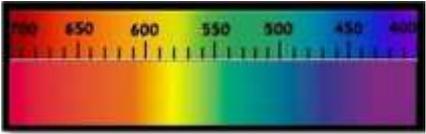


**Warning: this version has been completed with Google Translate , it certainly contains errors or inaccuracies.**

## Technical details - general: Black, White, Salt and pepper diamonds

Gemma - names	( Italian - Diamante) ( English - Diamond) ( French - Diamant) ( Spanish -Diamante) ( Portuguese - Diamante) ( Thai - เพชร phechr )	( German - Diamant ) ( Arabic - الماس almas) ( Russian - Алмаз Almaz ) ( Mandarin - 钻石 zu à nsh í ) ( Swahili - Almasi) ( Hindi - हीरा heera )	photo
Colors (GIA)	<p><b>The (real) natural black diamonds</b> : they are colored by countless microscopic particles trapped in the crystal lattice of the gem's structure during the formation process. These microscopic grains should not be classified <b>as impurities, but as inclusions</b> , because they are an integral part of the gem. They often form a strong concentration of "clouds", scattered more or less randomly inside the gem (and not just near the fractures) that absorb the light, offering an anomalous brilliance and a sometimes metallic, non-transparent appearance to the gem. The actual base color of a natural <i>fancy black diamond</i> is not necessarily black, but can vary from <b>gray, brown or dark "olive" green</b> . These crystals may also have flaking planes and / or (thousands) of microscopic fractures, darkened by <b>graphitization processes</b> , making them more vulnerable than colorless diamonds. In addition, the <b>surface</b> of natural black diamonds is dotted with tiny holes, a reminder of the mini-crystals that occupied them before polishing.</p> <p>White or <b>milky diamonds</b> ( <i>Milky</i> in English) are little known. These are type IaB gemstones that are essentially <i>translucent or opalescent</i>, rather than transparent. They are sometimes confused with highly fluorescent diamonds (which take on a slightly "foggy" or "greasy" appearance), but they are not the same thing.</p> <p>Salt <b>and pepper diamonds have a mottled / speckled</b> appearance due to their many visible inclusions and imperfections. The subtle distributions of these black and white internal features give the stone its unique appearance. Basically, a salt and pepper diamond does not shine like a colorless one because less light is refracted through its interior. Instead, it has a kind of grayish appearance in some parts, whitish in others, and glistening in places in the right light. Typically the dark inner features stand out on the transparent and colorless stone body, but other combinations are possible.</p>		
Cause of Color	<p>Black <b>diamonds</b> usually contain a high density of light-blocking mineral inclusions. Among these, the most common are: graphite, pyrite or hematite. The black color in heavily disintegrated diamonds can be caused by the graphitization of the fracture surfaces. In reality, they are not black but very dark (brown or green).</p> <p><b>White Diamonds:</b> These gems are colored by <b>nano-inclusions</b> (mainly nitrogen) not visible to the naked eye, but identifiable through an electron microscope (20 microns in size). The light hitting these mini-particles spreads out and scatters creating this characteristic hazy appearance. <i>Fancy white</i> diamonds they are predominantly , over 80%, <b>of type</b></p>		

	<p><b>1aB</b> (four nitrogen atoms surrounding a vacant atomic space). and it is generally considered the final product of the nitrogen aggregation process; geologically young diamonds show nitrogen as single isolated atoms that merge over geological time in pairs (aggregates A), so the white ones are of more ancient formation.</p> <p><b>Salt-and-Pepper Diamonds:</b> Black (pepper) is related to carbon / graphite inclusions - not crystallized, while white (salt) is derived from nitrogen / other impurities - defects in the internal structure. The distribution of black and white inclusions gives the stone its unique appearance. Usually, these internal features are made up of opaque minerals such as <b>graphite, hematite, native iron, and pyrite</b> .</p> <p><b>Allochromatic Gem</b></p>		
