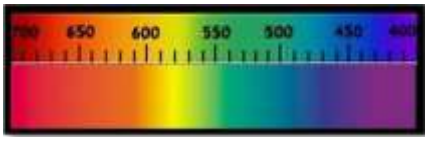
Warning: this version has been completed with Google Translate, it certainly contains errors or inaccuracies.

Data sheet - general: Diamond (colorless)

<table>
<tr><td>Gemma - names</td><td colspan="2">(Italian - Diamante)
(English - Diamond)
(French - Diamant)
(Spanish -Diamante)
(Portuguese - Diamante)
(Thai - เพชร phechr)</td><td>(German - Diamant)
(Arabic - الماس almas)
(Russian - Алмаз Almaz)
(Mandarin -钻石 zuànshí)
(Swahili - Diamante)
(Hindi - हीरा heera)</td><td rowspan="2">photo
  </td></tr>
<tr><td>Colors (GIA)</td><td colspan="3">The diamond is one of the many allotropic forms in which carbon can occur; in particular, the diamond consists of a crystalline lattice of carbon atoms arranged according to a tetrahedral structure.
Colorless (GIA : DEF scale) to pale yellow (GIA scale: Z). Any amount of yellow, gray or brown above grade Z is classified as a Fancy Color Diamond.</td></tr>
<tr><td>Cause of Color</td><td colspan="4">Absence or presence in particular combination of chromatophore elements (nitrogen, hydrogen, boron, nickel), plastic deformation and radiation damage.
Allochromatic Gem</td></tr>
<tr><td>Classification</td><td>Mineral class
Native non-metallic, mineral</td><td>Species - Group (mineral)
Diamond</td><td colspan="2">Variety
Colorless diamond</td></tr>
<tr><td rowspan="2">Optical properties</td><td>Specific Gravity:
3,516-3,525
Common: 3.52</td><td>RE: 2.417
Polariscope : SR
Birefringence:
The birefringence of polarized light is normally present in diamonds</td><td>Character optical
Isotropic</td><td>Pleochroism
NO</td></tr>
<tr><td colspan="2">Luster (luster) - luster of the fracture
Diamantina - adamantine</td><td colspan="2">Dispersion (fire)
0.044</td></tr>
<tr><td>Light</td><td colspan="2">Fluorescence
SWUV (254 nm) : inert
LWUV (365nm) : (type Ia) usually emit blue fluorescence, i green (usually in brown stones), yellow, mauve or red (in type IIb diamonds). About one third of natural diamonds show fluorescence.</td><td colspan="2">Phosphorescence
Rare (yellow, red)</td></tr>
<tr><td>Form</td><td>Crystalline dress
Octahedral, dodecahedral, cube-octahedral, spherical or cubic. Irregular for deep stones.
Melting point: 4.027 ° C,
Burns above 700 ° C in air.</td><td>Phenomenal optical effects
/</td><td colspan="2">Crystalline system
Cubic
Monometric
Crystal class</td></tr>
<tr><td>Chemical formula</td><td colspan="2">Carbon (typically 99.95%)
C.</td><td colspan="2">Spectrometer image
 
Not indicative</td></tr>
<tr><td>Fracture</td><td>Flaking
Distinta - octahedral (4 directions)</td><td colspan="2">Breaking- Parting
. Twinning law of the common Spinel (which produces "macle")</td><td>Fracture
Complex, irregular</td></tr>
<tr><td>Durability</td><td>Hardness (Mohs)
- Absolute
10; 1600</td><td colspan="2">Toughness
Fair-good</td><td>Stability (heat, light, chemicals)
Excellent</td></tr>
</table>

	(with variations in directional hardness)		
Clarity - characteristics	**Typical inclusions:** **External features**: Natural (surfaces), pits, chips, lines, scratches, polish etc. damaged culet, **crystalline inclusions**: Olivine, diopside, graphite, garnet, calcite, spinel, diamond, silica or iron oxide.  Inclusions typically reported on certificates: fingerprints, feathers, Natural (*naturals* in English, parts of the belt not polished) Natural Indented (*indented naturals* in English, as above, but turning inwards), knots, needles, dots, clouds, twins (Twinning Wisps in English) **Structural inclusions:** twin planes (knots), grain lines, fine splitting cracks (barbature) along the belt. **Rare inclusions** : Cohesite,		
	Guy: **NA**	**Transparency (commercial) - transparency** Transparent	
Deposits - types of rocks	Diamonds originate in the mantle of the Earth, where the conditions of very high pressure necessary for their formation exist. The diamonds found on the surface are thought to come from a depth of between 150 and 225 km. The crystals are brought to the surface, embedded in a rock containing a lot of olivine called kimberlite, by volcanic ducts through eruption. This gives rise to the diamond chimneys of the primary deposits. Subsequently, by erosion, the kimberlite can be crumbled, releasing the diamonds in secondary deposits, generally of the alluvial type. Very small diamonds, typically less than 0.3mm in diameter, have been found in many meteorites that have fallen to Earth. Some scholars believe that impacts of large meteorites, which occurred millions of years ago, may have produced some (or many) of the diamonds found today, but there is no evidence to support this hypothesis. **Geological age** : from 3.3 billion years to a few tens of millions (or maybe even less) **Types of diamonds** : all natural diamonds can be classified into 2 large groups: type I / one (presence of nitrogen-N) and type II / two (absence of nitrogen-N). **Type I (one)** : Type I diamonds have been divided into further subgroups: type Ia (groups of N atoms) and type Ib (single N atoms). Type Ia These subdivisions have a purely scientific interest and have no connection to the value of the gem. There is a further subdivision of types IaA (pairs of N atoms) and IaB (four or more N atoms). Some authors have identified with the type IaAB (or Ic) diamonds with structural defects (dislocations) (not related to the presence of nitrogen-N) **Type II (two):** Type II diamonds are in turn divided into two subgroups: IIa (absence of trace elements) and IIb (presence of B). Type II diamonds are significantly rarer in nature. They form at greater depths and can be large in size (almost all very large colorless diamonds are type IIa). In some classifications, type IIaAB diamonds (sometimes referred to as IIc) are found, i.e. those containing measurable quantities of hydrogen (H).		
Characteristics of rough stones	The most typical shape, especially for **type I stones** , is the octahedron, there are also diamonds in dodecahedral or cubic shape. Diamonds recovered from secondary deposits, which have therefore undergone a process of erosion due to natural elements (water or friction with other stones) can have a very irregular shape. Even super-deep diamonds (typically **type II**) do not normally have a regular or well-defined shape.		
Main deposits	The diamond deposits are divided into two groups: **primary and secondary** . The primary deposits are those in which the diamonds are still found inside the mother rock (typically, kimberlite), while the secondary ones are those in which they are found dispersed in sedimentary rocks often inconsistent such as sand, gravel, transported far		

