



Sapphires: The Gem of Many Colors

In February of 1981, Diana Spencer (soon to become Diana, Princess of Wales) made sapphires wildly popular when she forwent the traditional diamond and selected instead an 18-carat oval blue sapphire as her engagement ring. Soon, "Princess Diana" rings were the rage. The imitators obviously had smaller stones, but many buyers thought that was the only real difference. She had a princess-cut sapphire surrounded by diamonds. They had a princess-cut sapphire surrounded by diamonds, albeit smaller ones. In truth, carat size was only one of many significant differences.

(Visit: http://engagementrings.lovetoknow.com/wiki/Princess_Diana%27s_Engagement_Ring)

Those differences are what we discuss in this on-line jewelry educational tool we created for our clients. At St. John & Myers, we want you to be the best informed buyers of fine jewelry. The more you know, the more you will appreciate the quality and uniqueness of the pieces we offer. Therefore, we'll discuss a different stone or period of jewelry every view months.

We also hope you will stop by our salon at 400 Old Vine Street, Suite 100, Lexington KY 40507 to see our fine sapphires, including no-heat and rare color-change sapphires, as well as many other gemstones and fine jewelry. You can also set up an appointment-only showing during which we will give you the St. James & Myers Royal Treatment.

History

When she chose an 18-carat oval blue sapphire as her engagement ring, Princess Diana wasn't the first royal, or commoner for that matter, to admire gemstones.

"The intertwining stories of people and gemstones weave one of the oldest threads through time," writes our friend Fred Ward, a gemologist famous for his series on gems in *National Geographic Magazine*. "Every culture that has come into contact with gem crystals has loved and coveted them. Whether the prevailing allure related to magic, power, wealth, beauty, durability, or rarity the historical reality remains."

(Visit: <http://www.fredwardgems.com/>)

In terms of history, gems remained the province of royalty until the modern era. Says Ward, "Before the 1800s, gems and jewelry were the playthings of royalty....They (gems) symbolized the "state" and formed part of the state's treasury. Today almost anyone can buy several pieces of jewelry a year. But ponder the prospects of a barmaid or farmer's wife in Elizabethan England receiving a sapphire engagement ring. Preposterous."

Democratization of half the world, aided by the spread of the Industrial Revolution, also brought what Ward calls the "democratization of jewelry." For the first time in history, genuine gemstones were within the financial reach of most people.

Three cheers for democracy!

The Geology Behind the Beauty

Geologically speaking, sapphires are corundum, a crystalline form of aluminum oxide.

Like diamonds, sapphires are formed in the earth's crust. Most gem-grade corundum forms in metamorphic rocks. However, that's not where sapphires are usually found. Instead, they are usually discovered in stream sediments, where they have arrived after millions of years of weather eroding the rock in which they form. Because they are strong, sapphires break from the

rock and wash into streams. Because they are heavy, sapphires sink to the bottom of the stream. Most sapphires, therefore, are found by washing the gravels of stream deposits.

In its natural state, corundum is colorless, but it can become different colors when, over millions of years, impurities find their way into the earth's crust. The traditional blue most of us associate with a sapphire comes from a mixture of corundum with titanium and iron. Iron alone in corundum creates yellow sapphires. Various other elements in different concentrations make sapphires pink, lavender, orange, and green. Indeed, sapphires come in every color of the rainbow except one: red. When even a tiny bit of chromium seeps into corundum and makes it red, it is called a ruby.

(Visit: <http://en.wikipedia.org/wiki/Ruby>)

If you wanted to search for quality sapphires, you should expect some exotic travel into one of three locations—Kashmir (India), Burma (Myanmar), and Ceylon (Sri Lanka). These three countries are especially known for world-class sapphires. Sapphires from Burma typically have rich saturated hues and a high degree of translucency while those from Ceylon range from lighter or more pastel shades to richly saturated hues. Read the section called "Portable Wealth" for more about why Kashmir sapphires are often considered the standard by which sapphires are measured.

Quality sapphires also come from Madagascar, Kenya, Thailand, Tanzania, China, Australia, China, and right here in the United States in Montana.