<b>Classification</b>	<b>Mineral class</b> Native non-metallic, mineral	<b>Species - Group (mineral)</b> Diamond	<b>Variety</b> Diamond (fantasy) white / black / salt-pepper / milky
<b>Optical properties</b>	<b>Specific Gravity:</b> 3,516-3,525 Common: 3.52	<b>RE:</b> 2.417 <b>Polariscope</b> :SR <b>Birefringence:</b> The birefringence of polarized light is normally present in diamonds	<b>Character optical</b> Isotropic <b>Pleochroism</b> NO
	<b>Luster (luster) - luster of the fracture</b> Diamantina - <i>adamantine</i>		<b>Dispersion (fire)</b> 0.044
<b>Light</b>	<b>Fluorescence</b> SWUV (254 nm) : inert LWUV (365nm ) : inert ( <b>Black</b> ), generally blue, light to very intense ( <b>white</b> ), variable (salt and pepper)		<b>Phosphorescence</b> Variable
<b>Form</b>	<b>Crystalline dress</b> Octahedral, dodecahedral, cube-octahedral, spherical or cubic <b>Melting point:</b> 4.027 ° C, Burns above 700 ° C in air.	<b>Phenomenal optical effects</b>  /	<b>Crystalline system</b> Cubic Monometric <b>Crystal class</b>
<b>Chemical formula</b>	Carbon (typically 99.95%)  <b>C.</b>		<b>Spectrometer image</b>  Not indicative
<b>Fracture</b>	<b>Flaking</b> Distinta - octahedral (4 directions)	<b>Breaking- Parting</b> . Twinning law of the common Spinel (which produces "macle")	<b>Fracture</b> Complex, irregular
<b>Durability</b>	<b>Hardness (Mohs) - Absolute</b> 10; 1600 <i>(with variations in directional hardness)</i>	<b>Toughness</b> Fragile (depending on the number / nature of inclusions)	<b>Stability</b> (heat, light, chemicals) Excellent
<b>Clarity - characteristics</b>	<p><b>Black diamonds</b> : crystals of graphite (C), magnetite (Fe3O4), hematite (Fe2O3), pyrite (FeS2) and / or native iron (Fe, Siberia), in variable numbers.</p> <p><b>White diamonds</b> : These gems are colored by <b>nano-inclusions</b> (mainly nitrogen) not visible to the naked eye, but identifiable through an electron microscope (20 microns in size).</p> <p><b>Salt and pepper diamonds</b> : The purity of salt and pepper diamonds is not a problem in the traditional sense because the presence of inclusions is the main attraction. Gray body colored diamonds sprinkled with black and gray inclusions which give them personality are considered to be one of a kind gems containing distinctive landscapes and constellations.</p>		
	<b>Guy:</b> NA	<b>Transparency (commercial) - transparency</b> Transparent	
<b>Deposits - types of rocks</b>	<p><b>Black diamonds:</b> Black diamonds are quite rare, also because most of these stones end up in the "industrial" category. The alluvial deposits of Marange have been a constant source of diamonds containing high amounts of graphite for several years, although probably not the only source of black diamonds of this type. Additionally, Marange is unique as a source of diamonds exposed to high levels of radiation, many of which</p>		

	<p>contain abundant brown radiation spots in the fractures that contribute to their fancy black coloring.</p> <p><b>White diamonds</b> : Several researchers have studied <i>milky diamonds</i> and have concluded, based on mineral inclusions, that these type IaB diamonds originate from the transition zone or lower mantle (400–670 km deep). These gems were probably subjected to unusual conditions, such as higher pressures and temperatures corresponding to a greater depth. Such conditions may have instigated complete aggregation of the B centers, and the elevated temperature may have promoted some of the other unique features observed, such as platelet destruction and the formation of dislocation loops.</p> <p><b>Salt and Pepper Diamonds</b> : Many of these gems come from the Kalimantan alluvial deposits in Indonesia, their origin is unknown as there are no known primary deposits on the island. Other known sources are Botswana in Africa and Russia.</p> <p><b>Geological age</b> : 100 million-3 = billion years</p>
<b>Characteristics of rough stones</b>	<p>Never of regular octahedral shape if type II (nitrogen deficient and of super-deep origin). Black diamonds can appear with irregular shapes or as cubes / cuboids. Even white ones, given their origin at greater depths than most stones, can be irregular in shape. Salt and pepper buds can appear in both rhombohedral (octahedra, dodecahedron, etc.) and irregular forms.</p>
