Photographic Documentation – Systematic Collection of Photographic Evidence for Appraising Gems & Jewelry

With the advent of moderately priced high quality high resolution digital cameras it is now cost effective for Gem & Jewelry Appraisers to use digital imagining of the items they appraise as a form of photographic evidence in their appraisal reports.

There are basically Three (3) different types of photography, Standard photography, Macro-photography and Micro photography.

I’m giving you the simple short version instead of going into greater detail of the different types of photography that is most commonly used in photographing gems and jewelry for appraisal purposes.

Standard Photography:
Typically most digital cameras are capable of focusing from about Ten (10) inches out to infinity. Now when using today’s modern digital cameras you can use Standard Photography to capture the **Top View, Side View, Profile View, Bottom View or Back View**.

Macro-Photography:
Once again most digital cameras today have compound and complex lens systems which allow them to instantly switch and transform from a regular camera to a telephoto zoom camera and even switch to a camera capable of switching into a macro-camera system.

Macro focusing can range from Three (3) Feet down to less than One (1) inch from the item being photographed.

If you want you can also use the Macro setting on most digital cameras to capture the **Top View, Side View, Profile View, Bottom View or Back View** of most pieces of gems and jewelry. In some cases depending on the quality of the camera’s optics you can also capture smaller features such as Marker’s Marks and/or Hall Mark Stamps, Small Engraving, Model Numbers and Serial Numbers commonly found on the inside of rings shanks or on the back or inside of watches.

There again some cameras capable of switching to a macro mode can also zoom in while in the macro mode and allows for more capabilities.

Micro-Photography:
Micro photography is actually called Photomicrography which means the ability of a camera to be coupled to a microscope and allow the microscope to act as an additional lens system so the camera can capture images as if the human eye was looking through the microscope.

The possibilities are endless depending on how far you are willing to go and experiment with your camera equipment.

Coupling a camera to a microscope is an excellent means to which to capture **hallmarks, maker’s marks** and other very small features found on various jewelry items. It is also very useful to capture **inclusions** in diamonds and colored stones. This can be both **internal and external features** of the stones from **inclusions, chips, cracks, fractures, misshapen facets, polished and/or faceted girdles** and **laser inscriptions**. You can also use this method to photography and **document damage** of the item or capture **manufacturing defects** such as **porosity, stress cracks** and/or **fractures**. You can also document **poor or improper setting methods**.

The possibilities are endless.
This may seem like overkill but actually once you have a system in place to photograph the item such as Top View, Side View, Profile View, Back View and Bottom View and then switching camera modes to capture the Marker’s Mark and Hall Mark Stamps, engraving, serial numbers and model numbers. Then switching and setting the camera up on your microscope to capture internal and external features of the stones you can easily, fully and completely document the item in under Seven (7) minutes and capture approximately 25 to 50 digital images. **I personally do it fast and dirty because TIME IS MONEY!**

I then download the images into the client’s file folder and then later on pick out and select the various photographs that I will use and import into the appraisal document.

I personally DO NOT spend a lot of time and energy enhancing the photographs using PhotoShop type imaging processing programs. The point of the photographs is to simply document what you see. I simply crop and size the photographs to fit my document. I DO NOT change or balance the color. The reason being is that most appraisals are only going to be looked over rather quickly and there is no sense spending time, money and energy balancing the color. **REMEMBER TIME IS MONEY!!**

**Extremely Important Conditions and Limitations:**
One very important reminder is that every professional appraiser should list within their limiting conditions is the limited use by the users of the photographs. They should not rely on the color reproduction as a mean to gauge and/or grade color of the material, metals and/or color of the stones in the photographs in the document due to the various variables of lighting, color representation either on a color monitor of even printed on the paper as there are too many variables to allow for true and correct color representation of the item and their components.

**Other Uses of your digital camera in the laboratory:**
As I stated before the possibilities are endless.

You can use your camera to capture the digital scale readout to document the weight of an item.

You can even capture the digital readout when measuring something be it a ring shank, diamond or colored stone by photographing the digital or dial readout of your measuring devices.

You can use it to photograph the Refractive Index of a stone being tested.

You can capture the interference color and even capture the optic sign of some colored gemstones.

