

## View on the Selection of Faceting Rough

By Al Manestar, Revised January 2008, North York Faceting Guild

The evaluating of faceting rough is a real challenge for many facetors. There have been a number of articles on the selection of faceting rough. Over a period of time I have learned that the reading of these articles and talking and listening to other factors on the selection of rough has been very educational. When I first started to facet, rough was fairly inexpensive and plentiful (by to-days standards) so I went from dealer to dealer purchasing material that was many times of not good quality (it looked pretty).

After I had read a few articles about the purchasing of rough and after a short time "I knew it all" so I ignored a great deal of information by people who wrote knowledgeable articles. After having over the years purchased enough unsuitable rough to line the bottoms of a few large fish tanks. I started to observe purchasers, read and re-read articles and pay attention to the authors on the selection of rough.

What do I mean by observe? You all have come across a facetor who seems to have exceptionally fine and unusual gems in his collections. Watch them at dealer's booths. This facetor knows what he wants, has the gemmological knowledge and will take his time in examining a lot of rough. He will only select the piece or pieces that suit his needs. He examines the material under different lighting conditions, uses magnification, takes his time to study individual stones, and is not embarrassed to say that the material is not up to his standard. He will pay a premium for select materials but his results (cut stones) are usually a thing of beauty. Many times he will ask for the opinion of another cutter in case he has missed some inclusion, veil, or colour banding.

It is difficult to write about the purchase of rough because it is a technique that develops over years. In just about every article that I read I find some snippet of information that is a new revelation or a method that I can expand upon. These facts are not all necessarily about rough purchase but have to do with some aspect of faceting.

The selection of faceting materials is one of the more difficult skills to learn about faceting. New facetors are fooled by the "nice colour", shiny surfaces, nice flat area to place the dop, and they use improper techniques of inspecting the material. Knowledge of some gemology and a certain amount of expertise in the use of gemmological instruments is also helpful.

Why should we study gemology? We can understand what we are trying to facet if we know the RI (refractive index) which helps establish the cutting angle. Some understanding of birefringence so that we can locate the C axis this helps in avoiding sleepy looking stones. We can learn to identify cleavage which aids in the identification of certain cutting materials (topaz) and to avoid cutting on the cleavage plane. Hardness (Mohs scale) determines the wearability of a gemstone and the ease of cutting and what materials or laps to use in polishing.

Knowing about crystallography may help in the identification of the crystals this may help in the selection of faceting materials, and in finding the various axes are so that we can cut for the best colour.

What is the fastest way to learn how to choose faceting rough? It is when you have acquired a quantity of rough paid for with **a large chunk of your hard earned money** and then find out that it is not what you expected.

“YOU WANT WHAT?” Many factors have some unrealistic idea of what gem rough should be. They want to get the perfectly clean material, entirely flawless, the perfect colour, the exact shape to suit the design that they have in mind with a very high return, with the right crystallographic structure for the perfect stone. They want to cut a real prize winner, and to pay **pennies** a carat for it. DREAM ON. This type of material rarely gets into the hands of the average faceter. Why? This type of material is available at a higher cost but normally beyond the needs of the non-professional or semi-professional cutters.

Some rough materials that are available to the facetors come in smaller sizes (1 to 2 carats). This smaller sized material can be of exquisite colour and excellent quality. The cutter who wants to *cut large* high quality stones is at times chasing the impossible dream. Large stones can be difficult to dispose of (sell) and often need special mountings.

If you want to cut absolutely clean materials at a comparatively low cost you should think about using man made materials. Some of these materials have no counterpart in nature. These include YAG, Cubic Zirconia, GGG. There are new man made materials coming on the market constantly.

Other man made materials include the synthetic stones. These materials are the same in composition to natural materials but do not normally have some of the impurities that have crept into natural materials. They have been made over short periods of time compared to naturals which have developed over eons. They include corundum (ruby sapphire), spinel, and beryl (emerald) to name a few.

Some of the man made materials can be costly (due to the manufacturing methods) but they produce finished gems that are beautiful and affordable.

## NEEDED EQUIPMENT

What equipment is necessary when we go out to purchase rough faceting materials? Some of the tools listed below are very helpful. They are not listed in order of importance. I have been in many situations where I wished that I had had some of them available.

**Magnification:** head loupe such as the 5X can give you the necessary focal length to do your inspection comfortable, or your 10X hand loupe that you use for the inspection of your cut gems.

**Lighting:** Maglight or similar flashlight (plus spare batteries). I use both the AA and AAA size. I have a rubber attachment that happens to be a rubber chair tip with a 1/8th inch hole drill through the bottom to reduce the diameter of the light beam so that I can concentrate the light into small areas of the rough for closer inspection.

**Reflector:** white paper on which stones can be placed to see the true intensity of the colour of the material; this is done by shining the light on the paper behind the rough material. If you cannot see the light reflecting off the paper or in the stone it possibly will be too dark to cut a brilliant gem.

