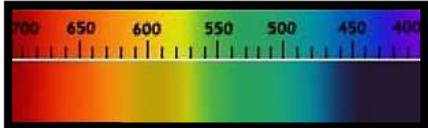
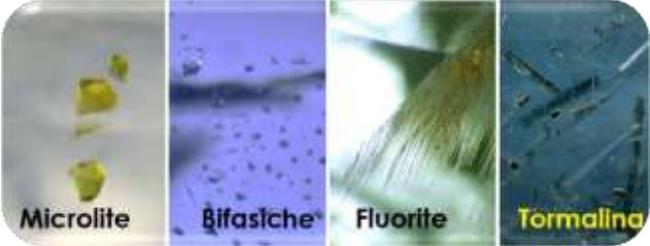


**Warning: this version has been completed with Google Translate , it certainly contains errors or inaccuracies.**

## Technical sheet - general: **T o p a z i o**

<b>Gemma - names</b>	( Italian - Topaz ) ( English - Topaz ) ( French - Topaze ) ( Spanish - Topacio ) ( Portuguese - Topázio ) ( Thai - บุษราคัม Bus <sup>+</sup> r ā kh a m )	( German - Topas ) ( Arabic - توباز tubaz ) ( Russian - Топаз Topaz ) ( Mandarin - 黄玉 Hu á ng y ù ) ( Swahili - Topazes ) ( Hindi - टोपाज़ topaaz )	<b>photo</b> 	
<b>Colors (GIA)</b>	<p><b>intense golden yellow</b> topaz (sometimes called sherry topaz) and <b>pink / orange / reddish (imperial) topaz</b> they are the most valuable; even the <b>blue</b> stones and <b>greens</b> they are popular. Natural pink stones are rare - most of the <b>pink topaz it is yellow</b> material heat treated. Much <b>colorless topaz</b> is irradiated and heat treated with a range of blues, some nearly indistinguishable from aquamarine when viewed with the naked eye. Other colors <b>include</b> brown , <b>brown yellowish , gray , green , reddish pink , red .</b></p>			
<b>Cause of Color</b>	<p>Pink, Red - Chrome Orange - Chrome and color centers Blue, yellow, brown - color centers</p> <p><b>Blue</b> , yellow and green color centers of unknown structure. <b>Orange</b> ("imperial topaz"), yellow center and Cr<sup>3+</sup> in octahedral coordination. <b>Pink</b> , Cr<sup>3+</sup> in octahedral coordination. Reddish brown ("sherry topaz") and red, center color.</p>			
<b>Classification</b>	<b>Mineral class</b> Nesosilicates	<b>Species - Group (mineral)</b> Topaz -	<b>Variety</b> -	
<b>Optical properties</b>	<b>Specific Gravity:</b> 3.49-3.57 Common: 3,	<b>RE:</b> Pink / Yellow / Brown : 1,629-1,637 <b>Blue / Colorless / Green:</b> 1,609- .617 <b>Polariscope :</b> DR <b>Double refraction:</b> - 0.008-0.011	<b>Character optical</b> Positive biaxial	<b>Pleochroism</b> Weak in thick sections X = yellow; Y = yellow, purple, reddish; Z = purple, bluish, yellow, pink
	<b>Luster (luster) - luster of the fracture</b> Vitreo - Vitreo		<b>Dispersion (fire)</b> 0.014 (low)	
<b>Light</b>	<b>Fluorescence</b> <b>SWUV :</b> Pink : weak - brown; <b>Red :</b> weak - yellow-brown; <b>Yellow :</b> weak - orange yellow <b>LWUV :</b> Colorless, <b>blue:</b> inert to yellow- (greenish); <b>golden, brownish, pink :</b> often yellow-orange		<b>Phosphorescence</b> NO	
<b>Form</b>	<b>Crystalline dress</b> Prismatic crystals  <b>Melting point:</b> 600+ ° C	<b>Phenomenal optical effects</b> Asterism	<b>Crystalline system</b> Orthorhombic - dipyramidal <b>Crystal class</b>	
<b>Chemical formula</b>	Aluminum fluorosilicate  <b>Al<sub>2</sub>SiO<sub>4</sub>( F, OH )<sub>2</sub> + Cr, Mn, Vn .</b>		<b>Spectrometer image</b>  <small>Normally non-indicative spectrum. The heat treated pink topaz gives the Cr spectrum at 682 nm</small>	
<b>Fracture</b>	<b>Flaking</b> Perfect - basal / pinacoidal (1 direction - at the base of the crystal)	<b>Breaking- Parting</b> Rare	<b>Fracture</b> Conchoidal, sub-conchoidal to irregular	
<b>Durability</b>	<b>Hardness (Mohs) - Absolute</b> 8; 200	<b>Toughness</b> Fragile	<b>Stability (heat, light, chemicals)</b>  Avoid heat and bright light	