	from places where the mother rock was and from which they derive by disintegration of the same, i.e. in alluvial soils. Around **7,000-8,500 kimberlite pipes** have been discovered around the world, of which less than **900-1000** have been classified as diamond-bearing and among them, just over **50** are economical enough to be profitable, with reasonable gain. Major producers in 2021 and 2020 in millions of carats, corresponding to Millions of USD / $) **Russia** 39.1 (2021 $ 2643) -31.2 (2020 $ 2255), **Botswana** 22.9 (2021 $ 4657) - 16.9 (2020 $ 2521), **Canada** 17.6 (2021 $ 1512) - 13.1 (2020 $ 929), **DR Congo** 14.1 (2021 $ 168) - 12.7 (2020 $ 89), **South Africa** 9.7 (2021 $ 1360) - 8.5 (2020 $ 959), **Angola** 8.7 (2021 $ 1626) - 7.7 (2020 $ 1017), **Zimbabwe** 4.2 (2021 $ 670) - 2.7 (2020 $ 153), **Namibia** 1.8 (2021 $ 823) - 1.5 (2020 $ 720), **Sierra Leone** 0.8 (2021 $ 164) -0.6 (2020 $ 119), **Lesotho** 0.3 (2021 $ 257) -31.2 (2020 $ 261), **Australia** 0 (2021 $ 0) - 10.9 (2020 $ 118). Other minor producers (2021): **Guinea, Brazil, Central African Republic, Liberia**. Total production in 2021 (120 million carats) and 2020 (108 million carats). The prices of rough diamonds in 2021 increased and the world average value reached 116.53 dollars per carat.
Year of discovery	**Uncertain:** 6000 to 2500 years ago.
History	Diamonds are thought to have been initially recognized and mined in India, where they were found in alluvial deposits along the **Krishna and Godavari rivers** . Diamonds were used in **religious icons and it is likely that they were known and considered precious as early as 6,000 years ago.** It is possible that African diamonds were also used in very ancient times, perhaps even traded by the Phoenicians, however there is no documentary evidence that confirms this theory. According to some theories, not supported by significant findings to corroborate their validity, the first diamonds were recovered from alluvial deposits **in central-southern India, around the river Penna (or Pennar).** There is also the theory according to which diamond splinters were used for the drilling of ornamental beads, already **in the second half of the second millennium BC** (Yemen). Other theories see them as parts of tools for smoothing ceremonial axes (China 2500 BC), or creating holes of precision unthinkable for the technology of the time (Egypt, 2500 BC). **Golconda** was a geographic area (which can be superimposed on today's Indian states of **Andhra Pradesh and Telangana)** of vital importance for the extraction and trade of diamonds for over a millennium (even before taking that name). During the reign of the historic Qutb Shahi dynasty (16th century – 17th century AD), it was also known as the "Golconda Sultanate". Diamonds (especially those from the **Kollur mine** in Andhra Pradesh) were transported to the city of Hyderabad (founded in 1591) to be cut, polished, valued and eventually sold. The city of Hyderabad maintained this role as a diamond trading center **until the end of the 19th century** . All the most famous ancient diamonds come from this deposit. The Golconda region has produced some of the most famous diamonds in the world, including the colorless **Koh-i-Noor** (now owned by the United Kingdom), the **Nassak Diamond, the Hope blue** (United States), the pink **Daria- i-Noor** (in Iran), the white **Regent** (France), the **Green of Dresden** (Germany), and the colorless **Orlov** (Russia), the **Nizam** and the **Jacob** (India), in addition to the now lost **Fiorentino Giallo, Akbar Shah and Gran Mogol diamonds.** Both in India and elsewhere (Europe, Middle East etc.), the diamond had both the meaning of carbon crystal, in its physical form, and a variety of symbolic attributes that often did not have a direct correlation with the stone. In the area of Indian influence it was known as ***vajra*** (***dorje*** in Tibetan). This term, as well as to identify the real diamond, referred to a type of stick, with two rounded or pointed ribbed heads, symbolizing the properties of a diamond (indestructibility) and lightning (irresistible force). In Hindu mythology, it is shown with 3 claws (sometimes 4 or more) which resemble the claws of birds; both of its parts are connected to each other by the handle in the middle. The ends of the object can be ball-shaped, or they can be separated and end in sharp points with which to pierce. The vajra is also the weapon of Vedic rain and the thunder deity, Indra,

