



GENUINE STONE

MATERIAL FACT SHEET

GRANITE

NATURAL STONE COUNCIL

MARKET OVERVIEW:

The United States is one of the chief producers of dimension stone in the world, having generated an estimated 1.5 million tons in 2006. Granite production typically is the largest or second largest portion of this market.

Despite its abundance in the U.S., granite is purchased from a number of other countries. Brazil, China, India, Italy, and Norway typically lead as sources of imports to the U.S. Exports of the material are shipped predominantly to Canada, China, and Italy.

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 granite 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

Common Building Applications

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

Other Uses: aggregate, curbing, & mulch

Available Finishes

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

Custom finishes may also be available through your stone supplier.



Photo courtesy of Planet Granite

FORMATION & SOURCES:

Granite is an igneous rock that forms when magma cools slowly beneath the earth's surface, forming large, easily visible crystals of quartz, feldspar, and mica. Scientifically, an intrusive (plutonic) igneous rock must contain between 10% and 50% quartz to be classified as granite, but other similar stones such as gabbro, diabase, anorthosite, sodalite, gneiss, and basalt are sometimes sold as "granite" commercially.

The granite quarried in North America comes mainly from the eastern and upper Midwest United States, but quarries can be found from coast to coast.

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 granite 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.

ENVIRONMENTAL DATA:

	Quarrying	Processing
Embodied Energy (MJ/ft ³ stone)	400	2,500
Embodied Water (gal/ft ³ stone)	86	9,100
Global Warming Potential (kg CO ₂ equivalents/ft ³ stone)	14	52

Source: *Natural Stone Council. Granite Dimensional Stone Quarrying and Processing: A Life-Cycle Inventory. August 2008. Center for Clean Products. University of Tennessee.* <http://isse.utk.edu/ccp/projects/naturalstone/results_pubs.html>.

INDOOR AIR QUALITY:

Volatile Organic Compounds (VOCs)

- None emitted directly from granite
- 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 granites 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 granite 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 granite.

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>.

Reuse & Recyclability

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

Concrete mixture
Fill

Landscaping
Re-installation on new buildings

Retaining walls
Statuary

Walkways



Photo by Jennifer Adams

ASTM STANDARDS:

ASTM C-615 “Standard Specification for Granite Dimension Stone”

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

PROPERTY	REQUIRED TEST VALUE
Density, min lb/ft ³ (kg/m ³)	160 (2560)
Absorption by weight, max, %	0.40
Compressive strength, min, psi (MPa)	19,000 (131)
Modulus of rupture, min, psi (MPa)	1500 (10.34)
Abrasion resistance, min, hardness*	25
Flexural strength, min, psi (MPa)	1200 (8.27)

*Pertains only to stone subject to foot traffic.

Adapted from C-615 “Standard Specification for Granite 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).

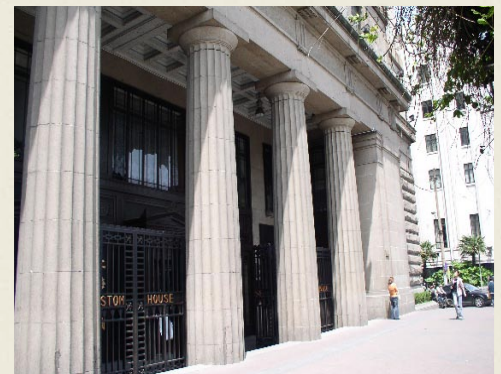


Photo by Jennifer Adams