Hastings Centre Rockhounds

Vancouver Lapidary

Lapidary Workshop Orientation Package

This Workshop Orientation Package is meant to establish the expectations of behaviour for Hastings Centre Rockhounds members who enter and/or use the workshop and its equipment. They are so that everyone can play safely and have fun!

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Hastings Centre Rockhounds Workshop Safety Rules

1. For lapidary and silversmithing, long hair, cranial and facial, is to be contained or tied back.
2. Sleeves are to be rolled up.
3. Watches, hanging jewellery, and large rings must be removed at the request of the instructor. Failure to do so may result in the denial of the use of the equipment.
4. No towels are to be hung around the neck or draped over the shoulders while at the machines.
5. Closed-toed shoes are to be worn.
6. If any member notices an unsafe situation in the workshop, they should address it with the person or persons involved as soon as possible and let the instructor know.
7. Be aware of the Emergency Procedures.

Workshop Rules and Regulations

1. All members must sign the register to use the workshop. Each member must conform to all workshop rules and regulations and obey the instructor in charge and the Workshop Chair if present.

2. Each member using the workshop must be a member in good standing; have paid and attended at least two General meetings in three, unless an exemption is granted for a limited time by the Executive Committee for valid reasons submitted by such member. Members' cards will be used to record attendance at General meetings.

3. Fees for each session in the workshop shall be recommended by the Workshop Chair and voted on by the members. Likewise, slab-cutting fees will also be recommended by the Workshop Chair and voted on by the members. Fees will be posted in The Rocket and on the website. There will be no charge made when the session is devoted to a club project.

4. Anyone wanting to use the workshop equipment will attend a training session to be given before using our equipment for the first time.

5. Each member using the workshop will present his or her current membership card if requested by the instructor.

6. The Workshop Chair or present session instructor shall be in complete charge of the workshop session and will direct the use of all the equipment as per the guidelines set out by the Workshop Chair. The Workshop Chair's decision shall override the instructor if there is a difference of opinion.

7. The Executive Committee may, if and when necessary, in consultation with the Workshop Chair and instructors, restrict the use of the workshop by specifying the number allowed to attend any specified class or session for any specified period of time.

8. Children under the age of 16 cannot use the workshop unless there is a waiver on file, which has been signed by their parent or guardian. The junior member must also be accompanied by an adult member of the club, who is responsible for their behaviour.

9. Members use the workshop at their own risk. Safety rules must be observed at all times. This is for our members' own protection. It is recommended that PPE (personal protective equipment) be worn, but it is the member's responsibility to use/buy the PPE (respirators, safety glasses, gloves, earplugs). The club will have foam earplugs and a limited supply of safety glasses. Members must wear appropriate, closed-toed footwear when in the workshop.

10. There is a "3 strikes in a year policy," money back and ejection from the shop for a bad attitude (refusing to follow the instructor's instructions). This would be followed up at the next executive meeting and may result in the formation of a Special Complaints Resolution Committee.

11. No equipment is to be turned on or cupboards opened before the instructor in charge is in attendance. The instructor must check all saws after set-up with a rock before they are turned on.

12. All equipment used during a session, including the tables and counters, must be properly cleaned after use by those using the equipment. Leaving early (thus avoiding clean-up) must be made known to the workshop instructor early in the session.

13. All small equipment must be put inside the cupboards at the close of each session.
14. Members who use the workshop will be called on from time to time for general cleaning and/or maintenance of the shop.
15. The trim saw is to be used only for trimming slices into working pieces and must not be used for slabbing rocks.
16. Water must be used at all times on every polishing machine. Ensure the water spray does not get all over the floor.
17. If the instructor in charge of a workshop session feels that any member is not treating the equipment with the care it requires, they can ask the member to redo the basic orientation. If the member declines, then they will be asked to leave. See #4 and #10
18. When the workshop is busy with members, everyone is expected to keep a limit on the time they spend on one machine, especially when others are waiting. Please be considerate of others.
19. Non-cab rocks need special inspection per individual case by the instructor.
20. Some rocks are toxic and not allowed to be cut or polished. A list of these banned rocks will be posted in the workshop. All rocks must be identified before working with them. It is the responsibility of the member to ensure proper identification.
21. Each workshop session will vote to decide whether to stop for a coffee break.
22. No members are to be in the courtyard accessing the big saw room when there are children using the courtyard.
23. Members are reminded that our club is a hobby club. Mass production of items for sale is prohibited. Anyone contravening this rule will be asked to leave the workshop. See #10

Rockhounder's Code of Ethics

Note: *This Rockhounder's Code of Ethics is written by the British Columbia Lapidary Society https://www.bclapidary.com/code-of-ethics.php.*

We ask all individuals participating through BC Lapidary Society member clubs to follow our Code of Ethics when joining us on rockhounding trips and club activities.