**White paper:** with a black line on it (or a line of type). What's the line or the type for, if you cannot see the line or the type fairly clearly the stone is possibly too dark or opaque.

**Immersion liquid:** can be any liquid, but the higher the refractive index the more useful the liquid is, remember to clean the stone to its original condition before returning it to the dealer. Some liquids that can be used range from water to various oils. It is not necessary but it can be a big help.

**Tweezers:** any tweezers that are capable of handling larger stones (preferably locking tweezers). Gem tweezers are too fine pointed for handling large rough material.

**Calipers:** to measure your piece of rough so that you have the right proportions of rough to cut the stone you want.

Let's start with the old formula in regards to gem rough:

"THE LOWER YOUR EXPECTATIONS THE GREATER YOUR SATISFACTION"

## SELECTING ROUGH

A gem cutter should always be aware of the light source whether buying, evaluating, cutting, or reviewing gem materials. NEVER LOOK INTO OR HOLD A MATERIAL DIRECTLY IN FRONT OF A BRIGHT LIGHT. Looking directly into a bright light will dazzle the eyes. When holding a stone between your eye and a bright light you have a difficult time seeing into the material but the colour may look impressive.

If inspecting a quantity of material, place the rough on a surface that will offer a neutral reflective background. The light should be lowered to a position where your stones are in bright light and your eyes in shadow. Sort through it first, separating the material that you want to inspect further from the rejects. This step will save a great deal of time as you will not spend time inspecting material that is not satisfactory. Not all materials will "sing to you".

Direct a light from 12 inches above and behind the material (remember that your eyes should be in shadow). Move the stones about with your fingers, isolate the rough that you are interested in and train the light directly on them. Do not pick up a crystal and aim the light through the back of the stone toward the eyes. This will almost invariably give you a wrong reading on the stone's colour, making it appear more transparent, and lighter in colour than it really is.

With calipers I measure the stone 3 ways length, width, and depth. As you measure, ignore and leave out any "bumps" that will disappear with any reasonable faceting but do not forget to consider any deep holes. If there is no color or crystal orientation factor to consider, the smallest number will be the depth of the stone and that will set the maximum size (most modern drawings give a percentage of the width for the depth of your finished gem. On the latest version of Gemcad U/W is a percentage number). This number is the crown depth plus the pavilion depth plus a girdle thickness. As a rule of thumb I use a 70% to 75% figure of the width for the minimum depth. This figure has to be modified when you go into the Barion cuts which require a deeper piece of rough (which may run up into the 85 to 90% range). .

The ratio between the other two measurements (length and width) sets the types and styles of cut that maybe made with a minimum of waste.

Study the shape of the stone in the length and width directions to see what cuts are for that particular stone (that is typical for those dimensions).

A purchase of a pre-made finding will control the decision in regards to the final dimensions. If the finding is to be custom made any choice of length to width is acceptable.

The choice of cut controls the number of facets. The general rule to follow is the smaller the stone, the fewer facets and the larger the stone the more facets.

If there are color or crystal factors to consider, set the table by these factors L x W x D for that particular orientation.

Now that I have eliminated a lot of the material what remains warrants closer inspection.

I look at the shape of the rough, I hold the rough in my fingers and move it about in any number of different positions or angles. I ask myself if this piece looks like a triangle, oval, rectangle, or a cushion shape. Is it shaped like a thin football? Is it blocky?" Deciding where you want to put the table needs as much consideration as the outline of the rough's shape. On some rough the culet is the controlling factor for the position of the table. For example, say you have a piece of rough that is long and shaped like a football. You think that the rough is shaped like a marquise. But, you realize that the table would have to be placed at point X. And then you say to yourself, "I'm going to lose a lot of this piece of rough". Even though it is marquise shaped it might not be deep enough. You may be better off cutting it in half and doing two triangular designs, thus getting a higher return on the single piece of rough, by cutting a suite. Always try to keep in mind what designs give you the best return. Remember that the round shapes will give you the poorest return on blocky or oblong materials.

On the inexpensive materials, I usually consider the shape of the rough, but not as long or as strictly. It doesn't cost much, so if I want to try a new cut, I try to pick a piece of rough that looks something like the shape I need. If I don't have one, I'll sacrifice some material to preform it into what I need. I don't lose sleep over it. Of course, you can't do that with expensive material.

If it is an expensive piece, the looking may take a while! With expensive material, you may have to play with angles too. If you have a nice piece of expensive rough you want to make the stone as big as possible because larger stones are rarer and more valued. If you think you can get a larger stone and the rough doesn't look deep enough you may lower the angles for the pavilion but not below the critical angle. The crown can be quite a bit shallower without detracting from the appeal of the stone. That's up to you. You have to decide whether it is worthwhile to sacrifice quantity for quality.

Experience with these questions offers the best understanding of how to decide what to purchase and what to cut. We all go through these questions, and we all make mistakes.

We all learn by our experiences.