

The Midwest Faceter



**Nigerian Sapphire, 8.47 x 8.03 x 3.29 mm,
2.30 ct. by Marie Bellard, FGA.**

The Official Newsletter of the
Midwest Faceter's Guild

JULY 2022

Contents

Contents

Officers	4
Contacts	4
President's Message	5
The Editor's Gem	6
Membership	7
A cut Above	8
Tips & Tricks	9
MWFG Interview	14
A bit of History	18

How Many Stones Can You Cut?	23
From a Faceter's Journal	24
Diamond Polish: An Alternative	26
A Joke for Faceters	27
Buy, Sell & Trade	28
Find Us !	29

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About the Guild

The Guild began in 1979. Its missions are to promote faceting education and recreation.

Developing the art of faceting is its most important responsibility. The Guild also creates an environment of shared information related to faceting via meetings for those of like interests and encourages the achievement of individuals.



President's Message



Hello everyone. I trust you are enjoying your summer. I know several of you have had opportunity to travel. I have enjoyed seeing facebook and intragram post of your journeys. Thank you for sharing.

This has been a very different summer for me, and I must admit I have not handled it all as well as I would have hoped. As a result, during a recent meeting of the board it was decided to forgo the seminar for this year. It was a wise decision as many things need to take place before a good seminar can happen. One is we need time to really look at our machines and prepare them. They have been sitting awhile and I did not make that a priority, along with advertising and other things.

We will be having a gathering. A very much needed gathering. All who are able are invited to **join us on Saturday October 1. We will meet at Tallmadge Township Hall for an all-day event.** One thing we will have the trailer there and will go threw it and will look at the machines and even facet on them so everyone

can become accustomed to them, especially those who completed the Faceting Instructor Academy.

We will of course put out more information on the gathering as soon as all details are worked out. I hope you will plan to join us.

I am very proud of the current board and pleased to be able to serve with them as we grow and learn.

I look forward to seeing and hearing more about your faceting.

Barb Yost

The Editor's Gem

This is another fully packed July issue of *The Midwest Faceter*. Take a look at some of the features in this edition.

This quarter, there was a new member, Ray Kuras, added to the Guild from Ohio and a bit of information about his experience in faceting. Likewise, a number of members sent in pictures of gemstones they have cut and they all are dazzling! It is important to add that any time you cut a new gemstone, please send a picture to the Editor and your gemstone can be featured as well.

As more and more members are creating or modifying an existing cutting diagram, included is an article from Dr. Reg and Raphael Bellard (Marie Bellard's husband) about how to design a cutting diagram. With the development and release of Gem Cut Studio, the task is not difficult since the app is more intuitive. Since many cutting diagrams were developed for using quartz, it is possible to use the Manual Optimizer within the app to enhance the existing diagram to enhance the color and sparkle to material you want to cut.

Speaking of which, Marie Bellard, past President of the Guild now living in South Carolina, was interviewed about how she got interested in faceting, gemology, and starting her own business. You will find the interview fun to read about her experiences.

In A bit of History segment, an article that appeared in *The Midwest Faceter* in 1989, presented the hazards of dust that members should take precautions to protect their lungs. Another article about the dangerous dust from

cutting stones was also added. Some of the materials mentioned are stones that faceters would likely not cut, but better safe than sorry.

In the continuing series from the Columbia-Williamette Faceters' Guild by Dianna Carroll is Part 3 of the superglue experiment. The article provides useful information about dopping small stones and her experience with using superglue.

The Guild had received a request from a company located in California called Tech Diamond Tools that developed diamond compounds for polishing. They asked if several members were willing to evaluate the diamond pastes that come in a syringe. You can read the evaluation and the polish you can obtain.

Lastly, the Guild also received a request from a gem dealer looking for people interested in cutting gemstones and getting paid for doing so. This information is passed onto the membership for your consideration. If any of you do explore this with him, please drop a line to the Editor and let us know if you decide to take him up on his offer or not. That can be passed onto others in the next issue.

As always, I hope you find *The Midwest Faceter* fun to read and it holds useful information for you. Enjoy the remaining summer and . . .

May all your facets sparkle!
Dr. Reg

Membership

Welcome to the following new member:

Raymond Kuras

Ray Kuras lives in Waterville, Ohio, and he has an Ultra Tec VL Digital machine. Here is what he said:

I have always had a rock hunting and collecting hobby. The faceting started with an order for my first new machine in 2019. Of course it still took a year to get my machine. Then I had to get laps and all the other goods to support my hobby so I just started faceting last year mid year. I have collected Fire opal and sunstone in Oregon and got to know some of the owners of several mines. What I look to get is experience from the people who have done it and bring it to Toledo's gem club and start training and bringing in material I have collected to work with. I would like to keep up the learning for newer generations and am looking to move to South Carolina in the future close to Asheville and looking to explore buyable land for mining. I have talked to other faceting people online like Justin Prim, and have been to Tucson twice but some how missed the facet frolic. Here is my first cut round brilliant with a not deep enough table 12mm and 5.1 carat. The Amethyst is 8 x 10mm and 3.59 carat. I am a Controls engineer by trade, and married with 2 children one boy (21) and one girl (16). What I need to learn most is how to polish and to get a calibrated sizing from my material. I bought the Gearloose polish kit, the tin + with 6000 has been my go-to for prepolish. I don't know how to use my Darkside or Greenway or the other tin but I have kept them stored and clean.



The Guild is excited to welcome the newest member!

A cut Above

These gemstones were faceted by members of the Midwest Faceter's Guild and demonstrate the talents that exist in the Guild. Thanks to all for sending in their pictures to *The Midwest Faceter*.

Linda Cunningham

Linda cut this colorless quartz design from Viet Gems. The gemstone is 13.3 mm and 10.4 ct.



Kreigh Tomaszewski

This is the first stone Kreigh cut, which is a 9.75 mm CZ Garnet. He thinks he did not weigh it for the carat weight.



Tom Ross

Tom's sky blue Topaz is a Phan Trung's Barley Flower cut. The gemstone is 15 mm and 16.8 ct. It won the Prettiest Natural Stone at the 2022 Faceting Symposium in Tucson.



Greg Stimpson

Greg cut this synthetic clear quartz that is 9.5 x 11 mm, 4.5 ct. with 81 facets.



Bjorn Merisheki

This gemstone is a pink zircon trillion, 10.70 x 10.70 mm and 6.26 ct. You can see that Bjorn cuts some beautiful gemstones!



Jenna Sloane

Jenna secured a job as a bench jeweler and moved to Charleston, SC. In the move her Facetron got bumped out of calibration and required repair. She cut this Periwinkle with rainbow rutile needles sapphire from Umba Tanzania .77 ct.



Tips Tricks

By Dr. Reg Williams
and
Raphael Bellard

Design a Cutting Diagram

Some have said that about every gem cutting diagram has been designed this side of heaven! To this testament you can peruse FacetDiagrams.org (<https://www.facetdiagrams.org/>) to see the array of different cutting diagrams from round, oval, emerald, pear, etc., just to name a few. With that said, maybe you are so inclined to see if you can come up with an original design.

Hold your horses, Kemosabe! Since when did the Lone Ranger get into gem faceting?

An article was written by Glenn Ruminson for the Columbia-Williamette Faceters' Guild in 2011 entitled, "A Short Primer on Creating Your Own Designs" (used by permission, *Facets*, No. 568, June 2022). He provided some guidelines for designs.

First, let's review some basic design concepts. Ignore these and you're likely to end up with a dull, boring, disappointing stone—

1. This is the most critical. Pavilion main angles must be suitable for the rough that you're cutting. Example - If you use a design with crown main angles meant for CZ, (R.I.=2.17; pavilion mains=40.75 degrees) and cut your stone in quartz (R.I.=1.54) using the same pavilion main angles, your stone will act like a window - no brilliance - and if your stone is colored, a lot of the color will leave with the light that escapes out the back of your stone. Example -Your stone will be pinkish instead of

reddish.

