

**MINI-SONIC®
MICRO-SONIC™
VIBRA-SONIC®
INSTRUCTION
MANUAL**



Steps and guidelines
for the use
of Mini-
Sonic®
Micro-
Sonic™
and
Vibra-
Sonic®
Tumblers.



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Congratulations on selecting the Mini-Sonic® or Micro-Sonic™ the original electronic tumblers. Considerable time and testing since 1973 have refined Mini-Sonic® and Micro-Sonic™ units into the finest magnetic drive tumbler available today. Constructed of only the highest quality materials, carefully assembled and tested, your unit is guaranteed under the limited lifetime warranty printed in the rear section of this manual.



PRINCIPLE OF OPERATION



Your new Mini-Sonic®, Micro-Sonic™, or Vibra-Sonic®, vibratory tumbler operates on a new and unique principle. Developed and patented by the Geo-Sonics, Division of Geode Industries, Inc., this method of operation employs vibration as the driving force which powers the rotation of the load inside the tumbler hopper. During rotation the tumbling load is alternately separated and compacted during each vibratory cycle. This improves the tumbling process and allows fresh abrasive to be drawn in between materials in the first stage. The compaction results on the other half of the cycle, effectively forcing contents against the container wall and causing an aggressive but gentle abrasive action. Only the contents inside the container or containers actually rotate. The containers themselves remain practically motionless except for their driving arc of motion. Only a small amount of abrasive is required in the unique and patented tumbling processes, since they operate on a

somewhat different principle than most ordinary tumblers. *As a general rule, one level Tablespoon of abrasives per pound load plus an equal amount of water are the basic requirements for starting the tumbling process.* As the abrasive begins to pulverize or break down and combines the rock dust and water, a slurry (or coating mixture) is formed, and it is this type of coating which should be maintained throughout all the tumbling processes. Excess water or abrasives may cause abrasives to collect in the bottom of the container retarding rotation and motion. It is necessary only to maintain a thin coating of abrasive slurry between the materials in the load. The load is capable of using only a given amount of slurry in rotation and suspension while clinging to the load. The excess does not serve any purpose, and will require increased processing time to pulverize, during the tumbling cycle. This can retard the action of the load, with the possibility of ineffective results.



SELECTING ROUGH

Select materials for processing with care..Poor materials in will result in poor materials out. No better results can be obtained than the quality of the load selected. Stones will maintain their basic shapes or configurations, except that the overall physical size will be reduced during operations using silicon carbide as the abrasive medium for processing.

VARIOUS HARDNESS

Most gem materials through the M.O.H. scale of 5—8 can be mixed and processed. Although it is wise to have some experience in vibratory finishing in order to achieve optimum results. Materials below 5 or above 8 will usually require some form of special treatment, and mixing with others is not recommended.

After experience in vibratory tumbling is achieved, selections can then be made on which materials might be suitable for mixed processing. In some instances the very nature of the material and toughness are factors.

MIXING VARIOUS SIZES

Do not load the container with crushed/broken gem material which is basically the same size and shape. This could cause the load to "knit" together and turn as a single mass, with poor rotation within the load itself. Material exceeding 1½" in KG-1/MT-4,10,14/VT-8,12,14/, may process slowly if multiples are included in the load.

Any crushed/broken gem material should be of varied sizes. Separate using rounded or cylinder shaped smooth media.. Ceramic cylinder media approx. ¼ diameter with angled ends and not exceeding ½" in length is highly recommended. This will provide optimum tumbling action, separation of the load and effectiveness of the abrasives.

Pre-Tumbled materials can be used as media, provided they are approximately the same size.

Process the media along with the load, through all cycles, including the polish when using the *wet* method.. When polishing with Vibra-Dry® the media can be removed from the load if desired.

STEP #1



GRINDING

Wash the material and drain off all water that runs off quickly and freely. Select enough rough (including any media) to fill the hopper 75% to 80% full. Do not fill too full...leave enough room for the load to rotate and fold over slightly at the top. Start the tumbler and slowly add 1 tablespoon of 60/90, #80, or # 60/120 Silicon Carbide per pound of tumbler load.

Do not add additional water at this time. Too much water could cause the abrasive to "sink" to the bottom of the container. After a few minutes of rotation the material should appear to be coated with the abrasive grains.

Adjust the speed to a good rotation. It may not be necessary to run at full speed, this depends on the shape and roughness of the load. Excess rotation does not necessary improve the results.

It is the unique patented process of the Mini-Sonic® and the vibration which gives results. The rotation of the load primarily serves to keep everything evenly coated with abrasive slurry.

After a few hours of operation a slurry like batter will begin to develop as materials wear away.

It is important to maintain this slurry, and as materials wear away the slurry will thicken.

Again, a few layers of kitchen wrap over the hopper opening before placing the lid, will help maintain moisture in the load.

Check your tumbler load daily and if the load thickens to the point of slowing or stopping rotation add water very sparingly to maintain the batter like slurry.

After 2-3 days it may be necessary to remove the load, wash off excess slurry & "rock mud" and re-start the load with fresh abrasives, especially with very rough surfaces. Softer materials will also develop excess slurry faster. Total average run time is 2-5 days.