<b>Main deposits</b>	<p><b>Black Diamonds</b> : The geographic sources of most <i>Fancy Black diamonds</i> (not to be confused with <i>carbonados</i> ) are uncertain and these are probably quite rare in most mines. If colored by mineral inclusions, the possible origins are different. Many black diamonds that contain patches of radiation may come from mines known for natural material irradiation <b>such as the alluvial ones of Marange in Zimbabwe</b> . Although several reports have reported the existence of black crystals whose color is due to non-carbon-bound inclusions, most of the samples from the <b>Mir mine in Siberia</b> (Russia), which is also a known source of pink to purple diamonds.</p> <p><b>White diamonds:</b> Mato Grosso, Brazil; Panna mines, India, Canada.</p> <p><b>Salt and pepper diamonds</b> : Kalimantan in Indonesia, Botswana, Russia and possibly many other deposits,</p>
<b>Year of discovery</b>	<p><b>Uncertain:</b> the discovery of diamonds is very ancient, but all three types of diamonds have only gained visibility in the last few decades. Among them the black ones are the best known, while the white ones are among the least sought after.</p>
<b>History</b>	<p><b>Black diamonds:</b></p> <p>Author JR Sutton wrote in his book <i>Diamond: A Descriptive Treatise</i> , <b>1928</b> : " <i>The ordinary black diamond is not very different from the dark sealing wax</i> ." This old comment is perhaps emblematic of how black diamonds have never enjoyed great popularity. Until the late 1990s, there wasn't much demand for black diamonds. But since then, designers have started using them by creating a contrast with small colorless diamonds in pave settings. Over time, these gems have grown in popularity. Natural large monocrystalline black diamonds (made from a single crystal) are not easy to find, but artificially irradiated ones are relatively abundant and used in many jewelry throughout the world. American rappers and hip-hop culture made them legendary. The largest diamond in the world is not, as many think, the Cullinan, but a stone discovered in Brazil in 1895 and called Sergio, or Carbonado do Sergio. This black stone, with its 3,167 carats exceeds the Cullinan by 61 carats. Sergio is not however composed of a single crystal, but of a myriad of mini crystals (these diamonds are known as polycrystalline) and therefore, in reality, the Cullinan can maintain its primacy. Today, there is a particularly significant problem with colored diamonds as, as of 2010, virtually all of the author's yellow melee (small) diamond packs contained HPHT synthetic diamonds. Additionally, as of 2019 most brown melee diamond packs contained CVD synthetic diamonds <b>and as of 2020 gray and salt and pepper diamonds (included) often contain HPHT and CVD diamonds</b> .</p> <p><b>Fashion</b></p> <p>In <b>2021</b> , gray and brown diamonds were chosen as pillars for Pomellato's Nudo (nude) and Sabbia (sand) collections, while a crescendo of diamonds from clear to shades of gray to black distinguished a pair of the London designer's dramatic drop earrings. Glenn Spiro.</p> <p><i>salt and pepper</i> stones have often been presented in his collections by Nina Runsdorf , a New York jewelry store, since the company was founded in <b>2005</b> because "they add uniqueness.</p> <p><b>White Diamonds</b> :</p>

	<p>In <b>2015</b> , microscopic milky diamonds found in a mine in Canada's Northwest Territories <b>provided new key</b> insights into how these stones are formed. It is quite well known that diamonds are formed when carbon is compressed under extremely high pressure within the earth's crust. While time and pressure are important, these gems form like other crystals and need a reactive fluid to grow. A group of researchers say they have uncovered evidence that points to certain types of diamonds crystallizing in trapped pockets of seawater about 200km below the earth's surface. The bold conclusion comes from data taken from <b>11 tiny diamonds</b> with millions of fluid droplets suspended within them. When crystals form quickly, they can sometimes trap pockets of liquid inside them. The liquid is often the same reactive fluid in which the crystal grew, leaving clues as to how the gem was formed.