2. When you want a brilliant stone, use designs with shallower crowns. Example - Quartz crown mains cut to about 30 to 35 degrees.

3. Shallower crowns also work better for darker rough, as long as it passes the white-paper test - you can see the color of the rough held over white paper with the light above the stone. Designs for some even darker material (the white-paper test still applies), such as garnet, may work only if you combine a shallow pavilion with a shallow crown with mains less than the usual. Example - Dark almandine garnet - pavilion mains cut to 35 instead of 40 degrees; crown mains cut to 20 instead of 36 degrees. You get the benefit of color this way but not much brilliance. With a deeper design, your stone would be very dark or nearly black.

4. Deeper crowns work better for light colored rough. Example - Rose de France (light amethyst). Cut crown mains cut to 40 to 45 degrees instead of 30 to 35 degrees. Result - deeper, richer color. Next, some perspective. Today's faceting designer is light years ahead with tools for creating new cuts. In the "Olden Days" all we had was a creative mind, ruler, protractor, compass, and pencil.

Mr. Ruminson went on to describe using Gem Cad and Datavue to design a cutting diagram. GemCad is a well-known application but will only work on a Windows computer. Now enters Gem Cut Studio (GCS). If you have purchased

GCS, but have not used it yet, there are six different tutorials in YouTube but accessible from the Help menu in GCS. The tutorials will teach you how to cut facets, adding meet points, the standard round brilliant to get you started, but also recreating an existing design and how to adapt a design to a different material. If you do not have GCS, it can be purchased for \$99 and the license can be used by a single user on multiple computers, Windows and/or Mac. This article will describe some of the process using GCS.

Let us assume you have a cutting diagram you obtained from FacetingDiagram.org that was designed for quartz with a refractive index (RI) of 1.54, but you want to cut this gem design using Spinel with a RI of 1.712—1.762. You can download the .asc file into GCS. Then view the tutorial on “Adapting a Design to a Different Material” (<https://youtu.be/AhGGRWOMD8Y>). Once you have the cutting diagram file opened, select the **Render** view button, which the square box at the right of the gem view. That opens the Render view (see Figure 1).

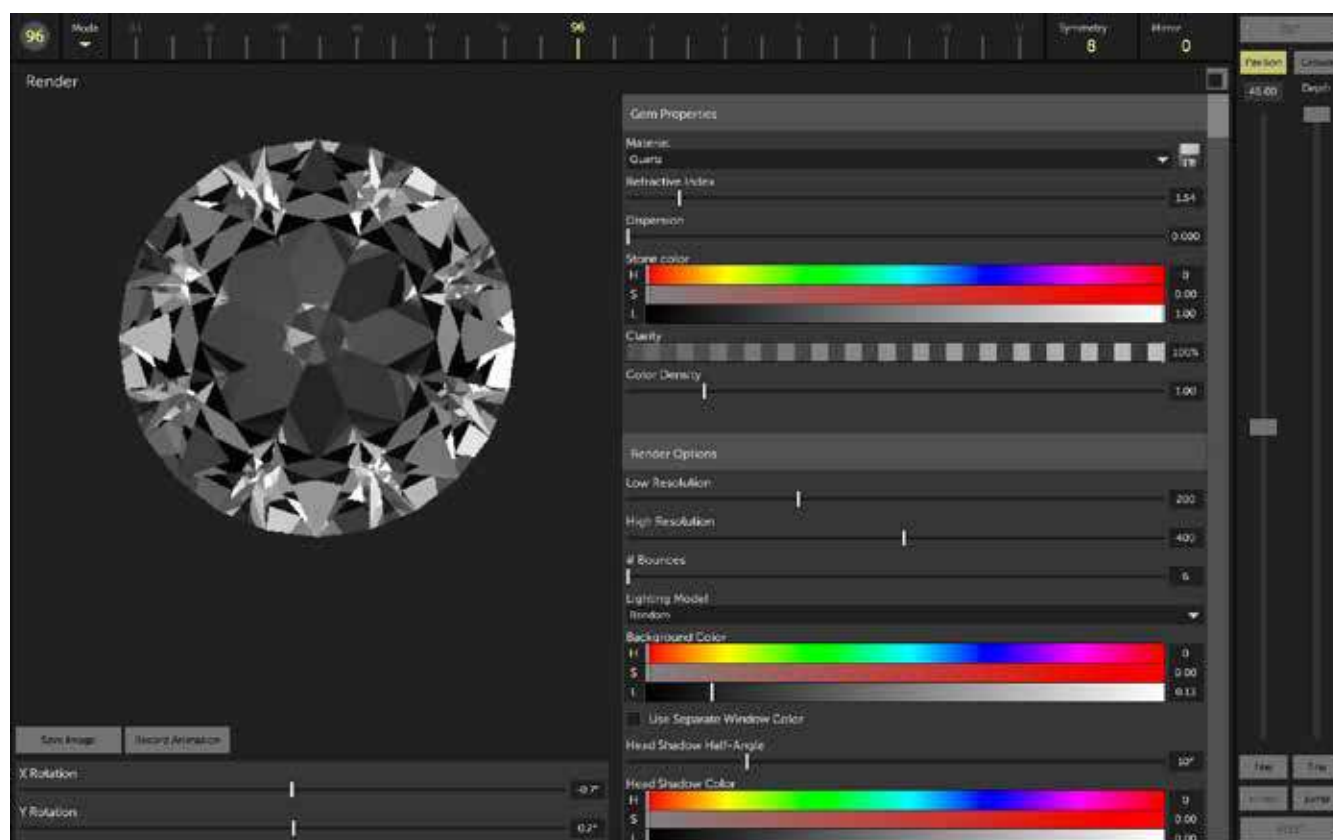


Figure 1. Render view of the round brilliant in Quartz

In the **Gem Properties**, change the **Material** from Quartz to Spinel, then increase the Refractive Index to 1.72 for the Spinel. Know that the angles in the cutting diagram have not changed as yet. To maximize the view, select the **Manual Optimizer** in the pull-down menu **Tools**. Look through the different Pavilion ranges and select the view that best reflects

the beauty of the gemstone. It is a judgement call and there is not a hard or fast rule. Then click on **Apply**. (See Figure 2). That will change the angles of the cutting diagram to fit the best view you have selected. The tutorial will walk you through these steps to optimize your cutting diagram for the material of Spinel.