<b>Clarity - characteristics</b>	<b>Typical inclusions:</b> needles, fingerprints, microline, inclusions, fluorite, tourmaline, microcline, quartz (463 cm-1), rutil, wolframite, uranophane, fluid inclusions, biphasic also with 2 immiscible liquids, triphasic e. with diamond-like incision marks.	
	<b>Type I.</b> Typically free of inclusions	<b>Transparency (commercial) - transparency</b> Transparent to translucent
<b>Deposits - types of rocks</b>	Topaz is a subduction related mineral found in meta-sediments and has a wide range of pressure and temperature stability. It is commonly associated with silica igneous granite and rhyolite rocks. It typically crystallizes in granite pegmatites or in vapor cavities in rhyolite lava flows. <b>Geological age :</b> Tens of million years. Topaz forms for a million years. When molten lava or magma cools, they become igneous rock, which evolves into granite, pegmatite, basalt, or other types of rock.	
<b>Characteristics of rough stones</b>	Prismatic, Combinations of shapes, massive, granular, like rolled pebbles.	
<b>Main deposits</b>	Topaz is a common gemstone all over the world. Topaz is found on all continents. The Mindat.org site lists <b>1186 locations</b> where this gem is mined. The most important sources are Brazil, Sri Lanka, Russia and Nigeria. Afghanistan ( Kosha Valley, Sirkh Rod- Nangarhar, Kamdesh -Nuristan ), Brazil (Bahia, Espirito Santo, Ouro Preto / Pedra Azul-Minas Gerais, Ariquemes -Rondonia), Canada (Bennett-BC), China (Ganzhou-JX, Altay -XJ) Kazakhstan ( Shet -Karaganda), Madagascar ( Alaotra-Mangoro, Atsimo-Atsinanana, Ambakireny-Betsiboka, Ilakaka-Ihorombe ), Mozambique ( Gilé-Zambezia ), Myanmar (Lay- tha Taung / Mogok / PeinPyit -Mandalay), Namibia ( Spitzkopje-erongo ), Pakistan ( Shigar-Gilgit.Baltistan, Katlang-Khyber Pakhtunkhwa ), Russia ( Kocjlar-Chelyabinsk, Yuzhakovo-Sverdlovsk Oblast, Sherlova Gora- Zabaykalsky Krai ) <b>Sri Lanka</b> (single source of colorless topaz, Matale -CD, Ratnapura- Sabaragamuwa ), Tajikistan ( Kukurt -Gorno-Badakhshan), Ukraine (Zhytomyr Oblast), USA (Ramona-California, Colorado, Maine, Montana, Utah), Vietnam ( Th ườ ng Xuân-Lâm Đ ò ng ), Zimbabwe (Karo-i- Mashonaland West, Gweru-Midlands). <p style="text-align: center;"><b>Variety</b></p> <b>Imperial Topaz</b> - Strong orange, pink or red topaz typical of the Puro Preto area in the state of Minas Gerais in Brazil. <b>Mystic Topaz / Mystical Topaz</b> - Topaz artificially coated with titanium or another metal to give a multi-colored sheen. <b>Blue color</b> : typically due to treatments, (but which also exists in nature) it is sold commercially with the following colors: <b>Sky blue (clear)</b> , obtained by exposure to gamma rays <b>Swiss blue (medium)</b> , obtained by exposure to high-energy electrons in a linear accelerator. <b>London blue (dark)</b> , obtained by exposure to neutrons in a nuclear reactor	
<b>Year of discovery</b>	<b>Ancient:</b> difficult to establish precisely.	
<b>History</b>	<b>Antiquity :</b> Ancient Sri Lanka ( Tamraparni ) exported native oriental topazes to Greece and ancient Egypt. This fact probably induced the Greek writer and scholar Lucius Cornelius Alexander Polyhistor (1st century BC; also known as Alexander of Miletus) to associate the stone with the island of Topazius (today known as the Island of San Giovanni). Even the first Egyptians had baptized the island with a similar name, <b>Topapwene</b> , which in their language meant the "land of Topaz". Pliny also gave us news of this etymology. He wrote that <b>Topazos</b> was a legendary island in the Red Sea and the mineral "topaz" was first mined there. Many English translations of the Bible, including that of King James / King James (1611), mention topaz. However, as these translations as topaz all derive from the translation of the Seventy topazes [ os ], which, as specified above, referred to a yellow stone that was not topaz, but probably chrysolite (chrysoberyl or peridot).	

