

# Gem Information Guide

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HiTek Gems

# Descriptions and Information on Gems and Precious Metals and Other Materials Used in Jewelry Making

by Patricia Hartman

## Gemstones

### Agate



Agate is a member of the quartz group, as is chalcedony, tigereye, aventurine, chrysoprase, heliotrope and carnelian, among other stones. Moss agate has green veining on white. Other agates show striping ranging from white to orange to brown tones. Agate is often artificially colored red, green, blue, black or yellow, depending upon the type of pigment used.

### Amethyst



Amethyst is the birth stone for February, or more historically accurate, for the zodiac sign, Aquarius (January 20-February 18). It is a member of the quartz family and color ranges from light lavender to deep purple. The most valuable stones are clear and deep, but vibrant purple. The lighter stones can still be valuable provided that they are clear and have fire. Faceted amethysts are more likely to be found inclusion free, while amethyst beads are typically more included.

According to legend, amethyst was believed to provide protection against becoming inebriated. It is also traditionally supposed to bring a sense of tranquility to the wearer. The most prized amethysts come from Guerrero, Mexico and the Ural Mountains. Royal families traditionally favored the gem, since purple is also the time-honored royal color. Other quartz varieties include citrine, smoky quartz, rose quartz and quartz crystal.

### Aquamarine



Aquamarine is blue or blue green beryl. Good color is quite rare and therefore expensive. It is often confused with blue (treated) topaz, which is far less expensive. Aquamarine ranges from a light blue to deep blue. It is the birth stone for March or Pisces.

## Beryl



All varieties of Beryl that are not green or blue are simply called beryl. Emeralds are green beryl and Aquamarines are blue or blue green. Morganite is a pink to lavender beryl. In addition, there are strawberry red (Bixbite), Golden Beryl and colorless (Goshenite). The Mohs hardness is 7.5 to 8. It ranges from transparent to opaque.

## Carnelian



Carnelian is a member of the quartz group. The best quality comes from India and the brown tones can become reddish when exposed to the sun. Usually, the typical orange color is striped, but can be solid.

## Citrine

Citrine is a quartz variety. It usually ranges from yellow to brown. It is often confused with yellow beryl and golden topaz, and it is a less expensive substitute for either. Most citrine is heat treated light colored amethyst. Most is mined in Minas Gerais, Brazil.



## Coral



Coral consists of calcium carbonate, the same elements that oyster shells are made of and the supplement we take to meet our calcium requirements. It comes from the fossilized skeletons of sea creatures and most comes from the Mediterranean Sea or from various coral reefs near Japan and Taiwan. Red coral is the most valuable. Bamboo coral is a natural coral that is usually dyed red to simulate the natural red coral.

## Diamond



Diamond is the hardest substance on the Mohs hardness scale, recording a 10. Diamond is probably the most well known gemstone, certainly in modern times. Diamonds are found in virtually all colors, but the most desired is colorless. Diamonds are rated on a color scale, with the letters in the beginning of the alphabet (beginning with the letter D) indicating the most nearly colorless (or blue-white). The letter R indicates a dark yellow. The legendary Hope diamond is brilliant blue, which is extremely rare. The Tiffany diamond is nearly orange. The Cullinan I and II, from the British

crown jewels, are white. The famous Koh-i-Noor, meaning mountain of light, is also white or colorless. Interestingly, the Dresden diamond is a definite green.

## Emerald



Emeralds are green Beryl. That is, all of their variation is within the green palette. The most valuable emeralds are deep "emerald green." Lesser valued emeralds can be quite opaque and an olive green. Emeralds are about the only gemstones that are not diminished by having flaws. The often prominent inclusions that are characteristic of emeralds, are referred to as the Jardin (French for Garden). They are also rather fragile and susceptible to fractures. Most high quality emeralds come from Colombia.

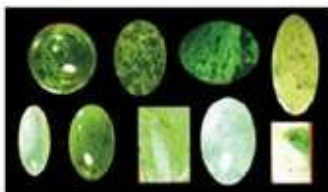
## Garnet



Garnet is the birth stone for January or for the sign, Aquarius (January 21 - February 19). The astrological connection with birth stones is far older than the monthly concept. The birth stone for each month idea is definitely a commercial one. The month birth stone is easier to identify the birth month than the zodiac sign, so probably contributed to its use, rather than the Sun sign.

Although most garnets are red in color, they range from various shades of red to bright green, opposite on the color wheel. The varieties include Almandine (red-brown to brown), grossular (colorless, orange or green), pyrope (dark red-ruby red), andradite (brown, black or green), uvarovite (green) and spessartine (orange, pink or brown). Although the profusion of garnets contributes to their relatively low cost, a really beautiful ruby red garnet can bring a fairly good price, particularly when combined with diamonds.