- I will respect private property and do no Rockhounding without the owner's permission.
- I will use no firearms or blasting material in Rockhounding areas.
- I will take garbage home or deposit it in proper receptacles.
- I will leave gates as found.
- I will do no willful damage to materials or take more than I can reasonably use.
- I will fill excavations, which may be dangerous to livestock.

- I will build fires in designated places or safe places only, and make sure they are completely extinguished before leaving.
- I will not contaminate wells, creeks, or other water supplies.
- I will not tamper with signs, structural facilities, or equipment.
- I will obey all laws and regulations of forestry and game departments in the area in which I am rockhounding.
- I will appreciate and protect our heritage of natural resources.
- I will always use good outdoor manners.
- I will show respect to other members.

Use of Workshop Machines

Note: *The majority of this text comes from a Diamond Pacific Tool Corporation Manual.*

Galaxy Metal-Bond Diamond Grinding Wheels

DESCRIPTION

Galaxy metal-bond diamond grinding wheels are designed to provide the gem-cutter with a smooth, fast cutting, true-running, grinding surface ideal for working stones. The diamonds in a Galaxy Wheel are held on a heavy steel ring by an extremely hard nickel alloy plating. The ring is mounted on a tough, glass-filled polyester core, making a smooth, quiet running wheel.

USE AND MAINTENANCE

Galaxy Wheels never need dressing. **Do not** attempt to do so, as you may damage or ruin the wheel.

For longer wheel life and to prevent wheel damage, the following practices should be followed when using your Galaxy Wheels:

1. Use a light to medium pressure when grinding stones. Although diamonds are extremely hard, they are also somewhat brittle and can be easily shattered by excessive pressure or the bumping of a heavy rock. The wheels cut most effectively with a light to medium pressure and will last longer as well.
2. Use a steady rest to avoid uneven wear patterns. Steadying your hand while grinding will help prevent bumping and chattering that causes uneven wear of wheels. It will also help prevent damage to stones.
3. Use a coolant while grinding. Water is best, and a small amount will normally do to keep the wheels wet. This prevents the formation of rock dust, keeps your stone cool, and stops the buildup of rock residue on the wheel surface, which can slow down cutting action. When grinding soft materials, such as onyx or turquoise, more water is needed to keep the wheel clean.

4. Use the entire surface of the wheel as you grind your stone. Avoid using just the center, edge, or any one area of the wheel surface, as this will cause excessive wear in that area and shorten the effective life of the wheel. When grinding crosses, hearts, fire agate, etc., be certain you grind with the diamond-covered surface, not on the bare metal side of the wheel, as this will undermine the diamonds and cause excessive wear of the wheel edge.

5. A few drops of Water Aid in the pan will improve the cutting ability of the Galaxy Wheels.

6. Reverse the wheels occasionally so that the diamonds cut from the opposite direction. The edges of the diamonds will wear with use, and the cutting speed will decrease. By reversing the wheel, the cutting edges of the diamonds are renewed.

Nova Resin-Bond Diamond Sanding and Polishing Wheels

DESCRIPTION

Nova Wheels are specially designed to produce an excellent finish on stones with a minimum of time and effort. The diamonds in Novas are embedded within a tough, flexible, plastic resin backed by an extra soft, thick, sponge rubber backing. This soft, flexible construction enables the surface of the Nova Wheel to conform to the stone, eliminating flat spots and scratches.

USE AND MAINTENANCE

1. Nova wheels **must** be used with a water lubricant. This fact cannot be stressed too strongly, for if the wheels are run dry for more than a few moments, rapid wear and damage can result. Make certain that the geyser is supplying sufficient water to the Nova Wheel before using it, and remember to move the geyser to the next wheel as you progress through the sanding and polishing procedure.