According to the **ancient Egyptians** , whose mining research technique was based on brightness. " *This Stone grows in the Rocks, obscured by the splendor of the Sun; it is not seen in the Day, but it shines bright and glorious in the darkest Night, and is discovered at a great distance. The Keepers of the Island disperse in different Places to look for this stone. , and wherever it appears, they mark the Place, with a large Vase of sufficient size to cover the glittering Stone; and then during the Day, go to the Place and cut out the Stone, and give it to those who are artists in polishing them .* " To recover the topazes, the Egyptian explorers followed the following technique: " *Topaz is a transparent stone **sparkling with a golden luster**, which however is not easy to distinguish by day, due to the brightness of the surrounding light, but at night the stones are visible to those who collect them. Collectors place a vase on the spot [where the topazes are seen] as a sign and unearth them during the day .* "

**First century BC: Diodorus Siculus** (90-30 BC) said that Philadelphus exterminated the " *different kinds of terrible snakes that once infested the island because of" Topaz, a shining stone, of a delightful appearance, like glass, of a golden color and of admirable splendor; and therefore everyone was forbidden to set foot on that Place; and if anyone landed there, he was immediately put to death by the Keepers of the Island.* "According to **Strabo** (63 BC-23 AD),

In his "Liber de lapidibus " (book of stones), written **in the 11th century, Marbodius** / Marbodo, bishop of Rennes in Brittany, states for the first time in history that the color of the **topaz is yellow** . From that moment the stone is no longer associated with green but with yellow (golden).

In **1734** the German mineralogist and metallurgist **Johann Friedrich Henckel** realized that topaz was different from quartz due to its cleavage (which quartz does not possess). Hence Henckel was the first to apply the term Topaz to fluorosilicate.

**1652** - Thomas Nicols , author of one of the first systematic treatises on minerals and precious stones, dedicated two chapters to the subject in 1652. In the Middle Ages the name topaz was used to refer to any yellow gem, but in modern times it denotes only silicate described above.

In **1740** , the **Braganza Diamond** (named after the aristocratic family Bragança), of 1680 carats, was found in Brazil and brought to Portugal to be set in the Royal Crown jewels. However, the diamond turned out to be a huge light topaz (some say it is an aquamarine instead).

In the **19th century** , the Irish scholar and geologist Valentine Ball (1843–1895) notes that the legendary "topaz" of the island of Topazios is olivine, which is not luminescent while real topaz is, and suggests: " *This story it may have been told to travelers by astute Egyptian gem merchants eager to increase the value of their wares by exaggerating the dangers inherent in procuring olivines.*  " *Nowadays, the island's mine is now submerged and inaccessible.*

Before the **20th century** , all yellow, brown and orange transparent gems were called **topazes** . Modern gemology has defined topaz as a distinct species of gem, chemically and physically.

