

Polishing Small Slabs by Hand (Condensed instructions)

Taken from Oct 1971 Lapidary Journal page 1030, author Clifford Older.

Materials needed:

- 1) Five or more squares of heavy glass, 8" to 10" on a side, at least 1/8" thick.
- 2) Graded carborundum grit in sizes of 220, 400, 600, & 1000, and Cerium Oxide polishing powder. This can be purchased at your local Rock Shop. One quarter pound of each is plenty for a start.
- 3) Several sheets of all purpose pink wax in 3" x 6" or 4" x 4" size 16 gauge thickness. These can be purchased at rock shops dealing in casting materials. A can of spray adhesive will also be necessary.
- 4) A dozen sheets of newspaper and a roll of paper toweling.
- 5) A pail of water, in which to wash glass squares and rock slabs.
- 6) Handy but not absolutely necessary are 4 old spice or other shaker top jars to contain and dispense the working supplies of carborundum grits.
- 7) A screw top jar of about one cup capacity, in which to mix a supply of about two tablespoons cerium oxide and a cup of water.
- 8) A small nylon paint (or pastry) brush for stirring and applying the mixture.
- 9) A small shallow pan or dish of water, in which to rinse the slabs for inspection during grinding and polishing.
- 10) A small bottle of dish detergent and a scrub brush.
- 11) Zip lock bags to hold the glass squares.

Preparation:

- 1) Knock off the sharp corners and edges of the glass squares by filing or grinding.
- 2) With the spray adhesive, cement several sheets of the wax to a clean surface of one of the glass squares. To avoid a sticky area outside the wax area, either completely cover the square with wax or clean off the sticky adhesive with a suitable remover. (I would cover the whole glass with wax).
- 3) Divide the wax surface into approximately 1/2 inch squares by deep scoring the wax using a clean straightedge and a knife point or other means of cutting the grooves.
- 4) Flatten the surface by coating the wax with a generous amount of liquid detergent, and then heating one of the other glass plates in hot tap water. Place this on top of the wax surface and weigh it down with a brick or rock or other convenient weight. After 5 minutes or so, remove the weight and slide the top glass off. ALWAYS store the Polishing Lap, when not in use, in a large zip lock bag, face up and with nothing on top of it. **DO NOT WASH AFTER USE!**

Procedure:

- 1) Select a nice slab. For a starting project it should be no more than two or three inches in surface area and at least 1/8" thick.**
- 2) Cover your working surface with 2 layers of newspaper.**
- 3) Arrange conveniently on the newspaper, the shallow dish of clean water, the 220 grit shaker jar and one of the glass squares. Label the glass square with the grit size. (Masking tape on the back would work)**
- 4) Sprinkle about a level spoonful of grit on the glass and add some water.**
- 5) After determining which side of the slab you want to polish, place this side on the glass and begin grinding. Apply as much pressure as you can without tiring your fingers too rapidly. Try to develop some system of grinding pattern that will ensure covering every square inch of glass plate equally. Do not confine your grinding to the center area alone. It is important that the plate and therefore the slab are kept flat. After each 5 minutes, rinse the slab in the dish of water, dry it with paper towel and inspect carefully. A good light is a necessity for a good inspection. When all saw marks have been ground out and the surface has a uniform appearance, clean up.**
- 6) Wash the slab and set it aside. Put away the 220 grit. Empty and rinse out the dish in the pail. Throw away the news paper, Clean off the glass plate in the pail and mark it's frosted surface 220 and put it away (a zip lock bag would be good).**
- 7) Put down clean newspaper. Wash your hands. Wash the rinse water dish and fill with clean water. Wash the slab using a few drops of detergent and a stiff brush, rinse it and your hands, and place it in the rinse dish temporarily.**
- 8) Get a fresh square of glass to be used only with 400 grit. Mark it. Wash it and place it on the newspaper. Sprinkle a spoonful of 400 grit on the wet glass and begin a grinding pattern with the slab that utilizes the whole surface of the glass slab.**
- 9) After a couple of minutes rinse the slab, dry and inspect it carefully. You should see the ground surface becoming more finely textured. Continue grinding for about 10 minutes, rinse and dry it again.**
- 10) This time, cover the ground surface with criss cross lines made with an aluminum or brass pencil. Grind again but only for about 30 seconds.**
- 11) Rinse, dry, and inspect. If all the lines are gone, the slab is flat and ready for the next step. If they are not gone, continue grinding for another 5 minutes or so and then re-test, as above. When the results are satisfactory (Lines removed quickly), clean up as before, and prepare for the 600 grit step.**
- 12) Again, grind and test until all is well, clean up as before, and go to the 1000 grit stage. In this stage the inspection and testing are very important. Use low angle lighting and look across the surface from several different directions. Every last scratch must be discovered and removed. The surface should be absolutely flat and with a completely**

uniform, semi polished appearance. No traces of the finish left by the 600 grit should be evident even under magnification. When satisfied, clean up again and prepare for the polishing stage.

- 13) Stir and brush on the polishing lap, some of the cerium and water mixture. Proceed to polish, using moderate pressure. Rotate the slab a bit every few minutes. You will soon feel the polish coming. Rinse, dry and inspect under low angle lighting. Use a magnifier if you have one. Brush on more cerium mixture as needed. You may find it necessary to slide the slab off over the edge of the lap rather than lift it. If inspection shows a bit of fuzziness in one area of the surface, put more finger pressure on this area while polishing. When you think you have a good polish, give it an extra 5 or 10 minutes of polishing. An extremely beautiful polish can be produced. This is the method that was used to make the finest telescope mirrors and lenses.**
- 14) Clean Up! It is time to admire your slab.**

Footnote: While grinding, the grit gradually breaks down. You can tell by the sound. It will be necessary to add fresh grit and water occasionally for fast and efficient grinding. After several additions of grit have been made, the slurry becomes sludgy, and a fresh addition of grit will seem to last only a few minutes. Rinse the plate and start all over. Dump the bucket outdoors, not into a house drain.