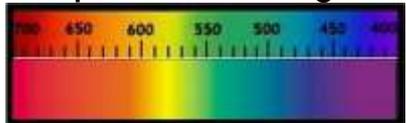


Warning: this version has been completed with Google Translate , it certainly contains errors or inaccuracies.

Data sheet - general: black tourmaline (schorl)

Gemma - names	(Italian - schorl) (English - schorl) (French - schorl) (Spanish - black tourmaline) (Portuguese - schorl) (Thai - ทัวร์มาลีน สี ดำ) Th ā wr ' mā līn s ī d ā	(German - Schorl) (Arabic - شورل shurl) (Russian - шерл-şerl) (Mandarin - 肖尔 Xiào ěr) (Swahili - schorl) (Hindi - शोर्ली shorlee)	photo 
Colors (GIA)	Generally black, but it can also be found in brown , blue and green very dark (in thin section).		
Cause of Color	<p>The dark color comes from high concentrations of iron (Fe²⁺), manganese Mn²⁺ and / or titanium (Ti⁴⁺). 95% of the tourmaline in the earth's crust comes from the Schorl-dravite series. Black tourmaline is commonly called schorl (rich in Na – Fe²⁺ -), but it is actually a solid solution between schorl and elbaite , and may contain the component minerals of olenite and foitite .</p> <p>Schorl is the black, iron-rich form of tourmaline and is very common. All tourmalines form similar crystals because they are isostructural, which means they share the same internal crystal structure.</p> <p>Tourmaline (general formula of XY₃Z₆Si₆O₁₈(BO₃)₃V₃W) is a supergroup consisting of 18 species approved by the Commission on New Minerals (2011) .</p> <p>Alkali Group (Nitrogen) Dravite, Schorl, Chromium-dravite, Vanadium-dravite, Fluor -dravite, Fluor -schorl, Elbaite, Povondraite , Chromium-aluminum- povondraite , Fluor-buergerite , Olenite ,</p> <p>Calcic Group Fluor-uvite , Feruvite , Uvite , Fluor-liddicoatite</p> <p>Vacancy group Foitite , Magnesium -foitite , Rossmanite</p> <p>The most common species are schorl , dravite and elbaite. The structural building blocks of tourmaline include six tetrahedra , which share vertices to form a ring (cyclosilicate) structure such that all tetrahedra point in the same direction. The atomic site <i>T</i> is typically occupied by silicon (Si>) and, to a lesser extent, by aluminum (Al) and boron (B). Boron is an essential component of tourmaline.</p> <p>Idiochromatic Gem</p>		
Classification	Mineral class Complex borosilicate	Species - Group (mineral) T. Black - Tourmalines	Variety /
Optical properties	Specific Gravity: 3.00-3.26 Municipality: 3.20	RE: 1,625-1,672 Polariscope : DR Double refraction: 0.018- 0.032	Character optical Negative uniaxial Pleochroism Strong when visible : yellow-brown to pale yellow, light brown.
Light	Luster (luster) - luster of the fracture Submetallic, vitreous, resinous - vitreous		Dispersion (fire) None
Form	Crystalline dress Prismatic to acicular, or flattened, crystals with prominent trigonal prism and pyramid. Melting point: 1050 - 1200 ° C	Phenomenal optical effects Gattitude (green-black tourmaline)	Crystalline system Trigonal - Pyramidal Ditrigonal Crystal class
Chemical formula	Hydroxide Silicate of Sodium, Iron, Aluminum and Boron		Spectrometer image  Not indicative

