EGL USA™ Newsletter

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Spring 2007 1

Large Baroque Cultured Freshwater Pearls now on the market

by David Bidwell, EGL USA, New York

Recently EGL USA in New York received two remarkable strands of freshwater pearls. Mr Armand Asher of Albert Asher Pearls submitted these pearls, unusually large for freshwater pearls and as stated by Mr. Asher, the pearls were from China.

Photos: Fernando Paredes

One strand totalled eighteen pearls approx. 20mm x 15mm x 12mm to 25mm x 17mm x 12mm, all baroque shape with a generally white body color with various tones of brownish pink.

The other strand totalled nineteen pearls of slightly smaller size 18mm x 14mm x 12mm to 22mm x 16mm x 12mm, with white body color and brownish pink to pink color, baroque in shape.

In 1946 Chinese freshwater pearl (CFWP) farmers started using tissue nucleation to create marketable pearls. This produced oddly shaped pearls with relatively good nacre coverage and reasonable luster. In addition, the mussel could be nucleated multiple times producing dozens of pearls of this type from each shell. This profitable CFWP business, also called "Rice Pearls, became incorrectly known as "Biwa" pearls. Biwa pearls correctly refer to the production of freshwater pearls from the mussel indigenous to Japanese Lake Biwa. These were also the original "Rice Pearls".

For decades, CFWP were only produced by tissue nucleation, growing rice pearls of odd shapes and small sizes. For this reason, these Chinese pearls were never able to compete against the saltwater Japanese Akoya pearl, which today is still considered the preferred choice for small round pearls.

In the late 1990's, CFWP farmers took a giant leap forward when, they started to perfect the culturing of a different specie of mussel (*H. cumingi)* which gave the ability to produce CFWP from 2mm to over 12mm in size in near perfect round.

EGL USA performed X-Ray analysis to determine the type and size of nucleation for these pearls. Most of the pearls were nucleated with both a large spherical bead and a piece of irregular shaped tissue.

These strands of Baroque freshwater pearls are significant, as currently pearls of this size and luster have only been available from South Sea production.

Mr. Asher stated: "As culturing techniques have improved, the percentage of off-shape and Baroque pearls has been decreasing. This has coincided with dramatic demand of off-shape and Baroque pearls in the past two years. On the other hand, younger farms, for example, Indonesia, tend to produce a larger percentage of non-round pearls and regularly supply the market with these lower quality Baroques.

That said, I don't believe there will ever be large quantities of these very large Baroque Freshwater pearls available. The reasons include significant growing time, more than three years, compared to a few months, and fewer pearls grown in any one mussel."

For further information, call David Bidwell at EGL USA at tel.: 212.730 7380.

Mr Armand Asher of "Albert Asher Pearls" can be contacted at 1.888.274 3777.

The EGL USA Group of Laboratories will be at the 2007 JCK Las Vegas Trade Show June 1 – 5 Booth 6041

EGL USA Supports Conflict Free Diamonds

Company News

EGL USA is proud to present a Conflict-Free seal on their Diamond certificates to the public. This important seal ensures that your diamond has been well recorded from extraction at the mine all the way to the retail sales counter. The documented origin of this diamond can be found to be compliant with the 2003 Clean Diamond Act and the Kimberly Process.

What is a Conflict Free Diamond?

In response to industry concerns, the Kimberley process was initiated early in 2003 by major diamond producing companies and governments to ensure that exported rough diamonds have not been tainted by having contributed to violent conflict and human rights abuses in their countries of origin. In addition, the DTC (a division of De Beers) created the Clean Diamond Act of 2003, which states that all DTC sight holders must comply with strict principles of business practice, or risk losing their sight holder status. These guidelines work in conjunction to establish procedures ensuring that each diamond is accounted for and legitimate, en every level from the mine to the consumer.