and is used symbolically in Buddhism, Jainism and Hinduism. It is often painted or sculpted to represent firmness of the soul and spiritual power.
In fact there are references to diamonds in Sanskrit texts: **the Arthashastra** of Kautilya mentions their trade, Buddhist works from the fourth century BC onwards describe the diamond as a very well-known and precious stone, even if they do not contain indications about the cutting techniques. Another Indian text written in the early 3rd century describes strength, regularity, brilliance, the ability to scratch metals and good refractive properties as desirable qualities of a diamond.
The diamond could (difficult, through current instruments to understand what the knowledge of the time actually was) also appear **in the Bible** , in particular in the breastplate of Aaron, the great priest. The terms used in the holy book are Yahalom (which still means diamond in Hebrew today) or Shamir.
Even in ancient Greece the presence of a word that eventually became synonymous with diamond (mineral and gem) appeared long before the arrival of the stone itself. Its presence is recorded (with different values, meanings and meanings) in **Homer, Pindar and Ctesias** . Among the first Hellenic thinkers to use it to certainly refer to a stone was **Theophrastus** (in his work his *Perí líthon*). In ancient times, a bit like still happens today, it is never certain when the gem described is really a diamond or a material with more or less similar properties, such as quartz, corundum / topaz / beryl or colorless spinel. . Important findings **of the rings of Aï Khanoum** (dating back to 280 BC). in Bactria / Bactria (an area between today's Afghanistan and Pakistan, but of Greek influence) and **Óc Eo, in southern Vietnam** (I-VI century AD, from trade with India). However, these findings attest to the presence of the gem both in the Greek cultural sphere and that of other societies outside India.
Diamonds came to ancient Rome from India and there are clear references to their use as engraving tools. In Asia, not only in the subcontinent, they were certainly already known from the beginning of the first millennium of the Christian era, probably even earlier.
It is possible that in the Far East, diamonds as a cutting and polishing tool were known from ancient times (the ceremonial axes could indicate a use of the mineral dating back to the third millennium BC), but it is believed, according to current knowledge, that in in the past, the Chinese did not consider diamonds as jewels, while they greatly appreciated jade. A Chinese work from the **3rd century BC** . he quotes: "Foreigners wear them [diamonds] in the belief that they can ward off evil influences from them." Even in the most recent dynasties, Ming and Qing, jade (nephrite, therefore jadeite) continued to dominate the jewelry, also, especially after the Ming (1368-1644) the presence of different precious stones also spread in the Celestial Empire.
Even the Romans certainly knew diamonds (some examples of rings adorned with these stones can still be seen in some museums). According to some generals and / or emperors (for example Nerva), these stones symbolized power and were of extreme value. An author of the empire who gave detailed information (for the time) is **Pliny the Elder** . In the 37th chapter of his encyclopedic *Historia Naturalis* (completed around 77 AD), Pliny illustrates the properties of precious stones known at the time. Among the properties attributed to the 6 types of diamond treated by the Latin author (Indian, Cypriot, Macedonian, Arab, Ethiopian and "canchero" as well as the reference to the mysterious *androdamas / argyrodamas and gallaica stones*) , there are the one that sees the diamond **yield to the fresh, warm blood of a goat** (i.e. to become vulnerable after being immersed in such fluid) and this stone's dislike for the magnet. These hypotheses remained commonly accepted, especially in Europe, until the late Middle Ages and beyond. Already in the X / XI these theories had been dismantled with the simple help of logic. To do so was, for example, **Al Biruni** . Biruni was a Muslim scholar and scholar who traveled to India in the early 11th century. His testimony had a lot of influence in **the Arab world** in the following centuries, less so in the Christian one. Biruni was certainly among the first to use **a hydrostatic balance** (which measures the density of a body by immersing it in a solution of known density) to determine the density and purity of metals and precious stones.
Around 600, deposits were discovered in Borneo (which, however, some sources give as active only from the XIV-XVII century AD), this increased the diamond trade in Southeast Asia.
With the fall of the Roman empire of the West, **even the already few diamonds present on its territory evidently decrease** . East-West trade declined and so did the demand for certain luxury goods.

The diamond also lacks one of the characteristics required for the gems of the time: it is almost **impossible to model in a cabochon style** .
One of the few examples of diamonds used in this era seems to be related to a **Charlemagne jewel** . In this period, however, almost all precious stones were imported. Only quartz (and its varieties), chalcedony, amber, jet, freshwater pearls and coral could be found in early medieval Europe. India 's monopoly **on diamonds began to creak with the invasions of Muslim rulers** .
With the Crusades, which weakened the Eastern Roman Empire, **Venice** it became the privileged center of luxury goods from Asia (and beyond).
At the same time, in the European Middle Ages (a period of about a thousand years) the contrasts between tradition, superstition and religion followed one another. Among the figures who theorized on the coexistence of these doctrines is The Bishop of Rennes (1061-81), **Marbodo** . The transalpine prelate wrote a compendium called *Liber de lapidibus* , which had considerable weight in the religion / real life diatribe. As for the diamond, for example, Marbodo wrote: "This stone has an aptitude for the magical arts" and keeps away both nocturnal spirits and bad dreams, cures madness. For these purposes the stone "should be set in silver, armored in gold and fastened to the left arm." *Elsewhere* Marbodo wrote that *artemis* it could cause miscarriage in a pregnant woman. Superstitions and **symbolic values accompanied all precious stones (and not only) throughout the Middle Ages and beyond** .
Diamonds probably entered the lagoon city already in the Lombard period (around the 8th century), **but only around the 13th-14th century did they begin to work them, either in the Venetian capital or elsewhere** . This probably happened due to a concomitance of events. On the one hand, the machines and techniques for cutting or polishing precious stones. Arcolai, rotary piers, with cranks initially appeared in the world of textiles were adapted to other professions, including those of lapidaries, received a notable technological impulse. A greater number of gems continued to come out of the Asian countries of origin due to the continuous invasions. The greater amount of material also contributed **to a development of tastes** . It seems plausible to think that even if **the facet forms** were applied to glass, crystal (Fatimid, Arab, Byzantine and possibly Venetian glyptic art) and occasionally on precious stones to remove obvious inclusions that disfigured their appearance, they had a definitive due to their hardness and cleavage planes, flat and symmetrical cleavage planes). In Roman times and even in later periods, regular geometric shapes were not favored by jewelry connoisseurs. The prevailing current theory of the beginning of diamond faceting (pointed cut, table cut, etc.), attributes it to Venetian *diamonds* . There are no documents available that corroborate or refute this hypothesis. What is certain is that between the 11th and 14th centuries, the **diamond lost its "invincibility".** A curious, but perhaps indicative example lies in the word itself that indicates the gem. Precisely in these years, the adamas lost its a and became "tameable", while maintaining its aura of extreme hardness and purity. An example of this transition could be found in one of the most important works of Italic / European culture of the time: in the Commedia (original title of the work to which Giovanni Boccaccio then attributed the adjective "Divina") by Dante Alighieri (1265-1321) . In this masterpiece, the Tuscan author refers to the stone with 2 terms: **diamond and adamant** and, and uses them alternately in the 3 canticles.
Diamante appears for example in Canto II del Paradiso (around 1316) when Dante and Beatrice, eager to reach the Empire, go up to the Sky of the Moon, where the poet's curiosity is attracted by the appearance of a star. Beatrice senses Dante's amazement and urges him to thank God for allowing him to go up there: the sky appears to the poet as a shining cloud, like a diamond illuminated by the sun. Dante instead inserts the word adamante, which derives from the Greek adamas (indomitable), when he wants to indicate the physical characteristics of the gem, such as hardness (large, solid), luster and brilliance, when it is hit by a ray of sunshine.
By the 1500s, various forms of cutting already existed as evidenced by some documents of the time.
For example, in a list of jewels given by **Galeazzo Maria Sforza to Princess Bona of Savoy** (1449-1503), we find the names of some forms of facets of the time: " ***At the table, in poncta , in costa, ad facete, in a lump, a rosette, in chuore , a zuchetta , a spongete , a squared, a star*** . "
Around the beginning of the 16th century, the center of gravity of world trade began to shift from the Mediterranean to the Atlantic Ocean (and others). Venice lost its