	Na (Fe₃²⁺) Al₆ (Si₆ O₁₈) (BO₃)₃ (OH)₃ (OH)		
Fracture	Flaking Weak / very weak (2 directions)	Breaking- Parting Basal	Fracture Concoidal, irregular
Durability	Hardness (Mohs) - Absolute 7.5; 150	Toughness Fragile to good	Stability (heat, light, chemicals) Very good
Clarity - characteristics	Typical inclusions: When transparency permits, 2 tube-like phases running parallel to the main axis of the crystal can be seen, film-like, irregular or filiform liquid inclusions, angular thin-film specular inclusions, lattice gas bubble inclusions, parallel oriented hollow tubes or needles.		
	Guy Not applicable	Transparency (commercial) - transparency Nearly opaque to translucent (less common)	
Deposits - types of rocks	<p>Black tourmaline can be an important component of igneous and metamorphic rocks. It is found in granites and in granitic pegmatites, in high temperature hydrothermal veins and in some metamorphic rocks; it can also be detrital. Although it is not the only black mineral common to such rocks, it is the only one that forms crystals with a clear triangular section. The greisen is closely connected with the schorl, both in its mineralogical composition and in its formation. Black tourmaline / Schorl is a pneumatolytic product consisting of quartz, tourmaline and, often, white mica which sometimes turns into greisen . Both of these rocks contain small percentages of cassiterite (tin oxide) and can be processed as tin ores.</p> <p>In gemmatic pegmatites (charged with crystals with potential gem quality), the "roots" (the most primitive portions) of tourmaline are typically black (generally schorl or foitite) and are covered with clearer crystals that may show compositional variations associated with different changes in the chromophoric elements (and therefore of colors).</p> <p>Geological age : up to 3.7 billion years (like dravite).</p>		
Characteristics of rough stones	<p>Opaque and prismatic crystals can be several meters long and can also be radial, fibrous and massive. Black tourmaline has many vertical streaks, grooves and ridges, and this is how it is recognized when it is in its natural form. Its well-formed crystals make up extraordinary mineral specimens. They are long and thin and are frequently associated with quartz, (tourmalinated quartz). The terminations can be a simple to complex trigonal pyramid or a flat basal face. The faces of the prism are generally striated longitudinally. In the cross section, all tourmalines will appear predominantly triangular in shape. Double-ended crystals are <i>hemimorphic</i> , which means that the two ends of the crystal are not exactly alike. Massive forms can also be found.</p>		
Main deposits	<p>Argentina (San Luis) , Brazil ; India (Rajasthan) , Madagascar (Alaotra-Mangoro , Vakinankaratra , Valley Sahatany , Antananarivo Province) , Myanmar (Mandalay and Sagaing Region) , Sri Lanka (Sabaragamuwa Province) , USA (Colorado; Appalachian Mountains) , Germany ; England (Cornwall) , Portugal (Malpartida) . Pakistan (districts of Skardu , Gilgit) , Afghanistan (Nangarhar province) . Namibia (Erongo region) , Italy (Elba, Lombrardia) , Czech Republic (Moravia) , Sweden (Råneå , Norrbotten) , Mexico (Sonora).</p>		
Year of discovery	<p>1505: First mentioned (as Schörl) by Ulrich Rülein von Kalbe (1465 - 1523) in the 1505. Rülein von Calw was a humanist, physician, mathematician and mining scientist, also active as a surveyor, urban planner and astrologer. For five years he was mayor of the mining town of Freiberg .</p>		
History	<p>The first relatively detailed description of Schorl with the name " SchürI " and its presence (various tin mines in the Ore Mountains of Saxony) was written by Johannes Mathesius (1504-1565) in 1562 under the title " Sarepta oder Bergpostill ". Until about 1600, additional names used in the German language were " Schurel " , " Schörle " and " Schurl " . Starting in the 18th century, the name " Schörl " was mainly used in the German-speaking area. In English, the names " shorl " and " shirl " were used in the 18th century for schorl. In the 19th century in the Anglo-Saxon area the names "common schorl" , " schörl " , "schorl" and " iron tourmaline" were used (Ertl , 2006).</p> <p>The Dutch East India Company brought Sri Lankan tourmaline to Europe for centuries before traders realized it was the same mineral as Schorl.</p> <p>During the Victorian era, black tourmaline was used extensively for mourning jewelry, but today it has little or no value as a gemstone.</p>		

The industrial use of black tourmaline has grown **since the new millennium** . It is used in air and water purifiers, cosmetics, textiles, paints and agriculture.