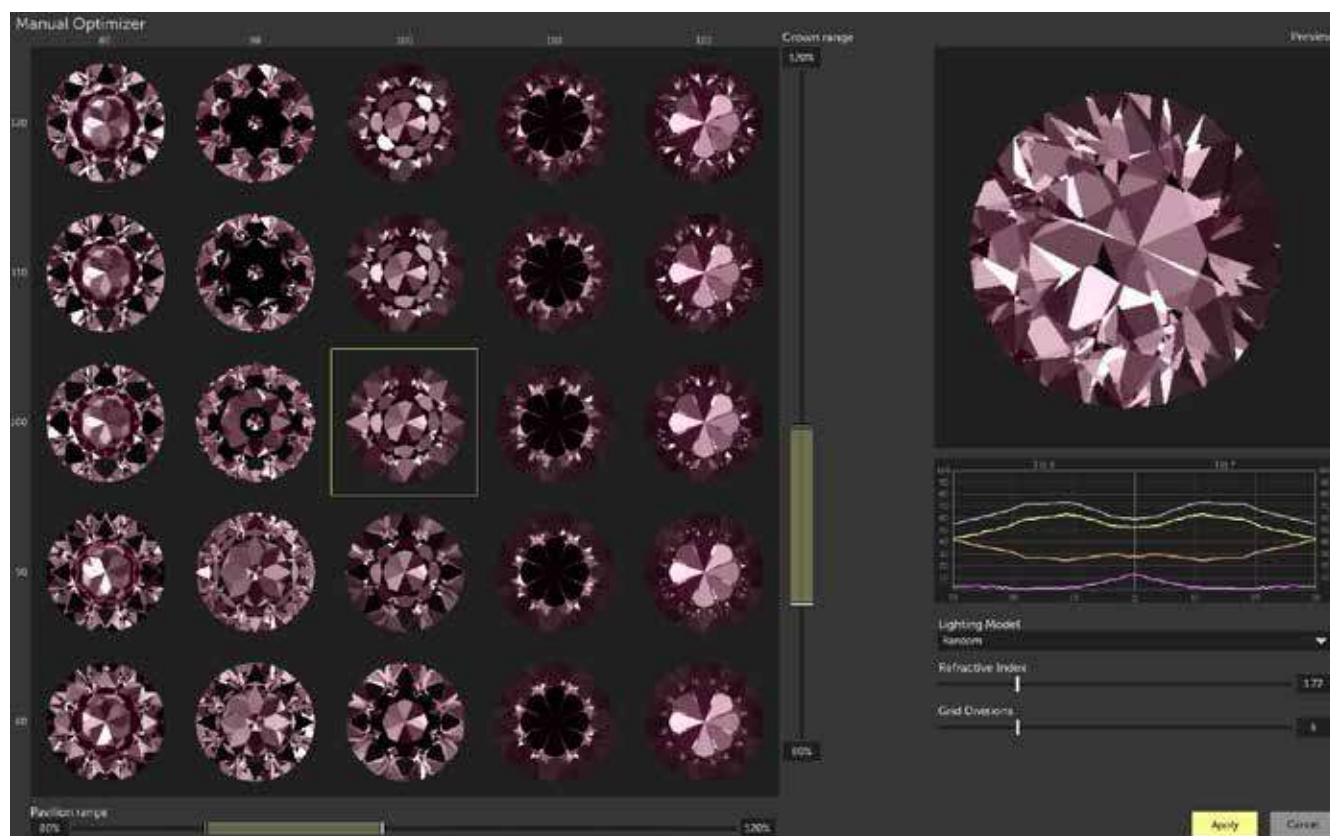


Figure 2. Manual Optimizer view for Spinel with RI 1.72

Another fun process to create a unique cutting diagram is to combine two different cutting diagrams. View the tutorial on “Proof Cutting or Replicating an Existing Design” (<https://youtu.be/IFjki8sXLg>). You can replicate the existing design for the pavilion and the other existing design for the crown. Obviously, the two different designs would need to be for similar shape stones such as a round, an oval, or a pear shape. Then you can go through the same steps to optimize the cutting diagram to bring out the most brilliance of the material you are cutting.

A member of the Guild, Linda Cunningham, has used this technique of using one diagram for the pavilion and another diagram for the crown. Being a member of the Guild, you have access to e-mail addresses of all the members. I checked with Linda to see if she was willing to talk with other members using this approach, so do contact her if you would like to seek her suggestions and help.

You can forgo all of these suggestions and use GCS to create your own and unique design. One of our Guild members used GCS to create a design based on the shape of the rough, so that he had minimal loss of material, therefore, maximizing the carat weight of the finished stone. Look at the gemstone that Marie Bellard cut that is featured in the title page of *The Midwest Faceter* and how she maximized the carat weight of the rough shape of the Sapphire. You are only limited by your imagination!

Professional gem cutters focus on maximum yield. It starts with the proper selection of the rough material. The proportions of the rough have to match the optical properties of the species you buy. The lower the refraction index, the thicker the stone will need to be in order to maximize the light return. A good rule of the thumb is to have the thickness of the rough ranging from $\frac{2}{3}$ to $\frac{3}{4}$ of its width. A natural gemstone with a high refraction index, such

as a Spinel or a Zircon, will always give more freedom to your imagination because you are able to cut a wider range of angles for both the facets on the pavilion and on the crown.

It is in general easier to select a design based on the proportions of the rough you already have than trying to find the ideal rough for the design you want to cut if you are looking to maximize the weight of your finished stone!

An easy start to find a suitable design for your rough material is to:

1. measure the ratio “thickness over width”, referred to as “H/W”, or the addition of “C/W” + “P/W” on most designs.
2. measure the ratio “length over width”, referred to as “L/W” on most designs.

Then you can use these ratios to narrow down the ideal design for your rough on websites like FacetingDiagram.org.

Lastly, we want to share a few tips about the gem properties and render options. A good starting point for the head shadow half-angle is to set the value to 8 degrees, as shown in Figure 3. It is a conservative value that will ensure that the end result of the gemstone you have been working on for hours will turn as beautiful as predicted by GCS... or better! Also, the head shadow color shall be kept black.

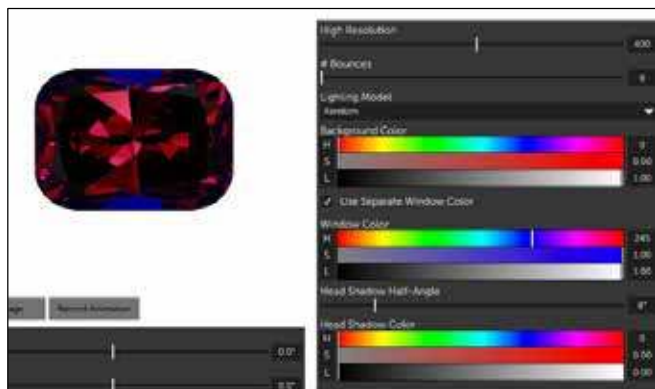


Figure 3. Render options in GCS

The color of the stone might be the most difficult parameter to set properly. After an unbelievable number of mistakes (we will call it experience!), we allow ourselves to share an approach that proved to provide relatively repeatable results.

The idea is to set the rough material on a white sheet of paper. In parallel, the thickness as well as the “width to length” ratio of the stone is set in GCS, as shown in Figure 4.

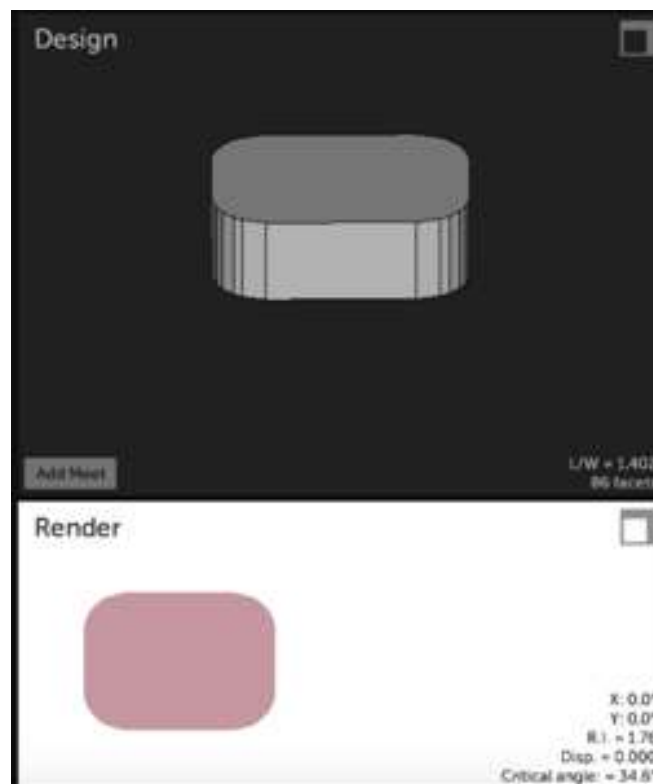


Figure 4. Color rendering of the rough

Once the rough material is modeled in CGS, it becomes possible to change the parameters “color density,” “clarity,” and “stone color” to match, as closely as possible, the color of the real rough on the white sheet of paper and the color rendering on the screen of your computer. It is not a pure science. But it is important to spend some time at the beginning of each new project because any deviation of the color at that stage will result in an incorrect rendering of the finished stone. When done cautiously,

this step allows to detect when a gemstone will turn too dark, the design can be adjusted to fit the color of the rough (See Figure 5).