central role over the years. Other cities, such as Antwerp, Brugge, Paris, Amsterdam, London etc. (in Europe) linked to migratory flows (for **example those of Jews** who often took charge of the processing and trade of diamonds, since these were on the one hand highly profitable professions, but on the other among the few granted to them in times of repression religious), the rise of military and commercial powers (as in the case of England and Holland) or simply due to a convenient geographical location.
The figure of **Louis of Berchen** (Lodewyk van Bercken or, in French, Louis de Berquem), a mysterious Flemish Jewish cutter of the fifteenth century who, according to tradition, not only introduced both a type of new machinery (the *scaife* , a polishing wheel infused with a mixture of olive oil and diamond dust invented 1456), but also created a new cut, the teardrop one. It is not known whether the native of Brugge was actually the creator of this innovation, it is certain that these innovations in the world of gems came into circulation in this period. Over time, cutters experimented with new shapes, sometimes with the simple aim of maximizing the value of non-regular rough stones (not all diamonds come in octahedral, dodecahedral, etc., indeed).
India, with its empires and territories, was still the only country of origin of diamonds (excluding the few gems that occasionally came from today's Kalimantan, Indonesia). The **reserves of the Asian country were running out** and in the eighteenth, there were few precious crystals that still came out of its almost exhausted alluvial deposits. Ironically, just as the major producer was languishing, a new one was discovered. Brazil soon became an excellent replacement for the Asian country. In both cases, the annual production was a fraction of the modern one. A good year furnishes about 50,000 carats of raw material of all kinds (from gem quality to what then as now, was not destined for jewelery, but rather for industrial uses). In this period, even the greatness of Venice as a lapidary center was exhausted. Northern cities such as Antwerp, Amsterdam and London (for the more sophisticated cuts) had become the new meccas of diamond makers.
Early indications of **Brazil 's diamond potential** were sporadic, but there is evidence that the crystals were found in **Bahia** over a century earlier than their official discovery. In one of the first descriptions, the historian **Pero de Magalhães Gândavo (1576)** mentioned the existence of "certain mines of white stones such as diamonds". In another account, Gabriel Soares de Sousa (1587) noted that fine eight-sided crystals, possibly diamonds, had been found during the dry winter months along some rivers. English adventurer Anthony Knivet , who was captured and later fled during a raid on Portuguese settlements in southern Brazil , described seeing what he believed were diamond crystals while living among the natives in the late 1890s. This would have been **another of the earliest reports of Brazilian diamonds** , although no details were provided and the crystals could have simply been quartz. Near the village of Arraial do Tijuco , Minas Gerais, at the beginning of the 1700s stories of unusually bright transparent crystals appeared that sometimes the gold diggers who flocked to the area in the late 1600s used as paperweights. In 1721, a gold miner secured several of these pebbles, which were later recognized as diamonds by someone who had traveled to the Golconda region of India. The discovery of Brazilian diamonds was also documented by Dutch explorer Jacob Roggeven / Roggewein , whose three ships anchored off the coast near Sao Paulo for a short time in November 1721 before resuming their voyage to the Pacific Ocean. Several crew members decided to defect to go to the diamond mining area. Eventually, reports of diamonds in Minas Gerais began to reach Europe. The accounts of the colonial governors came to the attention of both King John V and the Catholic Church in Portugal, and the discovery **was officially announced in 1729** . Between 1732 and 1771, over 1.5 million carats (about 42,000 carats per year) of diamonds were exported to Europe. Such production is considered minuscule by today's standards, but at the time it placed Brazil as the main source, eclipsing India's Golconda region. The need for manpower for harvesting operations coincided with the growth of the sugar cane business in northeastern Brazil. **Thousands / millions of slaves** were imported from present-day Angola, Congo and Mozambique to meet the needs of both industries.
Scientific discoveries also continued to advance. New theories and methods were being brought forward to identify and classify stones that were previously nearly indistinguishable. For example, around
In 1813 , Humphry Davy used a lens to focus the sun's rays on a diamond in an oxygen environment and proved that the only product of combustion was carbon dioxide, thus proving **that diamond is a carbon compound** . He later showed that at a temperature

of about 1000 ° C, in an oxygen-free environment, the diamond converts to graphite. The popularity of diamonds increased from the 19th century onwards thanks to the increased supply, the improvement of cutting and polishing techniques, the growth of the world economy and also thanks to innovative and successful advertising campaigns.

