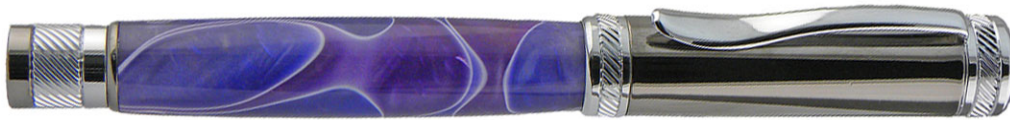


Berea Hardwoods Co., Inc.
Pen Instructions

Berea Hardwoods MP208 BallPoint/Roller Ball Pen (Berea #MG1807/B-xxx)



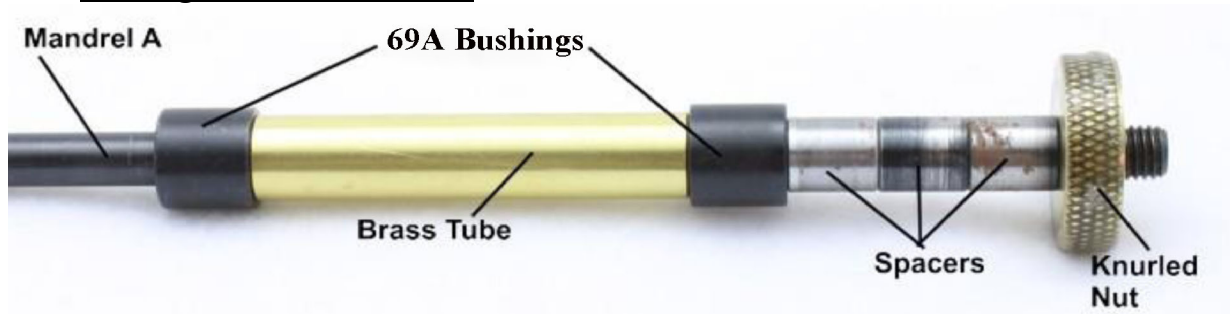
Needed: Mandrel A
Bushings 69A
Drill Letter V
Wood Size $\frac{3}{4}$ " x $\frac{3}{4}$ "

Preparing the Material Blanks

1. Only 1 material blank is required for this pen. Cut the material blank slightly longer than the brass tube.
2. Drill the blank through the center, lengthwise, with a Letter V 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 the other end is flush with the blank. Then rake the glue flush with that end. Now push the tube back into the blank until the tube is equidistant between both ends of the blank.
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 tube 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 tubes is the most common cause of pen 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 ends of the blanks until you can just see the bright brass end of the tube. STOP facing at this point. Your pen's proper operation is dependent on having the proper length tubes. This facing operation can also be done with the proper jig and a disk or belt sander.
16. Not having the proper tube length is the #2 cause of pen failure. 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 blanks are square and you can see the ends of the tubes brighten, then return the blanks to the mandrel and finish the turning until the desired contour is accomplished.

Turning the Material Blanks



1. Assemble the blank on the mandrel using the 69A bushings. Since these are the same size no special orientation is needed.
2. Since there is only 1 blank to place on the mandrel, you will have to place spacers on the mandrel in order to tighten the tube for turning. You can drill a 7mm hole in a piece of wood for a spacer or 7mm bushings make excellent spacers.
3. Tighten the tailstock before tightening the blanks on the mandrel. This will center the mandrel first. Then tighten the nut that holds the blanks.
4. 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.
5. After turning the blank, sand the surface in progressive steps until you get to 400 or 500 grit.

6. If a higher polish finish is desired continue sanding with Micro Mesh through 12000 grit.
7. Apply the finish of your choice and polish.
8. Remove the blank from the mandrel.

Assemble the Pen



1. Press Center Band into one end of Cap Tube.
2. Slide the Clip onto the Cap Finial Press the assembly into the Clip Bushing.
3. Press the completed assembly into other end of the Cap Tube.
4. Lay the cap aside.
5. Press the Threaded Nib Coupler into one end of your blank.
6. Press the Threaded Body Coupler into the other end of your blank.
7. Press the Finial into the Finial Insert.
8. Thread the Finial Assembly into one end of the Threaded Coupler.
9. Decide on a Ballpoint refill or a Roller ball Refill. **Note: Roller ball refill is not included in kit and is a Special size, a standard Roller Ball refill will not work. Make sure to attached the spring on the Roller ball refill as shown above.**
10. Thread the Nib into the other Threaded Coupler.
11. Sit back and admire your work!