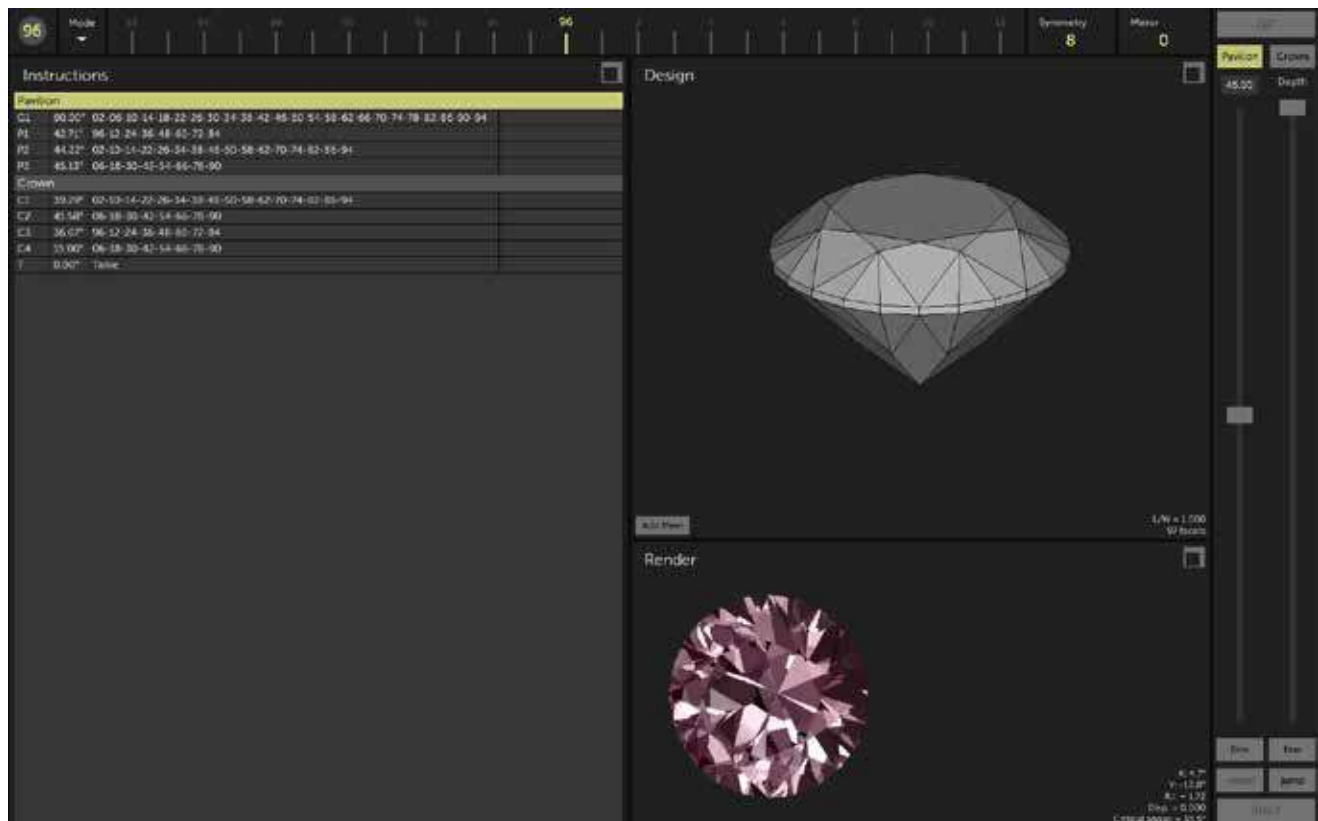
Figure 5. Color rendering of the finished stone.

It takes practice to have GCS to create a unique design but once you get the hang of it, the rewards are optimal--just a little play on words!

As mentioned, the tutorials that are available on the Help menu in GCS will walk you through the steps in this article. Using the Render

feature and the Manual Optimizer will make it possible for you to change a cutting diagram from Quartz to Spinel or whatever material you are using. Keep in mind that changing the cutting diagram from a lower RI to higher RI works better than the reverse.

We have found that GCS is more intuitive than using GemCad, but like so many software programs, it is what you learned on. So, when you are sitting at home, bored, and nothing to do, try GCS. Change cutting diagrams from quartz to some other material, play with the Manual Optimizer and see if you can get the stone to sparkle to beat all! Then reflect on the old days when designing a cutting diagram required mathematics, trial and error of how the finished stone turned out. Now it is just a click of a button. Who wants the good ole days?



MWFG Interview

By Marie Bellard, FGA

Editor's Note: Marie Bellard is the past President of the Guild, and through her story, you can see how many of her gemstones have graced the pages of The Midwest Faceter. Here is her story . . .

Tell us a bit about yourself.

I was born in the French Caribbean near Guadeloupe on the small island of St. Martin. The island has a French side and a Dutch side. I grew up there until I left for France at 15 years old. My parents thought it would be better to study, and life in general, because the island was so small that it does not have all the needed industries.

When I arrived in France, it was a shock. I experienced my first winter and the culture was slightly different. From there, we moved every year, so it was difficult and affected many aspects of my life. Then we finally settled in when I entered high school, where I studied graphic design for 6 years. After graduation, I tried to find work in graphic design but because of the self-taught and graduates flooding the market, pretty much everyone in my class, and myself included, decided to find other jobs in different industries.

How did you get interested in gemstones and faceting?

I went to a job fair that featured companies like trades in transportation, hotel, tourism etc., as well as trade schools. I found at the job fair my next school in jewelry making. I saw a bench jeweler at the exhibit doing a demonstration. Oh, I was just fascinated! I

remember he was doing a piece of jewelry for a very big company in Paris. I took down the information and several months later I started the school. The only requirement was to find a jeweler for an internship (2 weeks work/2 weeks at school for a total of 2 years). I found a Parisian jewelry company one month before the school started.

When I graduated, I had the choice to do a 1-plus year to be specialized in stone setting and advanced jewelry making or finish here. During those past 2 years, we've had 2 weeks of basic gemology and I decided to take this path. I learned about faceting gemstones, which I found more exciting than making jewelry because it was even more delicate and precious than metal. My teacher talked about gemstones in such a secretive way. I started to ask him questions about faceting, gemology, and even geology. Yet, he would act very secretive and give minimum information. But I was not put off by him and kept asking questions. Eventually he got annoyed with me and said, "come to my shop and I will teach you how to facet." He started me out cutting a cabochon.



That's where I learned the basics. He never told me, but he was in fact a gem cutter. He taught me how to use a Jam Peg, how to put the rough on a dop with wax. Every morning at 9:00 a.m. we would have a coffee and a croissant and then cut from 9:00 a.m. to 6:00 p.m. for two weeks. Then I found a job in the jewelry business with a polishing company. In France, jewelry companies specialize in one aspect of the whole work, such as jewelry polishing, stone setting, jewelry casting... not a lot of companies do it all. The job was polishing for big houses in Paris like Van Cleef and Arpel, Cartier, and Chaumet. I was working part-time, and I would return to my teacher's house every evening to cut more gems.

How did you become a gemologist?