Remember, if you add abrasives or re-start with fresh abrasives...run the load through the complete cycle. Cutting run times short will not allow the abrasives to "break down" properly and the next step may not be able to complete its cycle properly. Short changing a step may seem a time saver, but most likely will mean poor results. Complete each cycle fully. Go to step #2—with tumbler running—Do not let the load stand idle, or cleaning will be difficult.

STEP #2
1ST SANDING

Using two plastic pails and a plastic pan you can make a washing-cleaning setup. Never allow any abrasive slurry mix to enter any drain or plumbing system...it will set up like cement.

With the tumbler running, add about $\frac{1}{4}$ to $\frac{1}{2}$ cup water and a few drops of liquid, or $\frac{1}{2}$ teaspoon of powdered soap (to break the surface tension) to the load and run for 2-3 minutes to loosen the abrasive slurry mix. Then remove the hopper and pour immediately into a plastic pan and rinse at once with water until clean. Transfer load to the 2nd bucket, with ample water to cover the load and wash until *all signs of abrasive grains or slurry are removed.*

Abrasive grains caught in cracks and crevices could vibrate out during the end of a cycle and contaminate the load. Abrasive that settles in the 1st bucket can sometimes be re-used.

Wash the hopper free from any abrasive and/or slurry. Pour off all water from the clean load, that will quickly & freely run.. Place materials in the hopper, and add media or pre-tumbled stones to bring the load up to the optimum tumbling level as described in Step #1. A 10 to 20% loss in Step #1 is about average.

Step #2 requires a finer abrasive, silicon carbide, #120-220, #220, #2-F or #320 grit size.. Mixed grade sizes such as: sizes #120-220, #2-F are more economical in price and are commonly referred to as "ungraded".

With the tumbler running, add slowly 1 tablespoon of abrasive per pound of load. A *few* drops of concentrated burnishing soap such as Royal Green, or GS Brightener will help break the surface tension of the water.

Adjust tumbling intensity to bring the load to a good rotation. Use multiple layers of kitchen wrap to make a cover over the hopper before replacing the lid. The lid should be used as it is an important balance for the hopper. Normal tumbling times for this operation are 30-48 hours. Some materials may require longer processing cycles.

This is an important stage in tumbling, as $\frac{1}{2}$ the depth of the pitting from the Grinding Stage must be removed. After completing Step #2, and under magnification, pitting will still be visible, but will appear more widely spaced. The surface of the stones when rubbed on a cloth, (such as cotton or flannel) appear to have a dull, but uniform, finish. (Wash & clean load as per previous instructions)

STEP #3



2ND SANDING

Only a small volume of material is removed during the 2nd cycle, and it is usually not necessary to add material to the load. Drain off all water that will freely run and placed washed load in hopper. Add silicon carbide abrasives at the rate of 1 tablespoon per pound of load. Use a finer abrasive in this step, # 4/F, #500 or #600 Grit size. Start rotation and check the load level for optimum rotation. If load level requires--add only gem materials that have been processed through step #2, or ceramic media. Do not over-fill the hopper. This will cause the material to rotate as a compact "ball" or mass, but will not permit rotation within the load itself.

After a few hours check the slurry coating and if additional water is required to maintain the batter like consistency...*add very sparingly*. A slurry coating too thin will defeat the purpose and also as you progress closer to the polishing cycle..consistency becomes thinner. Too thin can result in chipping or spalling. Reduce the rotation to a good even roll. Excess rotation does not improve or speed up the operation, as very little material is removed during this cycle. It is

Normal running times are 30-48 hours. Longer running times are suggested for softer materials or ones that are unusually difficult to polish. These types of material usually pit deeper in initial tumbling stages, and consequently require longer processing times to prepare for the final polishing cycle.

If you are in an extremely dry climate area, and operations tend to dry out prematurely...make a small gravity drip system. A clean (unused) medicinal drip bottle with IV tube & control might be used. Insert the needle through the vinyl lid and adjust to give the right drip..

Do not add fresh abrasives in the middle of or at the close of a cycle. Only at the very beginning. If required...remember...excess water and/or abrasives can cause all the slurry to sink to the bottom and "cake" up. This is the case of where more is sometimes not better.

Should you experience this condition, remove the load, clean out the excess water or brasive slurry, and re-charge the load. If the slurry is too thin and you can see the stone surface, leave the lid off until slurry thickens.

STEP #4
PRE-POLISH
**Wet process for
Pre-Polishing**

Not all materials require this cycle. Usually soft or below 5 in hardness on the MOH scale or difficult to polish. Agates, most jaspers, quartz family minerals are in the exempt groups. Many times the use of this cycle can promote a faster polish process or a higher degree of polish. Meticulous cleaning should be done before processing. Just a few grains of silicon carbide can contaminate the load.

