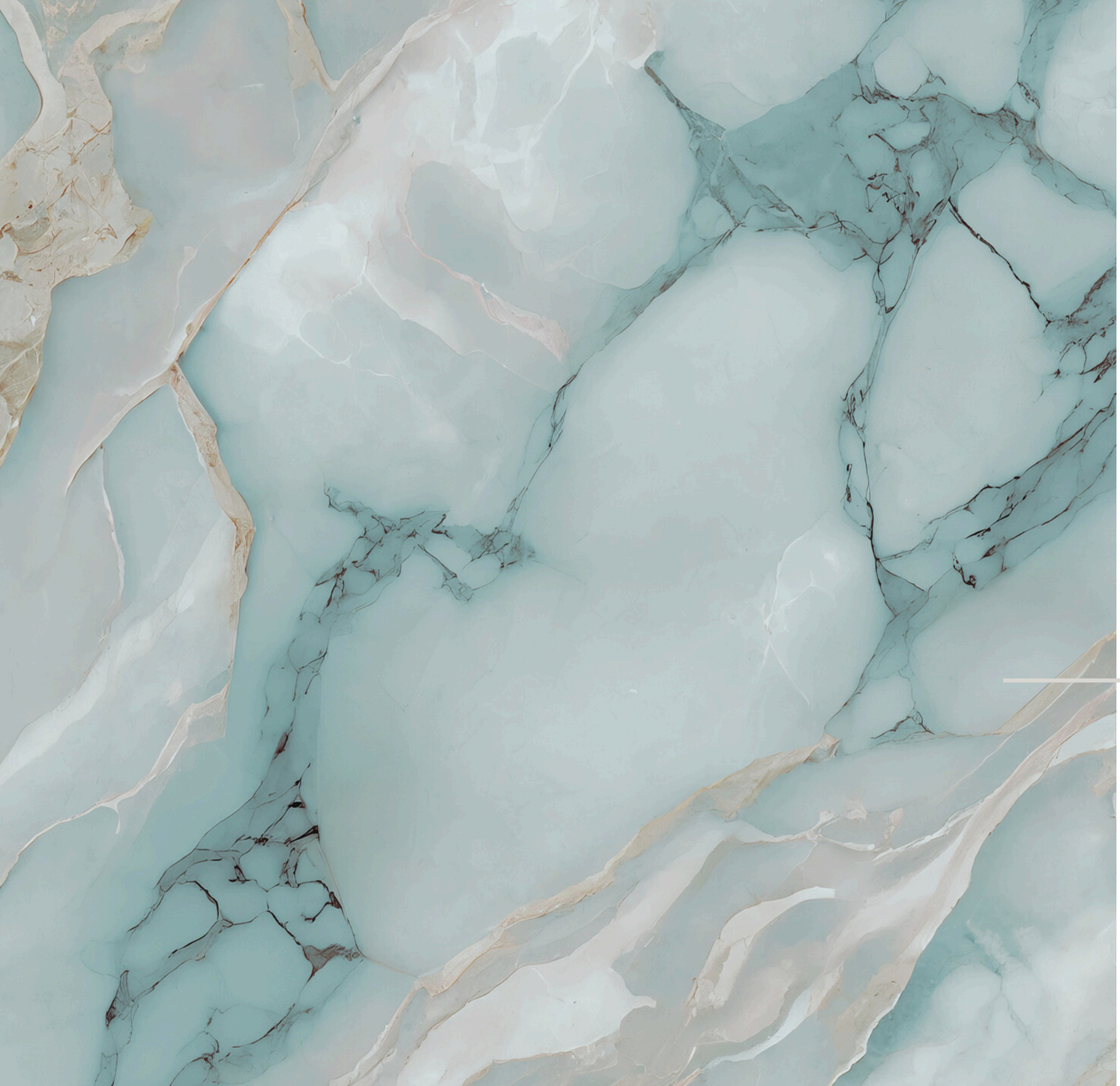


NATURAL STONE

History, types and characteristics

WHAT IS MARBLE?

Marble is a stone formed by nature, mined and used for centuries in construction, architecture and even in medicine.

Rich in shades, with unique patterns and a wide range of practical properties, it has been considered a symbol of sophistication, prestige, and grandeur for centuries.

