



GENUINE STONE

MATERIAL FACT SHEET

LIMESTONE

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. Limestone sales comprised the second largest portion of this market at 35% by tonnage. Dominating the sales were curbing, paving, rough blocks, slabs, veneer, wall panels, and tile.

Likely a result of limestone's prevalence in North America, Canada was the principle supplier and purchaser of the majority of 2006 U.S. imports and exports, respectively.

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.

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, when possible, the most common dimensions of limestone on the market are as follows:

BLOCKS: Maximum size of 8ft x 4ft x 4ft

SLABS: Maximum size of 8ft x 4ft with thickness of 2-3cm

Common Building Applications

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

Other Uses: aggregate, curbing, lime, mulch, & paving

Available Finishes

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

Custom finishes may also be available through your stone supplier.



Photo by Michael Reis

FORMATION & SOURCES:

Limestone is a sedimentary rock composed of calcium carbonate, plus calcium and/or magnesium. It is formed when layers of minerals (particularly calcite), fine sediment, and the skeletons and shells of marine organisms undergo lithification. Terrestrially-formed limestone is known as travertine.

Limestone is commonly quarried across North America, particularly in the Midwest United States.

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 limestone 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 (Btu/ton)	1.4 million	4.7 million
Embodied Water (gal/ton)	600	19,000
Global Warming Potential (kg CO ₂ equivalents)	20	80

Source: *Natural Stone Council. Limestone 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 limestone
- 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:

An especially wide variety of limestones 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 limestone 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 limestone.

PERFORMANCE:

Durability

- Interior applications: lifetime
- 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 limestone 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 Michael Reis



Photo courtesy of Indiana Limestone Company

ASTM STANDARDS:

ASTM C-568 “Standard Specification for Limestone Dimension Stone”

- Includes material characteristics, physical requirements, and sampling appropriate to the selection of limestone for general building and structural purposes.
- Classifies dimensional limestone into three categories: Type I (Low density), Type II (Medium density), and Type III (High density). The table below lists the required test values for each type of limestone; the necessary tests are prescribed by and located in the ASTM standards.

PROPERTY	TYPE I	TYPE II	TYPE III
Density, min lb/ft ³ (kg/m ³)	110 (1760)	135 (2160)	160 (2560)
Absorption by weight, max, %	12.00	7.50	3.00
Compressive strength, min, psi (MPa)	1800 (12)	4000 (28)	8000 (55)
Modulus of rupture, min, psi (MPa)	400 (2.76)	500 (3.45)	1000 (6.89)
Abrasion resistance, min, hardness*	10	10	10

*Pertains only to stone subject to foot traffic.

Adapted from *C 568-08a Standard Specification for Limestone 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 courtesy of Fischer Stone & Materials