

Understanding Diamonds

How are diamonds formed ?

Diamonds are the most popular of all of the world's gemstones. They are often referred to as the "gem of gems", due to their exquisite beauty, which is largely a result of their ability to refract light. While all transparent gems refract light, the refractive index of the diamond is the highest of all gems, making them sparkle more than other stones.

Natural diamonds were formed approximately three billion years ago, 150 kilometres beneath the earth's surface. Diamonds are made up of pure carbon atoms that exist deep in the ground, exposed to intense heat and pressure over billions of years. Over time, this pressure builds up and forces the diamonds and rocks up toward the surface in a volcanic-like explosion. The explosion creates a very deep, wide hole called a "pipe" into which most of the diamonds settle; these deposits of diamonds are known as primary deposits. Other diamonds are washed away by water or erosion, and often settle into the coastal waters of nearby bodies of water; these are alluvial deposits.

Where are diamonds found?



Diamonds in a semi-polished stage

Natural diamond sources have been discovered in approximately 35 different countries around the world across several continents. The first known source of diamonds was in India, where they were mined from alluvial gravel more than 4,000 years ago. Indian stones were sent to Greece, where they were known as "adamas", from which the name diamond is derived.

Until the early 18th century, diamonds were very rare, however in 1725 alluvial prospectors found diamonds in Brazil and more diamonds became available throughout the world. In 1866 the first South African diamond was found. It weighed 21 carats. In 1869 the 83 carat "Star of South Africa" was found. This was followed by the discovery of a number of large diamond bearing pipes, which transformed the world diamond market. Today, Australia, Canada, Russia, Botswana and southern Africa are the world's major diamond producers.

How does a diamond get from the mine to the market place?

Finding the rough diamonds is only the first step. Once diamonds have been mined and processed out of the 'overburden' (that is, the rocks in which they are imbedded), the rough crystals are sorted and categorized according to their size, colour, shape and other characteristics.

The mining company will then offer the newly mined rough diamonds to customers from around the world. These buyers, in turn, may cut the rough diamonds and sell the polished gems either to jewellery manufacturers (who set the diamonds into finished pieces of jewellery and then sell the jewellery to jewellery retailers), or to diamond wholesalers (who then, in turn, sell the diamonds to diamond retailers).



Argyle Mines, Australia

How is a diamond cut?

A newly mined rough diamond looks more like a piece of glass washed up on the beach than like the polished gems sold in jewellery stores. Bringing out their beauty requires the skill and art of a trained diamond cutter.

While incredibly precise, computerized machinery is now used in some parts of the cutting process for some diamonds, most of the work is still performed by hand using exacting and meticulous techniques passed down over the generations.

As a first step, cleaving or sawing is often used to separate the original rough into smaller, more workable pieces that will each eventually become an individual polished gem. Next, bruting grinds away the edges, providing the outline shape (for example, heart, oval or round) for the gem. Faceting is then done in two steps: during blocking, the table, culet, bezel and pavilion main facets are cut; afterward, the star, upper girdle and lower girdle facets are added.

Once the fully faceted diamond has been inspected and improved, it is boiled in hydrochloric and sulfuric acids to remove dust and oil. The diamond is then considered a finished, polished gem, ready for setting in a piece of jewellery..



Grading a Diamond

Coloured Diamonds

Natural coloured diamonds are extremely rare: the physical conditions that colour a diamond occur very scarcely, so much so that only one in 10,000 diamonds is a natural colour diamond.

Rio Tinto's Argyle Diamond Mine in the spectacularly rugged and remote East Kimberley region of Western Australia is the world's largest supplier of colored diamonds. Here, geologists discovered veins of diamond-bearing ore in the Kimberley Plateau, a landscape of stark, stunning elemental beauty – the birthplace of beautiful champagne diamonds and the very rare Argyle blue and pink diamonds.

Gemologists use three terms to describe colour in natural coloured diamonds:

- **Hue:** the dominant colour of the natural diamond. Sometimes, modifying colours or tints can affect the hue of a diamond.
- **Tone:** the amount of lightness or darkness in the natural coloured diamond. The range of tone extends from light to dark.
- **Saturation:** the strength or intensity of colour in the natural diamond. The saturation of light in diamonds can vary from pastel to vivid and intense. The darker and more intense the colour, the rarer and more expensive the diamond.