The high price of marble has led to the emergence of many synthetic alternatives on the market. However, finishing materials imitating the appearance of natural stone still fall short of the original in terms of quality and durability.

THE FORMATION OF MARBLE

Marble is formed through **metamorphism** – the transformation of sedimentary rocks such as **limestone** or **dolomite**.

This process involves a significant change in the structure of these rocks under the influence of **high temperature**, **pressure**, **water**, and other physical and chemical factors related to the movement of the Earth's crust. As a result, limestone particles **recrystallise**, forming a metamorphic rock.

Limestone itself is formed from accumulated remains of organisms that once lived in ancient seas, such as crustaceans and nummulites.

The action of saltwater and mineralised groundwater leads to the formation of dolomites, which differ from limestone mainly in their magnesium content.

CHEMICAL COMPOSITION AND PHYSICAL PROPERTIES OF MARBLE

Marble contains admixtures of various minerals and organic compounds, which give it its distinctive decorative qualities.

The irregular, banded structure of limestone and dolomite influences the appearance of marble, creating soft lines in various directions, blurred spots, and subtle transitions between shades. However, it is not only nature that determines the final pattern of the stone – it is also shaped by the cutting direction of the slab.

The main component of marble is calcium carbonate (calcite). It has a hardness of 3 on the Mohs scale and a density ranging from 2.2 to 2.6 g/cm^3.

Chemical formula:

$CaCO_3$

This is the basic component of natural stone.

MARBLE'S USEFUL PROPERTIES

- **Antibacterial**

  Marble has long been valued for its antibacterial and therapeutic properties. Nowadays, it's used in Turkish baths and as cladding in medical facilities.

- **Has a calming effect**

  Marble has been proven to have a soothing effect on the nervous system. This is enhanced by its delicate shades, natural patterns and sound-absorbing properties, which can help relieve irritability, headaches and fatigue.

- **Provides warmth**

  Although natural stone feels cool to the touch, it gradually warms up and adjusts to the ambient temperature. It is smooth and pleasant to the touch, offering a comforting tactile experience.

- **Dampens vibrations**

  People living in urban areas are often affected by vibrations from nearby roads, railways or trams. Marble’s natural resistance to vibrations helps reduce their impact on everyday comfort and well-being.

The **distinctiveness** of marble comes from the **wide range** of its shades and textures. The stone's composition and place of origin affect its appearance, structure, and potential applications.

TYPES OF MARBLE

MARBLE BY COLOUR

The colour of the stone is determined by the presence of both organic and inorganic chemical compounds and trace elements. These occur in marble in varying proportions, creating a wealth of shades.The full depth and saturation of the colour become visible after the surface is polished, enhancing its richness and vibrancy.

What gives marble its colours?

- Dark grey-blue, black – highly dispersed iron sulphide.
- Blue, grey, black (with a high content of admixtures) – bitumen, graphite.
- Red – iron oxides.
- Light yellow, brown, orange – iron hydroxides
- Dark yellow, brown – manganese and iron carbonates.
- Green – green epidote, chlorite (iron-rich silicates).

MARBLE BY PLACE OF ORIGIN

Marble is quarried in China, Africa, Central Asia, the Americas, Turkey, Italy, Spain, Greece, and other European countries – including Ukraine, where major deposits are located in the Zakarpattia and Donetsk regions.

Bright and richly saturated marbles are primarily sourced from Georgia (red, grey-red) and Armenia (brown, black, pink).

The colour and density of marble vary depending on the quarry location.

The most famous types are:

- **Carrara marble** - one of the most renowned varieties, known since the time of Julius Caesar. Quarried in Italy's Apuan Alps. A white marble available in seven variations, distinguished by subtle differences in shade and veining.
- **Paros marble –** a high-quality white stone from Greece. Noted for its hardness and fine grain, it is highly valued and often compared to the finest Italian marbles.
- **Gaza marble –** a delicate stone with warm tones, prized for its decorative qualities. Quarried in Uzbekistan and widely used in construction – including in the Opera and Ballet Theatre in Tashkent and the Moscow Metro.

TEXTURE

The surface texture of natural marble is shaped during the finishing process. This enables a single type of stone to offer greater visual diversity and a wider scope of applications.