After working with my teacher in faceting, I enrolled in the Gem-A gemology program in 2016. It is a program with two diplomas. The first part was from September to December for the fundamentals in gemology. Then from January to June 2017, I completed the more difficult part of the program on such topics as cause of colors in gems and identification lab classes. There was more on geology as to how gemstone formed and using gem identification instruments. After completing the course work, I had to take a written examination. That became the most difficult since you were given a question and a whole blank page you had to write on the topic. This is also when I met Raphael.

How did you and Raphael meet?

I met Raphael on Tinder in April 2017. We dated for a period in Paris. Raphael was looking for a new job and got a job offer in Michigan as a mechanical engineer, and this is where we said, "What do we do?" I was still studying for the written portion of the Gem-A program. We were doing great together, and decided to move to Michigan together. We

arrived in the U.S. in September 2017, and I was studying every day (9 to 5 and even on weekends) for the written Gem-A test. We decided to return to France in January 2018 to get married since we were not allowed to get married in the United States because I was under a visitor's visa, and he was under a work visa, and it would have been considered fraud.

How did you get into faceting in the US?

I had joined the Midwest Faceter's Guild in 2018 and I decided to purchase an Ultra Tec before the Annual Seminar in August where I used a Gem Master Fac-ETTE to cut the gemstone. I got the V5 in September 2018 and wanted to build skill in cutting. Raphael would tease me about wanting to cut gemstones, but say I had to study for the exam. Instead of having to return to France to take the exam, Gem-A had a testing site in Montreal, Canada. It took 3 or 4 months to get the results, but I had passed! Dr. Reg, Dave Vought, and I would meet at the Golden Egg café in Ypsilanti, and I would come with a ton of questions about faceting. I started searching the web for gemstone designs and where I discovered Gemology Online (<https://gemologyonline.com/>). So, from September 2018 and on I was discovering people in the gemology/gemcutting world online and on Facebook.

How have you been helped with gemstone designs?

Raphael, as an engineer, must have things perfect. So, if it is a square, it needs to be a perfect square! He was fascinated in the symmetry of gemstones. While I was cutting, he wanted to know why I was using this polishing compound or powder, why this and why that. At the Annual Seminar, he was behind Everett Brake that was using Gem Cad and was fascinated in it. He found more information online about gem cutting, gem design, and then discovered Gem Cut Studio

(GCS). Gem design has too much mathematics in my mind, but that so fits his background. He ended up purchasing GCS and I could work with him about a design, change a ratio, add a tier of facets, and he could do it. He would get the measurements of the stone and determine if there was sufficient material to cut a particular design. I learned from him how to select rough to get the maximum yield and he learned from me about difficulties in designs and the species cut.

How did you start a business in gem cutting?

I liked cutting natural gemstones and I thought about starting my own business. In 2019, I started talking about it with my friends in France that were in the jewelry business. They could not find some gemstones in France; it was not the right color or the right shape and things like that. So, I started to cut for them. It started to spread to jewelers that I did not know. It was easier for me to do business in France since I spoke the language and I knew how to negotiate and where to go. I could sell my stones to my friends, and they would give it to the jewelers. I sold most of my stones in France, Belgium and Switzerland. Some years later, because of immigration laws and our desire to stay within the United States, I have had to put a hold on my business until I can obtain a work permit.



Marie describes this bi-color Zircon as her favorite work. The design is her own and the gemstone is 11.47 ct.

Where do you see your business going once you are past immigration laws?

It was difficult for me to learn that I was not able to work and earn an income because of the laws, but slowly I am learning not to victimize myself. I am taking my time to think about what I want to do with my job. I really want to continue cutting gemstone because it really is my thing. I recognize how hard it is to just cut gemstones. I have made mistakes in my business, but I have also progressed a lot. When I can start working again, I will merge cutting gemstones and making jewelry. I have had a lot of people say to me, "Oh, I love your gemstones, but can you set it in jewelry." I do not have the equipment necessary to make jewelry, but I do miss making them. Therefore, my plan is to get the necessary equipment and do both cutting and making jewelry. The trick is to find a unique style for making the jewelry, otherwise I will not have enough time to cut the gemstone, make the jewelry, and then set the stone. Everything put together must be financially viable.

What was it like for you being an officer in the Guild?

I agreed to run for the Guild's Vice President position in 2020. Because the President had resigned, I had to take over as President, as specified in the bylaws, and honored that commitment. I put considerable energy into stabilizing the Guild, addressing the much-needed update of the bylaws, getting written guidelines for the officer positions, and starting the development of a plan for educational programs for Guild members. We conducted several Zoom and in person workshops. As October for nominations of new officers, I was not able to run again as President because Raphael had an offer from a company in South Carolina. He was working as an engineer for a

French company located in Ann Arbor, but the job in South Carolina was a perfect fit for him and his skills were a perfect fit for the company. We had to make the decision to move.

What are your thoughts about faceting guilds in the country?

It is an amazing thing to have faceting guilds in the United States. If I recall correctly, in Europe, there is not a single faceting guild. Without a guild, it would make it even more difficult for people who have gem faceting as a hobby or as a profession. Without being a member of a guild, it would have made the road of learning to facet a much more difficult task. It is a true blessing to have faceting guilds.

What would your advice be for faceters?

As a hobby, it is important to find a group or a person that can help you with building your skills in faceting. It is a very small world; you learn a tremendous amount of information in a very short time frame. You need your questions answered as you proceed. Even if you want to become a professional gem cutter, it is important to be part of guild where you get

answers to questions. If you want to create a gem cutting business, sell to international dealers not to just U.S. dealers. We are fortunate in the U.S. since jewelers can find what they want, but there is a serious limit in the number of gem cutters for the international market. Some of the best cutters are in Germany, but small jewelers find it difficult to find specific gems and colors in Europe.

What would be your parting words?

I am trying to find the right words! When I had mentioned that I would like to cut gemstones as a business, I would get some people who would tell me there is no money in cutting gemstones and I should never do it. I feel sad for them, but I wanted to tell them that “my experience is not yours.” People should not state such an opinion because I was not seeking their advice. My background and their backgrounds were different. What would have been far better would be to encourage the person’s gem cutting passion. Never respond to people, “you can’t do it, you can’t make it.” You can say “yes, but it is difficult.” But what isn’t difficult? Whoever heard that creating a business is not difficult? Be encouraging instead of discouraging.



A bit of History

In the January 1989 issue of The Midwest Faceter, an article was published about hazardous lapidary. Take a step back in the Guild's history. To add further background, also included is an article from Rock & Gem, 2018 about dangerous dust.

Lapidary and Mineral Poisons by Errol Alvey (The Midwest Faceter, 1989)

Why must we always wash up after doing any lapidary work? It may seem to those of us who snack or smoke while working that there could be little harm in a little rock dust. But, many substances we use can be hazardous. For example, emerald, aquamarine, and other varieties of beryl, plus chrysoberyl, all contain beryllium. The federal minimum exposure guideline for this material is set at less than one millionth of an ounce of airborne material per cubic foot of air in a work area.

Many other minerals, such as asbestos and those containing mercury (cinnabar), arsenic (realgar, orpiment), selenium, copper (chalcocite), uranium (uraninite), autunite, (pitchblende, carnotite), and boron are hazardous if you get dust or mineral fragments from them into your mouth and lungs. Also, many polishing compounds contain oxalic acid, the same poison found in rhubarb leaves. Finally, the dust from dry polishing quartz or any silicate can cause silicosis if one incautiously inhales enough.

Via Osage Hill Gems to us: *Flint Rock and Gem Newsletter*.

