Vibrating Lap Instructions

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What are Vibrating Laps? Well, basically it is an aluminum pan, or tray, attached to a motor, which has a spinning weight on it, creating a fast circular, or vibrating motion. It is used to grind, sand, sand and polish flats, such as slabs, or thunder egg halves. The principal is that the pan is vibrating so fast, that it moves underneath the slabs that are being worked. The pan usually has grooves, this helps to distribute the grit, and act as an anchor for the grit particles as the slab is moving across it. In most cases, with rocks with a Mohs of 6-7 (agate), I use the following grits, I'm sure if you have similar grits, it will work fine. You do want to use GRADED grits. Graded grits will just have one number, i.e. 80-grit. Un-graded will have 2 numbers, i.e. 60/90, you want the singled number grit. The 60 represents the roughest the grit will be, and 90 represents what the finest, the grit will be. You get a more efficient grind with graded grit.
The Grits I use are:
80-Grit, Gough Grind.
220-Grit, Course Sand.
600-Grit, Fine Sand,
And then Polish Stage.
Depending on roughness of the surface to be ground, you may be able to skip the roughest grade grit, if it is a very smooth surface, start with 220-Grit, and check progress, if needed go to 80-Grit.

Vibrating Laps can be very finicky machines, but once you get the hang of them, they are an easy way to polish several slabs at once. They can give excellent results with a bit of knowledge and practice. A lot of people give up on them because they get too messy, (I'll talk about that in a bit), or they won't polish the whole slab.
First preparing your slab for the Vibrating Lap, make sure that the side you want to work is free of saw burrs, and if possible grind the slab down as flat as you can to start with, it saves the pan, and time down the road.
OK, now that all of your slabs are ready, what now? You could just put them in as is, and it would work, but it will take longer, and you run the risk of chipping the edges of the slab. So, I found a way to speed things up a bit, and protect the slab edges. To do this you will need the following:
OLD cast iron saucepan, or similar.
Scrap Plexi-glass, doesn't matter if it is scratched or not.
Lead, either fishing weights, or Tire stores will sell used tire weights cheap.
Tin Snips.
Small Cat Food Cans, or similar.
2-sided sticky tape
2-part, waterproof, epoxy

OK, now we are ready to make our weights, and guards. First get a camp stove, wear gloves and goggles, and go outside on a day with a breeze, and always stand upwind, always! DO NOT BREATHE LEAD FUMES! LEAD CAN BE DANGEROUS! BE SAFE! AT YOU OWN RISK! Place the cast iron pan on the stove and add some lead, it will melt in a few minutes, depending on your stove it could take 10 minutes to start melting. It will turn liquid and silvery when melting. The metal parts of the tire weights will float to the top, and you can skim them off with a spoon. Once you have melted the lead you will need, CAREFULLY pour one-quarter inch to one-half inch of melted lead into a cat food can, let cool completely. When totally cool, use the tin snips to remove the tin can. You now have a lead "wafer".

You will want to make a selection of “wafers” for different projects. Paint the wafer with paint to minimize lead chips from breaking off, and maintain the paint job. I use thick clear paint any good paint will work. Now get the Plexi-glass, cut out sections of the Plexi-glass that are about one-half inch larger all the way around, than the lead wafers.

Make several sizes to work with different sized slabs, you can make different sized weights also. You will always want the Plexiglas to be larger than the slab you are trying to polish. Make sure corners are rounded, if they aren’t they will hang up on the vibrating process. Now, take the Plexi-glass that is a bit larger than the wafer, center everything, and then epoxy the two together, with waterproof epoxy. Let dry very thoroughly.

Now that the epoxy is dry, you are just about ready to get busy grinding with the vibrating lap. You will need to find the center of gravity for both the slab and the weight set. To do this, balance the slab on you finger, the point at which it balances is the center of gravity, mark it, on the side not to be ground, with a pencil, now do the same thing with the weight set up, mark that on the Plexiglas side, you now have the CG for both the slab, and the weight set up. Join the slab and the weight set up, with the CG's together, using 2-sided sticky tape. I use cut pieces about the size of a pea, about every inch along the slab, smaller pieces makes removal easier. Now your slab should be totally protected from bumping by the Plexiglas guard, and the weight will speed things up. NOTE: You do not want to use large amounts of weight, because that will cause premature wearing of the pan. As will slabs that have burrs left on them when grinding, you want to start with smooth slabs.

Try to use slabs of similar thickness, this way the Plexiglas guards bump into each other rather than sliding above or below. Be sure the Plexiglas guards are bigger than the slab you are working.