POLISHED TEXTURE

This is the most commonly applied finish. Its high-gloss, perfectly smooth surface enhances the colour and natural veining of marble.

Polished marble is easy to clean and resistant to staining due to its non-porous surface. However, caution is advised when using it on bathroom floors, around pools or in outdoor areas, as water and frost can make the surface slippery and hazardous.

HONED TEXTURE

Marble treated with grinding tools acquires a characteristic rough, matte finish.

This finish is often applied to building facades, where it adds an elegant, refined appearance – though it does require regular maintenance.

Due to its porous nature, the ground surface may be more prone to staining, which should be considered when planning maintenance.

SILK/SATIN Texture

An intermediate finish between polished and honed marble (also known as satin finish). It is characterised by a delicate sheen and a soft, velvety texture without intense shine. This surface finish emphasises the natural beauty and nobility of the stone.

ANTIQUE OR AGED TEXTURE

Abrasive brushes or acid solutions are used to give the marble an aged effect, creating an interior look reminiscent of bygone eras. The surface acquires slight roughness, which enhances the visibility of veining.

BUCHARDA TEXTURE

The name comes from the Italian stone hammer called a bucharda. The bush-hammered finish produces an even, grainy surface by striking the stone with a toothed tool. The degree of roughness depends on the size of the teeth. This type of marble is often used as cladding for plinths.

COLOTA TEXTURE

This finish imitates natural stone chips. The effect is achieved by partial chipping using special wedges or machines equipped with reinforced blades. Split-face marble is most often used to decorate building facades.

HISTORY OF MARBLE PROCESSING

CENTURIES-OLD TRADITIONS

Marble is a natural building stone known since ancient times. It was mined in ancient Greece as early as the fifth millennium BC. Some of the ancient quarries are still in operation today – for example, those on the island of Paros.

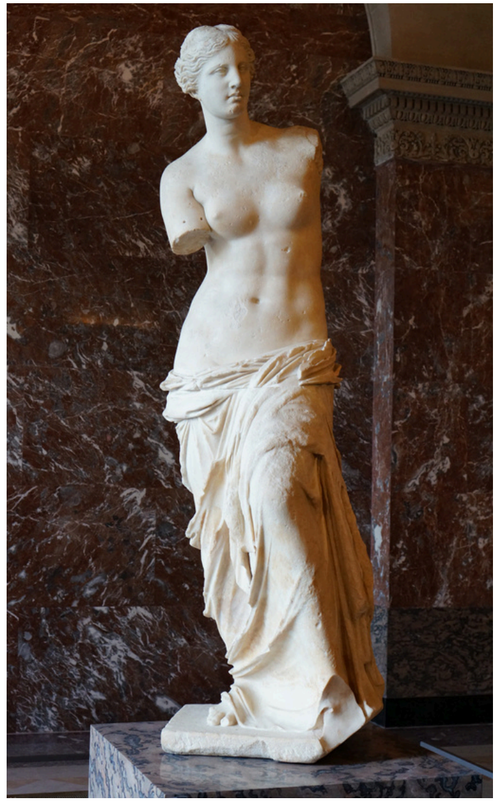
The name of the stone derives from the Greek word mármaros, meaning ‘shiny stone’. In this way, the ancient Greeks clearly defined one of the basic properties of marble.

Our ancestors also recognised many other advantages of this material and used it in a variety of applications.

In ancient Greece, marble was used for finishing houses, places of worship, and ritual structures.

It was used to build the famous Parthenon and Temple of Olympian Zeus, as well as the Temple of Artemis at Ephesus, which was one of the Seven Wonders of the Ancient World. Not all buildings were built of marble, but many were clad in it.

The Venus de Milo was made of marble.



> At the end of the first millennium AD, the first stone temple, the Church of the Mother of God, was built in Kievan Rus. The church was known as the "Marble Church" due to its rich decoration with marble imported from ancient Greece (Prokonnesos).

The architecture of ancient Rome is equally rich in marble monuments. Carrara marble became a preferred material for constructing grand temples, palaces, and other buildings. Marble inspired sculptors across different eras – it was the material used by Michelangelo to carve his iconic 16th-century statue of David.

In the 18th century, sculptor Antonio Corradini gained international fame for his “veiled” works, such as Virtue and Lady with a Veil.