Dangerous Dust by Douglas Hamilton (Rock & Gem, 2018)

When I first became interested in lapidary work, it seemed the perfect hobby. Today's equipment is simple, relatively cheap, and very high tech. Working material is easy to find, as rocks are about the most abundant material on the planet. The hobby itself is rewarding and exhilarating. And there is little danger of personal injury from runaway saws, faceting machines, or polishers, as the cutting edges are relatively dull and forgiving. So after 30 years of procrastination, I finally decided to go for it, and purchased a brand-new rock saw and grinder/polisher. Wow, did I have fun! For that first few months of cutting and grinding, I was in seventh heaven. All those lovely rocks I had lusted after for so long were finally put under my polishing wheel: lapis, agate, jasper, tiger's-eye, malachite, turquoise, chrysocolla and quartz.

But I soon began to experience a nasty and completely unexpected cavalcade of health problems: coughing, hoarseness, difficulty clearing my throat, breathlessness, and a dull ache in the pit of my lungs. Of course, I had always worn safety glasses with side protection, as recommended in every manual, but a mask seemed a cumbersome hindrance. As the situation worsened, I tried several dust masks, but there was little improvement. It was time to do a little research, so I hit the books and started talking to fellow rockhounds. It

was a revelation. Rock dust from lapidary work turns out to be more than just a nuisance; it can be deadly.

A single heavy dose can cause crippling lifelong problems. It attacks the lungs in a variety of ways: First, by coating the inner lining and blocking the transmission of oxygen into the bloodstream. Second, tiny sharp fragments slice and cut into the alveoli, which coat the inner lining of the lungs, causing irritation and inflammation. Fresh dust seems to be more harmful because the sharp edges have not had a chance to be softened by moisture. Some forms of rock dust are quite poisonous in and of themselves. Whether it is inhaled, ingested, or contacted by exposed skin, the effect can be injurious to your health. Malachite and chrysocolla dust is quite toxic (45% to 70% CuO), and should not be breathed, ingested, or left on skin surfaces.

Among the worst offenders are minerals containing copper (II) oxide (CuO), the higher oxide of copper, which can cause damage to the endocrine and central nervous systems. These minerals include some of our most colorful and treasured semiprecious stones: turquoise (9.8% copper oxide), chrysocolla (45%), and malachite and azurite (70%). These percentages are only close approximations; each rock has its own signature of impurities. It is worth remembering that other closely related copper compounds are highly bioactive and have been used in pesticides, fungicides, and wood preservatives for decades. This is dangerous material. These high-copper rocks should not be licked to bring out the color, and oil mixed with the dust should be carefully cleaned off exposed skin. Several lapidaries who smoke have described their own novel test for overexposure: Apparently, copper-impregnated dust combines with nicotine and

tobacco tar in saliva to form a sickeningly sweet compound similar to saccharin. When their mouths start to taste like a candy factory, these rockhounds know it's time to quit. Another sign is influenza-type symptoms. Symptoms of CuO dust poisoning mimic the flu, causing headaches, coughing, sweating, sore throat, nausea and fever. Skin, eye, and respiratory tract irritation are also common, along with a distinct "metallic" taste. A common name for these health effects is "metal fume fever".

In fact, when you get right down to it, almost all the rocks most favored by cutters and polishers contain compounds that can be dangerous when inhaled. Silicates are the most common family of minerals on Earth, and silicosis has long been one of the chief hazards facing stonemasons. The ancient Greeks and Romans were the first to observe its ravages, and correctly associated the problem with mining and rockwork. Similar to the "black lung disease" of coal miners, it came to be known in later years as "grinder's consumption". The simple steps taken to prevent it were a major achievement in the modern field of occupational health. Ironically, although silicosis is well understood today, thousands still die from its effects every year, mainly from mining and sandblasting in the third world. The symptoms of inhaling crystalline silica (SiO₂) dust include shortness of breath, cough, fever, emphysema, pulmonary fibrosis, lung scarring, and increased susceptibility to tuberculosis and cancer. Silicosis often takes many years to develop from repeated exposure to low doses of dust, but once established it is irreversible.

Dust from red jasper, Brazilian agate, and petrified wood all contain high amounts of silicon dioxide (SiO₂), which can cause silicosis when inhaled. The silicates include

a bewildering variety of precious and semiprecious stones. In fact, it's hard to imagine the world without them, as they can be found in every class of rock and occupy a niche in every conceivable geological environment on the planet. The family includes quartz, chalcedony, jasper, agate, aventurine, bloodstone, carnelian, chrysoprase, amethyst, opal, onyx, beryl, petrified wood, obsidian, flint, chert, soapstone, sandstone, glass and tiger's-eye. In almost all of these, the content of silicon dioxide approaches or exceeds 50%. It should be mentioned that African tiger's-eye also exposes the lapidary to another potent danger: asbestos. The vibrant optical effect of its chatoyancy is caused by parallel-oriented, finely fibrous amphibole asbestos. Serpentine has a high chrysotile asbestos content, but this is not considered quite as dangerous as the tiger's-eye. Some soapstone varieties also contain asbestos and should be cut or carved with caution.

While working on this story, I was surprised to discover a very different kind of hazard: radioactivity from fossils. In a recent study of 300 randomly selected fossils from the Hagerman Fossil Beds of Idaho conducted by C. Neal Farmer, Ronald L. Kathren, and Craig Christensen, a hand held Geiger-Müller survey instrument detected discernible levels of radiation one to two orders of magnitude above the ambient level of background radiation in three-quarters of the specimens ("Radioactivity in Fossils at the Hagerman Fossil Beds National Monument", *Journal of Environmental Radioactivity*, Vol. 99, Issue #8, August 2008, pp. 1355-1359). That is a huge difference.

In some areas, like the Hagerman Fossil Beds National Monument (Idaho) and the Morrison Formation at Dinosaur National

Park (Colorado/Utah), fossils have even been hunted using Geiger counters. According to the study, radioactive fossils seem to occur most commonly between 900 and 1,000 meters above sea level in ancient sandy riverbeds, while clay-rich deposits and those at other altitudes do not seem to show these high levels. Apparently, naturally occurring uranium produces radium, which decays into radon, an inert gas. Ancient groundwater transported these radioactive elements into sandy fossil-bearing areas, where they precipitated out of solution during the fossilization process. Even small fossils like shark teeth and trilobites can have significant readings. The National Park Service is so concerned that it put out a "Conserve O Gram" with detailed instructions for handling and displaying specimens. While it is probably safe to collect most fossils, at the very least, you should wash up and change your clothes after leaving the field. And always wear a respirator when you cut or polish the pieces—radioactive dust is highly carcinogenic!

Forget the cheapo dust masks—a quality NIOSH approved respirator is essential to the lapidary's respiratory health. But enough of the doom and gloom. This litany of dangers is not intended to drive rock lovers from their favorite hobby. On the contrary, a few simple precautions can almost completely eliminate the threat of injury from most rock dusts. Here is a list of suggestions that will make your workshop a lot safer and allow you to enjoy lapidary work in good health.

Always wear a National Institute for Occupational Safety and Health (NIOSH) approved respirator with replaceable cartridges and dust filters. Some cartridges today combine a prefilter with the cartridge, which makes things simpler. Respirators provide a wide

variety of protection against dusts, solvents, fumes and mists. They are designated N, R and P, depending on the cartridge's ability to filter out oil; N stands for "no protection", R for "resistant to oil", and P for "oil-proof". The number that follows the initial tells you what percentage of the particulates is filtered out by the cloth prefilter. For example, an N-95 respirator will not keep out oil spray, but will screen out 95% of airborne dust particles.

Avoid cheap dust masks; they don't fit tightly enough and they filter poorly. If you can, try on several different respirators at the store to get the best fit. Shave your beard, if you have one, to get an airtight seal. Store the mask in a closed container or plastic bag when it's not in use, and occasionally wash it with warm soap and water, both inside and out.

