

PLEASE READ BEFORE OPERATING UNIT.

Manufactured by

BELT INC.

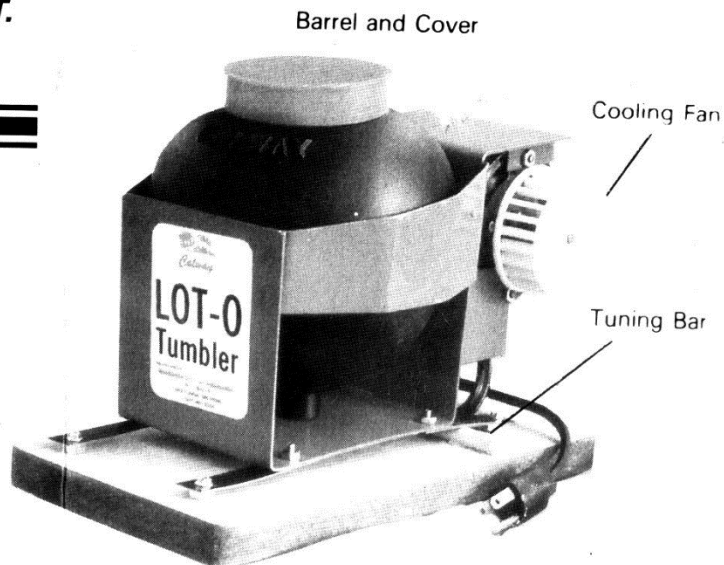
2923 WEST HWY. 14
OWATONNA, MN 55060
PHONE: 507-451-2254
FAX: 507-451-8887

E MAIL: uncletom@ic.owatonna.mn.us
WEBSITE: www.lototumbler.com



LOT-O-TUMBLER & LOT-O-TWIN-TUMBLER

DETAILED DIRECTIONS



MOUNTING INSTRUCTIONS

Using Solid Cement Block (40 lbs.) - Coat top of block with latex base paint (old inside wall paint will do nicely). Allow to dry. Remove protective paper from double sticky tape on bottom of board. Apply unit to floor and press down firmly.

For Lot-O-Twin-Tumbler - Use solid cement block 12 x 12 x 12 or 100 lb. minimum or on cement floor. Remove protective paper from double sticky tape on bottom of board. Apply unit to floor or cement block and press down firmly.

CAUTION

1. Keep fingers and grease off double sticky pads.
2. The heavier the base the better the action.
3. Do not mount on table or bench without putting unit on a block first.
4. On Lot-O-Twin-Tumbler both barrels must be in use.
5. Plastic pellets are not recommended in a vibratory tumbler.

OPERATING INSTRUCTIONS

1. Fill barrel with agates - about four pounds of stone. These can be mixed sizes. (Action is fast, but gentle.) It is important to keep the barrel full. If after grinding it is not full, add some from a previous batch to keep it full.
2. Rinse agates with water to remove mud. (Submerge filled barrel in container of water. Remove, shake and drain off water.
3. Replace barrel in frame firmly. Add 2 Tbls. medium 180 to 220 grit size. Place cap on barrel. (Punch small hole in cap to relieve pressure.) Add 1/2 cupful of water to keep a creamy consistency.
4. **Repeat steps 2 and 3 at 12 hour intervals until desired amount of agate has been removed.** Average time: 3 to 4 days. Add 1 capful of water after 12 hours if rocks cannot be washed.
5. Repeat steps 2 and 3 for 24 hrs.
6. Repeat steps 2 and 3, substituting 600 grit. Tumble 24 hours or less. Use only 1/2 teaspoon of 600 grit.
7. Repeat steps 2 and 3 using only 1/2 teaspoonful of tin oxide, Rapid Polish No. 61, or Lusterite Formula II. Tumble 24 hours, and no more. Rinse thoroughly and admire.

Suggestion for easy clean-up: About 15 minutes before cleaning out each time, add 1 cap full of water and about 2 drops of liquid detergent. Let run for 15 minutes and your rocks will wash off sparkling clean.

DETAILED INSTRUCTIONS

STEP 1: ROUGHING

In the roughing cut the goal is to remove the undesirable outer portion of the agate. This usually takes the longest time and is not as critical as some of the other steps. With the Lot-O-Tumbler, use of a medium grit such as 200 will do the fastest job of removing this outer material. (Use of a coarser grit such as 80 or 100 silicon carbide does not improve the performance.) The grit has to cling to the agate as it rotates in the barrel. coarser grit tends to fall off the agate as it rolls and delays the roughing action. In order to grind away the rock, the grit must be in between the agates when they come together. If two rocks merely tumble together, there will be a buffing action but the outer portion will not be removed. Anything which keeps the agate from coming together on the silicon carbide grit will reduce the action of removing the undesirable rock.

The best action is achieved by wetting the rock just enough for the silicon carbide grit to cling to the agate as it tumbles. This is achieved by putting just enough water in the unit to insure that the agate is wet. If too much water is used, it will cushion the vibration and increase the roughing time. For a full barrel of agate in a variety of sizes. Start with only the agate wet. If the agate cannot be rinsed in 12 hours add 1 capful of water.