</p> <p><b>Salt and Pepper Diamonds</b> : Only recently have these gems that have visible inclusions, as the name suggests, but not numerous enough to make them completely opaque, have gained some commercial success.</p> <p><b>Name</b> : The name diamond comes from the ancient Greek ἄ δάμ ας (adámas), "unalterable", "indestructible", "indomitable", from ἄ - (a-), "un-" + δα μdam ( damáō ), "I overwhelm ", or "I tame ".</p> <p>In India and surroundings: Etymology: Vai = Mouth, Ra = Light, Vaira = Portal of Light. In Sanskrit it also took on the meaning of diamond club or scepter.</p> <p>The 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 .</p> <p><b>Other trade names:</b> fancy black, fancy blacks (<b>blacks</b>), Galaxy / Galaxy, Salt + Pepper (<b>Salt and Pepper</b>), milky, cloudy / cloudy <b>fancy white, fancy whites (whites)</b>,  <b>Variety</b> : /</p>
<p><b>Property attributed</b></p>	<p><b>Black:</b> Natural black diamonds are quite rare, so they are often produced by chemically modifying dark green diamonds. They are considered less traditional than the classic clear / colorless diamond set in an engagement ring. Black diamonds can reflect the wearer's outgoing and alternative personality as well as passion, energy and action. For a bold statement, black diamonds are ideal. An old Italian belief states <b>that they absorb all love problems as a couple</b> . If so, using them as a wedding or engagement stone has its benefits. These gems are said to symbolize prosperity, strength and fidelity and also give courage to the wearer.</p> <p><b>White:</b> One of the most precious colors of the diamond, <b>white diamonds</b> represent eternal love.</p> <p><b>Salt and Pepper:</b> These gems don't appear to have properties specifically related to their appearance. They share their intrinsic qualities with the rest of the diamonds.</p> <p><b>Planet:</b> NA</p> <p><b>Month:</b> April (for colorless and fancy diamonds) <b>Zodiac sign:</b> NA</p> <p><b>Chakra:</b> root (<b>black</b>), / ( <b>white</b> ), / ( <b>salt and pepper</b> )</p>
<p><b>Treatments</b></p>	<p><b>Black diamonds treated</b> : they are partially colorless stones that have an extremely low value due to the high amount of inclusions contained in them. Since they are so <i>cloudy</i> , they are not normally intended for jewelry, however, with the help of treatments such as irradiation or heat (7–7.5 GPa and 1700–2200 ° C), they can enter the precious metals market. as very dark stones (their color is not evenly distributed in the crystals, but only around the cracks). Artificial irradiation can also produce such a dark green that the diamond appears black. Studies on some black diamonds from Marange also showed some examples where the clouds of inclusions, initially identified as graphite, were actually associated with <b>high amounts of hydrogen</b> . Often treated black diamonds do not have the dotted surface typical of their natural counterpart. The first treatments to produce the black color involved the presence of very high concentrations of defects. These defects were introduced by intensive irradiation treatment. Some of the earliest historically treated diamonds emitted measurable radioactivity and often show a dark greenish appearance when viewed through the pavilion, but appear black when viewed face up. These gems take on a <b>dark brown appearance when annealed after the irradiation treatment</b> .</p> <p>Today, the most common method of creating this black color is by heating a diamond to high temperatures in a vacuum , to allow pervasive graphitization of pre-existing cracks or inclusions. This is done on heavily fractured diamonds or diamonds that contain abundant clouds of micro-inclusions and often initially have a grayish appearance.</p>