The **first diamond,** l " **Eureka** , was found by a boy named Daniel Johanes Jacobus Jacobs in **1866** , He was the son of a Dutch farmer, who did not suspect its value. In 1867 Dr. William Guybon Atherstone , Cape Colony 's principal mineralogist , claimed that the Eureka weighing 21.25 carats or 24 carats in its raw form was the first diamond discovered in South Africa. Its value was estimated at £ 800 at the time (then a carat was worth less than £ 10 according to schrauff scholar of the time). With the exhaustion of Indian resources, significant discoveries took place in Brazil, after **1867** , **South Africa** thus became the main world center for the production of this precious gem. After the first discovery in South Africa in 1866, near the sources of the Orange River, only alluvial deposits were exploited until **1871 .** Later it was discovered **the existence of diamond chimneys** , of which the best known is the Kimberley mine which gave its name to the mother rock of the diamond, **the kimberlite** . In fact, in 1869, some Boer prospectors had discovered diamonds near the craters of two of the largest kimberlite chimneys in South Africa, on the adjacent farms of Du Toit's Pan and Bultfontein , a few miles south of the Vaal River excavations. **In the late 1870s,** the "prospectors" created a base camp near the mining town of Kimberley - and began excavating, effectively revealing the first 2 kimberlitic chimneys in history: the Du Toit's Pan and the Bultfontein . The other two large kimberlite cones were identified a few months later. The 2 craters, which would become known as **the De Beers and Kimberly mines** , were discovered on an adjacent farm, Vooruitzicht , in May and July 1871 respectively. While in the previous 4 years, there were at most 10,000 prospectors in the river excavations, by the end of 1871 **there were nearly 50,000 people encamped in the new dry excavation** , actively exploiting the richest diamond hoard in the country. Just in that year, the future diamond magnate and British imperialist, Cecil Rhodes, then 18, was sent to assist his brother in business in South Africa. During the late 1870s and early 1880s, the merger of numerous diamond mining operations was increasingly recognized **as the only solution to ensure the longevity of the industry** . De Beers took an early lead in the merger rush, absorbing most of its smaller competitors in the last quarter of 1886. By May 1887, Rhodes, his competitor, had taken over the Victoria Company, the latest competitor in the De Mine. Beers. Eventually, Rhodes also took control of De Beers. As De Beers lacked the liquid capital to make an outright offer to purchase the French company, the last bastion of the monopoly, Rhodes, with the assistance of De Beers' GM William Gardner and the powerful financier **Alfred Beit** , they secured the financial support of **Nathaniel Rothschild** , head of Europe's richest financial house and an active speculator in diamond stocks. With financial assistance from Rothschild, Rhodes was able to offer four-fifths in cash for the French company. Barney Barnato , who owned the last fifth of the shares in the French company, blocked De Beers' purchase of the French company for some time, urging the owners of those shares to resist better conditions. Eventually Rhodes overcame the obstacle and, in **1888,** created the famous company **De Beers Consolidated Mines** .

The **Second Boer War was** a great threat to De Beers: the city of Kimberley was besieged and Rhodes himself had to work through pressure on the British government to get out of a situation that dangerously threatened the company's major interests. Rhodes himself made available to the defenders of the cities all the armaments and ammunition he had at his disposal, as well as the raw materials to build new weapons in the mine yards. Upon Rhodes's death in 1902, De Beers held 100% of South African production and 90% of world diamond production.

Southern Rhodesia (now Zimbabwe) and Northern Rhodesia (now Zambia) were named after Cecil Rhodes. By the mid-1890s Rhodes created the **Diamond Syndicate , which was the forerunner of the Central Selling Organization (CSO),** a more modern group of financial and marketing organizations that came to control much of the world's diamond trade. Another important branch of the "Company" is the **Diamond Trading Company (DTC),** which deals with social relations and advertising. The CSO is the central sales organization acts as a clearinghouse for the entire industry. Adjust the quantity and price on the market. Packets of diamonds are bought and sold to special traders, called ***Sightholders*** in events (called ***Sights***) that were once held ten times a year in London on a *take-or-leave basis* and which **have been moved to Botswana**

since 2011 . In the 1980s, De Beers had about 300 sightholders, privileged but chained buyers, today (2022) there are only 97. Since it remains a privilege to witness the sights of the CSO, few traders dare to refuse a package offered to them. . Attempting to bargain on the quantity and price of the package offered could result in the viewer not being invited again. Over 80 percent of the world's diamonds were traded through the CSO in its early days.

The discovery of large diamond mines near Pretoria and along the coast of German South West Africa (now Namibia) in 1902 and 1908 , respectively **, severely weakened De Beers' control of the diamond market** . **Ernest Oppenheimer** , who had founded the Anglo-American Corporation in 1917, began to engage aggressively in the diamond industry in the 1920s, gaining control of the South West African mines and in 1925 creating a new diamond syndicate. He bought a seat on the De Beers board in 1926 and became president **in 1929 .** From this position Oppenheimer **strengthened the monopoly** on diamond marketing initiated by Rhodes. In the 1930s, during the Great Depression, world demand for diamonds dropped significantly, forcing De Beers to close several mines. To increase sales, the company turned to advertising agency NW Ayer and Son, which soon managed to persuade the American public to associate diamonds with social status and romance. The highly successful slogan " **A diamond is forever** " was coined by **Frances Gerety** , agent of NW Ayer, in **1947** . Subsequent advertising campaigns successfully linked diamonds to the rich, comfortable, and safe suburban lifestyle that many Americans aspired to in the 1950s.
In 1939 - the Gemological Institute of America, (in collaboration with De Beers) launched the industry's first universal diamond grading system, **the 4Cs: cut, color, clarity and carat**.
Starting in the 1960s, De Beers pursued numerous campaigns, often using movies and famous people, to increase the demand for diamonds. Among the initiatives of note were the introduction of bespoke jewels for special occasions, such as wedding anniversaries (the "eternity ring") and rites of passage (the "sweet 16 pin"). The diamond "tennis bracelet", advertised in the 1980s (after it was worn on the courts by the number 1 tennis player, Chris Evert). In **2001** De Beers began marketing **the "right ring"** for single women, conceived as a symbol of independence and self-sufficiency.
De Beers silently continued to control the world crude oil market until the 1990s. Between 1980 and 2000, huge new fields were opened in Australia, Russia and Canada. Already in previous years, many African countries had proved fertile ground for diamond prospectors. Angola, Zaire / Congo, Namibia, Zambia, Zimbabwe, Ghana, Sierra Leone, Tanzania had turned out to be important diamond deposits during the twentieth century. However, the Company (as De Beers is often referred to) had always managed to secure the main production of these new mines. By **1978** , **diamond prices had skyrocketed , thanks to a mix of financial speculation, post-oil crisis lowering and other political** factors . A carat of this gem in the late 1970s was worth around 60,000 USD. This explosion also led to the birth of specialized companies such as **Rapaport** , still today the reference point for diamond prices all over the world, despite recent (and past) controversies related to the company.
The thud in the cost of these gems that began from **1980** gave a big blow to the sector (in fact even today almost no one mentions it). The concomitant influx of millions of carats of crude from the new sources of Ekati / Diavik (Canada), Mir (Russia) and Argyle (Australia) and the speculations of figures such as the Uzbek Lev Leviev (battle name meaning Lion of the Lions) **led to the progressive crumbling of the Single Channel (De Beers' monopoly) and the birth of the multiple one** (which included companies such as the Russian Alrosa, the Australian Rio Tinto etc.). This system continues to the present time. **World production** it went from a few thousand a year, before the discovery of African deposits, to about one million id carats at the beginning of the 1900s, to reach the peak of 177 million carats in 2005 and settle at the current 130-150 million carats annuals in recent decades (but only about 120 million in the era of Covid restrictions).
The new challenges in the world of diamonds today come from both **synthetic stones** and the so-called ***blood diamonds*** . Starting from the second half of the last century, the proceeds that came from the sale of gems that came from some states (mainly African, and for a short period also Venezuela) were used to subsidize wars of repression by dictatorial governments (often piloted shadowed by more powerful European and North American nations). To counteract the trade in these gems. The **Kimberly Process (KP or KPCS,** officially launched in 2000, today (2022) it has 85 signatory countries, of

