CHARLES & COLVARD®

THE ORIGINAL CREATED MOISSANITE™

BENCH JEWELER'S GUIDE

Charles & Colvard Created Moissanite® has a hardness of 9.25 on the Mohs scale, and it's toughness is similar in nature to sapphire and ruby. The gems come in a variety of colors: near-colorless, light green, dark green, and can also be color treated to almost any color. The following guidelines for working with moissanite are offered here.

Repairs and Sizing: General repairs and ring sizing may be done with near-colorless or natural green moissanite in place, but the piece should be allowed to cool slowly. Do not quench jewelry set with moissanite. Color treated stones must be removed from the mounting or extremely well protected from heat to prevent the color treatment from being removed from the pavilion of the stone. Be sure the gem is thoroughly cleaned, as any dirt or other contaminants will cause
permanent spots on the stone when heat is applied to the jewelry piece.

Re-Tipping: When heating a moissanite gem for re-tipping it will turn yellow, then red in color but will return to its original color when allowed to cool slowly. The gem should not be held at high temperatures or at a red color for more than a minute because it may alter the color of the stone. Repairs should not be made with a high temperature solder around the stone, such as 14k hard, 18kw hard, or platinum solder because this can cause fracturing or burnt spots to the stone. No color treated moissanite can be re-tipped with the stone in place unless a laser welder is used. Be aware that the heat of a torch will remove all color treatment.

Acids: Near-colorless and natural green moissanite maybe "pickled" to remove fire scale. Color treated moissanite cannot be put in a hot "pickle". It will remove some or all of the color from the stone, turning it back to its natural color before treatment.

Polishing Near-Colorless and Natural Green Moissanite: No silicon carbide sanding disc, drum sander or wheels impregnated with silicon carbide should be used around the stone. This can cause scratching of the gem. Do not tumble polish jewelry with any stones that are set, this will cause scratching of stones. Tumbling will also remove all color coating from all of the color treated moissanite.

Polishing with Color Treated Gems Set in Mountings: When polishing a mounting with a color treated moissanite stone care must be given to avoid any type of polishing wheel to touch the pavilion of the treated stone. If a buff or silicon wheel of any type is used it must ONLY be used on the metal. If it touches the pavilion of the stone, it will remove some of the color treatment. Because of the nature of these stones, it is strongly recommended that the mounting be polished before the stone is set, so that only the tips of the prongs need a light polish that can be done with a felt wheel.

Plating: When plating jewelry with created moissanite either near-colorless or treated, all solution used in the plating process must be at room temperature. Damage will occur to all products used in the plating process if
the solutions are above 90 ºF.

Setting: Certain techniques are recommended when setting moissanite. Created moissanite does not have cleavage directions that will cause the stone to cleave, but it can chip. Care should be given to the girdle when setting, so that there is no crowding against other stones.

Moissanite is a tough material, not easily prone to damage, but chipping may occur if special care is not given where sharp points and thin girdles are concerned. For instance, the sharp points on the radiant, princess, and marquise cuts must be protected against unnecessary pressure. When a seat or bearing for such stones is cut, a small indentation should be drilled where the points of the gem will rest. This will allow setting pressure against the sides, but will avoid pressure against the points. A small drill bit or ball burr is ideal for this job. Be careful not to drill through the back of the prong. A hand-held burr is usually sufficient to cut this indentation unless the prong is very large. Also, if you presently use 60 degree bearing cutter burs, try 90 degree bearing cutter burs instead. This angle is more parallel to the gem's pavilion and may also prevent breakage on the girdles.

Prong Work: If bearings (seats) are properly made in each prong the gem should pose no problem. In setting with
pre-cut bearings you must be sure that the lower section of the bearing is parallel to the pavilion facets of the stone. If not, it is a simple matter of shaping the lower part of the bearing so that the stone fits into it instead of being pushed up against a curved edge. In such cases the point of contact acts as a fulcrum and even slight pressure may chip the girdle. Look at the contact between the gem and the bearing. If there is an open space next to the girdle then the
bearing's bottom edge needs to be adjusted.

Hammer Work: If bearings are properly cut, you may use your electric hammer to move metal above the girdle on the gem. Trimming the excess metal on the inside of the prongs with a graver should not pose any problems. Burnishing should be done on the metal over the gem, not against it.

Trimming Metal Prongs: If you use abrasive wheels to trim prongs after setting you must be sure that the wheels are made of rubber (not stone) and do not contain either silicon carbide (carborundum) or diamond abrasives. These will scratch the gems on contact and will require re-polishing of the scratched facets. If the wheels are made of hard rubber, avoid contact with the girdles of the gems. Your tool supplier should be able to supply information regarding the abrasives in the rubber wheels you are using. If you use files to trim prongs, avoid passing the file over the sharp facet edges or the girdle edges. They can chip the gem, but not scratch it. One way to avoid the rough file catching on a stones' edge is to use a three-corner file and grind down and polish the corners. This will allow you to trim the inside of a prong with the file, while only the polished corner edge is touching the stone.

Bezel Setting: When bezel setting these cuts, the entire bezel must be level and clear of burs. If setting a square shaped stone, the corners should be drilled and the angle at the bottom of the bearing should match the angle on the pavilion of the gem. Push downward on the metal, making sure it forms over the edge of the crown, thereby closing the bezel. Do not push the metal into the edge of the stone to close the bezel as this may cause the girdle to chip.

Bead Work: Girdles should be fitted slightly below the metal surface and beads raised above the girdle rather than against it. Girdle edges on moissanite may chip if direct pressure is applied against them. When rounding a bead with a beading tool the edge of the tool should not touch the stone because it can cause chipping or breaking.