2. Nova Wheels should be broken in by sanding and polishing a large agate cab prior to working on others. This is necessary in order to remove excess resin coating surfaces of the diamonds. Spend from two to five minutes on each wheel with the first cab, working it over the entire surface of the wheel. The finer grit wheels, especially the 3000-grit, will take longer to remove the excess resin, and will continue to improve in speed and finish as more stones are worked.

3. Use sufficient pressure to cause the surface of the wheel to depress slightly to conform to your stone. This eliminates the flat spots left by the grinding wheels and will cause fewer scratches than would be produced by pressure that is too light.

4. It is important to hold your stone so that you do not allow the upper or leading edge to act as a plow and dislodge diamonds from the surface of the wheel. The diamonds in Nova Wheels are firmly embedded in the resin and, with proper use, cannot be dislodged to cause contamination when proceeding from one wheel to the next. But they can be dislodged with the sharp edge of a stone.

5. To prolong the life of your Nova Wheels, be certain to prepare your stone properly on the grinding wheels prior to sanding. Use the Galaxy metal bond wheels to grind your stone to its final size and shape, and to remove all sharp edges and corners. This leaves only the final sanding and polishing of the Nova Wheels. Similarly, it is important to do a good job of sanding at each stage before going to the next, as the finer grit wheels will take much longer to remove scratches than the coarser wheels.

6. If your stone still has scratches after the final polish, check the following procedures:

    a. Make certain all deep scratches left by the coarse (80-grit) grinding wheel are removed by the fine (220-grit) grinding wheel.

    b. Make certain you are using enough pressure on the Nova Wheels. Too light a pressure can cause scratches.

    c. Make certain your Nova Wheels have been broken in properly, especially the 3000-grit wheel. If any one wheel seems to be causing the scratching, take a large agate cab and work it across the entire surface of the wheel.

    d. Almost all problems with scratches are caused by improper procedures in the above three areas.

Procedure for Grinding and Polishing Cabochons

PRE-FORMING – PREPARING STONE FOR GRINDING WHEELS

Since most gem material comes in sizes and shapes larger than desired for a single cabochon, it must be pre-formed. This is usually done by cutting the rock into slabs about 1/4 inch thick with a lapidary or rock saw. The best areas of the slab are then selected and marked with a template for the shape and size of the desired stones. Excess material is removed with a trim saw or one of the other tools available for this purpose. The more material that can be removed from a pre-formed stone at this step, reducing it to as near its finished size as possible, the less time will be taken in the grinding process. Just as important, the life of the grinding wheels will be increased.

GRINDING ON THE GALAXY GRINDING WHEELS

The basic procedure is to grind your stone to the proper size and shape on the Galaxy Grinding Wheels. If the stone is properly prepared on the grinding wheels, it is only a matter of minutes more to polish it on the Nova Polishing Wheels.

First, grind your cabochon to the approximate size of the template outline using the left hand or coarse (80-grit) Galaxy Wheel. Use light to medium pressure and work the stone over the entire surface of the wheel. Check the stone's size as you work, either with the template or the mounting in which it will be set. Leave a small amount of material outside the outline so that the stone is slightly larger than the template or mounting. The balance of the excess material will be removed in fine grinding and some in the sanding process. Using the Cab Rest during the above procedure will make it easy to grind a uniform 12-½ degree bezel angle all around your stone.

Proceed to the fine (220-grit) Galaxy Wheel, making certain that you move the geyser to the wheel you are using. Again, a light to medium pressure is all that is necessary. Finish grinding the bezel of the stone, leaving only a small amount of material that makes the stone just a fraction too large.

Now move back to the coarse grinding wheel to grind the face or dome of the cab to shape. For best results, the stone should be dopped to enable you to hold it more easily.

Grind from the edge towards the center of the stone, and then back to the edge using a circular and oscillating motion as you work. The circular component of this motion is accomplished by continually rotating the base of the dop stick using your right hand. At the same time, your left hand is used to move

the stone back and forth in an oscillatory manner so that its point of contact with the wheel spirals from the edge of the stone to the center and back without stopping, since stopping produces a flat spot.

This circular, oscillating motion is the key to well-shaped stones and the prevention of flat spots. Check the curvature of your stone frequently to achieve symmetry. The outline should form a smooth arc when viewed in any direction, with no high spots or flats, especially at the top of the dome.