Alundum (Aluminum Oxide) #600 grit is a suggested pre-polish compound. Use approx. ½ tablespoon per pound of load, and an equal amount of water. *Adjust tumbling intensity and rotation.*

Rotation serves to keep the load evenly turning and coated with slurry. Excess rotation & intensity (since the slurry mixtures are thinner) could result in damage to the load. Add moisture if required, to maintain the slurry like batter. Running times are 18 to 36 hours depending on materials. The load will appear to have a dull shine, when cleaned and rubbed with a cloth. Clean load when completed and proceed to step #5

**Dry process for
Pre-Polishing**

Vibra-Dry® compounds may also be used *in place of* the wet method of pre-polishing. This method has advantages in processing materials below 6 in hardness, and difficult to polish gem stones.

Vibra-Dry® *standard* is pre-packed, requires no water to be added, can be used right from the container and is re-usable. Another advantage is that it will not creep into cracks or fissures, causing an unsightly white appearance. Vibra-Dry® can be screened through a plastic colander and saved for re-use. Stones are cleaned with a gentle rinse in detergent water, and readied with ease for the next cycle. An additional plus is the cushioning effect of the compound all but eliminates damage to delicate materials.

Abrasive mesh size #600 is for materials below 6 in hardness. Above 6-8 process in #1700. Use approx. 4 oz (by volume) per pound of load. Processing times are normally 36-48 hours or slightly longer for soft stones.

8.



STEP #5

FINAL POLISH

Wet Polishing

After cleaning and washing the load...place back into the hopper adding ¼ cup water and detergent. Run for a few minutes to shake loose any abrasive. Re-wash the load, as any abrasive carried from the previous step, to the polish cycle could cause contamination and dulling of the polish.

Use ½ tablespoon of Cerium Substitute compound (or Aluminum Oxide) per pound of load. The compound must be hard enough to withstand vibratory finishing, and yet "break down" into finer particles to produce a highly polish surface.

Inferior polishing compounds, or Cerium, Tin, & Iron Oxides and other natural earth compounds are not recommended. These break down too rapidly and become "worn out" before they can produce a satisfactory polish.

Normal running times are 24-36 hours or until polish is achieved. Softer stones tend to pit deeper in the pre-finishing cycles and usually take longer to bring to a final polish. The harder materials tend to start the polished appearance before the softer stones. Continue running until the entire load is polished.

Dry Polishing

After cleaning & washing the load as described, thoroughly *dry* all materials. Use Vibra-Dry® at the rate of approx. 4 oz. by volume, per pound of load. **Do not** add water at any time.

Materials 7-8½ in hardness on the MOH scale are best processed using #1700 mesh and #14000 compound. An Additional cycle in 2500 for difficult to polish materials.. Running times Minimum of 36-48 hours per step.

Materials 2-6 in hardness a 3 step a recommended sequence of 600/2500/25000 Vibra-Dry®. Approx. 4 ounces (by volume) per pound of load. Run times are usually 36-60 hours per step, or until polish is achieved.

Vibra-Dry® can be "sifted" through a colander. Enlarge to allow free flowing of the compound and still retain the load. Burnishing can sometimes bring up a higher gloss on the surface. Use our plain KG carrier, approx. 4 oz. (by volume) per pound of load. Add two tablespoons of extender fluid and run load a few hours. Keep containers sealed for re-use. Use a few drops of extender fluid to keep dry compounds soft and in their optimum polishing state.



Wet Polishing

Pre-Forms, or objects that have been pre-shaped, from grinding wheels or pre-forming machines can usually eliminate steps #1 and #2. Unless pronounced grinding marks, grooves or machining marks are present can be started in #500 or #600 silicon carbide. If there are marks or grooves, start in # 220 or #2/F

Double or triple the amount of media per pound of load so that all work is separated and maximum contact is maintained. The larger the flat surface area, the greater the ratio of media to load.

Use 1 tablespoon of abrasive per pound of load and an equal amount of water. Layers of kitchen wrap can be used to cover hopper before placing the lid on the hopper. This will help retain moisture and the slurry coating. (A dash of table salt can reduce foaming of the slurry)

Running times can vary greatly especially with carvings or intricate shapes. Usually 36-60 hours for pre-formed cabochons or carvings, with longer times required for items with more flat areas compared to rounded shapes.

Sawed slabs—Normally omit the 1st and 2nd steps in the tumbling process, unless pronounced saw marks are present...then start in cycle #2 #220 or 2/F, continue to cycle #3 #500 or #600, and use cycle #4 #600 Alundum for softer materials.

Polish using Step #5 wet cycle and separate the slabs by using double or triple the amount of media. If the slices "lap" together only one side will receive treatment.

Running times should be 3 to 4 times longer than other materials and slabs will process from the outer edge towards the center. If the cycles are not long enough then the center will not receive the proper processing and finish will not be satisfactory.

Process the media along with the load, completely through all operations and do not add fresh media during any cycle.

Do not overload the hopper with slabs which are too long, or too large. This will slow the rotation and also cause uneven rotation of the load. Time and patience is the key to processing sawed slabs and flat pieces.



S U V A
LAPIDARY SUPPLY

DIAMOND WHEELS
PIXIE COLLECTION
GENIE COLLECTION
TITAN COLLECTION
CABBING SUPPLIES
CARVING SUPPLIES
TUMBLING SUPPLIES