For further information on coloured diamonds:

- **Argyle Diamonds**: The world's largest producer of natural coloured diamonds is located in the East Kimberley Region of Western Australia. For further information refer to www.argylediamonds.com.au
- **Argyle Pink Diamonds**: The world's rarest diamonds are pink diamonds and the Argyle mine is the world's only consistent producer of these jewels. For further information on their rarity, exclusivity and glamour, visit www.argylepinkdiamonds.com
- **Champagne Diamonds**: Champagne diamonds have caused quite a stir in the diamond jewellery market. Find out more about them at www.champagnediamondcenter.com
- **Natural Color Diamond Association** (NCDIA): The preeminent public advocate for natural colour diamonds. Its membership includes prominent rough colour diamond producers, diamond and jewellery manufacturers and established diamond retailers. The NCDIA website at www.ncdia.com is a wealth of information about natural coloured diamonds.

What shapes do diamonds come in?

There are seven popular diamond shapes that are most commonly offered by fine jewellers:

Round diamonds

Princess diamonds

Marquise diamonds

Oval diamonds

Pear-shaped diamonds

Emerald diamonds

Radiant diamonds

Heart diamonds

Of these diamonds shapes, the most popular by far is the round diamond, which takes centre stage in the classic engagement ring – a round, solitaire diamond set either in yellow gold or platinum. Shapes other than round are called fancy shapes.

Diamond shape vs diamond cut: what's the difference?

The terms “shape” and “cut” are frequently confused. People refer to an emerald cut diamond, but emerald is really the shape of the stone, not the cut. The shape is the geometrical form of a diamond after a diamond artisan cuts and polishes it.

What about diamond settings ?

Diamond settings are the platform – or stage -- in which the diamond sits. This is how your diamond will be shown to the world. The variety of diamond settings available is almost limitless. The shape of the diamond will narrow the field in terms of diamond settings, since settings are designed with a particular shape of stone in mind. You will need to make a series of decisions about your diamond setting.

- Will it be yellow gold, white gold or platinum?
- Will the band be simple or adorned with smaller stones?
- Do you prefer a solitaire or a three-stone setting?
- Or, would you like your diamond to be set with additional stones, whether more diamonds, or perhaps sapphires or emeralds?
- Does your taste run to modern, vintage, floral, romantic or more contemporary?

Commonly used diamond jewellery settings are as follows:

Prong settings

A prong setting is the one most often used to hold a solitaire. A prong setting puts the emphasis on the diamond and not the metal supporting it.

Bezel setting

A bezel setting is a collar of precious metal that wraps around the diamond. The bezel is attached to the top of the ring and stands up above it, adding height and another dimension to the setting. Although solid bezels have a very traditional look, the bezel may be 'split' into two sections, arcing around just part of the diamond. This is called a half bezel. This simple change suddenly opens up the setting and gives it a totally modern look.

Channel setting

A channel setting is also used to set round diamonds. Channel setting offers a sleek, elegant appearance, though the end result is a very different look.

Setting round diamonds into channels leaves small spaces closest to the metal bars of the channel. By choosing round diamonds, the designer creates a clean line of stones. Channel setting is also used when there is no center stone at all. The placement of baguettes around an entire band is a beautiful choice for a wedding band, one that goes well with a matching ring set with a diamond solitaire.

Channel setting protects the diamonds extremely well. None of the edges are exposed, and so they are not subject to hard knocks or general wear and tear.

Pavé setting

When the surface of a ring appears to be covered with tiny diamonds, the technique is called Pavé which means paved. It's an apt name because the surface looks a bit like a very pretty street paved with cobblestones.

Tiny diamonds are placed in small holes that have been drilled out of the ring shank. On a band that does not taper across the top, each diamond should be exactly the

same size. The diamonds are placed in rows, but in such a way that they fill as much of the space of the surface as is possible without actual touching. The more precisely cut the diamonds, the better the final appearance of the ring.

Each tiny diamond, weighing just a few points, is fully cut with 58 facets. Though small in size, each stone contributes to the overall, shimmering look of the design. Pavé is a demanding technique that is most successfully accomplished in the hands of a patient and extremely talented jeweller.

Cluster setting

The cluster setting is another variation on the theme of choosing a ring with a number of smaller diamonds. There are cluster rings with the stones arranged in the form of a stylized flower, or those done as an abstract arrangement of stones.

Cluster rings are usually multi-level, with considerable height above the hand. The arrangement of stones can be quite open and airy looking, or it may be more tightly arranged. The choice is a matter of taste, but the shape of the finger can also play a role in making that choice.

Flush setting

The flush setting is one of the subtlest diamond-setting techniques. Stones are sunk into the mounting until they are nearly level or flush with the surface.

This technique seems to go against everything we know about diamonds in relation to light, but it's become quite a popular setting. It's a very subtle look, and one that appeals to the woman who likes the idea of tiny, glittering bits of light twinkling like stars in the sky. The flush setting is also used for larger stones, offering great protection and a modern look.