The “marble veil” technique continued into 19th-century Italian sculpture. Sculptor Raffaello Monti masterfully used it to depict the Vestal Virgins – priestesses of the Greek goddess Vesta – draped in delicate stone veils.

MARBLE PRODUCTS

Marble has become firmly established in interior design.
It is commonly used as a cladding material in halls, bathrooms, spa zones, and swimming pools. It is used to produce washbasins, countertops, stairs, balustrades, skirting boards, garden ornaments, fountains, fireplaces, statues, and statuettes.

The variety of stone types and the uniqueness of their shades and veining make it possible to create exclusive products and design stylish, contemporary interiors. Even when using the same pattern, it is impossible to create two identical pieces – no two natural stones are ever the same.

We manufacture a wide range of interior design elements from marble. Modern technology enables us to cut even the most delicate mosaic elements and combine them into unique, one-of-a-kind compositions.

ITALIAN MARBLE

Carrara and Calacatta are among the most renowned Italian marbles, with over 20 different varieties falling under these names, each with distinct visual characteristics and properties.

CARRARA

Marble in a variety of shades – from delicate white and yellowish tones to a wide spectrum of greys – is extracted from quarries near the Italian town of Carrara. The most common variety is a light grey marble with a uniform background and fine, regular veining, giving it a subtly darker look.

One of the most exclusive varieties is Bianco Carrara Extra – a rare marble featuring a predominantly white background with minimal veining and subtle grey speckles.

Carrara marble is internationally acclaimed and has been used in iconic architectural landmarks such as the Temple of Apollo on the Palatine Hill, Trajan's Column, and the Pantheon in Rome.

CALACATTA

Calacatta marble is considered one of the most premium varieties, combining refined aesthetics with exceptional durability. It is distinguished by a white, light grey, or beige background, crossed by striking, decorative veining and spots of varying thickness.

Among the most valued types are Calacatta Vagli – featuring a white base with finely structured grey veining – and Calacatta Gold, known for its pure white background highlighted by naturally golden veining.

SPANISH MARBLE

Spanish marble, extracted across various provinces, is known for its broad colour palette and distinctive veining. It is highly resistant to temperature changes, humidity, and harsh environmental conditions.

EMPERADOR DARK

The most well-known Spanish marble, quarried in the southeast of the country. Emperador Dark features a deep brown background with a rich network of golden veins and specks. Its composition includes manganese, calcite, and iron carbonate.

This marble is especially popular for wall cladding. Despite its dark background, the light, contrasting veining distributed across the surface helps brighten up interiors visually.

CREMA MARFIL

A soft beige marble from Pinoso (Alicante), highly valued by designers. It features a uniform, delicate colour with faint veining, making it suitable for many interior design applications. Its wavy geological layers create a distinctive appearance, forming subtle wave-like patterns that become visible once polished. Its pastel tones make it easy to combine with a wide range of other finishing materials.

Crema Marfil is exported to over 100 countries and is used for both interior and exterior applications, particularly in regions with a moderate climate.

INDIAN MARBLE

A country full of vivid colors, rich in unique shades of marble. Bright, pattern-saturated, as if created by an artist.

VERDE GUATEMALA

Known as the hardest of all green marbles quarried worldwide, Verde Guatemala impresses with its deep emerald tone and lively colour, enhanced by light speckles that contribute to a bold and opulent look.

Its ease of processing makes Verde Guatemala a frequent choice in architecture and interior design, especially where luxurious aesthetics are the focus. The main deposits are located in southwestern Rajasthan.

BRUNO

This marble features a light beige, milky-toned background, crossed by dark veining in shades from grey-blue to chocolate brown. The flowing pattern resembles a stream weaving through stone, giving it a distinctive, artistic feel.

Bruno is well suited for wall cladding, flooring, staircases, and other decorative applications.

UKRAINIAN MARBLE

Marble has been quarried in Ukraine since the 4th century BC. Carpathian stone was widely used in temple construction during the Kievan Rus period (10th–12th centuries), valued for its durability and distinctive aesthetic.

Promising marble deposits explored for angled extraction include Novoselytske and Velyka Kamyanske (brown with a reddish hue, pink marble), as well as Dilove and Negrebove (white marble), and Novopavlivka (black).