## Jade



Jade is used to describe either nephrite or jadeite. In China, historically nephrite was worked, but in the last two centuries, Jadeite has been imported from Burma. The most valuable, imperial jade, is made of gadded, rather than nephrite. Nephrite is far more common than gadded and is

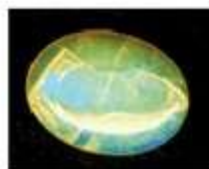
consequently, less expensive. Also, nephrite tends to appear more of an olive green, whereas gadded tends to have more blue green pigment and is more translucent.

### Lapis Lazuli



Lazurite, is rare and possesses deep blue crystals. It is more commonly found in large amounts combined with other minerals. When combined with other minerals, such as pyrite, it is called lapis lazuli or Lapis for short. It is ideally of a deep indigo, which is produced by the presence of sulphur. It is also related to sodalite, which closely resembles it, except that sodalite does not contain pyrite. Lapis has traditionally been mined for centuries from a locality still in use today in the remote mountain valley called Kokcha, Afghanistan. In the past, it was ground into a paint pigment called ultramarine. It is rather soft, with a Mohs scale score of 5.

### Opal



Precious opal is characterized by a rainbow iridescence or aurora borealis effect. The rainbow effect is due to a gelatinous structure layered within. Light is captured and reflected in the layers. Opals contain and must not lose water. They are best stored in a slightly moist cloth. Very dry conditions can cause the loss of water and of luminescence as well. Cracks also can cause the loss of moisture. Capping the finished stone with quartz is often employed to protect the fragile opal. The clear quartz

can protect the stone, while allowing light to pass through. Opals are found basically with either white or dark backgrounds. Black opals (from Australia) are the rarest variety.

### Pearl



Pearl is the birth stone for June, or Gemini (May 22 - June 21). It is reputed to be the world's oldest gem. The pearl has been traditionally associated with weddings and is a symbol of purity.

A natural pearl forms when an irritant works its way into a particular species of mollusk that resembles a scallop more than an oyster. The mollusk secretes a fluid to coat the irritant as a defense mechanism. As layer upon layer of the coating (known as nacre) is deposited, a lustrous pearl is gradually formed. These days, you

will only rarely find natural pearls, unless part of an antique collection.

Cultured pearls go through the same process, except that an irritant is implanted by human intervention. Usually, the object is mother of pearl. The core is, therefore, much larger than what would occur in a natural pearl.

Pearls have built in fake detection. Run the pearls gently across your front teeth. If the pearls seem slick, they are not real. Real pearls produce a gritty sensation. Remove your pearls before

showering or swimming. After you have worn your pearls wipe them with a soft cloth since the slight acid in your perspiration will affect the pearls over time. Pearls also will absorb perfume. Store them in a cloth pouch or wrapped in a piece of cloth.

Fresh Water Pearls are cultured similarly to Oriental (salt water) pearls, except that each mollusk produces up to 30 pearls. This helps to make them affordable, while still beautiful. The time involved ranges from 1 to 5 years for pearl production. They come in a much greater variety of colors than do salt water pearls.

### Peridot



Peridot is also referred to as olivine. Like many stones, peridot is easily confused with others. Since Peridot ranges from a very olive green to bright lime green, it can be confused with green beryl, demantoid garnet, tourmaline, or even emerald. Mohs hardness is 6.5 to 7. Most important deposits are in the Red Sea area. It is the August birth stone, or the astrological sign Leo's birth stone. It is commonly carved as beads as well as being faceted.

### Rose Quartz



Rose quartz (other quartz as well) is made up of silicon dioxide. It is usually opaque, or nearly so, which precludes using it as a faceted stone. Consequently, Rose quartz is more commonly produced as a cabochon or bead. The pink to rose red color (caused by iron and titanium impurities) makes it different from any other pink mineral species.

Rose quartz is found in Madagascar, India, Germany and several localities in the USA. Much rose quartz was extracted from a famous site near Custer, South Dakota, but now, most of the world's supply of good carving quality

rose quartz comes from Brazil.

### Ruby



Ruby (along with sapphire and emerald) is one of the most beautiful precious stones. Ruby and sapphire are made of the same material; corundum. The red stones are rubies and other colors are sapphires. Ruby is 9 on the Mohs scale and the next hardest to diamond. Rubies are legendary and often linked to India. Although it is very hard, it is brittle and care must be taken in faceting it. Rubies can be faceted or carved into cabochons which may appear as six rayed stars (star ruby).

### Sapphire



Sapphires are made of corundum and comprise the colors other than red. There are pink, blue, green and yellow sapphires. In fact, the decision of whether the stone is pink or red will determine if it is a ruby or a sapphire. Hardness is the same as ruby. The Mohs scale hardness is 9. Although diamond is 10 on Mohs, the diamond 140 times as hard as sapphire and sapphire is 7 times as hard as topaz, which is 8 on the Mohs

scale. As you can see, Mohs is not made of equal intervals. Sri Lanka contains the deposits known from antiquity, but there are currently deposits in Montana, Thailand and Australia as well. But, India has claim to the most desired sapphires.

