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## **POLISHING INSTRUCTIONS FOR VERTICAL WHEEL GLASS POLISHER WITH 380 RPM**

### **INTRODUCTION**

The information in this instruction is brief and basic. If at all possible, the beginner should work under the supervision of a skilled artisan or take a class under a trained instructor using a detailed glass-working text.

Beveling is the process where by the edges of a piece of glass are angled from some point on the surface to the rim.

The purpose of pre-polish is to remove the haze that has been left on the surface of glass by the smoothing stone. The vertical cork wheel with pumice powder has been found to be the best device for this purpose.

The purpose of final polish is to give the glass surface a clear sparkling effect. The vertical felt wheel with jeweler's rouge or cerium oxide has been found to be the best device for this purpose.

### **DESCRIPTION**

This cork and felt polisher is a complete glass-polishing unit with component parts mounted on Lam-I-Cushion base. Individual wheel tank and splashguard helps protect the work area from polish residue thrown by the wheels. Guard back plate with water valve/spray nozzle and sponge bench adjusts for three wheel diameters. Removable tank sides permit easy wheel changes.

Arbor has steel 1" X 23-3/4" shaft and heavy-duty ball bearings that are neoprene sealed and greased for life. Vertical beveller comes with 1/3 HP motor, belt guard, operation instructions and guarantee. Size: 24"L X 23"W X 18"H. Shipping weight: 75 lbs.

### **TERMINOLOGY**

**ROUGHING WHEEL:** The first wheel used to obtain the glass shape. It may be a silicon carbide, aluminum oxide, or diamond wheel.

**SMOOTHING WHEEL:** The second wheel used to obtain the glass shape. It may be a silicon carbide or aluminum oxide wheel (or stone) cast from a mold. A fine diamond wheel may also be used.

**BEVEL:** The term can be used to mean the entire piece of glass, the edges which have been slanted from the starting surface or, as in pencil bevels, with the remaining surface edge. The term also describes a slanted edge so far as its length is concerned.

**PENCIL BEVEL:** A term used to describe a piece of glass where the complete surface of the glass becomes beveled.

**MITRE:** This term describes the width of the bevel.

**ANGLE:** The term means the line made by the mitre with the untouched glass surface. It is also the line between continuous levels. The mitre controls the angle. Thus, the BEVEL is the MITRE plus the ANGLES; in short, the entire piece of glass.

### **TERMINOLOGY (Continued)**

**GROZZING:** The abrading of the glass surface.

**SCALLOPING:** Sometimes called gouging. It is an effect that results from allowing glass to remain too long in one spot on the roughing plate.

**TAPERING:** Where a bevel starts at one width and ends at another.

**STEP BEVEL:** The process of beveling within a bevel, giving the effect of steps going down to the edge. Sometimes called STEP-MITRING.

**CROSS BEVEL:** Where the bevel changes direction within its plane; that is, it angles in a slightly different direction from the beginning of the bevel.

**NOTCHED BEVEL:** A bevel in which the angle has been worked with an engraving wheel to make scallops. The scallops can give a beaded effect.

**DIMINISHING BEVEL:** Instead of running the length of the glass edge, the bevel faces into the surface part way down.

**FACETS:** Waves within the area of the bevel. Usually the smoothing stone can remove the waves.

## **INSTALLATION**

**SAFETY:** Before plugging the unit into your electrical supply, read the Covington Safety Demand Sheet.

**LEVEL:** The lap unit should be located on a sturdy, level table to avoid vibration.

**VIBRATION:** Covington units delivered with the wheels installed are checked for vibration before the machine leaves the factory. Wheels are checked for balance, wobble and round at the time installed. **DO NOT** use the machine if the wheels do not run properly. Contact Covington Engineering for instructions.

**AFTER ACCEPTING THE MACHINE, THE RESPONSIBILITY FOR MAINTAINING THE BALANCE OF THE WHEELS IS THE RESPONSIBILITY OF THE CUSTOMER.**

**WHEEL INSTALLATION** (when not factory installed): When putting wheels on the shaft, be sure the arbor holes are the correct size and that there is no dirt between wheel and shaft. Wheels should not fit tightly on shaft. Allow up to .002" clearance for heat expansion. A soft material such as cardboard (less than 1/8" thick) or blotter paper (less than .025" thick) should be used between the flanges and the wheel to compensate for uneven surfaces. This will produce an even mechanical joint. Flanges used must be perpendicular to the shaft. Flat washers should not be used in place of recessed flange washers. Tighten nuts and secure wheels firmly in place. **DO NOT** over-tighten, as this action may damage wheel. Rotation of shaft will keep retaining nuts tight when wheels are in motion. Rotate wheels and check for side wobble and round.

It is IMPORTANT to install wheels properly and AVOID VIBRATION. Should vibration occur, mark wheels and loosen nuts; turn each of two wheels in the opposite direction 1/8" revolution and repeat check until balance is obtained. **CAUTION:** An out of round wheel CAN NOT BE BALANCED.

**CORK WHEELS:** Dress with a sharp chisel or sandpaper-sanding block. If using chisel or scraper, hold tool point in downward position to wheel rotation to avoid the possibility of the edge digging into the wheel. Roughing the circle surface with a hack saw blade provides a better contact with the glass being worked.

## **INSTALLATION (Continued)**

**FELT WHEELS:** Dress dry wheels with a clean coarse tooth file. Dress (damp wheels) with a fine tooth file. Brush away felt residue. Use a dust mask when dressing a dry wheel.

## **PRE-POLISH**

In addition to removing the haze from the bevel, pre-polish removes any defects that have occurred in the previous two steps (roughing and smoothing). The cork wheel is not porous. This makes it difficult to keep pumice compound on the surface.