You can even purchase or build an adaptor for your camera so you can hook your camera up to a dichroscope, spectroscopy, Microscope, AGS Hand-Held ASET Scope, Hearts & Arrow Scope, Brilliant Scope, Ideal Scope.

In fact if you can see it with your naked eye then you can capture it with a digital camera it just takes some experimenting and a little legwork to get the results you are looking for.

All of these special photographic techniques are extremely useful when you are hired to perform a Hypothetical Appraisal for a court case or performing a Damage Report Appraisal that may result in a court case.

When you go into court and show documented evidence it is really hard to argue the findings and results when you have captured and fully documented the results in living color.
Selecting a Digital Camera:

The most important requirement of all is that when selecting a digital camera for use in your gemological appraisal lab is that the camera MUST BE ABLE to switch to a Manual Focusing Mode!

The reason being is that if you want your camera to be able to take pictures through your microscope or any other optical device in your gemological laboratory such as, a spectroscope, dichroscope, AGS ASET Scope, Brilliant Scope, Ideal Scope, Hearts & Arrow Scope, or though your laser welder then you will need to be able to switch your camera to its Manual Focusing Mode.

When taking pictures through these various optical devices YOU MUST FOCUS YOUR CAMERA AT INFINITY!! This method is called A-Focal Photography and by setting your camera’s focus at infinity you then use the focus knob on your microscope to bring the item you want to capture into focus and then take your picture. If you are using your spectroscope or AGS ASET or Hearts and Arrow Scope you must also focus your camera to infinity and then lift or lower the hand held scope until the item comes into focus then take your picture.

You can go on the web and search for articles on A-Focal Photography to learn more about this fun and exciting method of photography. HOWEVER, I WILL WARN YOU NOW! Once you start playing and experimenting with this type of photography most of you will soon get hooked on it and it might turn into an obsession.

If you try to use the camera’s self-focusing or auto-focus mode you may or may not capture a clear image due to the camera not knowing what it is you are trying to focus on.

So remember pick a camera that has the ability to switch to MANUAL FOCUS to over-ride the Auto-Focus mode.

Once you pick out a suitable camera then you will need to buy or build a adaptor so your camera can be attached to your microscope and then if you want to use other optical devices such as the AGS ASET Scope or Hearts & Arrow scope you will need to build your own adopters for them or have someone build them for you.

I designed and built my own adaptors and I was able to do it for under $100.00 but I had a friend who had a metal lathe and he donated his time in trade for several steak dinners. However you can have a machinist design and build adaptors for you but it can get costly if they aren’t designed properly.

If you are interested in having an adaptor plate made I might be able to help you and my friend might be able to make your adaptor plates to fit your instruments but I can’t guarantee that my friend will do a whole bunch of them.

You can also search the web and contact several astrophotography shops that do custom adaptor plate for taking pictures through telescopes and you might be able to get them to make an adaptor plate for you or they can direct you to a person who can. Some of those sites sell readymade adaptor plates and tubes for several type and models of digital cameras so you might want to first look at those sites first and see what kind of cameras they are building adaptor plates and tubes first before you purchase a digital camera.

I did everything for under $400.00 total including the camera so there is no need to spend thousands of dollars on a high dollar camera when a simple camera can do the same job. Why spend the money if you don’t have to?
On the following pages I am enclosing some photographs that I have personally taken with my home made adapter plates and inexpensive digital cameras to give you an idea of what all is possible.

Another technique that is extremely useful is to bracket your photos.

Meaning that once you have your camera and your microscope coupled together and have your camera set to the manual focus mode you slightly focus your camera above the object or inclusion you are wanting to capture and you snap a picture and very slightly turn your microscope’s focusing knob down just a touch and take another picture of the same inclusion and then focus the microscope down just a little more and take another picture and then focus your microscope again so that you have a series of photographs of the same inclusion so later on you can review the pictures at full scale size on your computer screen and then pick out the image that has the best focus of the inclusion you were trying to capture.

After some trial and error picture taking you will learn very quickly where your camera and microscope is focusing as far as depth and you will be able to quickly shoot several bracket shots and with a few small quick twists of the microscope’s focusing knob to capture the image you want. A bracket of 5 to 7 pictures of the same inclusion or image you are trying to capture can be done in less than 30 seconds. Since you are not using film there is not cost involved and if you want you can just delete the images that weren’t quite in focus. However I myself I save every single image as you never know when those images will come in handy. I store a secondary copy of all of my digital images on a separate external hard drive just as a safety backup.