Once you have achieved a uniform shape, move to the finer grit wheel and remove all the scratches left by the coarse wheel. It is important to remove all scratches possible before proceeding to the Nova Wheels.

SANDING AND POLISHING WITH THE NOVA WHEELS

Before using any Nova Wheel, make certain that the geyser is supplying water to that wheel. **NOVA WHEELS MUST NOT BE USED DRY**.

1. Start with the 280-grit Nova Wheel, making certain that the geyser is supplying water to that wheel. Use a firm pressure, depressing the rubber backing so that it conforms to the surface of the cab, and keep moving your stone with a circular and oscillating motion at all times. This firm pressure (in contrast to the light to medium pressure used on the grinding wheels) and the circular and oscillating motion are important procedures in eliminating flat spots and scratches. Using too light a pressure, or allowing the stone to remain in one position, can result in more scratches and flat spots.

2. Spend enough time on the 280-grit Nova Wheel to completely sand away the scratches and facets left by the grinding wheels. This should only take a minute or two, leaving the stone with a uniform finish over its entire surface and reduced to very near its final size.

3. Proceed to the 600-grit Nova Wheel, making certain that you move the geyser first. Continue using firm pressure and the circular and oscillating motion. You should only need to spend a minute or two on each of the 600, 1200, and 3000 grit Nova Wheels to achieve a fine polish on your stone.

4. It is important to do as good a job of sanding and polishing as possible at each stage before going on to the next, as the finer grit wheels take longer to remove scratches than do the coarser grit wheels.

5. Some hard-to-polish materials, such as Jade, may require a finer grit polish than the 3000-grit Nova Wheel. A canvas pad and syringe of 14,000-grit compound are provided with the machine and will generally give an excellent polish. Diamond compounds, or polishes such as cerium, tin, or aluminum oxides, can also be used with untreated canvas, felt, or leather pads to provide the final polish.

Summary of Polishing / Grinding Guidelines

Before grinding or polishing any material, make certain that it will not produce toxic fumes or dust. Seashells are one of the known hazardous materials of this type.

If you want to grind metallic ores or other mineral specimens, be aware of the possibility that they may contain toxic quantities of such substances as uranium, lead, mercury, arsenic, asbestos, copper

sulphate, etc. If you are unsure of the chemical composition of a stone you are about to grind or polish, ask the instructor in charge.

Rock dust can be hazardous to one's health. Use **sufficient water** at all times while grinding and polishing stones so that rock dust does not form.

Use safety glasses to protect your eyes from flakes of stone or other objects that might be thrown by the wheels.

Water must be used at all times on the wheels. The Titan machines have the pumps automatically begin to operate when the motor is turned on.

The geysers should be placed in the water pan with the large hole down, and set towards the rear of the wheels to avoid excess water splash. Remember to move the geyser from wheel to wheel as you work. **Never work on dry wheels**! This will damage the wheels VERY quickly, and they may need to be replaced.

The Galaxy metal-bond diamond grinding wheels are designed to provide a smooth, fast cutting, true-running grinding surface ideal for working stones. The diamonds in the Galaxy wheels are held on a heavy steel ring by an extremely hard nickel alloy plating. The ring is mounted on a tough, glass-filled polyester core, making it a smooth, quiet-running wheel.

The Nova polishing wheels are specially designed to produce an excellent finish on stones with a minimum of time and effort. The diamonds are embedded within a tough, flexible, plastic resin backed by an extra soft, thick sponge rubber backing. This construction enables the surface of the Nova wheel to conform to the stone, eliminating flat spots and scratches.

Proper Use of Diamond Wheels

For longer wheel life and to prevent wheel damage, these guidelines need to be followed when using your diamond wheels. This applies to both the Galaxy and Nova wheels we use.

Always use water to keep the wheels wet while working. Move the water geysers (spitters) as needed to keep the polishing machine wheels wet.

On the grinders, adjust the water so it is flowing just enough to wet the wheels, but not so much as to splash all over the floor.

Use a steady light to medium pressure when grinding and/or polishing stones. This will cut the stone you are working on best and will also help the wheels last longer.

Use the entire surface of the wheel as you work on your stone. Avoid using just one area, like the center, since it will lead to excessive wear in that area and shorten the life of the wheel.

When you want to polish flat surfaces, the flat lap machine does a better job and saves the diamond wheels from damage.