



GENUINE STONE

MATERIAL FACT SHEET

# MARBLE

NATURAL STONE COUNCIL

## MARKET OVERVIEW:

The United States is one of the chief producers of dimension stone in the world, having generated an estimated 1.3 million tons in 2006. Marble sales comprised 14% of this market by tonnage, most in the form of rough blocks for construction.

Although marble deposits are not commonly found in the United States, a small quantity of marble is indeed quarried. The majority of these quarries have been in existence for 75 years or more. All marble quarries in the U.S. offer some fabrication services, while others sell block material for others to fabricate. Many blocks are exported through Canada. U.S.-imported marble sources from a variety of nations across the globe. Canada, China, France, Israel, Italy, Lebanon, Mexico, Spain, and Turkey frequently sit at the top of this list with respect to quantity purchased.

Sources: Dolley, T.P. 2007. 2006 Minerals Yearbook: Stone, Dimensional. U.S. Geological Survey. pg. 72.0-72.14.

Dolley, T.P. 2008. 2007 Mineral Commodity Summaries: Stone (Dimension). U.S. Geological Survey. pg. 160-161.

Stone World Magazine. Monthly Statistics. Accessed 15 December 2008.

<<http://www.stoneworld.com/CDA/HTML/a8142955339b7010VgnVCM100000f932a8c0>>.

## PRODUCTS & APPLICATIONS:

### Common Dimensions

Characteristics of quarried stone are dependent upon the attributes of the deposit from which the stone was extracted; each quarry is able to offer a range of products unique in dimensions, color, and structural properties to its deposit. Therefore, it is preferable that the designer and stone supplier collaborate closely prior to and throughout the design process since planning a project around readily available stone reduces the environmental impact of raw material extraction. Nevertheless, the most common dimensions of marble on the market are as follows:

BLOCKS: Maximum size of 8ft x 5ft x 5ft

SLABS: Maximum size of 8ft x 5ft with thickness of 2-3cm

Custom cubic may also be offered.

### Common Building Applications

- Cladding (exterior/interior)
- Landscaping
- Statuary
- Flooring
- Moulding

### Available Finishes

|          |                 |             |            |              |
|----------|-----------------|-------------|------------|--------------|
| TEXTURED | Bush-hammered   | Rock face   | Shot-sawn  | Chat-sawn    |
|          | Machine-tooled  | Sandblasted | Split face | Waterblasted |
| SMOOTH   | Circular-sanded |             | Polished   |              |
|          | Honed           |             | Flamed     |              |

Custom finishes may also be available through your stone supplier.

This factsheet was developed by the Natural Stone Council as part of a continuous effort to provide reliable and useful information regarding Genuine Stone® products. The information presented has been extensively reviewed by owners and operators of marble quarries and fabrication facilities. To access factsheets for other stone types and learn more about Genuine Stone®, including the industry's environmental initiatives, visit [www.genuinestone.com](http://www.genuinestone.com).



Photo courtesy of IKM, Inc.

## FORMATION & SOURCES:

Marble is a metamorphic stone formed when limestone is subjected to intense heat, pressure and chemical solutions, causing the stone to reform into an interlocking structure of calcite, aragonite, and sometimes dolomite crystals. Marble formed from very pure limestone is white, but the presence of other minerals, as well as clay, silt and sand, can give it richly varied coloration.

Marble is found in the mountainous regions of most countries, but relatively few quarries exist in the United States.

ENVIRONMENTAL DATA:

|   | Quarrying         | Processing        |
|---|-------------------|-------------------|
| Embodied Energy (Btu/ton)                                 | No data available | No data available |
| Embodied Water (gal/ton)                                  |                   |                   |
| Global Warming Potential (kg CO <sub>2</sub> equivalents) |                   |                   |

INDOOR AIR QUALITY:

Volatile Organic Compounds (VOCs)

- None emitted directly from marble
- May source from adhesives and sealants applied; low-VOC options are available on the market
- Resources: refer to MSDS of chemical(s) used

PHYSICAL PROPERTIES:

A wide variety of marbles exist on the market, both foreign and domestic, and these can be drastically different in density, hardness, porosity, and aesthetics. Users should verify that the marble they plan to use is applicable to the demands of the project and has a successful history in such installations. ASTM test data is the most common data available to compare the properties of any stone, including marble.

PERFORMANCE:

**Durability**

- Countertops: lifetime
- Flooring: 100 years with proper maintenance
- Exterior applications: lifetime

Source: National Association of Home Builders. 2007.  
 Study of Life Expectancy of Home Components.  
 <[http://www.nahb.org/fileUpload\\_details.aspx?contentID=72475](http://www.nahb.org/fileUpload_details.aspx?contentID=72475)>.

**Reuse & Recyclability**

- Ensure reclaimed marble meets ASTM specifications before using for structural purposes
- Example applications:

|             |                                  |          |
|-------------|----------------------------------|----------|
| Landscaping | Retaining walls                  | Walkways |
| Fill        | Re-installation on new buildings | Statuary |



Photo courtesy of Polycor Georgia Marble

ASTM STANDARDS:

**ASTM C-503 “Standard Specification for Marble Dimension Stone”**

- Includes material characteristics, physical requirements, and sampling appropriate to the selection of marble for general building and structural purposes.
- The table below lists the required test values for marble; the necessary tests are prescribed by and located in the ASTM standards.

| PROPERTY   | REQUIRED TEST VALUE |
|--|---------------------|
| Density, min lb/ft <sup>3</sup> (kg/m <sup>3</sup> ) | 162 (2590)          |
| Absorption by weight, max, %                         | 0.20                |
| Compressive strength, min, psi (MPa)                 | 7500 (52)           |
| Modulus of rupture, min, psi (MPa)                   | 1000 (6.89)         |
| Abrasion resistance, min, hardness*                  | 10                  |
| Flexural strength, min, psi (MPa)                    | 1000 (6.89)         |

\*Pertains only to stone subject to foot traffic.

Adapted from C-503 “Standard Specification for Marble Dimension Stone, copyright ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428. A copy of the complete standard may be obtained from ASTM ([www.astm.org](http://www.astm.org)).