

Marble

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Venus de Milo, front.

Marble is a [metamorphic rock](#) resulting from the [metamorphism](#) of [limestone](#), composed mostly of [calcite](#) (a crystalline form of [calcium carbonate](#), CaCO_3). It is extensively used for [sculpture](#), as a [building](#) material, and in many other applications. The word 'marble' is colloquially used to refer to many other stones that are capable of taking a high polish.

Faux marble or [faux marbling](#) is a wall painting technique that imitates the color patterns of real marble (not to be confused with [paper marbling](#)). Marble dust can be combined with cement or synthetic resins to make *reconstituted* or [cultured marble](#).

Places named after the stone include [Marble Arch, London](#); the [Sea of Marmara](#); [India's Marble Rocks](#); and the towns of [Marble, Minnesota](#); [Marble, Colorado](#); and [Marble Hill, Manhattan, New York](#). The [Elgin Marbles](#) are marble sculptures from the [Parthenon](#) that are on display in the [British Museum](#). They were brought to [Britain](#) by the [Earl of Elgin](#).



Marble.

Contents

- [1 Origins](#)
- [2 Kinds of marble](#)
- [3 Construction marble](#)
- [4 Industrial use of marble](#)
- [5 Production](#)
- [6 Etymology](#)
- [7 Cultural associations](#)
- [8 See also](#)
- [9 External links](#)

Origins

Marble is a [metamorphic rock](#) resulting from regional or rarely contact [metamorphism](#) of [sedimentary carbonate](#) rocks, either [limestone](#) or [dolostone](#), or metamorphism of older marble. This metamorphic process causes a complete recrystallization of the original rock into an interlocking mosaic of [calcite](#), [aragonite](#) and/or [dolomite crystals](#). The temperatures and pressures necessary to form marble usually destroy any [fossils](#) and sedimentary textures present in the original rock.

Pure white marble is the result of metamorphism of very pure limestones. The characteristic swirls and veins of many colored marble varieties are usually due to various mineral impurities such as [clay](#), [silt](#), [sand](#), [iron oxides](#), or [chert](#) which were originally present as grains or layers in the limestone. Green coloration is often due to [serpentine](#) resulting from originally high magnesium limestone or dolostone with silica impurities. These various impurities have been mobilized and recrystallized by the intense pressure and heat of the [metamorphism](#).

Kinds of marble



Natural patterns on the polished surface of "landscape marble" can resemble a city [skyline](#) or even trees ([see photo](#)).



Blocks of cut marble at the historic mill in Marble, Colorado

Some historically important kinds of marble, named after the locations of their [quarries](#), include:

- [Beijing White](#) from [China](#)
- [Black Marble](#) from [Kilkenny](#), Ireland
- [Boticena and Onyx\(Green\)](#) from [Pakistan](#)
- [Brač](#) from the island of [Brač](#), [Croatia](#)
- [Carrara](#) and [Luni](#) from [Italy](#)
- [Connemara](#) from [Ireland](#)
- [Danby](#) from [Vermont](#)
- [Durango Marble](#) from [Coyote Quarry](#), [Mexico](#)
- [Fauske](#) from [Norway](#)
- [Llano Pink](#) from [Central Texas](#)
- [Macael](#) from [Spain](#)
- [Makrana](#) from [India](#)

- [Nabresina](#), from near [Trieste](#)
- [Paros](#) from [Greece](#)
- [Penteli](#) from [Greece](#)
- [Proconnesus](#) from [Turkey](#)
- [Rouge de Rance](#) from [Rance](#), [Belgium](#)
- [Royal White](#) from [China](#)
- [Thassos](#) from [Greece](#)
- [Vietnam White](#) from [Vietnam](#)
- [Yule](#) from [Colorado](#)

White marbles, like Carrara in Italy, Royal White and Beijing White in China, have been prized for [sculpture](#) since classical times. This preference has to do with the softness and relative [isotropy](#) and homogeneity, and a relative resistance to shattering. Also, the low index of refraction of [calcite](#) allows light to penetrate several millimeters into the stone before being scattered out, resulting in the characteristic "waxy" look which gives "life" to marble sculptures of the human body.

Construction marble

In the [construction](#), specifically the [dimension stone](#) trade, the term "marble" is used for any massive, crystalline calcitic rock (and some non-calcitic rocks) useful as building stone. For example, "[Tennessee](#) marble" is really a massive, highly fossiliferous gray to pink to maroon [Ordovician dolostone](#) that [geologists](#) call the [Holston Formation](#).

Industrial use of marble

Colorless or light-colored marbles are a very pure source of [calcium carbonate](#), which is used in a wide variety of industries. Finely ground marble or calcium carbonate powder is a component in [paper](#), consumer products such as [toothpaste](#), [plastics](#), and [paints](#). Ground calcium carbonate can be made from limestone, chalk, and marble; about 3/4 of the ground calcium carbonate worldwide is made from marble. Ground calcium carbonate is used as a coating pigment for paper because of its high brightness and as a paper filler because it strengthens the sheet and imparts high brightness. Ground calcium carbonate is used in consumer products such as a food additive, in toothpaste, and as an inert filler in pills. It is used in plastics because it imparts stiffness, impact strength, dimensional stability, and thermal conductivity. It is used in paints because it is a good filler and extender, has high brightness, and is weather resistant. However, the growth in demand for ground calcium carbonate in the last decade has mostly been for a coating pigment in paper.

Calcium carbonate can also be reduced under high heat to [calcium oxide](#) (also known as "lime"), which has many applications including being a primary component of most [cement](#).

Production

According to the [USGS](#), U.S. dimension marble production in 2005 was 207,000 tonnes valued at \$18.9 million. Crushed marble production (for aggregate and industrial uses) was 7.76 million tonnes valued at \$58.7 million, of which 4.8 million tonnes was finely ground [calcium carbonate](#) and the rest was [construction aggregate](#). U.S. dimension marble demand is about 1.3 million tonnes. The DSAN World Demand for (finished) Marble Index has shown a growth of 10.5% annually for the 2000-2005 period. The largest dimension marble application is tile. The U.S. makes very little marble tile. Most marble tile is made in mammoth completely automated plants that operate 24 hours per day seven days per week in places such as Italy (for example, in Viareggio) and China.

Etymology

The word "marble" derives from the [Greek](#) *marmaros*, "shining stone" ([OED](#)). This stem is also the basis for the English word "marmoreal" meaning "marble-like".

See also

- [list of minerals](#)
- [building material](#)
- [calcium carbonate](#)
- [dimension stone](#)
- [limestone](#)
- [travertine](#)
- [alabaster](#)
- [granite](#)
- [sandstone](#)
- [marble sculpture](#)
- [Pietre dure](#) — inlaying with marble and other stones.
- [scagliola](#) — imitating marble with plasterwork.
- [cultured marble](#) — marble powder with a binder.
- [paper marbling](#)
- [Stones of India](#) Marble

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