Ultra-Sonic and Steam Cleaning: The ultrasonic cleaning of mounted moissanite will have no problems in a

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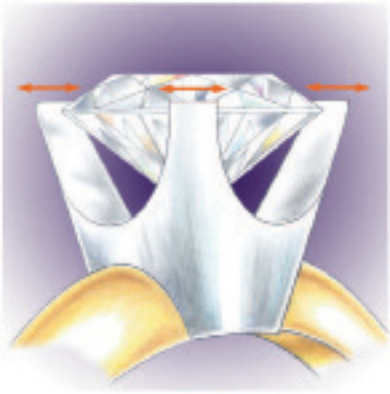
POSSIBLE SOLDER AND HEAT ISSUES

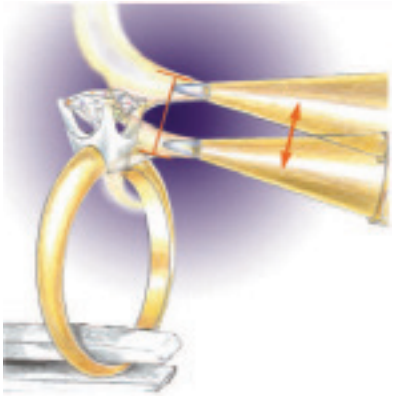
One of the more invasive and potentially damaging procedures requiring heat for any gem material is performing a prong re-tipping procedure with the stone in place. To test the limits of Moissanite and the working characteristics when heat is required at soldering temperatures, a 14 karat gold two-tone solitaire ring with worn prongs was re-tipped using standard torch techniques. Here is a summary of the procedure, results, and some potential problems.



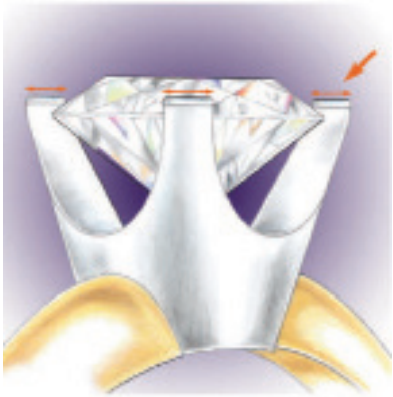
Re-tipping using Easy Solder:

- The ring set with moissanite was thoroughly cleaned.
- The top portion of each of the worn 14 karat white gold prongs was filed flat.
- The ring and moissanite were firecoated using a mixture of denatured alcohol and powdered boric acid and allowed to air dry.
- The ring was generally preheated using a torch with a bushy flame.

Note: While heating lab-created moissanite, the material exhibits a change in color. After soldering was completed and the piece allowed to air cool, the original body color returned.



- Individual fluxed chips of white gold easy solder were placed at the top flat portion of each prong. Note: Hoover and Strong's 14 karat white easy solder was used. It has a melting point of 1240o F.
- General heat was again applied. After sufficient preheating, direct heat was applied to individual prongs, melting (but not flowing) the solder at the top portion of each prong.

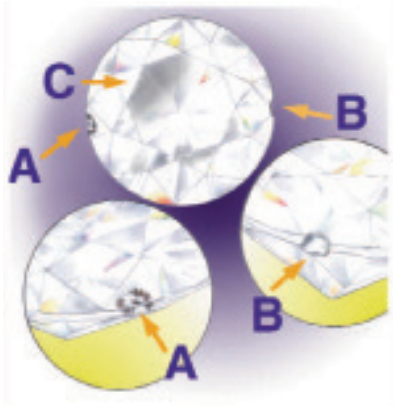


- Because the solder was melted and not flowed, and with the particular torch technique utilized, the solder retained a flattened shape.
- Next, the ring and stone were preheated. Slightly flattened 14 karat white gold beads were fluxed and placed on the tops of each prong.

- Using the illustrated torch technique, the beads were soldered into position in contact
  with the crown to the stone.

- After the ring was allowed to air cool, it was submerged in pickling solution, rinsed and finished.

Results:
After finishing and polishing the ring, the lab-created moissanite was un-mounted and carefully inspected under magnification. No changes to the stone or damage were observed.



Re-tipping Using Hard Solder:

- As part of the research, the featured re-tipping procedure was also done using 20 karat white hard solder in place of the 14 karat white easy solder.
- While this is not a common practice in the trade, this procedure provided an opportunity to test the limits of the
  lab-created moissanite and extreme heat in close proximity to the stone.

Note: Hoover and Strong's 20 karat white hard solder was used. It has a melting point of 1565o F and a flow point of 1615o F.

Results:
After the procedure was completed using the excessive heat required for 20 karat white hard solder, the moissanite was removed. Here's what was observed:

- Minor dark stains were evident on the surface of the moissanite under two of the four prongs (A).
- A small fracture occurred under one prong (on the girdle) (B).
- The surface of the moissanite was slightly etched on the table and crown facets (C).

Ring Sizing and General Repair Requiring Heat

- Reversing rings set with lab-created moissanite were sized up and down using standard torch technique and hard solder.
- Stud earrings set with heart shaped lab-created moissanite required new posts. The inferior worn posts were removed and new posts were torch soldered in location using 14 karat white easy solder.

Results:
After all procedures were concluded, the stones were removed and inspected under magnifications for damage. No changes to
the stones or damage were observed.

The User Speak
Berkeley Grimball, owner of Grimball's Jewelers, an AGS retailer in Chapel Hill, NC states they have sold lab-created moissanite jewelry for years. They routinely size and perform general manufacturing with lab-created moissanite jewelry and have not experienced stone damaged or related problems when heating and soldering.

Daniel Ballard, PM West's technical expert recently supervised field testing at a production casting facility in Los Angeles for stone in place casting using karat gold with lab-created moissanite. Using procedures common to the process they experienced positive results. The stones were removed from the bezels they were cast into and inspected. No changes to the stones