	<p><b>White Diamonds</b> : There is no known treatment method to mimic the cloudy and hazy appearance formed by nano-inclusions in milky natural diamonds. However, a similar effect can theoretically be generated by annealing of nitrogen-enriched stones with center B and hydrogen by HPHT treatment.</p> <p><b>Salt and pepper diamonds</b> : Given the relative novelty on the market and the not too high value, added to the difficulty of a process to produce designs of inclusions such as those typical of salt and pepper stones, it is unlikely that there are currently treatments to create this type. of gems. In theory, the same methods of obtaining black diamonds can be applied to obtain moderately embedded stones. In the case of synthetic stones, the production of such inclusions could avoid further examination and make them pass for natural gems.</p>		
<p><b>Synthetic counterpart</b></p>	<p>There are 2 types of single crystal synthetic diamonds: <b>CVD</b> (chemical vapor deposition) diamond and <b>HPHT</b> (high pressure and high temperature) diamond.</p> <p><b>Synthetic black diamonds</b> : these stones are obtained from a periodic controlled texturing on a nanometric scale of the surface of a synthetic CVD (Chemical Vapor Deposition) diamond, capable of drastically modifying the interaction with solar radiation, from a good optical transparency up to solar absorption values even higher than 90% (almost total black). Surface texturing using an ultrashort pulse laser has been shown to induce outstanding optical and photoelectronic results. This success paves the way for future applications of black diamonds outside the world of jewelry.</p> <p>In addition, some CVD-created diamonds are produced with such a high concentration of nitrogen vacancy centers (NV) and, under direct light, appear patterned black, while they are reddish in transmitted light.</p>		
<p><b>It can be confused with</b></p>	<p>Black diamonds are often confused with <b>Carbonados</b> : these particular micro-crystalline "agglomerates" are found only in some areas of the planet: mainly Brazil and Central African Republic, but also in the district of Martapura (Kalimantan, Indonesia, whose mention is also found in old reports of Dutch merchant companies preceding the official discovery of the <i>carbonado</i> , which took place in Brazil in 1841). The tiny diamond crystals that make up these stones are intertwined in no precise order and are typically around <b>20-30 microns in size</b> . Carbonados appear as opaque aggregates, composed of various materials (not just microdiamonds). They are not classified by some scholars in the "diamonds" category, but in that of rocks. The intrinsic fabric that composes these minerals makes them extremely resistant, much more than monocrystalline diamonds (those used in jewelry).</p> <p><b>Black coated diamonds (or other materials) and composite stones</b> : the jewelry industry has, in recent years, witnessed the introduction of different types of faceted gems (diamond, topaz, quartz, cubic zirconia and others), <b>coated with thin layers colored or colorless surfaces</b> of substances such as aluminum oxide, diamond-like carbon (DLC) and synthetic nano-crystalline diamond . These covers were introduced to change either the color or presumably the appearance and / or durability of the coated stones. Even if the layers are only a few microns thick, they are sufficient to change some characteristics of the gemstones treated in this way and "cheat" some unwary buyers. A recent composite simulant involves the combination of a <b>CZ core combined with an outer coating</b> of amorphous diamond created in the laboratory.</p> <p><b>Possible imitations</b> for all three types:</p> <p><b>Moissanite synthetic (separable through: doubling, dispersion, inclusions )</b>, <b>Cubic Zirconium / CZ</b> (separable through: optical character, spectrum, splitting), <b>YAG</b> . (separable through: SG, dispersion), <b>glass (separable through: hardness, appearance, inclusions )</b></p>		
<p><b>Indicative gemological tests</b></p>	<p>To avoid mistakes, all Fancy black diamonds, regardless of whether their color comes from micro-inclusions, graphitizations or a high amount of defects, should be tested by a reliable gemological laboratory.</p> <p>The same goes for the other types of diamonds, especially if they are gems of a certain value.</p> <p>There are devices that are able to separate natural stones from simulants (imitations) such as CZ and moissanite and also devices to distinguish natural gems from those created in the laboratory. Typically, these machines are optimized for colorless stones and therefore their reliability for fancy diamonds is not always the highest.</p>		