However, only a limited number of deposits are currently mined on an industrial scale. The most significant is located in the Zakarpattia Oblast – the Trybuszany site.

TM ‘Trybuszany’

The colour palette includes white, cream, and cream-grey (the most common), along with limited quantities of green and black varieties.

This marble is known for its frost resistance, high mechanical strength, and low water absorption. It also remains free from microcracking.

It is used in construction, particularly for floor mosaics and facade cladding.

THE LARGEST MARBLE DEPOSITS

Guangxi, China

China is the world’s leading producer of marble, with 27 deposits currently being exploited across multiple provinces.

One of the most notable regions is Guangxi Province, where large-scale stone extraction takes place. The province is part of a full production cycle, where marble slabs and products in classic colours – white and black – are manufactured on site.

Quarries in Carrara, Italy

The marble deposit in Carrara, Tuscany, has been exploited since the times of ancient Rome. It was during this period that intensive extraction of white marble for architectural use began.

Today, large-scale extraction is supported by highly mechanised mining operations and a well-developed transport infrastructure. As a result, Carrara marble is delivered to numerous processing plants and successfully distributed worldwide.

THE LARGEST MARBLE DEPOSITS

Rajasthan, India

India ranks among the world's largest marble producers and is a major competitor to Italy in this regard. The most important deposits are located in the north-western part of the country, in the state of Rajasthan.

Particularly valued is green marble, extracted in the south-western part of Rajasthan, near the cities of Udaipur and Dungarpur. Extraction takes place over an area of approximately 520 hectares, where more than 400 quarries are currently in operation.

Tasos, Greece

Since ancient times, the island of Thasos has been referred to as the "marble island" due to its abundant white stone deposits. Today, 12 quarries are in operation, extracting three distinct varieties of marble.

The tradition of marble extraction on Thasos dates back more than 20 centuries. Today, marble from the island is highly valued in global architecture and construction and is widely exported.

THE LARGEST MARBLE DEPOSITS

Alicante, Spain

The province of Alicante, located in the south-east of Spain, is internationally renowned for its Crema Marfil marble – a delicate, creamy-coloured stone highly valued by architects and interior designers.

Extraction is conducted using a multi-level system encompassing the entire production cycle – from blasting techniques to precision stone processing.

Turkey

Turkish marble enjoys worldwide recognition for its quality and variety. The tradition of marble extraction in Turkey dates back over 4,000 years. It is estimated that Turkey has about one third of the world's marble reserves.

Turkey is renowned for its remarkable diversity of natural stone – nearly 250 types and 80 structural varieties of marble are extracted across the country. Turkish marble is available in 120 different colours and shades.

THE LARGEST MARBLE DEPOSITS

Vermont, USA

This small American state is home to deposits of light-coloured marble valued for its high durability. Mines near the city of Rutland have been in operation since the late 19th century. Vermont marble has been used in numerous public and institutional buildings, including the West Virginia Capitol and the Oregon Supreme Court.

Vermont is internationally recognised not only for its white marble but also for the Vermont Marble Museum located in the town of Proctor.

Juventud, Cuba

The deposit north of Cuba's island of Juventud (Isla de la Juventud) has been actively mined since the late 20th century. Initially developed with American investment, the mining operations are now managed by Cuban entrepreneurs.

The site yields dark grey, fine-grained marble, primarily used for interior finishing applications. Most of the material is exported.

THE LARGEST MARBLE DEPOSITS

Trybuszany, Ukraine

The deposit is located near the village of Dilove, in the Rakhiv District of Ukraine's Zakarpattia Oblast. Marble blocks in a variety of shades have been extracted here since 1947.

The mine's industrial output also includes gravel and marble powder, both widely used in construction.

KEY ADVANTAGES OF MARBLE

- Universal application. Marble works well in a wide range of interior applications – from kitchen countertops and islands to bathroom furniture and refined wall cladding.

- Easy to maintain. For daily care, simply clean the surface with water and a mild detergent to restore its natural lustre.

To preserve the stone’s appearance for years, specialists recommend using impregnating agents that penetrate deep into the marble’s structure.

One of the most popular products is Protex by Tenax – an impregnating solution that provides effective protection for marble, granite and other natural stones against stains and moisture.