Tourmaline became famous in Europe in the early **eighteenth century** , when traders began to import varieties of precious from the Far East. At that juncture its pyroelectric and **piezoelectric** properties were also discovered, phenomena that attracted the attention of the first scientific communities. symmetrical. It "electrifies" by heating and the crystals acquire opposite charges at the two poles. This property was also used to support **Benjamin Franklin** 's theory of positive and negative electricity . Pyroelectricity , the release of charge due to the change in temperature of a material, occurs in all minerals that belong to a class of polarized crystal symmetry. In 1707, the Austrian Baroque painter, Johann Georg Schmidt (c.1685 - 1748), reported the following words: "*The ingenious Doctor Daumius , chief physician of the Polish and Saxon troops on the Rhine, told me that, in the year 1703, that the Dutch had brought, for the first time from Ceylon, to the East Indies, a precious stone called **tourmaline** , turmali , which had the property not only to attract the ashes from the burning coals, as the magnet does, but also to repel them ...* " 1747 Carl von Linné / (Linnaeus / Linnaeus) provided the first scientific description of the piezoelectric characteristics of this mineral, referring to the mineral as **lapis electricus** . Ten years later (in 1756), Franz Aepinus performed the first systematic scientific analyzes on the electrical properties of tourmaline,

eighteenth -century experiments attempted to link the properties of tourmaline to magnetism. Indeed, in **1766** Johann Wilcke used its intrinsic characteristics to link heat, electricity and magnetism in an early version of a "**grand unification theory** " of physics. Later, prominent physicists such as Lord Kelvin (**in 1878**) and Pierre Curie (**from 1880 to 1908**) published articles relating to the electrical properties of this stone. Since these dawns of scientific investigation, tourmaline has maintained a constant presence in scientific discourse.

Name : The word schorl probably comes from **Zschorlau** , a village in Saxony, Germany, in which there was a mine with deposits of black tourmaline . The term was used by mistake, in labeling the shipment that found the first copies and the name has remained since then, albeit with some changes. Variations of the term "schorl" may have been used to describe black tourmaline even before 1400. In J. D. Dana 's **1868 classification of minerals** , we note how the terms **Schur** (Gesner , 1565), **Shurl** (Erker , 1595), **Schirl** (Brückmann , 1727) were used to designate "small black stones", which were a waste product in the sieving of gold and tin.

The term "**tourmaline** " comes from the word "**turamalin** "(many also mention the term tourmali / turmali). Until the early 18th century there were only small quantities of Ceylonese gem tourmaline on the market . raw from Ceylon (now Sri Lanka) there were some stones characterized by a relatively low density which was given the name *turamalin* . This was also used as a generic name for crystals of various colors, especially yellow zircons. It is thought that the former report comes from the German doctor Christianus-Fridericus Garmann (1640-1708) in **1707** . They believed it to be a new type of gem. In **1717** the name *Pierre de Ceylon* (stone of ceilon in French) was introduced. However, the name *turamalin* was kept in parallel, and in the second half of the 18th century the spelling changed to *tourmalin* . Tourmaline, as a more or less specific mineral name, was used by the Swedish chemist and mineralogist Sven Rinman (1720 - 1792) in **1766** . In **1771** the name *tourmaline garnet* was introduced , perhaps referring to *rubellite* (today it refers to the pink to red variety of tourmaline). At the end of the 18th century, the discovery of rubellite deposits near Nerchinsk , Siberia, and the deposits of green Brazilian gems, called **smaragdus brasilius** , produced significant quantities of gem-quality tourmaline. The Irish geologist and chemist **Richard Kirwan** (1733-1812, one of the last supporters of the phlogiston theory, a mysterious element contained within combustible bodies and released during combustion) shortened the name to *Tourmaline* (later tourmaline in Italian) in **1794** . In **Victorian-era England, the mourning period** also revived in black tourmaline. After the death of Prince Albert in **1861** , Queen Victoria went into deep mourning, increasing the public's demand for formal crepe dresses. black and jewels with dark crystals (jet, schorl etc.) . Mourners, including children and servants, were required to adhere to heavily regulated periods of mourning.

Other trade names: Schorl, schirl (ancient), schorlite / sxhorlomite (ancient), ferro-dravite (ancient),

Variety : The black core is an "**oxy -schorl**" containing manganese (Mn). The yellow-greyish intermediate zone is Mn-rich **fluoro-elbaite** which contains a relatively high Mn