In India, a pinkish-orange sapphire is called padparadscha. True padparadscha are among the rarest of sapphires, but beware. In recent years, a large number of this unique color sapphire appeared on the market. Suspicions soon arose about their authenticity, and fraud was discovered.

A Gem by Definition

To be considered a gem, a substance must have three qualities: durability, beauty, and rarity.

Gem crystals such as sapphires are among the hardest substances on earth, even harder than stainless steel. Sapphires rate a 9 on the Mohs hardness scale of 1 to 10, exceeded only by diamonds, which are pure carbon. Corundum is, therefore, quite durable. In fact, it is commonly used as an abrasive on everything from sandpaper to large machines used in machining metals, plastics, and wood. Some sandpaper is a mix of corundum and other substances.

(Visit: http://www.amfed.org/t_mohs.htm)

Beauty, as they say, is in the eye of the beholder, but few would argue that sapphires aren't beautiful. Their vast array of colors offers something for everyone's tastes, and their hardness allows them to be cut and fashioned in myriad settings.

In terms of rarity, corundum is a relatively common mineral in the earth's crust. But as fine translucent gem crystal, corundum is rare, making natural sapphires rare.

What Color is Beauty?

Color is the most important feature of a sapphire. When a sapphire is in its natural state, color distinguishes the best sapphires from those of lesser quality and tells gemologists where the sapphire came from. However, the color of the gems sold in retail shops are seldom the color that came from the ground.

Instead, most sapphires are subjected to a heat treatment that improves the color and clarity of the gem. To be scientific about the matter, heating maximizes a stone's color potential by realigning elements and altering valence states. That's probably more than you wanted to know, but you need to know that heat treating is inexpensive and permanent. However, it does not remove inclusions.

If you buy a more inexpensive sapphire, you should assume the sapphire has been heat treated until proven otherwise. This makes no-heat sapphires all the more valuable and their glorious color all the more remarkable.

Back to science for a moment. In scientific terms, *sapphire* refers to all varieties of corundum except ruby (a red variety of corundum) and emery (a black variety of corundum caused by a mixture of magnetite, hematite, and spinel).

In gem terms, sapphire refers to the blue variety of corundum, unless a color is mentioned as a prefix to sapphire (i.e. green sapphire). Gemologists call sapphires with a color other than blue a "fancy." We also have many other terms to describe the differences in color and origin of sapphires. See [Varieties of Sapphires](#) for these terms and their definitions.

Another piece of good news about sapphire: The color in most sapphires is stable. With basic care, a sapphire will remain colorful and beautiful well beyond your lifetime.

No-Heat Sapphires

The most valuable of sapphires need no heat to enhance their color. However, if there were no heat treated sapphires on the market, gem-quality sapphires would be very scarce. Few sapphires come out of the ground with a highly desirable color like cornflower blue.

An untreated sapphire, therefore, will usually command a much higher price than a heat treated sapphire. For instance, a 3 ct. heat-treated sapphire would cost about \$7,200. A comparable untreated Burmese no-heat sapphire would cost \$14,000 or more.

“Portable Wealth”

The most valuable color of sapphire is cornflower blue, known as Kashmir sapphire. Sapphires from Kashmir (India) are known for their intense blue color and velvety texture. Dealers consider a Kashmir sapphire the “ultimate measure of sapphire quality,” according to C.R. “Cap” Beesley, president of the American Gem Laboratories (AGL). Writing in the *Rapaport Diamond Report*, Beesley says, “Their intense blue color that holds up in changing lighting environments and their characteristic velvety, light-scattering internal texture contribute to their uniqueness and desirability in the world of the connoisseur.”

A rare variety of sapphire known as a color-changing sapphire exhibits different colors in different kinds of light. In natural light, a color-changing sapphire is blue, but in artificial light, it is violet.

There is no difference in durability between a “new,” meaning a newly mined sapphire, versus an “old,” meaning a sapphire mined generations ago. Both are millions of years old. The difference lies in color, origin, size, and cut, and treatment, all of which greatly affect value.

In comparison to other gems, many gemologists consider sapphires a bargain because they sell for hundreds to thousands of dollars a carat instead of the tens of thousands a carat that top-quality emeralds, diamonds, and rubies command.