As you can see this pretty much captures the entire Ring and all of its detail, Top View, Side View, Profile View, Bottom or Back View. The inside ring engraving and the laser inscription on the diamond’s frosted girdle.

Once again you are not trying to win awards for the best photograph you are merely documenting the item.
Length of the Stone in question

Width of the stone in question

Depth of the stone in question

Bulge Factor length-wise of the stone in question

Actual carat weight of the stone in question

Bulge Factor Width-wise of the stone in question
Two (2) Rings with British Hallmark Stamps on the inside of the bands. Do you know what each of these stamps mean?

Here are Four (4) different Maker's Marks taken from inside the ring shanks can you identify each of the makers?

High Sierra Gem Lab & La Shawn Bauer, GG Email: HighSierraGemLab@gmail.com
© April 2007 Updated © October 2008, November 2009, January 2010
Page 6 of 27
The center stone on this ring was poorly set and heavily damaged during the setting process.

From the Profile shot you can see the stone is set Off-Center to the ring shank.

Very poor setting job as you can see.
Massive Chip and heavy damage occurred during the setting process
When photographing watches it is best to take a shot of both the front and back of the watch.

It is also a good idea to photograph the case number and the serial number of the watch as well.

****Important Note ****

It is also a good idea to list within your report as to if the watch appears to be running and keeping time. Another factor to mention in your report is if you opened up the watch to verify the movement and its model number and serial number and if that movement is typically found in that style of watch. If you DO NOT open the watch, make sure to make a notation in your report that YOU DID NOT open the watch for verification and you are only relying on outward appearances and observations to identify the watch.

If you open the watch and don’t know what you are doing you could break the seal and then the watch could fail if moisture were to get into the watch and you would be liable for any and all repairs and damages so be careful and know what you are doing before you do it or it could end up costing you in the long run.
This is a Leo Cut Diamond at 10x and then photographed through the hand-held AGS ASET (Angular Spectrum Evaluation Tool)

This is the laser inscription of the same Leo Cut diamond at 45x. Notice the faceted girdle and the cold laser inscription. You should list in your report that this stone has a faceted girdle and is also laser inscribed.

Remember to list in your report if the diamond or colored stone is a Branded Cut or Branded Manufacture. List the Brand and other important information about the brand and the cut.

If you don’t list it in your report as a branded cut stone then it is possible that the insurance company can replace it with a lower quality Non-Branded Cut Stone. The insurance companies can’t read your mind so be very clear with your information.
A Near-Ideal Cut Round Brilliant under the AGS-ASET Hand-Held Scope

An Old European Cut Diamond under the AGS-ASET Hand-Held Scope
This is a cool Round Step Cut Faceted Diamond. Is this a Branded Cut? If so, who is the Maker?

The same Diamond photographed through the AGS-ASET Hand-held Scope
This is a modified round brilliant with triangular crown facets. Is this a Branded Cut Diamond? If so by who?

Here is another shot of the triangular crown facets.

This is how the diamond looks like under the AGS-ASET Hand-held scope.
This is a very poor setting job. Notice the over-cut seat. The top of the prong is not fully down on the crown of the stone. It will snag and end up getting torn off in a very short amount of time from wearing it.

Notice the large air gap under the stone where the prong has been over cut too deep. This will cause major stress on the stone if it is hit and may cause the stone to fracture and/or break.

This should have never passed QC (Quality Control). It should have been re-set and if you can’t seat the stone properly a new head needs to be put in and the stone re-set all over again.

NO!!! I DID NOT SET THIS STONE!!!! But I know who did!!!!

This is a Pear Shaped Diamond. Do you know what style of cut this is?
Here are some really intense and extremely complex and intricate Native American Inlay pieces

This is all done by hand!!!

The stars are really small holes drilled completely through the onyx and a silver wire is pulled through the hole.

The black border strips separating the stones are paper thin strips of onyx.

Now imagine trying to fully describe these two pieces in your appraisal report without using a photograph!!!

The top photo is a heavy cuff style silver bracelet.

The other piece is a Bolo Tie.
With your digital camera you can even capture the refractive index of a stone and document it.

