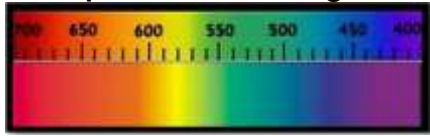


Warning: this version was completed with Google Translate, it certainly contains errors or inaccuracies.

Technical data sheet – general: **Goethite**

Gemma – names	Italian : goethite English : goethite French : goethite Spanish : goethita Portuguese : goethite Thai : โกเอทิต (k`oxi t)	German : Goethit Arabic : غويثيت (ghwaythyt) Russian : геотит (geotit) Mandarin : 褐铁矿 (hè sè tiě kuàng) Swahili : goethite Hindi : गेथाइट (gēthā'ita)	photo
Colors (GIA)	Goethite is a mineral that can present a variety of colors, including brown, yellow or rather yellowish, red, black and green. Color is influenced by impurities, hydration and the presence of other minerals associated with it. There are also specimens that show iridescence or rainbow effect (multiple colors).		
Cause of Color	The main cause of the color in goethite is the presence of impurities and inclusions of other minerals, which can vary depending on the location where it was found. Goethite is an allochromatic gemstone, meaning its color can be affected by external factors such as light and temperature. Therefore, its color may appear different depending on the environmental conditions in which it is observed. The oxidation state of iron in goethite is primarily ⁺³ . This oxidation state contributes to its reddish-brown to yellow-brown color. The presence of iron in the ⁺³ oxidation state also makes goethite an important component of iron ore deposits. Allochromatic Gem		
Classification	Mineral class Hydroxide	Species – Group (mineral) Goethite - Diaspore	Variety ---
Optical properties	Specific Gravity: 4.27 to 4.29 <i>Municipality:</i> 4.28	RI: 2,260 - 2,398 Polariscope : DR or AGG Birefringence: 0.138 (high)	Character optical Biaxial Negative
	Luster (luster) – luster of the fracture Adamantine, Silky, Matte (earthy), Metallic - Silky, Matte (earthy).		Pleochroism Strong
Light	Fluorescence SWUV (254 nm) : generally inert LWUV (365nm) : generally inert		Dispersion (fire) Moderate
Form	Crystalline dress Botryoidal, stalactitic, bladed, columnar Melting point: 1565°C	Phenomenal optical effects Iridescence	Crystalline system Orthorhombic Crystal class
Chemical formula	Iron hydroxide FeO(OH)		Spectrometer image  Not available
Fracture	Flaking Perfect (1 direction), moderate (1 direction)	Breakup- Parting May exhibit polysynthetic twin planes	Fracture Irregular, chipped
Durability	Hardness (Mohs) - Absolute 5.0-5.5; 48-60	Toughness Fragile	Stability (heat, light, chemicals) Stable
Clarity - characteristics	Being a stone of poor transparency, the internal characteristics are not indicative. More important are the particularities of the surface, such as color or lustre.		
	Guy NA	Transparency (commercial) - diaphanity Generally opaque	
Deposits - types of rocks	Goethite is formed through different geological processes and environments. One of the most common ways it develops is as a breakdown product of other iron-containing minerals, such as pyrite, magnetite, and siderite , which undergo oxidation and		