which 27 European-EU states are listed as one of them) . Officially, the overwhelming quantity (the site declares that 99.8% of the current world production); diamonds mined in the world must now obtain this certification in order to be placed on the market. In fact, these policies have left many open points. While opposing the direct sale of diamonds linked to nations plagued by years of civil war (many of them have not been since the turn of the millennium, however, in states like DR Congo such disasters persist), the KP fails to address problems such as those linked to the exploitation of miners, sometimes even at a young age, those related to the relatively simple falsification of documents or circumvention of the rules and to the fact that the restrictions are applied only to producing countries, but not to buying ones (in which dictatorial regimes may exist or defined as such by the international community, however highly corrupt.
In the last 2 years, the big names of this world have promoted in unison the traceability of gems, the need for the sustainability of their extraction. Both policies are often addressed to the new generations (millennials and Gen Z), more voracious of internet news and interventions, at least in intention, beneficial. In this context, even artificial stones, whose cost has dramatically dropped over the last 10 years, and new software / applications that allow you to follow the life of a diamond, from its extraction to its sale and based on blockchain technology. **Given the concomitance of galloping inflation, uncertainties in the markets** (currently falling rather sharply) and cryptocurrencies (Bitcoin temporarily below 30K USD) and national restrictions piloted by supranational authorities, it is difficult to indicate a future with certainty. It is probable that between the final part of 2022 and the following years, the world economy will suffer several blows of adjustment. If diamonds continue to be an alternative asset of refuge and investment, it will probably be seen within the next five years.
For more details, you can consult my books:
The 4 eras of the diamond (formation and history / time line up to 1300, in Italian)
https://www.lulu.com/en/gb/shop/dario-marchiori/le-4-ere-del-diamante-era-i/paperback/product-8dy99v.html?page=1&pageSize=4
or
DiamondZ are for now (timeline in English, through 2017)
https://www.amazon.com/DiamondZ-are-now-journey-through/dp/1641366419 (also on other Amazon sites, with price variations from country to country)

Synthetic diamonds

The first single crystal man-made diamonds **(HPHT process) were produced in 1953 by ASEA in Sweden,** the first **polycrystalline stones (CVD process)** in **1952** by the Union Carbide Corporation, USA. The GE company, too, had managed to create pure carbon crystals in **1954** , as part of a project code-named " **Project Superpressure** ". This initiative began in the 1940s, but the Second World War slowed down the works. For years, scientists experimented with various methods, temperatures and pressures to make diamonds from carbon. A team of scientists, including both Herbert Strong and Howard Tracy Hall, received credit for this discovery, and GE was able to **create gem-quality crystals beginning in 1971** .
Gem-quality synthetic diamonds therefore came into circulation **from the 1970s,** but were actually commercially available, in minimal quantities, only from **the late 1980s** . Until then, GE diamonds (the US company General Electric), produced through the HPHT process were too small for the use of gems and were commonly used for industrial purposes. However, this discovery paved the way
Between **2013 and 2014** , when the Russian company New Diamond Technology (and Dr. Andrei Katrusha first created **large, perfectly colorless and clean HPHT synthetic diamonds** . New Diamond Technology achieved this goal thanks to a new design, so-called " **cubic HPHT presses** " from China, combined with improved technology. Since then, synthetic diamonds have started to become a real problem for the precious metals market . Today, most of the manufacturing facilities are located in China and in India. Until **2003** all **gem quality synthetic diamonds** were produced with the HPHT process, after which the Apollo Diamonds USA company announced the successful growth of single crystal gem quality synthetic diamonds **using the CVD process** . process was heralded as revolutionary, as it could produce colorless rather than colored material, the year 2003 set The rise of synthetic diamonds began, although it took another nine years (**in 2012**) for CVD synthetics to actually become commercially available. **In 2010** , Gemesis - another company that had previously marketed colored HPHT synthetic diamonds - began producing CVD synthetic diamonds on a larger

