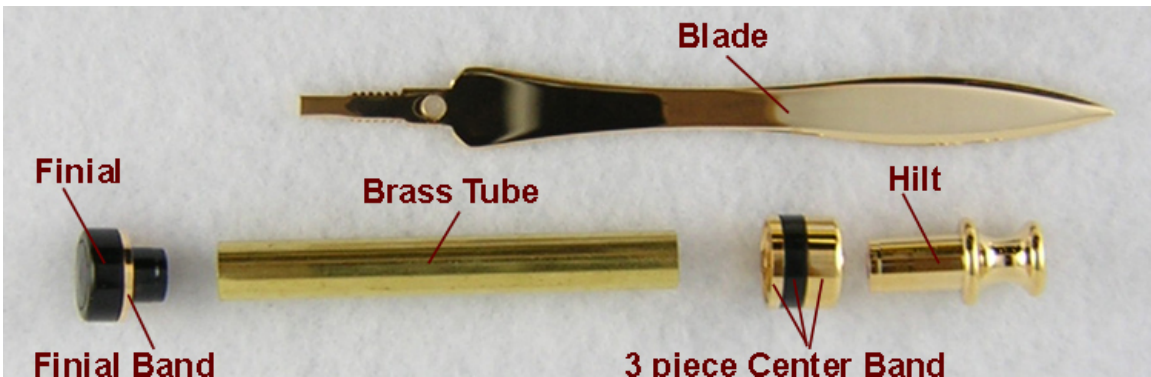


Berea Hardwoods Co., Inc.
Pen Instructions

Flat Top American Wavy Letter Opener (Berea #4162/03-xx-x)



Needed: Mandrel-B
Bushings-1B Use #1 and # 2. You can match them up with the hardware for size
Drill-O
Wood Size- 5/8" x 5/8"



Parts Diagram for Flat Top American Wavy Letter Opener

Preparing the Material Blanks

1. Cut the material blank a little **SHORTER**, approximately 1/16", than the tube. This is to give enough exposed tube to be pressed into the center band when the letter opener is assembled. You can cut the blank the same size and then part off 1/16" at the lathe if you want. Otherwise, you will need to square up that end of the blank with a skim cut while on the lathe.
2. Drill the blank through the center, lengthwise, with a letter O bit.
3. Polish the brass tube with sandpaper. This can be done by hand or on a power machine such as a belt sander. The purpose of the sanding is to clean off the oxidation and roughen the tube so that the glue will have a better adhesion surface.
4. Plug the ends of the tube with the material of your choice. Some use base wax, a dental product, or Play Dough, or even a slice of potato. Just push the ends of the tubes into a thin section of the material. This will form a plug to keep the glue from getting into the tube.

5. Clean the tube, after plugging, with acetone or alcohol on a rag.
6. Prepare your glue. We recommend two part epoxy glue that is available in all hardware stores. Use a fast drying type, one hour or less. Be sure to mix it thoroughly. (A Post-it Note Pad makes an excellent mixing place. When you are finished just tear it off and throw it away.) Polyurethanes and thick flexible CA's can be used, but they each have their drawbacks.
7. Place some epoxy into the blank using a small piece of dowel or other small stick.
8. Roll the tube in the epoxy.
9. Insert the tube with a twisting motion until it is almost in the material blank. Then use the dowel to push it in until the end is flush with the blank. Use the stick to rake off the excess glue even with the blank and the tube.
10. Push the brass tube through the blank until one end is flush with the blank. Then rake the glue flush with that end. Now push the tube back into the blank until the 1/16" brass is exposed from the other end. Clean as much glue from the exposure as possible.
11. Move it aside for 60 minutes until the epoxy has had time to reach its maximum strength.
12. If you are using CA glue, the wait is only about 60 seconds. When using polyurethane the wait will be about 24 hours.
13. When the glue has cured use a hobby knife to remove the plugs from the ends. It is also a good idea to clean the tubes with a brass gun cleaning brush to remove any glue that may have gotten into the tubes.
14. Not cleaning out all glue from the tube is the most common cause of failure. BE CERTAIN that all dried glue is removed from inside the tubes before proceeding.
15. Using a barrel trimmer of the proper size, face off the end of the blank, where the brass is not exposed, until you can just see the bright brass end of the tube. STOP facing at this point. This facing operation can also be done with the proper jig and a disk or belt sander.
16. Sanding, on a disk sander, using a jig to hold the tube square with the disk, is a more sure way of getting the proper length. It should be tried if you have any doubt as to your abilities to square the material with the barrel trimmer.
17. Another good method of squaring the ends of the blank is to turn the blank until it is just round. Using a miter gauge to maintain the blank perpendicular to the sanding disk, just touch the ends to the disk. Once the blank is square and you can see the ends of the tubes brighten, then return the blank to the mandrel and finish the turning until the desired contour is accomplished.

Turning the Blanks



1. Assemble the blank on the mandrel using the bushings from the 1B bushing set. Match the center band diameter with one bushing and the finial ring to the other bushing. Fill the empty mandrel space with spare bushings or brass tubes.

2. Tighten the tailstock before tightening the blank on the mandrel. This will center the mandrel first. Then tighten the nut that holds the blank.
3. Turn the blank to the desired contour making sure that the area next to the bushing is turned to the size of the adjacent bushing.
4. After turning the blank, sand the surface in progressive steps until you get to 400 or 500 grit.
5. If a higher polish finish is desired continue sanding with Micro Mesh through 12000 grit.
6. Apply the finish of your choice and polish.
7. Remove the blank from the mandrel.

Assembling the Letter Opener

Please refer to the Pen Parts diagram

The third most common error resulting in a non-functional or damaged letter opener is the misalignment of the parts when pressing them in place. The use of a good pen press or small arbor press is recommended, but it can be accomplished with a good “C” clamp and much care. When pressing in the various parts, by any means, BE SURE that the parts are straight and in line with the blanks. If the part is cocked or otherwise misaligned, at the very least, a poor fitting letter opener will result. At the worst, you may have a letter opener that is not usable. Exercise caution here!

One other word about parts. Occasionally, you will encounter parts that are a little loose fitting. This can be corrected by using a SMALL spot of glue, usually CA, on these parts before pressing them home.

1. Assemble the 3 ring center band.
2. Push the hilt through the center band assembly.
3. Press this assembly into the end of the finished blank that has the brass tube exposed.
4. Place the finial ring over the finial and press it into the other end of the blank.
5. Screw the blade into the hilt.
6. Admire your beautiful letter opener.

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