GRANITE

Granite (Italian: granito – ‘grainy’) is an intrusive(formed underground) igneous rock with an acidic chemical composition and normal alkalinity. It belongs to the granitoid family. It consists mainly of quartz, plagioclase, potassium feldspar and mica (biotite and muscovite).

Granite is almost twice as hard as marble. It is characterised by high hardness and low abrasion, as well as resistance to high temperatures and acidic and alkaline environments.

It is an exceptionally strong rock – the average density of granite is approximately 2600–2700 kg/m^3.

WHAT DOES GRANITE MINING LOOK LIKE?

All over the world, granite is mainly extracted using three methods: explosive, mechanical and abrasive.

The choice of technology depends on the conditions of the deposit – its depth, characteristics and type of rock.

Fine-grained granite is particularly highly valued – not only for its strength, but also for its aesthetic qualities. Its structure offers superior aesthetics than coarse-grained rocks, which is why it is often used in finishing works.

The most commonly used methods in quarries are:

- drilling and blasting – holes are drilled into the rock and filled with explosives,
- air cushion method – instead of explosives, pressurised air tanks are introduced into the drilled holes.

NATURAL QUARTZITE

Quartzite is one of the most durable rocks on Earth, both physically and chemically. Mined like other natural stones, quartzite is prized for its refined aesthetics and premium character. When properly treated, it offers resistance to moisture, bacteria, staining, scratching, and high temperatures.

HOW IS QUARTZITE FORMED?

Quartzite is formed through metamorphism – the transformation of quartz sandstone under the influence of high temperature and pressure. It typically forms through the recrystallisation of quartz grains and, less commonly, from igneous rocks such as porphyry.

WHERE IS QUARTZITE MINED?

Quartzite deposits are found in Finland, Italy, Brazil and India, among other places. These deposits primarily originate from the metamorphism of tuff and medium-grained sedimentary rocks.

WHERE IS TRAVERTINE MINED?

The largest travertine deposits are found in Turkey. The deposits on the slopes of Pamukkale are particularly well known and have become a tourist attraction. The Denizli region in central Turkey alone accounts for about 50% of the world's reserves of this stone.

TRAVERTINE

Travertine (from French travertine, Italian travertino, Latin lapis tiburtinus – ‘Tiber stone’) is a calcareous tuff, i.e. a brittle, fine-grained sedimentary rock. It is composed primarily of calcium carbonate in the form of aragonite and calcite, with aragonite typically being more prevalent.

HOW IS TRAVERTINE DIFFERENT FROM MARBLE?

The most important difference between travertine and marble concerns their formation.

- Marble is formed as a result of the transformation of limestone under high pressure and temperature.
- Travertine, on the other hand, is formed in hot springs and limestone caves, where additional pressure and temperature lead to the precipitation of calcium carbonate.

HOW IS ONYX FORMED?

Onyx forms in thermal spring waters. This process is influenced by several factors, including suitable temperature and water acidity, reduced pressure, and high carbon dioxide concentration. During crystallisation, the mineral fills tectonic fissures and cavities in rocks, and can also form stalagmites within cave environments.

Due to its physical and mechanical properties, onyx is similar to marble.

WHERE IS ONYX FOUND?

Significant onyx deposits are located in Australia, India, Brazil, Pakistan, Mexico, Sri Lanka, the United States, Uruguay, and Madagascar. Among the most prized varieties is Black Arabian Onyx.

ONYX IN INTERIOR DESIGN

Onyx is a decorative stone that has been admired for centuries for its rich colours and natural translucency. It is used to finish walls, floors, countertops, lighting elements, and decorative accents. Onyx is crafted into slabs, mosaics, and sculptures, with applications ranging from modern to classical styles – whether backlit or not.

Thanks to its resistance to moisture and temperature fluctuations, onyx is also ideal for kitchens and dining rooms. It can be used as a countertop, bar, table or an impressive coffee table.

WHAT COLOURS DOES NATURAL ONYX COME IN?

Natural onyx is available in an extensive colour palette, including shades of beige, yellow, green, brown, pink, and rare multicoloured variations.

It is a stone that is never uniform – its colour and pattern depend on mineral admixtures and the conditions in which it was formed. This makes each piece of onyx unique, like a work of art created by nature.


Thank you for your attention!