	scale. Only since 2012 have CVD diamonds actually been commercially available through Gemesis and, on a smaller scale, through other companies such as **Scio** (which had acquired Apollo Diamonds), **Orion and Soni** . However; the overall production was still minimal compared to natural stones. **Name** : Adamas and Vajra - Etymologies and Comparisons The name **diamond** comes from the ancient Greek ἀ δάμ ας (adámas), "unalterable", "indestructible", "indomitable", from ἀ - (a-), "non-" + δα μdam (damáō), "I overwhelm", or I "tame". The Asian / Sanskrit term **vajra** indicated 2 distinct things: the "diamond" or the "lightning bolt". It also referred to a kind of battle weapon used by the god Indra. In Tibetan Buddhism this same object-stone-weapon is indicated by the name of **Dorje** Etymology: Vai = Mouth, Ra = Light, Vaira = Portal of Light. In Sanskrit it also took on the meaning of diamond club or scepter. Other trade names: / **Varieties** : Colored varieties - Fancy diamonds - Fancy color diamonds
Property attributed	**Modern Beliefs:** Enhances the functions of the brain. Purify the bodies, drive out negativity. It gives abundance, innocence, purity, fidelity. It should be used with caution as it radiates a very powerful energy. The light it gives off can be destructive to a spiritually weak person. Even given their cost, diamonds have the power to remove any inferiority complex. It is often prescribed as a panacea for the **creative blocks suffered by artists** , writers and actors. Those who believe in the powers of gemstones credit the diamond with the power to ward off negativity and maintain good health. Some famous diamonds are believed to be **cursed** : the Regent, The Orlov, The Hope Diamond, the Koh-i-Noor (can only be owned by a woman). **Natural, physical, optical, electrical properties** The diamond is the **thermodynamically unstable form of carbon** which, in theory, according to the second law of thermodynamics, should completely transform into graphite. This does not happen because there is a need for a translation of the carbon atoms which, being bonded to each other in a tetrahedron structure, are kinetically prevented . Therefore the diamond is unstable from the thermodynamic point of view but **stable from the kinetic point of view** . In other words, it is a **metastable material** . Diamonds have a multitude of applications, thanks to their exceptional physical and chemical characteristics. The most relevant are the extreme hardness, the high optical dispersion index, **the very high thermal conductivity** , the great resistance to chemical agents and the very low coefficient of thermal expansion, comparable to that of invar. Diamonds are **highly water repellent** : water does not adhere to their surface, forming drops that slide off easily. A diamond immersed in water and then extracted will be perfectly dry. On the contrary, fats, including any type of oil, adhere very well to their surface, without affecting them. Resistance **to chemical agents is very high** : diamonds are not affected by most acids and bases, even in high concentrations. It is the **10th and 60th wedding anniversary gem** . **Planet:** Venus **Month:** April **Zodiac sign:** Aries (but also beneficial for Pisces or Scorpio) **Chakra:** Crown
Treatments	**Laser drilling:** Diamond makers can use lasers to remove or lighten a dark-looking inclusion by making a small hole at the site of the inclusion. The laser can cause the inclusion to vaporize or the treatment can apply bleach or acid to further lighten the inclusion. Recoating using diamond-like materials / carbon (DLC) and fine layers of synthetic diamond, can cover the entry holes related to drilling using the LASER. **Filling of the fracture:** The infusion of a molten lead glass-like substance into fractures of a diamond is the most common diamond treatment used to improve clarity. Crack filling of cracks that reach the surface can effectively mask these features. **Treatments to enhance the color** **Irradiation:** Irradiation can produce green, blue, brown, yellow, black and other colors. Sometimes this process will be followed by annealing. Irradiated diamonds are sensitive to heat, and jewelry repair, cutting, and re-polishing procedures can change their colors.

	Annealing : This is a controlled heating and cooling process that is often used after irradiation to change a diamond's color to brown, orange or yellow. It has been reported to produce pink, red and purple colors as well. When annealing is used alone, it can change the color in series, generally from blue to green, from brown to yellow. The treatment is stopped when the desired color is reached. If heat is subsequently applied to an annealed diamond during routine jewelry repairs, it can drastically alter its color. This 0.55 ct brown-orange-red round brilliant cut synthetic diamond has been treated by irradiation and annealing to produce its red color. **High pressure, high temperature (HPHT):** HPHT treatment uses machines that are essentially the same as those used to grow synthetic diamonds. The HPHT process can turn some colorless brownish diamonds or turn these brownish stones into other colors such as yellow, greenish yellow or green. This process is also associated with pink, blue and yellow-orange diamonds. HPHT is considered a lifelong process. It is sometimes followed by annealing and irradiation which can produce colors ranging from pink to red to purple. **Coating** : Silica coatings can be applied to colorless or near colorless shiny diamonds to produce a variety of natural looking fancy colors, including pink, orange, yellow, blue and purple. The coating is strong enough but not permanent. Coated diamonds can be damaged by heat and chemicals during jewelry repairs and polishing. They can also be scratched.		
Synthetic counterpart	There are 2 types of single crystal synthetic diamonds: **CVD** (chemical vapor deposition) diamond and **HPHT** (high pressure and high temperature) diamond.		
It can be confused with	**Moissanite synthetic (separable through: doubling, dispersion, inclusions), Zircon colorless** (separable through: double regenerative), **Cubic Zirconium / CZ** (separable through: optical character, spectrum, splitting), **Strontium titanate** (separable through: dispersion, SG, inclusions), **YAG** . (separable through: SG, dispersion), **GGG** (separable through: SG, luster), **Synthetic rutile** (separable through: optical character, dispersion, splitting), **Sapphire / Natural / synthetic spinel colorless** (separable through: optical character, luster, dispersion), **doublets / triplets** (separable through: inclusions, luster).		
Indicative gemological tests	Standard gemological tests can generally separate natural diamonds from their simulants (imitations). Microscope, polariscope, visual examination, specific gravity, etc., are usually sufficient for		
Value (2021)	**High :** 200,000+ $ / ct **10 carat +**	**Medium: $** 15-60,000 / ct **1-2 carats**	**Low:** $ 1,000-5,000 / ct **below the carat**
	The four factors that determine the value of the diamond are **the four "Cs",** from the initials of the four terms in English that is: color (color), clarity (purity), cut (cut) and carat (weight). **Color** (in English Color): the completely colorless and transparent gems, which are the purest, are defined " Colorless ", marked by the letter D. Followed by the almost colorless or " Near Colourless "and the colored or" Slighty Tinted ". Some European states or regions or cities or entities (Antwerp, New York, Switzerland, Scandinavia and France) have adopted various sub-nomenclatures for the three classes of colors described above. Diamonds can take on almost any color, which is due to impurities or structural defects: amber yellow and brown are the most common, red, pink and blue are the rarest. It should be noted that colorless diamonds do not appear as such to the eye, as the facets reflect the colors of the surrounding environment, as for other colorless gems, by moving them the colors change rapidly (this effect, very intense in diamonds, is called "brio" or "fire"). "Black" diamonds are not really black diamonds, but rather contain numerous inclusions which give them a dark appearance, although nowadays, due to the market demand, poor quality diamonds are artificially treated to obtain this color. When the color is sufficiently saturated the stone can be defined by the gemologist as a fancy color diamond (in Italian it can be translated fantasy), otherwise they are classified by color with the normal color scale of the other diamonds. Most of the impurities in diamonds replace a carbon atom in the crystalline system, and are called a "substitutional impurity". The most common impurity, nitrogen, causes a more or less intense yellow color depending on the concentration of nitrogen present.The Gemological Institute of America (GIA) classifies diamonds of low saturation yellow and brown as diamonds in		