Therefore, the EGL USA Conflict-Free seal is made available only to DTC sight holders and selective diamond suppliers with the most impeccable business practices. This seal is laser inscribed on the girdle of the diamond alongside the EGL USA report number, accompanying the EGL USA certificate.

In addition to having established a long standing relationship with the jewelry industry, each supplier wishing to declare their diamonds as conflict free, must possess full documentation and submit a signed declaration, stating that all diamonds submitted by their company to EGL USA are compliant with the Kimberly Process, as well as the Clean Diamond Act of 2003, established by the DTC, a division of De Beers corporation.

Interested customers can contact Mitch Jakubovic at our New York office at 212.730 7380 ext. 214 for further details.

Identification of Fancy Color Lab–Grown Diamonds Smaller than 0.09 ct with EGL USA CIS Method

By Dusan Simic, EGL USA, New York
Liz Burnett, EGL USA, New York

EGL USA is known to have contributed extensively to the general trend of accepting and recognizing lab-grown diamonds as a product that has a future. Our most recent research project includes our seven-year-long research in the certification of lab-grown diamonds, as well as the current challenging identification of mounted small diamonds in jewelry.

As a result, we have developed a new system which makes it possible for us to identify quickly and accurately any lab-grown diamond, regardless of its size, shape and whether it is loose or mounted in any kind of jewelry.

Existing methods of identification of loose and mounted diamonds

Currently a number of identification methods are used for testing ***loose*** lab-grown diamonds and each of these methods may result in an effective final identification. A quick and reliable identification of loose lab-grown diamonds is the CPF method. This requires just a microscope and polarization filters, the instruments every jeweler is likely to have.

Identification of ***mounted*** diamonds is much more complicated, especially with small sizes of 0.01 to 0.03ct and VS_1- SI_1 clarity grades where none of the known methods would work. These methods depend on several factors, the most important of which are the size of the diamond and the kind of setting.

See the table below:

Existing Identification Methods of Lab-Grown Diamonds

Method	Loose Lab-Grown Diamonds	Mounted Lab-Grown Diamonds
Diamond Sure	Provides a reliable screening for further advanced testing	Cannot be applied to small mounted lab-grown diamonds.
CPF (Cross Polarized Filters)	This is the fastest procedure to date that can be used to test loose diamonds of any size and provides indicators for final identification	Cannot be applied because the mounting surrounding the diamonds prevents the diamonds from being examined from the appropriate angle which would yield results.
Diamond View	Fluorescence reveals the characteristic cubic grown structure of a lab-grown diamond and can therefore provide final indicators, but this method is quite slow when it comes to diamonds of 0.5 mm to 2 mm in diameter	Cannot be used for mounted diamonds as the piece of jewelry cannot be placed in the instrument. The Fluorescence also becomes even less visible if the diamonds are smaller than 1mm in diameter.
UV – VIS - NIR and **FTIR spectroscopy**	These are final identification methods as well, but require a substantial data base, routine application and experienced operators	Cannot be applied to small mounted lab-grown diamonds.
XRF, or chemical analysis	Cannot be accurately applied to high clarity grades where there are insufficient traces of metal catalysts which would provide final indication. With lower clarity grades this method could be used for positive identification.	Cannot be applied to high clarity grades where there are insufficient traces of catalysts which would provide final indication. With lower clarity grades of SI_2 or lower, this method could be used for positive identification

The Effective EGL USA - CIS Method

The only method which can effectively be applied in all cases regardless of the size and clarity of diamonds, as well as the shape and size of the piece of jewelry, is the Fluorescence (induced) method using sources of light of 365nm and 254nm (eventually 220nm). In most cases the short wave fluorescence of lab-grown diamonds is stronger than long wave fluorescence and is always identifiable regardless of whether the cubic structure is visible, which further facilitates identification.

The Fluorescence is either hardly visible or invisible to the naked eye or under a microscope, but it can always be seen using a special camera and a trinocular microscope, which is adjusted to function as a dark room.