Try this simple negative pressure test on your respirator: Block up the air inlets, breathe in, and hold your breath for 20 seconds. If the mask is still held airtight against your face, it fits. Cartridges should be changed after about eight hours of use.

An open window or air conditioner does not provide adequate ventilation for the lapidary workplace. The simplest solution is to work outside. This keeps most contaminants out of your workshop and costs nothing, but it is not always possible. If inside is your preference, consider setting up a local exhaust ventilation system. This would include a dust hood to collect contaminants, ducts to carry them outside, and a suction fan to power the system. Adjustable blast gates would allow a dust hood to be placed next to each appliance. Ducts should be circular, with as few bends as possible, and should exit the shop. If you have close neighbors or are processing a lot of rock, provide a dust collector to remove contaminants from the vented air.

Setting up such an elaborate system can be expensive and time-consuming for the

part-time hobbyist. Some woodworking tool suppliers have come up with an ingenious alternative. They have adapted a wet/dry-type vacuum cleaner with a High Efficiency Particulate Absorbing or Arresting (HEPA) filter to collect shop dust using a little extra pipe and some suction nozzles. There is no reason this system should not work for rock dust, as well. The vacuum should be placed outside the house because the dust-laden air sucked into the intake will be blown out the vacuum's exhaust port. Even HEPA filters fail or become clogged, and some dust will always slip through. It's far better for it to be blasted outside than into the shop or another enclosed area. Kits, diagrams, pipe, and suction nozzles available on the internet. Search for "dust collection" and "dust collection network". Fossils can pose a surprising hazard: radioactivity from natural elements.

Always use water or oil as a lubricant when cutting, drilling, polishing or faceting, but be aware there are problems with both fluids. When water evaporates, it stops holding the dust down, allowing it to become airborne. A fine oil mist laden with toxic dust can be kept out your lungs with a good respirator, but it will settle on skin surfaces and stick like glue. Also, most lapidary oils are highly irritating or downright poisonous to breathe. Some, like old-fashioned kerosene, are dangerously flammable, as well. Everyone has their favorite method, but I work outside using mineral oil and a P (oil-proof) respirator cartridge with a built-in 100% particulate filter.

Always wear a head covering and apron and/or coveralls when grinding, and change clothes after you have finished. Rock dust loves to stick to clothing and hair, and you will carry it around the house and breathe it all day long (as will your family) if you don't change. Take a shower after your lapidary work, shampooing your hair and using lots of soap. Launder coveralls and work clothes frequently.

Disposable clothing, coveralls, and an apron might also be an option.

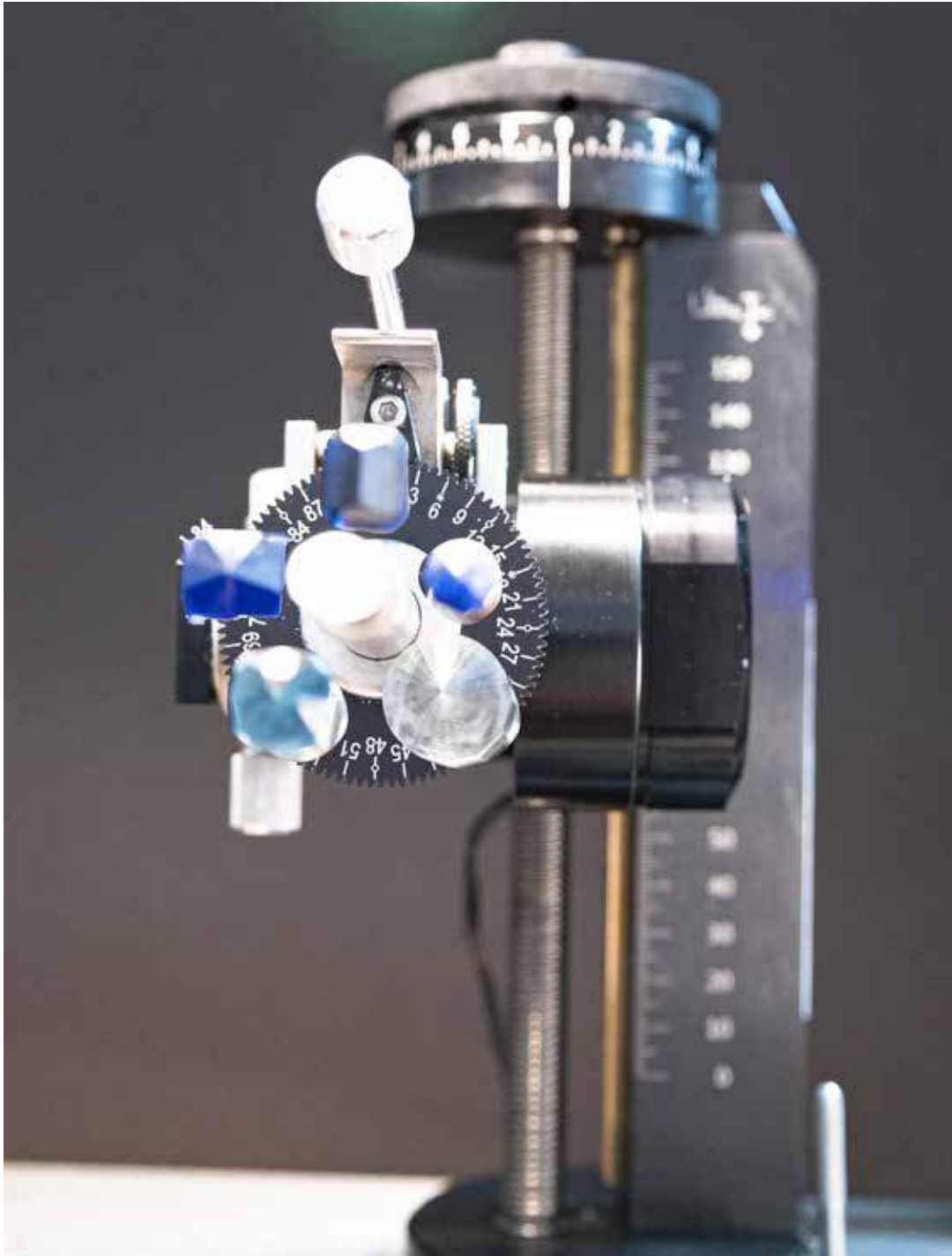
Never dry sweep the workshop. Most of the dust will just become airborne and migrate elsewhere. Use a vacuum cleaner with a HEPA filter instead. If you really want to get down and dirty, use a wet mop on the floor and a wet rag with a water bucket on other surfaces.

Not all of these suggestions need be slavishly followed. If you grind infrequently, you can probably forget some of them, but if you are an addict like me, you might want to implement most. Individuals vary greatly in their tolerance to rock dust. Some will go through life with nary a problem, but others can be extremely sensitive. Low doses on a daily basis will slowly accumulate, and that dust isn't going anywhere once you breathe it in. Smoking and living with a woodstove or in an area with poor air quality will make you that much more vulnerable to problems. Listen to your body. If your lungs start to complain, take more precautions; you only have one set to last a lifetime.

How Many Stones Can You Cut?

Picture by Dr.
Reg

Pete was a creative faceting guy. He devised a method where he could cut more than one gemstone at a time! Give Pete a call if you want to learn his secret.



From a Faceter's Journal

The Superglue Experiment **The Superglue Experiment, Part 3: The Dual-adhesive approach** **by Diana Carroll**



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May 2022, No. 567

So, for this second round I had four small sapphires dopped with epoxy, two on a 2mm dop and two on a 1.5mm dop. Each of these stones had been removed from their epoxy "cradle" and superglued back in place using generic superglue. When doing this deliberately, it turned out to be very easy (yikes!) to snap the stone from the dop with my fingers.