<p><b>Value (2021)</b></p>	<p><b>High</b> : \$ / ct <b>Blacks</b> : 16.000+</p>	<p><b>Average</b>: \$ / ct <b>Blacks</b> : 5.000</p>	<p><b>Low</b>: \$ / ct <b>Blacks</b>: 1.000</p>

	<b>Whites:</b> 3000+ <b>S&amp;P:</b> 7,000 + <b>10 carat +</b>	<b>Whites:</b> 500+ <b>S&amp;P :</b> 1,500 <b>1-2 carats</b>	<b>Whites:</b> 200 <b>S&amp;P:</b> 150 <b>below the carat</b>
	<p>The four factors that determine the value of the diamond are <b>the four "Cs"</b>, from the initials of the four terms in English that is: color (color), clarity (purity), cut (cut) and carat (carat, that is weight) find a relative application in fancy stones. In the case of these types, the entry "clarity" has an impact linked to the singularity of the gems. The color "C" is also applied differently than colorless gems .</p> <p>There is also a classification system for <b>salt and pepper diamonds</b> . This method considers 5 grades, but it is used only by some companies that sell these stones (it is not an internationally accepted standard):</p> <p><b>SP1</b> Light Salt and Pepper  <b>SP2</b> Light to medium salt and pepper  <b>SP3</b> Medium to dark salt and pepper  <b>SP4</b> Dark to natural black salt and pepper  <b>CSP</b> Champagne Salt and Pepper with a golden hue.</p>		
<b>Typical cut</b>	<p>Black <b>diamonds</b> are often tougher to work with due to their large inclusions. They may even show a metallic luster or have an irregular surface or characterized by mini-holes resulting from the removal of inclusions.</p> <p>Milky <b>diamonds</b> , as well as traditional cuts such as brilliant, oval or pear-shaped ones, can be found on the <b>rose / rosette faceted market</b> .</p> <p>Many companies <b>specifically claim that they do not sell milky diamonds</b> . Often these stones are linked to a strong fluorescence which makes them undesirable to many. They are often regarded as <b>collectible gems</b> .</p> <p>Salt <b>and pepper diamonds</b> are often <b>rose cut</b> which have a softer luster than the traditional round brilliant cut. One of the qualities often associated with sellers is that they see salt and pepper diamonds as being more environmentally friendly. These diamonds require far fewer resources and time to mine, which makes them much less burdensome on the environment than regular diamonds. In addition they are often promoted as conflict free (Blood Diamonds).</p>		
<b>Famous stones</b>	<p><b>Black diamonds :</b></p> <p><b>The Black Orlov</b> (or Brahma's eye): a 67.50-carat, "gunmetal" colored, opaque and cushion-cut gem. It was named after the (mysterious) Russian princess, Nadia Vyegin Orlov, who would have owned it in the 1930s. It was discovered in the early nineteenth century in India and is one of the three gems resulting from the cut of the original 195-carat stone, has and is currently set in a diamond and platinum necklace.</p> <p><b>The Black of Amsterdam</b> : a 33.74 carat and 145 facet gem, extracted in South Africa (perhaps the only one ever recovered in this state) in 1972. It is drop-shaped and obtained from a rough of 55.85 carats. it was sold at auction twice until it reached a record price of \$ 352,000 in 2001.</p> <p><b>White diamonds and salt and pepper</b> : famous gems of these types are not known.</p>		
<b>Record stones</b>	<p><b>Black diamonds: The Spirit of de Grisogono</b> : the largest black diamond in the world (the fifth largest in the world ever). Starting at a crude weight of 587 carats, originally mined in the West Central African Republic. The resulting <b>mogul / moghul cut diamond</b> weighs 312.24 carats and is set in a white gold ring with <b>702</b> smaller colorless diamonds totaling 36.69 carats.</p> <p><b>White diamonds</b> : too uncommon on the market to be considered worthy of note in the case of gems of particular size, weight or price.</p> <p><b>Salt and Pepper Diamonds</b> : There is a 25-karat, salt and pepper diamond called <i>Starry Night</i> for sale online.</p>		