	<p>hydrolysis in the presence of water and oxygen, resulting in the formation of goethite. It commonly forms a pseudomorph after other minerals, particularly Marcasite, pyrite, siderite, and gypsum .</p> <p>Additionally, Goethite can be found in hydrothermal deposits , where it precipitates from solutions rich in iron and other elements in veins and fractures within rocks during the cooling of hydrothermal fluids. In marshy or marshy environments, Goethite can accumulate as "swamp iron ore" when iron-rich waters react with organic matter and form goethite deposits over time.</p> <p>In tropical and subtropical regions with high precipitation, Goethite can accumulate in lateritic soils , where leaching of other minerals leads to concentrations of iron and aluminum oxides, including goethite. Additionally, Goethite can be present in sedimentary rocks , such as banded iron formations, which provide important information about the Earth's geologic history.</p> <p>Other sources of Goethite formation include oxidation of iron ores in various geological settings, accumulation in mine tailings and mining waste materials, and biogenic precipitation influenced by microbial activity. In some rock environments, Goethite can also precipitate from mineral-rich water, creating unique formations such as stalactites and stalagmites made of goethite.</p> <p>It is known that 5 million years after the mass extinction that killed the dinosaurs, at the end of the Cretaceous, 65 million years ago, some minerals common in Australia were replaced by goethite, Geological age : NA</p>
Characteristics of rough stones	<p>It is often found in thin, needle-like crystals , but can also occur in massive, crusty formations. Goethite is an iron hydroxide mineral that crystallizes in the form of masses, botryoids, stalactites and, more rarely, small prismatic crystals .</p>
Main depots	<p>Australia's largest raw material export . (Western Australia, Queensland and South Australia), Other important supplier countries are Nigeria (Kaduna), Germany (Rhineland-Palatinate), Other deposits: Brazil (Carajás), United States (Michigan, Minnesota and Missouri), India (Odisha, Karnataka and Goa), Russia, China, South Africa, Canada (Labrador and Quebec), Sweden, Chile, United Kingdom. Hesse, Germany (Pribram) and the Czech Republic.</p>
Year of discovery	<p>1806: JG Lenz first discovered this mineral in 1806 in Herdorf, Germany.</p>
History	<p>Goethite has been used for thousands of years by many different civilizations . It was a popular pigment used to color paints, with some notable artifacts found containing Goethite. Ocher colors , also composed of goethite, were used by many indigenous groups in art and continue to be used today. Walinynga archaeological site (Cave Hill), South Australia. Rock art dating back 43,000 years has been found in Australia .</p> <p>The famous Lascaux Caves in France contain numerous cave paintings of animals and human figures drawn with Hematite and Goethite pigments. These drawings are estimated to be over 16,000 years old .</p> <p>In a royal tomb from the ancient kingdom of Phrygia , possibly dating to the second millennium BC, a body believed to be King Gordias , father of the legendary King Midas , was found . The shroud had been dyed with a dye containing goethite, which in its original unfaded state would have made the shroud appear woven of gold. Historians speculate that the legend of King Midas' golden touch may have originated from Phrygian royalty who wore clothing made from gold-colored fabrics.</p> <p>It was first described in 1806 from occurrence in the Hollertszug mine, Dermbach, Herdorf, Siegerland, Rhineland-Palatinate, Germany .</p> <p>In the United Kingdom she is remembered for a particular curious event. In England, despite the presence of iron deposits in various British locations, goethite has never represented a major resource for the region, contributing less than 1% to the total production of the United Kingdom, especially in the period of maximum mining activity, between the 1850s and 1870s. Among the Cornish iron mines , Restormel stood out for its productivity. Its importance grew further when, in 1846 , it received a visit from Queen Victoria and Prince Albert, after which it was renamed the Restormel Royal Iron Mine. In her diary, Queen Victoria describes the experience: <i>"Albert and I sat in a mine cart, pulled into the mine by the workers... Albert and the other gentlemen wore miners' helmets. The space was so confined that you could barely keep</i></p>