Another four stones got the precise same treatment with the E6000, and all of them got a couple extra days to cure while I was busy doing other things. I marked the dops with Sharpie to discern which was which, but later realized that their different textures made that rather unnecessary.

For this round, I used plain old generic superglue for all of them, so the only difference was between the E6000 and the epoxy. The superglue ended up getting a couple days to cure, because I was busy, but it doesn't actually need that much time.

At the faceting machine, I started off with the 600 lap that's somewhat worn, and gave each stone another round of trial-by-girdle. Some of the stones had a few girdle facets from the first round, but many didn't, and regardless they were not precisely centered. To my amazement, the first few stones went

remarkably well, by which I mean that I was able to facet all eight girdle facets without them coming off the dop. I was actually three stones into the experiment when the little green sapphire let out a squeak and skittered under the lap to hide in the catchbasin. That was the second E6000 specimen.

The third didn't come off the dop, per se, but the E6000 got rubbery and flexed in various directions. The result was a bizarre distorted effect that would have struck Salvador Dali fans as familiar, and was oddly unsettling to look at.

At the end of the second round, the epoxy was the clear winner. All four of the stones dopped with epoxy had not only completed their girdle facets but also their pavilion facets, and with such small stones (between 2 and 3.5 mm) the 8k put a rather nice polish on them and they were ready for the transfer block. Only one of the stones dopped with the E6000 made it to that transfer-ready state, two of the others now providing the startling impression of having melted in place. I gave those stones a tour of the acetone jar and redopped them with Epoxy to continue on to the next round.

Addendum: About those little superglue tubes I suspect they're all a conspiracy by the superglue distributors to make you buy more

superglue. Actually it's not the little metal tubes I have a problem with so much as their tops, with the long pointy applicator and the little plastic cap that never fits quite right. The long pointy applicator is a guessing game with a sticky ending, you squeeze the tube and take a wild guess at when it will fill with glue and come oozing out the end, and once you've squeezed too much glue out there's no putting it back and next thing you know it's everywhere. And then of course, after you use some miniscule amount for your gluing needs, you put the little ill-fitting plastic cap on and over the next few hours it all adheres together so next time it's a solidified superglue mass and you have to open another tube.

Since I like to get maximum use out of my superglue, I generally refuse to use that pointy

applicator. Instead I poke a hole in the little foil top of the tube, and use a toothpick to scoop up and apply exactly as much glue as I need to the target location. Then I put a little piece of plastic (snipped from a plastic sandwich bag or a produce bag) across the top and screw the cap back on. It will seal quite nicely, and when I next need some superglue I can peel the plastic off and use it again. Used this way, one tube of superglue lasts quite a while and is very economical.

The charming exception to this is the Loctite 404, which actually comes with a properly airtight cap and a little foil seal. It was a bit more expensive than the others, but I do like its container. I also like how it gels up a bit in the fridge, making it easier to apply neatly and sparingly, and mess-free.



Diamond Polish: An Alternative

By Dr. Reg Williams

The MWFG was contacted via the website, by Tec Diamond Tools in Santa Clara, California, asking if there were members interested in testing and evaluating their diamond pastes for polishing gemstones. Several members volunteered to give the diamond pastes a try including myself. The diamond pastes come in 5-gram syringes, in a large array of different grits. I had requested syringes at 8,000, 14,000, 50,000, and 100,000. These tend to be the grits I use for polishing gemstones that require a diamond polish.

With just a bit of history of trying different diamond polishes, I was not having good luck with powdered diamond packets. I would try to evenly coat a polishing lap with the powdered diamond grit by spreading it with about 4 drops of diamond compound extender charging fluid Crystalube. I would, at times, get scratches in the facet and not get a great polish. I even tried spray diamond compound and got similar results as with the powder. I tried Mountain Mist Products diamond paste, which worked better, but found spreading the thick paste was more of a challenge. A friend had mentioned using Gearloose Pandimonium Polycrystalline universal base diamond polish. I found it worked exceptionally well with using Professor Ignatius Snake Oil lubricant extender. Pandimonium comes in a stick tube dispenser, and I placed the diamond paste from the tube on the lap for one complete rotation. Then with a Kimwipe, I was able to spread the diamond very evenly across the polish lap with the 4 drops of extender. Each stick tube costs about \$29 but will last for a long time.

Given this opportunity to test Tec Diamond Tools diamond paste against Gearloose Pandimonium, I thought it might provide an interesting comparison of the two diamond

pastes. First, I put about 4 to 6 small dots of the Tec Diamond paste on the polishing lap, however there is an extender in the diamond paste. Then with a Kimwipe, I was able to spread the diamond paste very evenly across the lap. The cost of each 5-gram syringe is \$6 to \$8.50 depending on the grit.

I was pleasantly surprised that I was getting an excellent polish on the CZ gemstone I had cut just using the 14,000 and 50,000-grit after I had prepolished the facets using my 1500-grit Hyper Edge sintered lap. There were a couple facets that I used the 8,000-grit paste to remove a few hairline scratches, to then proceed on with the 14K and 50K grits.

Here is a picture of the CZ pear shape gemstone where I had polished the pavilion and the crown with 14K and 50K diamond paste. I was pleased with the results of the polish and did as well as Gearloose Pandimonium.



I was grateful to Diamond Polish Tools for the opportunity to try these diamond pastes and certainly have no qualms to recommend the pastes to other Guild members. Check out the Diamond Polish Tools website at <https://techdiamondtools.com/> or you can send them a message via their website.

A Joke for Faceters

A Riddle:

You see a boat filled with people. It has not sunk, but when you look again you do not see a single person on the boat. [Answer at the bottom].



The arrow means Amazon has everything from A to Z!



Do you see the arrow in white between the E and x?

TEN (10) THINGS I KNOW ABOUT YOU AS A FACETER:

- (1) You are reading this.
- (2) You are human.
- (3) You can't say the letter "P" without separating your lips.
- (4) You just attempted to do it.
- (6) You are laughing at yourself.
- (7) You have a smile on your face and you skipped No. 5.
- (8) You just checked to see if there is a No. 5.
- (9) You laugh at this because you are a fun loving person and everyone does it too.
- (10) You are probably not going to send this to see who else falls for it!

Answer to the Riddle: All the people were married.

Buy, Sell & Trade

This section of the Midwest Faceter is dedicated for members to list any items to buy, sell or trade. The section can serve as the Guild's "Craigslist!" If you have something, do send an e-mail to the Editor and your item(s) can be listed in the next issue.

The Guild was contacted via our website, and the information is included here for members if interested. This is not meant as an endorsement by Guild. If you explore this, please let us know your experience to share with our members.

Name

Ezekiel Loftin

Organization

Old Virginia Gem Co.

Email

Contact@oldviriniagem.com

Phone Number

936-402-0320

Message

We are looking for a gem cutter to cut our rough, and we also buy faceted gems. We do not know if you provide buyer info to your members, but we do need custom faceting by skilled cutters. We are an excellent source for your members to sell their work. We are honest and have references like Ales Krivinek, John Dyer etc. We are looking for someone to do custom cabochons and some old style faceting for a new line we are producing, and also carvers. Thanks, and we hope we can be an asset for your members to sell their rough and give opportunities to your members. We of course have quality standards but we love to support talented new cutters. They almost always move on, but that's a good thing. We try to cut USA, but when they go retail we can't compete with them. But before that, they are usually happy to get our business. We are, alas, a stepping stone unless contractual cutting, and even then we have more rough than we can cut in my lifetime.



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The Midwest Faceter's Guild was established in 1979 for the purpose of developing the art of faceting, to promote education and recreation through the exchange of information, to provide meetings for those with like interests and to encourage the achievements of individuals.

The Midwest Faceter's Guild is also a member of the Midwest Federation of Mineralogical and Geological Societies as well as the American Federation of Mineralogical and Geological Societies.