Gemologists also call all gems “portable wealth.”

“Think about transporting a million dollars,” Fred Ward challenges. “That million in dollar bills, almost a ton of money, would occupy 42 cubic feet of space. A million-dollar gold brick (with \$400 –an-ounce gold) would be difficult to lift at 156 pounds. But the 99-carat padparadscha sapphire which recently sold for several million dollars weighed just over half an ounce (about the weight of quarter and a half dollar).”

Synthetics and Simulants

Sapphires were first synthesized (created in a lab) in 1902. The process of creating synthetic sapphire is known as the Verneuil process. Only experts can distinguish between natural and

synthetic sapphire because lab-grown crystal have the same chemistry and characteristics as natural crystals.

(Visit: <http://www.theimage.com/newgems/synthetic/syntheticanimate1.html>)

There are five types of corundum synthetics. They are flame-fusion (the least expensive), flux-grown, Czochralski-melt or pulled, hydrothermal, and heat-exchanger. Many of these are used in industry and high-tech applications. When they are sold at a retail store, they should be identified as lab created. Fortunately, lab-created corundums are mostly used in industry.

(visit: <http://en.wikipedia.org/wiki/Corundum>)

Simulants are not synthetics but inexpensive look-alikes. For example when cubic zirconia is used to imitate diamonds or corundum, it is a stimulant.

What to Look For in a Sapphire

As a gemologist with more than 25 years of experience, Louis Scholz has seen many sapphires. Here are some of the characteristics that he says differentiate nice sapphires from investment-quality sapphires.

“The first is a characteristic is admittedly subjective—that is the stone should be “pretty,” Scholz says. “It should be a beautiful blue or a phenomenon known as a color-change sapphire. In the best stones, the bright blue color is even with no dead zones that lack fire or sparkle or are colorless.

“To retain and increase value, the stone should be in a classically designed setting. If you purchase such a piece from a reputable jeweler and maintain it properly, that jeweler should be willing to allow you to trade it back in five years later with no loss of value.”

Scholz cautions potential buyers to remember that the vividness of the stone is usually commensurate with its price. At \$1,000, a stone may not be perfectly brilliant. At \$10,000, it should be a 3-4 carat, no-heat stone that is a beautiful blue color.

“Like a diamond, cut is also important,” Scholz says. “Native stones are typically cut for maximum weight. To maximize the stone’s color and brilliance, it should be re-cut and the top and bottom facets should match up.”

Ideally, you want a no-heat/no-treatment sapphire that has not been coated or filled. Its color is as it came out of the ground. You want to know where the stone originated. Kashmir sapphires are the most valuable, followed by stones from Burma and then Ceylon.

How do you know if you are getting all this in a stone?

The answer is certification with the the American Gem Trade Association (AGTA), the most popular certifier in the US. They will certify whether the stone has been treated in any way, its carat weight and origin. Certification from the recently closed American Gem Lab (AGL) is also good.

Caring for a Sapphire

After carefully choosing your sapphire, you will be pleased to know that it won’t need much care to remain beautiful for your lifetime and beyond.

Almost any cleaning technique works on sapphires, including, ultrasonic cleaners, steamers, warm soapy water, and brushes. However, if your sapphire is heavily fractured, avoid mechanical cleaners. Steam or ultrasonic cleaning might remove the oil.

Keep sapphires separate from diamonds, other gems, and precious metals such as gold, silver, and platinum. Sapphires can scratch other gems and precious metals. Diamonds can scratch sapphires.

Bet You Didn't Know

Rubies are the fraternal twins of sapphires. They are composed of the same material—aluminum oxide (corundum). The only difference is that chromium has mixed with the corundum to create the red color we identify as a ruby.

Corundum accounts for half of the four major gemstones alongside diamonds and emeralds.

You find sapphires at the checkout line at the grocery store. The top 1/32 inch of the laser windows at the checkout is lab-created sapphire. It is used because dragging items across glass windows produced scratches that interfered with scanners. Only a diamond can scratch sapphire, and sapphire-topped windows can last for more than 10 years. Lab-grown sapphires serve many other industrial uses as well.