The Lot-O-Tumbler breaks down the 200 grit rather rapidly. Therefore, on the first two days of tumbling, there should be a fair amount of grit placed in the unit. The usual amount is about two tablespoons of silicon carbide. When the agates are washed daily, mud and grit will be observed coming out. There should be a small quantity of the original grit remaining to insure that the unit is grinding over the full period of time. On the last day of the 200 grit, it is best to use a light charge of silicon carbide so that all the grit will break down and the agate will start to polish. This insures that none of the course grit is carried over into the next polish.

As the grit breaks down and the excess material is removed from the agate, mud forms inside the barrel. This mud tends to reduce the action of the unit so regular removal is important. The barrel and agate should be washed every 12 hours if possible. In this washing, where the same grit is used, it is sufficient to simply fill the unit with water and swish it around. For a faster roughing the mud and excess material should be removed every 12 hours.

Some difficulty may be encountered in this first step if the lid pops off the unit. This is due to the generation of gas during tumbling. The problem can be reduced by punching a small hole in the top of the cap to allow the gas to escape without removing the lid. The normal grip of the lid is gas tight and should remain on the unit unless it is stretched by some means. In this case, a substitute lid can be used from such items as potato chip, dog food, or cat food cans.

STEP 2: START OF FINISHING OPERATION

In the first step of tumbling agate, a rough grinding action is used to remove the undesirable overburden of the agate. This rough grinding action produces a finish which is smooth and is dull in appearance. In order to obtain a bright luster the external surface of the agate must be smoothed so that no visible scratches are seen. This intermediate polish or 600 grit is used to start the polishing action. By allowing the tumbler to run for a longer time on the roughing grit it is possible to break down the roughing grit and start the polishing process. However, this process takes longer than changing to a finer grit.

In the Lot-O-Tumbler process, all that is necessary is the rinsing of the agate and dumping of all the old mud and grit. 1/2 teaspoon of the fine or 600 silicon carbide type is added. This insures the breaking down of the grit and less difficulty of carry-over to the polish stages. After 24 hours of tumbling the agate should show an increase in lustre.

In order to polish materials such as Apache tears and quartz, it is necessary to cushion the action in the 600 grit and polish of the tumbler. This cushioning is easy to do by adding more water with the grit to reduce the action and bring on a lustre to these hard-to-tumble materials. The grit and agate are placed in the barrel and enough water is added to be visible through the top of the agates. This cushioning material is adequate to produce a fine finish on hard-to-tumble materials without the addition of any other materials such as tumbling pellets.

STEP 3: FINAL OR POLISH STEP (A Seperate barrel is recommended for this step)

Before proceeding into this step all the material being tumbled should be removed from the tumbler barrel and inspected for any residue grit left from the previous step. The barrel, too, should be inspected to be sure that it is clean. If any of this grit is carried over it will continue to scratch the surface and prevent development of a high lustre. With the proper amount of 600 grit there is less chance of carry over and less washing to be done.

This polishing operation is accomplished in the same way as the previous steps except that a polishing compound such as Rapid Polish, tin oxide, or Lusterite Formula II is added instead of the silicon carbide. Again, only enough water to wet the agate is placed in the barrel. Then add about $\frac{1}{2}$ teaspoon of polish - just enough to insure a light coating on the agate. By watching the action of the unit as the polish is introduced, the operator will see a white film appear on the outside of the agate - indicating that enough polish has been added. This polish does not break down like the silicon carbide and can be reused. However, the quantity used in this unit is so small that it may be more practical to discard after use. The risk of contamination of polish increases with each reuse and could produce inferior results.

On the hard-to-polish materials such as Apache tears and quartz, the polish is introduced along with sufficient water to submerge the agate. This provides the cushioning action necessary to produce a shine on these materials. In some instances it may be desirable to operate the unit for more than one day to produce the desired finish. Usually one day is enough time, but longer times will not materially affect the agate and may produce a higher shine on hard to polish material but not on agate.

SPECIAL OPERATIONAL PROCEDURES

SLABS: (Aluminum oxide pellets are recommended for slabs. To keep them apart and for faster grinding action.) It is possible to tumble a full load of slabs in the Lot-O-Tumbler by using the regular techniques described. Some difficulty is encountered if the slabs are not completely smooth, or are stepped by the saw cut. A longer tumbling time will remove the step. If the slabs do not seem to polish adequately, the difficulty is usually in the roughing of the slabs prior to polish. A fair amount of material must be removed from the surface the slab prior to polishing. This may involve considerably more time than the three days necessary for the round agate. More frequent washing is needed. Follow the normal instructions being used for cabochons below, after roughing, to achieve a high luster in 4 days.