Pumice comes in powder form. To use in beveling, you add water to make it into a paste, usually a half-and-half mixture. Extra coarse pumice will remove sand and some facets. However, pumice lines that result can be a problem.. On the other hand, fine pumice takes forever to get an effect.

The cork wheel is never used by itself; it is always used with pumice paste applied to it. It is best to apply the pumice paste with a sponge while turning the wheel by hand. Be prepared for the pumice to fly about when you start your wheel. Adjust the sponge rest so the edge is close to the wheel. This sponge will catch some of the pumice that is thrown off. It is a good idea to stand to the side of the wheel rather than in front to avoid being splashed by the compound.

Water is not necessary for the cork wheel. Unless you turn it off completely, it will work against you and wash the pumice from the wheel. Your mixture of pumice and water must be wet enough to adhere to the cork. Roughing the surface with a hack saw blade could help hold the compound.

With the cork wheel the technique is that of tipping and rolling. There is not enough grinding power to change the shape of the bevel. However, you can soften the bevel edge by going over the margins.

Watch the bubble under the glass. Control the bubble with a tipping or rocking motion. As the part of the wheel you are working on becomes dry, move to another part where the surface is wetter. This is easier than stopping the wheel and applying more pumice.

The polishing movement on the wheel is diagonal. As you polish, you will get striations running in one direction; turn the glass so that the striations run crosswise and wipe them out by going at an angle to them. Eventually they will become fainter and fainter.

As you use the cork wheel, most of the haze left by the smoothing stone will disappear. Remember the purpose of the cork wheel is to remove whatever facets remain from using the smoothing wheel. The cork wheel is a pre-polish.

## **HELPFUL HINTS FOR PRE-POLISH**

Inside curves can be done on the face of the cork wheel if they do not have sharp turns. Again, watch the bubble to be sure you are getting the full effect of the wheel across the bevel. If the curve is too radical for the face of the wheel, round (dress) one edge of the wheel to facilitate polishing inside curves and other awkward shapes. More of the wheel's surface touches the bevel when you use the face rather than the edge, so use the face of the wheel whenever possible. Remember to use cross wheel polishing.

Just because you are in the pre-polish stage does not mean that you cannot go back to the smoothing stone if necessary. Final defects should be caught at the cork stage. You should not have to go back from the felt station (final polish) to a preceding step.

## **POLISH**

The felt wheel can be used with jeweler's rouge or cerium oxide. If cerium oxide is used, it should be applied wet with a scrub brush as the bristles will lift up the nap of the felt and work the cerium oxide directly into the surface.

**POLISH** (Continued)

It is best to turn the wheel by hand when applying the polish by this method.

Adjust the sponge rest so that the edge is close to the wheel. The sponge will catch some of the cerium oxide that is thrown off. It is a good idea to stand to the side of the wheel. Unlike cork, you should use the water valve on the wheel. If you run the wheel too dry, it will heat the glass and possibly crack it. It is all right to have water running on the wheel while it is turning, but once it gets wet and you turn the machine off, the water in the wheel tends to seep to the bottom. This will leave the surface of the wheel unevenly wet.

One way to avoid this problem is to mix the cerium oxide very wet and apply to a dry wheel. Use no water from the valve unless there is a lot of polishing to do. Perhaps just a squirt of water from the valve, to achieve the proper amount of water.

Remember, you want to polish with cerium oxide and felt. Without a combination of these two things you cannot build up the proper friction to polish properly. It is important that the wheel be loaded properly as you cannot watch it during the actual polishing process. The glass bevel must become hot from friction to get rid of the pumice lines. It is through continuous polishing that you can get the necessary friction.

As with the cork wheel, you polish in different directions. Try to go against whatever striations are on the glass. If the bevel shows polishing grain one way from the cork wheel, buff the opposite way on the felt wheel.

Since you cannot see what you are doing very well, it is a good idea to polish from the middle of the wheel upward so that you do not risk catching the glass. Then turn the glass around to do the remaining surface. Remember not to tip the glass too far down when you turn it around or the wheel may grab it. Try to stay in the center of the wheel, polishing from the center of the bevel up. Then, turn it around and do the rest.

Corners are difficult to do on the wheel. Maneuver the glass to get maximum pressure. Do not apply so much pressure that you lose control.

### **HELPFUL HINTS FOR POLISHING**

Inside curves can be done on the face of the felt wheel if they do not have sharp turns. If the curve is too radical for the face of the wheel, round (dress) one edge of the wheel to facilitate polishing inside curves and other awkward shapes. More of the wheel's surface touches the bevel when you use the face rather than the edge, so use the face of the wheel whenever possible.

About five minutes before using your wheel, wet it with the cerium oxide mixture while your machine is turned off. Then, right before use, re-wet the wheel. Your wheel will soak up part of the mixture and throw off any excess. After this, the polish mixture can be applied with a scrub brush from time to time while the wheel is turning. The brush lifts up the nap of the felt. If a thick build-up of polish accumulates on the surface, it can be removed by holding the edge of a piece of glass to the wheel until the felt is exposed again.

If when you turn off the machine, the water sinks to the bottom of the wheel, it may bounce badly from uneven balance. The only way to rectify the problem is to let the wheel dry out completely. This takes several hours. You should wet the felt with the cerium oxide mixture only to a depth of 1/4". If you wet it to 1/2", you will have a problem.

### **MAINTENANCE**

Oil the machine after each 500 hours of use using S.E.A. 20 oil.

The tank and splashguard should be cleaned periodically to prevent an excessive build-up of polish residue.

**DO NOT** allow water to be absorbed by the wheel, as it will upset its balance. After each use, wheels should be run dry for at least one minute before the machine is stored for the day. **NEVER** allow the wheel to set in water when not in use.