	the normal scale of the color, and applies a rating scale from 'D' (colorless of exceptional purity) to 'Z' (light yellow). The GIA classifies diamonds that have an intense color with the term fancy (which can be translated as fantasy). The rarest color is that of red or pink diamonds (which never reach considerable size), followed by blue and green ones. The red diamond is found only in the Argyle mine in Australia, where a few specimens are extracted a day and almost never weigh more than 0.5 carats. This gem, which is by far the rarest in the world, can cost up to 100,000 euros per carat. Purity (in English Clarity): inclusions are often and improperly called "carbons" and can be of different types; in fact, garnet crystals but also diamonds can be found, however natural cracks (or "glazes"), traces of flaking and "growth lines" of the original gem are considered defects. If a gemologist finds one of these latter inclusions, he can define the stone as IF (Internally Flawless) instead of F (Flawless) (see table below). To deepen the purity of the diamond, it is necessary to use suitable 10 magnification lenses: the diamonds must not have impurities, the so-called carbons, and internal fractures, the so-called glazes. Cut: before cutting, the cutter must take into account the shape of the blank, the cut he wants to obtain, the proportions of the cut, the symmetry. Based on the quality of the cut, the diamonds have been divided into three categories: " very good" (symmetry / perfect proportions or with irrelevant defects); "good" (lower symmetry / proportions); " poor " (poor, with larger and / or numerous defects). Weight (in English Carat): Diamonds are weighed in carats. One carat is exactly equal to 0.2 grams. The carat can be divided into points that are equivalent to 1/100 of a carat, in the past the grains that are equivalent to 1/20 of a gram were also used.
Typical cut	Diamond cutting includes three operations: **Cleavage** : this operation consists in hitting the diamond rough piece with a sharp blow so that the piece is reduced to an octahedral shape (this is necessary if the piece is not already octahedral in shape). The proportions to get a good brilliant cut are: upper part (called crown) = ⅓ of the total of the total piece; lower part (called pavilion) = ⅔ of the total (however some recent pieces the height may correspond to slightly more than ⅔ of **the** total); **Roughing** : with special means the main faces are sketched; **Polishing** : it is the actual cut of the diamond. This operation refines the existing faces, creates the minor faces and then polishes the piece by means of various ***dopps*** (pincers) that press the stone against the cutting wheel.
Famous stones	Among the most famous cut diamonds are: The Kohinoor or **Koh-i-Noor** is one of the largest cut diamonds and weighs **105.6 carats** . When it was extracted from the Kollur mines in India, it weighed 186 carats. It has an oval brilliant cut and is colorless in nature. It has an ancient and mysterious history. **the Regent** Considered to be one of the most beautiful and pure diamonds in the world, the Regent diamond weighs 140.64 carats. It was found before the end of the 17th century. **Centenary** Diamond weighs 273.85 carats and is colorless of grade D, which is the highest grade of colorless diamond with absolutely no flaws. It was first discovered in 1986. The **Taylor-Burton Diamond** It was found in the year 1966 in the Premier mine in South Africa. The rough was 240.80 carats and was cut into a 69.42 carat drop cut diamond. As the name suggests, Richard Burton bought it for $ 1,100,000 and named it as a gift to Elizabeth Taylor. **The Sancy** 55 carats, it was cut in the shape of a drop and was owned by **Charles the Bold** , Duke of Burgundy, who lost it in a battle in 1477. The stone is in fact named after a subsequent owner, Seigneur de Sancy, French ambassador to Turkey at the end of the 16th century.
Record stones	The largest diamond ever discovered was not a transparent stone, but a "carbonado" nicknamed "Sergio", from the name of its discoverer. It weighed a gigantic **3,167 carats** (633.4 g; 20.36 ounces) and was found on the surface in Lençóis (State of Bahia, Brazil) in 1895 by **Sérgio Borges de Carvalho** . Like other carbonados it was believed to be **of meteoritic origin** . **gem** -quality rough diamond belongs to the **Cullinan** , found in 1905 in the Premier Mine of South Africa. Perfect in clarity and color, it weighed **3106.75** carats; cut into 105 worked stones, the largest, **Cullinan I and II** , weigh **516.5 and 309** carats (until 1988 the

	largest worked diamonds). Currently the largest worked diamond is the **545.67 carat Golden Jubilee,** found in 1985 in South Africa. The 15 largest colorless rough diamonds: 1. Cullinan - 3106.75 carats (also recently recovered the 2. Sewelô - 1758 carat 3. Unnamed diamond from 1174 carat from Lucara 4. Lesedi La Rona - 1111 carats 5. Debswana - Untitled - 1098 - carats 6. Unnamed 998 carats 7. Excelsior Diamond - 995.2 carats 8. Star of Sierra Leone - 969 carats 9. Lesotho Legend - 910 carats 10. Incomparable - 890 carats 11. Constellation - 813 carats 12. Koh-i-Noor - 793 carats 13. Millennium Star - 777 carats 14. Woyie River - 770 carats 15. Vargas - 726.6 carats