	<p><i>your head up... we got out and we climbed up to observe the veins of ore, and Albert began to break off some fragments."</i></p> <p>Today, in more modern times, Goethite is processed for its iron content , while high-quality samples are sold on the mineral market or made into rare and valuable pieces of jewelry.</p> <p>As NASA's Spirit Rover explored the surface of Mars , it encountered large deposits of this mineral. This abundance of iron leads scientists and astrologers to believe that liquid water was once very common on this planet and may very well have supported life.</p> <p>In 2003 , nanoparticle autogenic goethite was shown to be the most common diagenetic iron oxyhydroxide in marine and lake sediments.</p> <p>Name : Goethite takes its name from Johann Wolfgang von Goethe (1749-1832), a friend of the mineralogist Johann Gottlob Lehmann . In 1804, 1806 (or 1784), Lehmann named the mineral "goethite" in honor of his literary friend, recognizing the inspiration he had drawn from Goethe's contributions to color theory and the natural sciences in his work on mineralogy. This symbolic gesture was a tribute to the contributions of German genius to scientific knowledge.</p> <p>Other trade names: Götheite, Goetite, Göthite, and Goethite. Bog Iron, Brown Hematite, Fullonite, Sammetblende, Mesabite, Weimar Stone, Brown Ironstone, Glocker Przibramite, Bog Iron Ore, Mesabite, Allcharite, Goetite, Allcharite, Yanthosiderit, Getit, Ehrenwerthite, and Goethita.</p> <p>When found in environments such as swamps, lakes, and swamps, and has a red hematite coating , it is commonly called brown hematite or bog iron . This mineral, an iron oxide, takes many forms, including spots, blades, stalactites, discs, plates, botryoidal formations and prismatic crystals.</p> <p>Brown Iron Ore : This name refers to its distinctive brown color and its association with iron.</p> <p>Yellow Iron Ore : Goethite can vary slightly in color, ranging from yellow to brown, so it is sometimes called "Yellow Iron Ore."</p> <p>Limonite : In the past, limonite was considered a separate mineral species from goethite, but today it is recognized as an impure form of goethite. As a result, the term "limonite" is often used interchangeably with goethite.</p> <p>Goethite Brown : This name emphasizes goethite's distinctive brown color.</p> <p>Ferrous Ocher : "Ferrous Ocher" refers to its iron content and color.</p> <p>Variety : There is a variety of Goethite known as "iron needle", which has elongated and thin crystals, resembling needles.</p>
Attributed properties	<p>Goethite is a gemstone with a wide range of healing properties and benefits. This crystal is known to enhance inner strength and vitality , helping to unblock the lower chakras. Furthermore, it stimulates the mind, improving intelligence, decisiveness and critical thinking ability . Goethite is useful for concentrating at work and motivating yourself. It can also promote mindfulness and inner peace, offering support against stress, depression and anxiety . This stone is able to help overcome toxic situations and start anew. From a spiritual perspective, Goethite can be used to explore astral travel, protect oneself from negative influences , deal with karma from past lives, attract good luck and establish contact with spirits. In summary, Goethite is a versatile gemstone that offers a number of benefits, including enhancement of vital energies, improvement of mental abilities, concentration, inner peace and spiritual support.</p> <p>Goethite is weakly magnetic , meaning it can be attracted to a strong magnet but does not exhibit strong magnetic properties like lodestone.</p> <p>Planet: Mars</p> <p>Month: NA Zodiac sign: Aries, Scorpio</p> <p>Chakras: Third Eye and Root</p>
Treatments	<p>Goethite, as a gem, is not among the most common and therefore is not subject to a wide range of treatments or manipulations like other more common gems. However, it is important to explore what is known regarding treatments and imitations or synthetic counterparts according to the Gemological Institute of America (GIA) and other gemological authorities:</p> <p>Stabilization : Some varieties of Goethite can be stabilized to improve durability and facilitate use in jewelry. This process involves saturating the mineral with a substance such as resin to consolidate its structure.</p>
Synthetic counterpart	<p>Given its less common nature as a gemstone, there are not many imitations or synthetic counterparts specifically created to simulate Goethite.</p>

	However, some materials can be used to imitate the appearance of Goethite, such as colored glass or synthetic resins .		
May be confused with	<p>Goethite can be confused with several other stones or minerals (but not gemstones), due to its variety of colors and shapes. Some of the minerals it can easily be exchanged for include:</p> <ul style="list-style-type: none"> • Hematite : This mineral often has a similar color and luster to Goethite. However, hematite has a reddish streak, while that of Goethite is yellow-brown. • Limonite : Not a true mineral but a term used to describe a mixture of hydrated iron minerals, including Goethite. Sometimes, Goethite is misidentified as limonite. • Magnetite : Although magnetite is generally darker and magnetic, it can resemble Goethite in some forms. • Psilomelane : This manganese mineral can have a similar appearance to Goethite, especially when it occurs in botryoidal masses. • Lepidocrocite : Another iron hydroxide, lepidocrocite, can be similar in shape and color, but usually has a more orange streak than Goethite. • Pyrolusite : This manganese mineral can sometimes be confused with Goethite, especially in the fibrous or botryoidal forms. • Turgite : It is an obsolete term that was used to describe a mixture of hematite and Goethite. This mineral can have similar characteristics to both components. 		
Indicative gemological tests	Gemological authorities such as the GIA use advanced methods to identify and authenticate gems, including Goethite. These methods may include spectroscopic analysis, microscopic examination and other gemology techniques.		
Value (2021)	High : 200+ \$/exemplary	Medium: \$ 50 / exemplary	Low: \$5/ exemplary
Typical cut	In rare uses in jewelry it can be shaped into pendants and earrings with irregular shapes. Fine specimens of goethite are rare and therefore are valuable collector's items. Banded or iridescent varieties are cut and polished into cabochons for jewelry making.		
Famous stones	There are no specimens of Goethite that are particularly famous in the same way as some gems such as diamonds or emeralds. However, specimens from known locations or associated with historical or scientific discoveries may gain some notoriety.		
Record stones	The characteristics of the larger or more expensive specimens of this material are not known.		