CABOCHONS OR FREE FORMS: The finishing of cabochons can be completed in the Lot-O-Tumbler. Normally, if the cabochons have been taken from a 200 grit silicon wheel. Normally the amount of material removed in one day of tumbling with 200 grit is equivalent to the thickness of the pencil line used to mark the cab, and almost insignificant in the mounting of the cab. Cabochons finished with a tumbler are sometimes more desirable than those finished by hand because the tumbler polishes both front and back of the cab. **Day 1:** Put cabochons or preforms that you want polished in barrel, fill with aluminum oxide pellets to $\frac{3}{4}$ full, turn on machine and add aluminum oxide pellets to get best rotation. Add $\frac{1}{2}$ of red cap of water, 1 $\frac{1}{2}$ tsp. of 180-220 Grit. Run for 24 hours. Wash out and put contents back into barrel. **Day 2:** Add $\frac{1}{2}$ tsp. of Fine Grit run for another 24 hours and wash out. **Day 3:** For the best results, we have found that on the 3rd day, to add $\frac{1}{2}$ tsp of 1000 or 1200 Graded Aluminum Oxide Grit. Run for another 24 hours then wash out. **Day 4:** 24 hours, add $\frac{1}{2}$ tsp. of Rapid Polish 61. You should have a GREAT POLISH If you follow this. To help you in cleaning out the tumbler, about 1 hour before you wash it out, add a few drops of liquid soap and a small amount of water. You will find the stones will wash off sparkling clean. **Note:** Use very little water in each step, as to much water only washes the stones and slows the action of the tumbler.

APACHE TEARS: In the finishing of Apache tear, it is important to remember that they are delicate and chip easily. Care should be taken in the final finishing to prevent chipping. Tears are started in the same way as agate with 200 grit and a small amount of water in the tumbler to assure fast removal of the extra material. This requires two to three days of tumbling. Wash away the excess material that has been removed and replace the grit after each day. After roughing in 200 grit, all of the tears should have a uniform surface. When the tears have been ground so that most of the chips in the tears have disappeared, the finishing operation can be started. The tears are placed in the barrel with enough water so that the water is visible down through the top of the tears, and $\frac{1}{2}$ teaspoon of 600 grit added to begin the polishing. After 18 hours the tears will begin to shine but will still look cloudy and non-transparent.

At this point all evidence of grit is removed from the tears and the tumbler barrel. The tears are put back in the barrel with water to cover and one teaspoon of Rapid Polish No. 61 or tin oxide for polishing. Two days is usually sufficient to produce a high lustre on the tears. (Experimentation with a long period of time in the 600 grit will help the operator find the fastest time for polishing this material.

When tumbling tears it is recommended that one tear be removed daily to use as a comparison with the progress of the others. If the corners are shining while the flat portion is still cloudy, a longer period of tumbling is needed to improve appearance. If the corners are checking out and the flat portions are shiny, the action is too aggressive. It is important to keep the tumbler as full of tears as possible during the polishing operation in order to avoid the too aggressive action.

QUARTZ: All styles of what is normally referred to as quartz are handled in the same way as the Apache tears. The same method of roughing and polishing will produce excellent results.

TURQUOISE: Turquoise is an extremely soft material. Care must be taken in the roughing cut so that not too much material is removed. Start with a 200 grit, or better yet, plastic pellet with grit imbedded and check the operation periodically. Intervals of two or three hours are usually adequate in the roughing cut if turquoise. The finishing procedure is the same as for normal agate but the polish will be less than adequate. After normal polishing the unit can be filled with water on the polish cycle to obtain a more lustrous finish. A dry polish is then required to obtain the best results such as that used to polish silver or brass (walnut hulls and red rough).

SMALL STONES: Small stones are processed in the same manner as other material of similar hardness. Sometimes the smaller stones will increase the weight of the tumbler and reduce the action. If the stones are all less than 1/4 inch in diameter, the load size should be reduced.

LARGE STONES: Normally anything that can be put through the lid of the tumbler can be tumbled. If one or two large stones are tumbled, the remaining load should be of small size in order to obtain proper tumbling action. It is not advisable to tumble just two or three large stones by themselves. Large stones are handled in the same manner as other material of the same hardness. A mixture of sizes in a single load is suggested.

WARNING: If the material in the tumbler does not roll, difficulty will be encountered in all steps. A small load is one reason for lack of rolling. The other reason may be mechanical, lack of adequate anchor weight, broken springs or faulty motor.

Cerium oxide has not proved to be a good polish for use in the Lot-O-Tumbler.

Plastic pellets are not recommended for a vibratory tumbler.

The unit as it is shipped from the factory is resonantly tuned to provide the maximum amplitude of vibration under a full load condition. The tuning is accomplished by the position of the tuning bar which is underneath the springs on the motor end of the unit. Moving the tuning bar changes the amplitude of vibration. It is not recommended that this be done until the operator has become familiar with the unit. With the tuning set for maximum vibration it is important to have a full load of agate. Anything less than the four pounds which the unit is designed to tumble will generate an action that is too aggressive and could result in damage to the unit or to the agate. Do not attempt to tumble small quantities of precious material without providing a filler to bring the weight close to four pounds. Use a tennis ball, with a hole, set in barrel - instead of the cap for a few stones. Be sure to add agate to the regular barrel.