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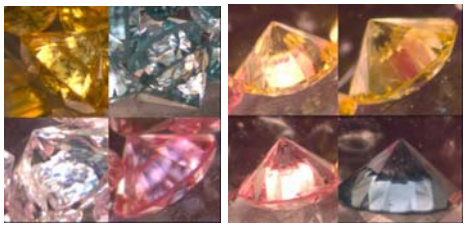
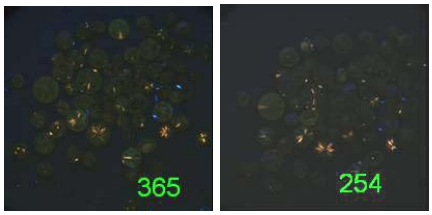
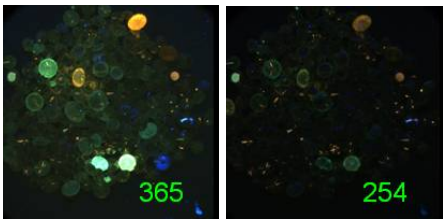


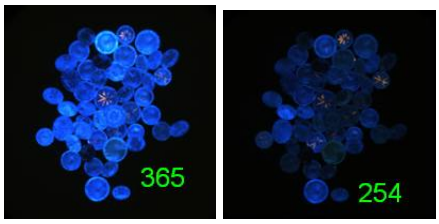
Top left to right: CPF of natural vs. lab-grown diamonds



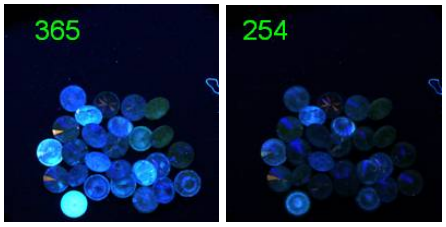
Top: LW and SW UV of Fancy Vivid Yellow diamonds



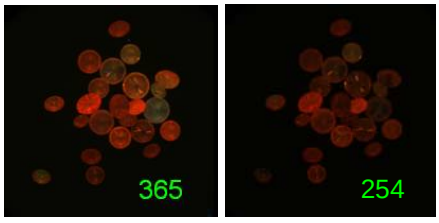
Top: LW and SW UV of Fancy intense Yellow diamonds



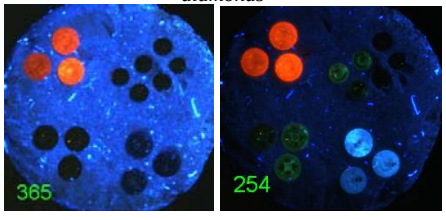
Top: LW and SW UV of Fancy intense Pink diamonds



Top: LW and SW UV of Color Enhanced Blue diamonds



Top: LW and SW UV of Color Enhanced Purple Pink diamonds



Top: LW and SW UV of lab-grown diamonds

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Identifying Criteria for Fancy Color Lab-Grown Diamonds smaller than 0.09ct

Different colored lab-grown diamonds respond differently to certain identifying methods. See table below:

Identification of Fancy Color Lab-Grown Diamonds smaller than 0.09ct

Fancy Color	Identification Method	Additional Comments
Blue lab-grown diamonds of lower clarity (SI_2 and below)	XRF – good fluorescence and clearly visible cubic structure - the final indication for Blue lab-grown diamonds would be chemical analysis for SI_2 and lower clarity and visible cubic grown structure.	These lab-grown diamonds are often of lower clarity due to the reduction of nitrogen during the growing process of the crystal. Short wave fluorescence is stronger than long wave fluorescence, and there is a presence of phosphorescence. Natural blue diamonds (IIb diamonds) contain boron and also show a stronger short wave fluorescence than long wave fluorescence, and phosphorescence occurs regularly, however, no cubic structure is visible in natural diamonds. The same LW/SW principle that applies to all natural diamonds (accept IIB diamonds) also applies to the color enhanced (electron radiation) natural Blue diamonds, where long wave fluorescence is stronger than short wave fluorescence.
Yellow lab-grown diamonds	Evidence of cubic growth structure and a stronger short wave Fluorescence than long wave Fluorescence	These are the most frequently mounted lab-grown diamonds and are known to have the highest clarity. Most of the lab-grown yellow diamonds as small as 0.01ct to 0.02 ct, however, do not show a cubic structure.
Pink lab-grown diamonds	Mostly equal long and short wave orange fluorescence, absence of green fluorescence	These diamonds are lab-grown diamonds which undergo electron radiation followed by annealing. The cubic growth structure is not clearly visible in Pink lab-grown diamonds due to the presence of strong orange fluorescence caused by annealing after electron radiation. Lab-grown Pink diamonds show no green fluorescence. Green fluorescence only occurs as a result of annealing after radiation, and the creation of H3 and H4 centers in color enhanced natural Pink diamonds. Green fluorescence is typical of natural diamonds which contain aggregated nitrogen, most often in A and B form. HPHT treated natural diamonds which are additionally treated to obtain Pink color, also exhibit green fluorescence.

Lab-grown diamond manufacturers are transparent and cooperative in their product disclosure, the majority of their diamonds are certified, and they support the EGL USA research projects. Still, there is a certain amount of lab-grown diamonds that reach laboratories undisclosed, and there are also lab-grown diamonds brought in by individual buyers who bought them as natural diamonds in different parts of the world.

Therefore, we continue to pursue and foster research projects to accurately identify all types and all colors of lab-grown diamonds. Although the number of colorless lab-grown diamonds on the market is still insignificant, EGL USA is already in the process of developing an identification system that will prevent possible errors that may occur due to the lack of experience with a new product or technology.

For more information, contact Dusan Simic at dusan@eglusa.com.

Star Sapphire vs. Star Quartz

By Nick DelRe, EGL USA, New York

One type of optical phenomenon that is popular in gemstones is a star, also known as asterism. Asterism in gemstones can be achieved when the proper rough material is cut in cabochon form and properly oriented to the main crystallographic axis of the gem.

A popular gem that is associated with asterism is sapphire. Star sapphire is a variety of corundum which crystallizes in the hexagonal system. This consists of three crystallographic axis which are perpendicular to the main axis. Here lies an arrangement of three sets of fine rutile needles called silk. These are oriented at 60° to each other. In the case of Star Sapphire these are concentrated along the surface and the effect is also known as epiasterism.

The three axis cross when a direct pointed light source hits the surface, the full complement of this gives rise to a beautiful and lively star effect. When the body color is blue, it can be even more desirable.

Recently a stone showing asterism was submitted to the EGL USA lab in New York. Visually it appeared to be a star sapphire. However, standard gemological tests showed a refractive index spot reading of 1.55, and a Bulls Eye uniaxial optical reading. This concluded the stone to be a Natural Star Quartz.

Photos: Fernando Paredes
A Natural Star Quartz appearing to be a star sapphire. The back shows the coating that caused the effect.
Courtesy: James Gattas Jewelers
Tel.: 1.901.767 9648

With star quartz the star effect is also based on the hexagonal system and known as diasterism. In quartz the rutile needles are much finer and more deeply seated in the quartz. To bring out this effect, light usually needs to be directed through the stone, but being set in a ring how was this possible with the stone submitted? The solution was with the blue color. We observed that the cabochon base was coated to an almost opaque blue to allow light from the outside to bounce off the blue and back up to the viewer.

Thus a clever way was used to have the same effect as a Star Sapphire. With proper disclosure, this gem is an inviting piece for a gem collector.

For more information on Gem Identification at EGL USA, New York, call Nick DelRe at 1.212.730 7380.

Untreated Colored Stones are Getting Popular

Branko Deljanin, EGL Canada, Vancouver
Tara Middleton, EGL Canada, Vancouver

There have been numerous treatments performed on gemstones in the last three decades. One of the major roles of the gemologist, especially one working in a gem lab, is to separate natural colored gems from treated ones.