**In the 1960s** , a two-step method was discovered to transform colorless blue topaz. First, the rough is irradiated, turning it brown. Then, the brown stone is heated to obtain a stable blue color. The process thus almost duplicates what happens in the Earth, a treated stone cannot be distinguished from a natural one.

Prior to this development, natural blue topaz was rare and valuable, while colorless topaz was common and could be bought inexpensively per ton. The consequences: Blue topaz prices have fallen, and these are now among the least expensive gems available.

Topaz is the symbol of friendship and the official gemstone of the US state of **Utah** . Blue topaz is the state gem of the US state of **Texas** .

**Name** : The name "topaz" derives, through the old French: Topace and the Latin: Topazus , from the **Greek Το πάζιος** ( Topázios ) or Το πάζιον ( Topázion ) , from Το παζος ( Topázos ) , the ancient name of **the island of San Giovanni in the Red Sea** from which in ancient times a yellow stone was extracted (now considered **chrysolite** : yellowish olivine / peridot); the name topaz was first applied to the mineral now known by that name in **1737** . Alternatively, the word topaz can be related to the Sanskrit word **तपस्** "**tapas**", which means " **heat**" or "**fire** ".

<b>Property attributed</b>	The ancient Romans believed that topaz protected against <b>dangers while traveling</b> . During the Middle Ages it was believed that attaching the topaz to the left arm protected the owner <b>from any curse and warded off the evil eye</b> . Wearing topaz was
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	<p>also believed to increase <b>body heat</b> , which would allow people to <b>relieve a cold or fever</b> . In Europe during the Middle Ages it was believed that topaz increased <b>mental powers</b> . An English superstition held that topaz cured madness. Topaz can reduce the level of <b>stress</b> , an emotional benefit that leads to physical benefits.</p> <p>In the Middle Ages, carved gemstones were believed to be natural wonders with special powers. For example, in the <b>13th century AD work</b> , <b>The Book of Wings / The Book of Wings, the author</b> Ragiel (according to some Arabic Aly Aben Ragel ) wrote: "<i>The figure of a hawk, when placed upon <b>a topaz</b> , helps to acquire the benevolence of kings, princes and magnates.</i>"</p> <p>Topaz is a very useful gemstone that can be placed in a variety of places. Topaz can be placed indoors to keep you and your family healthy. It is a birthstone that <b>protects the home</b> from accidents and fires. Placed <b>under a pillow</b> , it will ward off nightmares and prevent sleepwalking. Keep one or two in the southern part of your home to strengthen your local reputation and reputation. Place a yellow or orange topaz gem in any activity room to energize the area and fill it with "fire energy". If you, or someone you know, are recovering from an illness or an operation , a topaz placed nearby will speed up your recovery time.</p> <p>Topaz is the stone of choice for 4th (blue) and 23rd (imperial) wedding anniversary jewels.</p> <p><b>Planet:</b> Pluto</p> <p><b>Month:</b> November ( official)      <b>Zodiac sign:</b> Scorpio</p> <p><b>Chakra:</b> Colorless , blue, imperial</p>