Sapphires are the birthstone for September.

Varieties of Sapphires

Gemologists use a variety of terms to describe sapphires from different regions or of different colors. Here are some of the most prevalent, according to The Mineral and Gemstone Kingdom, a free, interactive guide to rocks, minerals, and gemstones (<http://www.minerals.net/home/homelnks/about.htm>).

Kashmir Sapphire - sapphire with a distinct velvety-blue color

Burma Sapphire – a sapphire that can be definitively traced to Burma. It should be accompanied with a certification declaring its origin as Burma

Cornflower Blue Sapphire - synonym of Kashmir sapphire (above)

Star Sapphire - sapphire displaying asterism

Padparadschah - orange-pink variety of sapphire

Color Changing Sapphire - Sapphire exhibiting a different color in natural and artificial light

Bi-colored Sapphire - sapphire with more than one color

Cat's Eye Sapphire - sapphire exhibiting cat's eye effect

Fancy Sapphire - any sapphire with a color other than blue

Some other (rarely used) variety names:

Australian Sapphire - dark blue to nearly black sapphire

Bengal Amethyst - purple sapphire

Blue Alexandrite - synonym of color changing sapphire

Ceylon Sapphire - light blue sapphire

Indian Topaz - yellow to yellow-brown sapphire

King Topaz - yellow to yellow-brown sapphire

Star Topaz - yellow star sapphire

Ultralite - blue sapphire

False Names

Brazilian Sapphire - blue tourmaline or blue topaz

Gold Sapphire - lapis lazuli with shiny pyrite sprinkles

Hope Sapphire - synthetic blue spinel

Lux Sapphire - iolite

Lynx Sapphire - iolite

Rose Kunzite - synthetic pink sapphire

Sapphire Quartz - massive blue quartz or chalcedony
Sapphire Spinel - blue spinel
Uralian Sapphire - blue tourmaline
Verneuil Sapphire - synthetic, laboratory-grown sapphire
Water Sapphire - iolite

Useful Terminology

Understanding these terms and organizations will help you understand the quality of a gemstone.

AGL — American Gemological Laboratories, also known as AGL Gem Lab, was the first laboratory to quantify colored stones in a linear, comparative manner back in 1977. Unfortunately, AGL closed in early March., but their examination reports are still valid and respected.

AGS —The American Gem Society is an association for jewelers who are dedicated to the highest standards of business ethics and professionalism in the industry. Only a small percentage of those who apply are awarded membership. St. John & Myers is a member of AGS.

AGTA — The American Gem Trade Association has become a leading industry force in the ethical promotion of natural colored gemstones and cultured pearls. Two of their most significant contributions to the trade are the creation of the AGTA Code of Ethics and Principles of Fair Business Practices and the Gemstone Enhancement Manual (G.E.M.).

Faceting — The process of cutting a gemstone so its surface is completely covered with facets (small, ground, plane surfaces of various shapes and sizes). If properly shaped and placed, the facets result in greater brilliance.

GIA — Established in 1931 and now with 1,100 employees including scientists, diamond graders, and educators, the Gemological Institute of America is the world's largest and most respected nonprofit institute of gemological research and learning. Located in Carlsbad, California, their goal is to ensure the public trust in gems and jewelry.

GCAL — Gem Certification and Assurance Lab is a diamond research and identification laboratory specializing in guaranteed diamond grading. Located in New York's diamond building, it is a subsidiary of Collectors Universe and has state-of-the-art technologies and instrumentation.

Inclusion —A foreign material, usually minute in size, that is enclosed within a natural mineral. The inclusion can be solid, gas, or liquid. Inclusions are considered flaws in the stone.

Lattice Diffusion — Diffusing beryllium into gemstones using high heat for hours or days. This process produces dramatic changes in the color of corundum. Labs can detect stones that are not diffused throughout by simple immersion. To detect complete diffusion, however, requires a much more expensive lab test.

Sources:

Ward, Fred. "Rubies & Sapphires." Gem Book Publishers, 1992.

The Mineral and Gemstone Kingdom (<http://www.minerals.net/home/homelnks/about.htm>).