You simply switch the camera to its Macro Mode and then use the zoom until you have the perfect picture and click. It is that easy.

So do you know what this stone is just from the refractive index? The stone is red by the way.
This is one of the first spectrums I shot and captured with my camera. Can you tell what it is?

This is a pierced, high relief, hand engraved, silver and gold hand-made belt buckle. The only store bought item is the ball bead coin bezel and of course the gold coin.
Pope John Paul II
A Special Commissioned Piece given to His Holiness on July 4th, 2003

You can also use your camera to document special commissioned pieces and document the entire process from start to finish. This is what I did for this once in a life time project.

I took about 50 pictures of the entire process and I even measured and weighed each and every piece of turquoise and weighed the gold beads before they were soldered into place. I actually made a historical document of who, what, where, when, how and why.
Documenting Visible Treatments: You don’t need to include these photographs into your appraisal unless you think it is necessary and relevant but you should at least document the treatment and have them saved in the client’s file folder so if later on there is a question as to damage then you can instantly refer back to your original pictures to check and verify if any damage has been incurred since you did your first appraisal.

As you can clearly see this is a Clarity Enhanced Diamond and you can readily see and identify the flash effect and even see the surface reaching fissures.

Remember CYA
Protect yourself and perform a reasonable amount of Due Diligence

It only takes a couple extra minutes and in the long run you will thank yourself in the end when all things are said and done.

Do the Right Thing and Go the Extra Mile.
Damage Report Documentation

As you can see this is a Composite Glass Filled Ruby. The damage you see here happened in less than Five (5) minutes when the ring was sized and put in the heated pickle pot after soldering the ring shank.

When performing a Damage Report, fully document, everything and I do mean everything. Because in a lot of cases you might find yourself on the witness stand and then you will have a lot of explaining to do.

The last thing you want to happen is to get ripped to shreds on the witness stand. Spending a few extra minutes can end up saving you thousands of dollars and a lot of heart ache.
Pentax Optio 33WR
Gemological Camera Platform System by La Shawn Bauer

This was relatively simple to engineer and make. The picture is the Pentax Optio 33WR 3.2 megapixel camera. The camera adaptor plate with 3 different spectroscopes, dichroscope, 2nd Generation and 1st Generation AGS ASET (Angular Spectrum Evaluation Tool)

Front and Back View of Camera Adaptor Plate. Black Felt was used to protect the camera from being scratched up, 3-Pins were installed to hold the camera in place when the microscope is tilted back.

High Sierra Gem Lab & La Shawn Bauer, GG Email: HighSierraGemLab@gmail.com
© April 2007 Updated © October 2008, November 2009, January 2010
Page 21 of 27
1st Generation AGS ASET (Angular Spectrum Evaluation Tool) locked in place with a thumbscrew. Camera Plate without and then with the camera in place ready to take an ASET Photomicrograph. Quick Simple and Easy to Use.

Top View of Camera with the camera adaptor plate and AGS ASET in place, ready to shoot. Second picture is the adaptor with the Large OPL Spectroscope locked in place ready to shoot a spectrum.
Adaptor plate and camera mounted on my Gemolite Mark V Microscope ready to take photomicrograph's. Quick, Simple and Fast. Left ocular (eyepiece) has enough room to look through to line up shots before fine focus is made looking at the LCD screen on the back of the camera.
Adaptor plate on the microscope without the camera in place. Small footprint so you can still look through the left ocular (eyepiece)

Notice the home made LED Flashlight Spotlight between the microscope head and focusing knobs

Very Simple, Quick Change, Versatile and Easy to Use.

I use it every single day.

I have taken over 35,000 pictures with this little camera.

It is a major workhorse in my lab
Canon PowerShot A640
Gemological Camera Platform System by La Shawn Bauer

This is another style of adaptor I designed and built using a 10.0 megapixel digital camera.
With a little imagination anything is possible.

Don’t be scared or shy to experiment.
The best thing of all is that my camera doesn’t stay in the lab all of the time.

Cameras are meant to take pictures so have fun, play around, experiment and try new things.

This is a very rare Tennis Shoe Tree. You can find it on Highway 50 the loneliest highway in America in the state of Nevada near Fallon, Nevada.

Thanks for taking time to read my article and I hope you learned a thing or two and had fun all at the same time. Please email me with your comments and suggestions.