<p><b>Treatments</b></p>	<p>Already in the seventeenth century systems were known to alter or imitate gems such as topaz. The English naturalist Philip Skippon (1641–1691) declared that a certain Monsieur Lort , of Montpellier, France, was a "forger" of "amethysts, <b>topazes</b> , emeralds and sapphires"</p> <p><b>Imperial topaz:</b> heated to enhance color usually Detectable only with an internationally accredited laboratory variable Irradiated to enhance color sometimes variable Avoid heat and bright light.</p> <p style="text-align: center;"><b>Radiation</b></p> <p>The irradiation processes began in the early 1970s and continue today .</p> <p>When a colorless or light colored topaz is exposed to <b>gamma rays</b> , a color is usually produced in the sequence from yellow to brown to maroon to very dark brown, with a significant color already appearing at fairly low radiation doses (e.g. , less than one megarad of Co-60).</p> <p><b>High-energy electron</b> exposure treatment works very differently from gamma rays. It produces considerable heat, more concentrated on the surface of the gem. Samples are usually <b>cooled with cold running water</b> during the irradiation procedure; even so, <b>cracking is common</b> if certain inclusions or defects are present, and melting can occur if the water supply is interrupted or the electron beam remains fixed in one spot. A large amount of negative electricity is also carried by the beam into the sample and an internal electrical discharge or "internal lightning" (also known as the "tree effect" or "Lichtenburg figure " in other contexts) can occur. Since energetic electrons have limited penetration, the coloring effect, like heat, is more intense on the surface. The depth of penetration can be increased by increasing the electron energy, but then induced radioactivity can occur. The latter factor depends on the specific impurities present in a specimen, and for topaz it usually sets above an energy of about 15 mega electron volts . A <b>cool-down period of</b> a few days to a few weeks (or even longer) may be required , during which the <b>induced radioactivity decays</b> to an acceptable level.</p> <p><b>Neutrons, produced in nuclear reactors,</b> can also induce radioactivity in all but the purest topaz crystals. However, they have excellent penetration, so there are no surface heating or coloring problems, and <b>the colors produced are generally uniform and deep</b> . Since there is no risk of rupture, the problem is not the size with the irradiation of high-energy electrons. Neutrons in a nuclear reactor can be of varying energy and are also accompanied by gamma rays and other rays and particles. By placing the material to be irradiated in a cadmium-coated iron container, the thermal neutrons that carry out essentially all the activation are absorbed by the metals, which therefore also generate further gamma rays. Doses up to 1,000 megarads are said to be adequate to produce a <b>deep blue</b> after heating . The color may be darker than that produced by electrons, often "<b>ink</b>" or "<b>steel</b>". <b>Color zoning</b> can be expected to be similar to that observed with other irradiation techniques used for the blue product. Irradiation can also be used <b>to restore the natural yellow / brown / blue</b> in a topaz when it has been accidentally</p>