### Topaz



Topaz is the birth stone for November or for Sagittarius (November 23 - December 22). Topaz comes in a large variety of hues and colors. They include, blue, green, yellow, white and pink. Most people are familiar with blue topaz (either Swiss blue or London blue), but topaz is rarely blue naturally. It is irradiated and then heated to produce the brilliant blues seen in jewelry. Natural color usually ranges from clear to golden. Topaz is similar in color to citrine and is often confused with it, although citrine is substantially less expensive. It occurs in Brazil, Pakistan, Ural Mountains and San Diego,

California. It is relatively hard, with a Mohs of 8.

### Tourmaline



Tourmaline holds the record for the most color variation in gemstones. Colors include, pink, red, blue, green, yellow, lavender. Deposits are found with tricolor stones, displaying red to green, sometimes termed watermelon tourmaline. Heating will turn green to vivid emerald green and reddish browns will become bright red. Deposits are in Sri Lanka, Africa, Russia and California, among others. Of course, the color variation sets tourmaline for confusion with many other stones, such as ruby, sapphire, emerald, topaz, citrine, etc.

### Turquoise



Turquoise is the birth stone for December or for Capricorn (December 23 - January 20). Again, the astrological connection with birth stones greatly predates the monthly concept. The birth stone for each month idea is definitely a commercial one. It is easier to identify the birth month than the zodiac sign.

It seems strange that the lovely blue-green stone is actually Hydrated Copper Aluminum Phosphate. It has been mined for at least eight thousand years. It is possibly the most valuable of the opaque, or non-transparent gems. Turquoise is relatively soft (about 5-6 on the Mohs scale.) Because it is soft, it is often stabilized with resins to keep it from crumbling. Turquoise often contains a matrix of other minerals, such as pyrite, limonite, quartz and clays. Color ranges from almost green to sky blue. The most valuable turquoise is usually a blue with no matrix, but native American jewelry commonly uses beads with prominent matrix.



## Metals in Jewelry Making

### Gold plated

Gold-fill is 50 to 100 times thicker than regular gold-plating, and about 17 to 25 times thicker than heavy gold electroplate. The base metal used is usually brass, copper, or steel. Gold-filled items are made by combining a layer or layers of gold alloy to a base metal (usually brass) then rolling or drawing the metal to the desired thickness and shape.

### Gold Filled

Gold plate is a very thin deposit of gold, electroplated or electrochemically applied to the piece. (The industry standard is .15 to .25 mils thickness of gold-plated to the surface of the base metal.) It is a very small fraction of an inch thick (1/1000 inch to 1/1,000,000 or so of an inch thick). Heavy gold electroplate might be .002 or .003 in thick.

### Sterling Silver

Sterling Silver items are made of 92-1/2% pure silver and 7-1/2% copper or other alloy proportions fixed by law (925 92.5% silver, 7.5% other). Sterling will "patina" in time, that is, its color will take on an "antique" look.

### Fine silver

Fine silver has more silver content than sterling. In fact, it is almost pure silver (.999 or 100% pure silver).

### 14k gold

The karat indicates the percentage of pure gold versus the percentage of alloys added. Twenty-four karat gold is pure gold with no alloys added. Twelve karat gold is 50% gold and 50% alloys. Thus, 14k gold is 58% gold. Generally, 14k gold will give you the look of gold, whereas, 10k gold may appear a little less brilliant, but will not wear off, because the percentage of gold exists throughout the piece, and is not a coating.

## Stringing Materials in Jewelry Making

### SoftFlex 24k gold wire

SoftFlex gold wire consists of 24K Gold over stainless steel. Soft Flex® 24K Gold Flex constructed of 21 strands of micro woven stainless steel wires covered in 24K Gold.

### Silver colored Soft Flex wire

Soft Flex was formerly coated in clear nylon. Recently, the color "Silver" has been processed into the clear nylon resulting in a very nice matte "Silver" finish.



### Tigertail wire

Tigertail wire is usually made up of 7 strands of wire cable twisted together and coated with nylon. Depending upon the thickness is very strong and is used for large and heavy beads.

## Other Materials-Glass

### Dichroic Glass



This space age material was created in a lab. Dichroic means that the glass has two colors when viewed from different angles or from transmitted to reflected light. This gives it an iridescent quality. To get the dichroic effect, thin layers of metallic oxides, such as titanium, silicon, and magnesium are deposited upon the surface of the glass in a high temperature, vacuum furnace. Metallic oxides are vaporized by an electron beam, and the rotating glass target is evenly coated with many

thin layers. The result is a beautiful piece of glass that can be combined with precious metal or fused to other glass.

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