At EGL USA we have noticed a change in the market in an increasing submission of natural gems to the lab.

As an example, recently we tested four **sapphires** ranging in size from 2.65ct to 3.35ct (see Fig. 1). They had intact rutile needles combined with "fingerprints" (fluid drops). When both long and short needles were illuminated with a fibre-optic light source they displayed rainbow interference colors thus proving natural color. Based on the inclusions and characteristic UV-VIS spectra we suggested that these stones originated from Sri Lanka. "Ceylon" sapphires are known to be 5-15% more expensive than sapphires of similar color from Madagascar, but 45 –65 % less than those coming from Burma. Here is the proof that origin does play an important role in pricing. Natural color sapphires therefore attract a premium over heated ones.

Fig. 1: Natural untreated sapphires from Sri Lanka

We have also received several light pink gems in larger sizes (see Fig. 2). After standard tests (refractive index, strong pleochroism, UV lamp) we concluded that they were pink spodumene, known in the trade as **kunzite**. Even though it is possible that the color of kunzite can be produced by irradiation, this is another example of the increasing popularity of colored stones other than the usual classic range.

Fig. 2: Standard gemological tests, showed these pink gems to be spodumene, also known as kunzite.

Gemstone Profile

The Demand for Zultanite Continues to Grow

By Liz Burnett, EGL USA, New York

One of the few colored stones gaining in popularity that is used entirely in its untreated nature, is the phenomenal gemstone called Zultanite, known to gemologists as color-change diaspore. These stones are found exclusively at 4,000+ feet in the inhospitable mountainous region of Anatolia, Turkey.

Very little has been known about this stone until recent years when the stone was promoted specifically for its unique color change ability of tranquil green to pink colors.

Zultanite is a beautiful transparent, usually eye-clean, gemstone of medium hardness with cat's eye chatoyancy and color change as its phenomenal properties. Some jewelry designers see this stone as a 'male' stone due to the earthiness of its colors, however, it has been as popular as a 'feminine' stone due to the champagne pinkness in indoor light. The phenomenal property is sensitive to mixed light sources but the green is best revealed in daylight or fluorescent light and the champagne or raspberry pink is best seen in candlelight or incandescent light. The best color will be found in sizes of 3 cts or more.

This stone is hard to find in large sizes with stones of 5 cts or more considered as unusual. It also has a perfect cleavage making it a difficult stone to cut with a yield of less than 10% of the rough, adding to its rarity.

Gemstone Properties:
Chemical Formula: ALO(OH)
Crystal Structure: Orthormobic
Hardness: 6.5 – 7.0 on the Mohs scale
Refractive Index: 1.74 – 1.77
Density: 3.4
Gem Specie: Diaspore
Color: Color change from light green to purplish-pink or brownish-pink
Clarity: Type II – usually eye-clean
Carat Weight: Over 5 carats is rare
Origin: Anatolia, Turkey
Enhancements: None
Cleaning care: No heat. No ultrasonic
Price Guide: From $200 - $800/carat or more for unusually large sizes

The color of phenomenal gemstone Zultanite changes from kiwi-green in daylight to a raspberry champagne-pink under traditional indoor light. Photo courtesy Zultanite Gems LLC www.zultanitegems.com

On occasion we receive optically phenomenal gemstones such as the chatoyant gem seen in Fig. 3. At first glance this stone appeared to be a cat's eye chrysoberyl, but limited gemological testing such as a spot reading on the refractometer (1.64) and spectra (strong 580nm doublet) revealed the stone to be a **cat's eye apatite,** a stone with no known enhancements to produce the golden green color. At 74.47cts this is the largest apatite we have tested in our Vancouver lab.

Contact the EGL USA Group of Laboratories for all your colored stone identification and grading. See page 4 for contact information

Fig 3: A 74.47ct cat's eye apatite. Photos: Kia Toosmanesh