	<p>destroyed by overheating. Although irradiation usually also produces an additional yellow to brown component, this can be removed by gentle heating or exposure to bright light, thus producing a restoration of the original color. Irradiation followed by heat treatment produces most of the blue colors. The irradiation also produces yellow, orange, red, brownish, pink and greenish colors: often unstable, they can fade with direct exposure to sunlight.</p> <p style="text-align: center;"><b>Heat treatment</b></p> <p>A warm-up step is usually required to remove the yellow to brown color and reveal any blue present. Just as not all colorless topazes will turn yellow to brown with irradiation, not all yellow to brown irradiated stones will turn blue; and color variations are possible from stone to stone, or even within a single stone. The colors from <b>yellow to brown</b> can be whitened by heating for a short time at <b>200 ° -300 ° C</b> if stable (they do not fade if exposed to intense light), or with a more or less long heating at 200 ° -400 ° C if the color it is not stable. The natural <b>blue color and the blue produced by irradiation are stable to light, however they vanish when brought to around 500 ° C</b>. The colors from yellow to brown and blue are all related to color centers. To avoid the dangers of stone breaking due to heating these processes are performed on faceted, or at least preformed stones (rough but unfinished gemstones) that are shaped so that they do not contain stresses, defects or inclusions. An added benefit of using preforms is that irradiation rates are <b>based on weight</b> and there is a great weight reduction from rough to preformed or faceted stone. The yield of the faceted product destined to become blue topaz is lower than that of most other gem materials because all but the smallest stumps, defects and inclusions have to be eliminated.</p> <p style="text-align: center;"><b>Coating</b></p> <p>Full or partial coating: may show peeling coating at veneer joints, iridescence (reflecting light), mottled coloring. Some surface treatments are only removed with acids (mainly green and blue).</p>		
<b>Synthetic counterpart</b>	<p>Good imitations of topaz can be made by melting the <b>rhinestones</b> with a certain amount of antimony glass (antimony oxide) and with a trace of Cassius purple (a compound containing gold) or with a little iron oxide. Cassius purple gives a darker, more reddish yellow and iron oxide a lighter yellow. Such imitations can be distinguished from authentic stones through tests of refraction, lower specific weight, much lower degree of hardness and the complete absence of dichroism. -</p>		
<b>It can be confused with</b>	<p>Aquamarine, zircon, CZ, glass, diamond (rare), quartz (rare).</p>		
<b>Indicative gemological tests</b>	<p>Natural <b>basal flaking</b> can cause small cracks when exposed to excessive heat or friction.</p> <p><b>Yellow Topaz: Citrine</b> (separation through: optical figure, RI, SG, inclusions), <b>Yellow beryl / heliodor</b> (separation through: optical figure, RI, SG, inclusions), <b>Synthetic sapphire</b> (separation through: optical figure, RI, SG), <b>Glass</b> (separation through: optical character), <b>Apatite</b> (separation through: optical figure, RI, birefringence, inclusions), <b>Danburite</b> (separation through: SG).</p> <p><b>Blue Topaz : Aquamarine</b> (separation through: optical figure, RI, SG, inclusions), <b>Glass</b> (separation through: optical character), <b>Synthetic spinel</b> (separation through: optical character), <b>Barite</b> (separation through: SG, luster, hardness), <b>Synthetic quartz</b> (separation through: optical figure, RI, SG), <b>Apatite</b> (separation through: optical figure, RI, birefringence, inclusions).</p>		
<b>Value (2021)</b>	<b>High</b> : 3500 \$ / ct (imperial) <b>3 carat +</b>	<b>Medium</b> : 200-500 \$ / ct <b>1-3 carats</b>	<b>Low</b> : 1-5 \$ / ct <b>Under 1 carat</b>
<b>Typical cut</b>	<p>Sometimes an elongated type of style (such as marquise or oval) is applied to protect the stone from damage related to its basal flaking plane.</p> <p>Generally it is veneered with traditional cuts such as drop, round, shuttle, oval, etc. The most included stones, but with good color, are worked in cabochon, beaded or, less frequently, intaglio style.</p>		
<b>Famous stones</b>	<p><b>Aurangzeb</b> topaz , observed by Jean Baptiste Tavernier at the end of the 17th century, weighed 157.75 carats.</p> <p>It seems that one of the most famous specimens, which was originally thought to be a diamond, is actually a colorless topaz: a 1680-carat stone known as the "<b>Braganza diamond</b>" set in the Portuguese crown jewels.</p>		
<b>Record stones</b>	<p>The <b>El - Dorado Topaz</b> , which weighs a <b>whopping 31,000 carats</b> (6.2 kg) currently ranks the crown as the <b>largest faceted gem in the world</b> . Originally discovered in <b>1984</b> in</p>		

mineral-rich Minas Gerais, Brazil, pre-cut El-Dorado crystal tipped the scales at a staggering 37kg.

At **22,892.5 carats** , " **American Golden** " topaz is one of the largest gems in the world. It was faceted by Leon Agee over a two-year period in the late 1980s from an 11.8 kg rounded topaz pebble.

**Lindsay raw topaz , in the Smithsonian** 's collection of gems and minerals, exhibited in the Hall of Geology , Gems and Minerals consists of a short vertically striated prismatic crystal terminated by a **pyramidal face weighing approximately 32 kg** . This huge gem comes from Minas Gerais in Brazil.

The " **Topaz Azul** ", of Brazilian origin, is a huge cushion cut gem of **8225 carats** of good clarity and originally colorless, yellow or yellowish-brown. The massive gem was irradiated by one of the following methods: - ultraviolet, X-rays, gamma rays, high-energy electrons and the stone acquired a **permanent deep blue color** . Gamma irradiation is the common method employed in this process and is perhaps the largest irradiated blue topaz in the world.