	<p>content, with about 6% by weight in MnO . The almost colorless edge of fluoro-elbaite has the highest lithium (Li) content of all varieties.</p> <p>Fluoro-schorl (NaFe²⁺ 3Al₆Si₆O₁₈(BO₃)₃(OH)₃F), is a new mineral species (2016) of the tourmaline supergroup from alluvial tin deposits near Steinberg , Zschorlau , Erzgebirge (Saxon Mountains), Saxony, Germany, and from pegmatites near Grasstein (area from Mittewald to Sachsenklemme), Trentino, Alto-Adige, Italy. Fluoro-schorl formed as a pneumatolytic phase and in the high-temperature hydrothermal veins of granitic pegmatites. The crystals are black (light brown to pale bluish-greyish). Fluoro-schorl is brittle (toughness) and has a Mohs hardness of 7; it is non-fluorescent, has no observable separations and little / indistinct cleavage.</p> <p>Luinaite - (OH) appeared to represent a distorted monoclinic (pseudo-rhombohedral) variant of tourmaline. This species has, however, been discredited .</p> <p>Long, thin crystals of schorl are common as inclusions in quartz , forming the ornamental stone called " tourmaline quartz ". This stone is unique with its prismatic, needle to straw-colored, straight arrow-shaped, pitch-black crystals that contrast the clarity of colorless quartz. This attractive stone is used in semi-precious jewelry, carved figurines, obelisks, crystal balls, eggs and as a popular tumbled stone.</p> <p>Mushroom tourmaline is a rare variety of tourmaline and owes its name to the natural form of crystal growth, which is very similar to a mushroom. These crystals have two colors, a pink outer zone (Rubellite Tourmaline - Elbaite) and a black zone in the center (Schorl Tourmaline).</p> <p>Velvet / Velvet Tourmaline : Unusual stalactite or radiant Schorl tourmaline formation from Santa Cruz, Sonora, Mexico.</p>		
Property attributed	<p>Black tourmaline is a piezoelectric and pyroelectric stone . Piezoelectricity, the characteristic of producing a potential difference upon compression, has several industrial applications. The most common concerns the normal kitchen gas lighters , where a crystal subjected to manual pressure via a button sets off a spark without the need for power batteries. The pyroelectric effect, on the other hand, is widely used in infrared sensors, thermal imaging or intrusion alarms, gas sensors and fire alarms.</p> <p>Black tourmaline is an excellent stone for calming the mind and protecting the spirit. It could have positive effects on the body by balancing the left and right sides of the brain . It is said that this stone can cancel and reject negative energy and propitiate a life less chaotic and richer in positivity and light. While black tourmaline may look stripped of any color, it is an extremely powerful stone for those who want to wear a constant protective cloak . It effectively helps the wearer to be absolved of dark feelings and embark on a path to spiritual healing.</p> <p>Some believe that black tourmaline blocks or may mitigate the effects of electromagnetic waves , such as those caused by cell phones, laptops, televisions, and other electronic devices.</p> <p>Planet: / Month: October Zodiac sign: Capricorn Chakra: Root</p>		
Treatments	There are no known routine treatments for this gem.		
Synthetic counterpart	Synthetic tourmalines are used for research purposes only. The stones, offered as synthetic tourmaline, are rarely tourmaline-colored synthetic spinels . Due to its ready availability, synthetic black tourmaline production in the laboratory is not very cost effective. Therefore, the threat of the man-made material being sold as black tourmaline is relatively low for this gem.		
It can be confused with	<p>Although rarely imitated, black tourmaline can often be confused with other similar looking black rocks and glass , and can also be dyed to look deeper and more prosperous.</p> <p>Separation : Elbaite : even when black, never completely opaque. Dravite : Even when black, it has a slightly brown tinge on the edges. Aegirine (raw): different crystalline form and steeper endings. Black rutile : has a reddish hue on the edges, softer. Jet : much lighter, black CZ , much heavier.</p>		
Indicative gemological tests	Appearance and characteristics detectable with common gemological instruments are generally sufficient for the correct identification of this gem: Refractive index, birefringence, specific weight, appearance and reaction of the dichroscope or polariscope.		
Value (2021)	High : 50+ \$ / ct 3 carat +	Medium: \$ 20 / ct 1-3 carats	Low: \$ 1 / ct below the carat

Typical cut	Black is the most common species of tourmaline, however, it is not as commonly faceted due to its less popular black color in the market. It is used in semiprecious jewelry, carved figurines, obelisks, crystal balls, eggs and as a tumbled stone.
Famous stones	There are no specimens worthy of particular note.
Record stones	There are also large crystals (some kilos), but there is no news of a specific gem that holds the record.