OK, enough, let's get that Lap, Vibrating.
Take you're weighted slabs, and place them in the pan, you do not want to cram the pan full, and I would say 80% is about right. When the slurry is right and the pan running, your slabs should "dance" freely, if there are too many slabs, they will "catch" and "bind", if you have too few slabs, they will not "dance" and rotate around the pan. They should be able to move freely, and should be moving, when lap is on. Now, add grit as per manufactures instructions. I will use a 12" Lap as an example; you will have to adjust yours accordingly. I add about 3-4 tablespoons of 80-Grit. Then I put 1 small drop of liquid dishwashing soap, this breaks surface tension, and allows the grit to stick to the slab better. Now add water to get a thin pancake batter consistency. I use a spray bottle; this gives better control over amount of water. Let it run for 5-10 minutes, then check the consistency of the grit slurry again, and adjust as needed. Now for the messy problem. If you have the slurry too thin, you will know it, because grit will start splashing out, right at the point that the splashing stops, is the point you want to be at. You can put a shower cap over the lap to minimize any splash that may happen, one cap per grit. The lap will run for a couple of hours without having to add water, but check it fairly often, and add water as needed to keep the slurry at the desired level. Use a spray bottle, this allows for fine adjustment.
The first grind time will depend on the roughness of the slab at starting time, but on an average it will take around 10-16 hours of vibrating to get through the first stage. You should add about 1-3 tablespoons of fresh grit every 3-4 hours.

The way that you test the slab to see if it ready, is to get a pencil and mark a zigzag so that it covers most of the slab. Place the slab back in, and after 2 minutes, check it, if the pencil line is COMPLETELY gone, you are ready to move to the next grit. If ANY of the pencil line is still there, keep on that grit, and recheck every few hours, until it passes.

Now, when moving to the next grit, you want to wash the slabs, and weights, very, very, thoroughly, DO NOT LEAVE ONE GRAIN OF GRIT ON SLAB. Clean, Clean, Clean. Now clean the pan out, not leaving any trace of the previous grit, anywhere. Clean bumpers, pan, slabs, and work area. Now that everything is clean, let's move on. Place slabs back into pan, add 3-4 tablespoons of 220-Grit, and add a drop of soap, then add the water to make the slurry as you did earlier. If it is splashing, the slurry is too thin, add a bit more grit. Again check it after 5-10 minutes, and adjust as needed. Recheck slurry thickness every hour or two. Add1-3 tablespoons of fresh grit, every 3-4 hours. When it again passes the pencil test COMPLETELY, it ready for the next grit. (About 10-16 hours) When the slabs are ready we will move to the final grit stage.

OK, again clean the slabs, and EVERYTHING else COMPLETELY. When clean, add the slabs, drop of soap, and 3-4 tablespoons of 600-Grit. Sand on 600-Grit, adding1-3 Tablespoons of fresh grit only **once** after 3-4 hours. We won't add more fresh grit after this, because the grit will break down and act as finer grit than 600 for the last stages of sanding. Keep on 600-Grit until it passes pencil test Completely. When it does, Wash and Clean EVERYTHING AGAIN. Clean, Clean, Clean. Now you are ready for polishing.

Place the polishing pad in the pan, add the bumper, and then add the CLEANED slabs. Add about 2 tablespoons of polish, and add water until you see the slabs pushing about one-quarter inch of slurry in front of them, again if it is splashing, too much water. Check water every hour or two, and polish until done, usually 10-20 hours.

You will find and develop your own way of working these Laps. This is just what worked for me after much trial and error. I am hoping to save people the frustration I had, I almost gave up several times. I want to show that the Vibrating Lap can be a fun and good Lapidary tool when used correctly. Feel free to contact me with comments or questions. Let me know what has worked for you.

NOTES;

- Too much weight will wear the pan out sooner.
- Clean thoroughly between grit stages.
- Only one shower cap per grit, do not use a cap that was used for 80-Grit, on the 220 stage.
- Be Careful when melting lead, read up on it, be safe, do not breathe lead fumes.
- Use Graded as opposed to Un-graded grit.
- Softer Stones such as Marbles, and Obsidian, will have a reduced working time, than above, keep an eye on progress, and when passes pencil test, it ready to move on.
- The pencil mark must be 100% gone when doing the pencil test, or that part that is not gone will not look good when slab is done, all the pencil mark must be gone after two-minutes.
- Some smoother slabs, and softer stones, will not need the roughest grit stage, start them at 220-Grit.
- For added protection, add a wide rubber band around the Plexiglas guard.
- Try to use slabs of similar thickness, Plexiglas guards work better.
- If desired you can add wafers on top of each other for more weight, but remember pan will wear faster.
- Be sure tube guard around inside of pan is in good condition, and cleaned well in-between stages.
- Check grit slurry regularly, it does dry out if not attended.