

Appendix

An excerpt from the *Dimension Stone Design Manual 2022*
(April 2022)



**Produced and Published by the
Natural Stone Institute
380 East Lorain St. Oberlin, Ohio 44074
Telephone: 440-250-9222
Fax: 440-774-9222
www.naturalstoneinstitute.org**

Disclaimer: This manual contains general guidelines. The Natural Stone Institute and its Member companies are not responsible for any use or misuse that causes damage of any kind, including loss of rights, material, and personal injury alleged to be caused directly or indirectly by the information contained in this manual.

© 2022 Natural Stone Institute
© 2016 Marble Institute of America (Chapter 21, 22, Glossary, Appendix and Index)
© 2011 Marble Institute of America (Chapter 17, Glossary and Index)
© 2010 Marble Institute of America (Chapters 13, 14, 15, and Index)
© 2007 Marble Institute of America (All other Chapters)

All rights reserved. No part of this document may be reproduced or transmitted in any form or by means electronic or mechanical, including photocopy, recording, or by an information storage and retrieval system, without written permission from the Natural Stone Institute.

CONVERSION TABLES

Inches to Millimeters

<u>Inches</u>	<u>Millimeters</u>
1/32 in	0.794 mm
1/16 in	1.588 mm
3/32 in	2.381 mm
1/8 in	3.175 mm
5/32 in	3.969 mm
3/16 in	4.763 mm
7/32 in	5.556 mm
1/4 in	6.350 mm
9/32 in	7.144 mm
5/16 in	7.938 mm
11/32 in	8.731 mm
3/8 in	9.525 mm
13/32 in	10.319 mm
7/16 in	11.113 mm
15/32 in	11.906 mm
1/2 in	12.700 mm
17/32 in	13.494 mm
9/16 in	14.288 mm
19/32 in	15.081 mm
5/8 in	15.875 mm
21/32 in	16.669 mm
11/16 in	17.463 mm
23/32 in	18.256 mm
3/4 in	19.050 mm
25/32 in	19.844 mm
13/16 in	20.638 mm
27/32 in	21.431 mm
7/8 in	22.225 mm
29/32 in	23.019 mm
15/16 in	23.813 mm
31/32 in	24.606 mm
1 in	25.400 mm

<u>Feet</u>	<u>Millimeters</u>
1 ft	304.8 mm
2 ft	609.6 mm
3 ft	914.4 mm

Note: Some of the SI International System of Units (metric) conversions listed in these tables are rounded numbers at the third decimal place.

Centimeters to Inches

<u>Centimeters</u>	<u>Inches</u>
0.2 cm	1/16 in
0.3 cm	1/8 in
0.5 cm	3/16 in
1.0 cm	3/8 in
1.4 cm	9/16 in
1.5 cm	5/8 in
2.0 cm	3/4 in
2.5 cm	1 in
3.0 cm	1-3/16 in
3.5 cm	1-3/8 in
4.0 cm	1-9/16 in
4.5 cm	1-3/4 in
5.0 cm	2 in

NOTE: Centimeters (cm) have been rounded off to the nearest tenth of a cm.

Square Feet to Square Meters

<u>Square Feet</u>	<u>Square Meters</u>
1 sq ft	0.093 sq m
2 sq ft	0.186 sq m
3 sq ft	0.279 sq m
4 sq ft	0.372 sq m
5 sq ft	0.465 sq m
6 sq ft	0.558 sq m
7 sq ft	0.651 sq m
8 sq ft	0.744 sq m
9 sq ft	0.837 sq m
10 sq ft	0.930 sq m

Square Meter to Square Feet

<u>Square Meters</u>	<u>Square Feet</u>
1 sq m	10.764 sq ft
2 sq m	21.528 sq ft
3 sq m	32.292 sq ft
4 sq m	43.056 sq ft
5 sq m	53.820 sq ft
6 sq m	64.583 sq ft
7 sq m	75.348 sq ft
8 sq m	86.111 sq ft
9 sq m	96.875 sq ft
10 sq m	107.639 sq ft

CONVERSION TABLES

Conversion Ratios

Length and Area

<u>Convert from</u>	<u>To</u>	<u>Multiply by</u>
millimeter	inch	0.04
centimeter	inch	0.3937
centimeter	foot	0.03281
meter	inch	39.37
meter	foot	3.281
square meter	square foot	10.763
inch	millimeter	25.4
inch	centimeter	2.54
inch	meter	0.0254
foot	meter	0.3048
yard	meter	0.9144
square inch	square meter	0.000645
square foot	square meter	0.092990
square yard	square meter	0.836127

Weight

<u>Convert from</u>	<u>To</u>	<u>Multiply by</u>
pound	kilogram	0.4536
ounce	gram	28.3495
long ton	pounds	2240
short ton	pounds	2000
gram	ounces	0.0353
kilogram	pounds	2.2046

Volume

<u>Convert from</u>	<u>To</u>	<u>Multiply by</u>
cubic cm	cubic inch	0.061
cubic meter	cubic feet	35.3198
cubic inch	cubic cm	16.387
cubic feet	cubic meters	0.028
liter	gallons	0.2642
lb/ft ³	kg/m ³	16.02
MPa	lbf/in ² (psi)	145
lbf/in ² (psi)	pascals (Pa)	6895
lbf/in ² (psi)	kg/sq m	4.882
kg/m ²	pascals (Pa)	9.807

Mohs Scale

In 1812, the Mohs Scale of mineral hardness was devised by the German mineralogist Friedrich Mohs (1773-1839), who selected the ten minerals because they were common or readily available. The scale is not a linear scale, but somewhat arbitrary.

<u>Hardness</u>	<u>Mineral</u>
1	Talc or mica
2	Gypsum
3	Calcite
4	Fluorite
5	Apatite
6	Orthoclase
7	Quartz
8	Topaz
9	Corundum
10	Diamond

Source:

American Federation of Mineralogical Societies, Inc.

Slab Production Table

<u>Blocks</u>	<u>Slabs/Foot</u>	<u>Slab Thickness</u>
1 cu ft	10	3/4"
1 cu ft	8	1-1/4"
1 cu ft	7	1-1/2"
1 cu ft	5	2"
1 cu ft	4	2-1/2"
1 cu ft	3½	3"
1 cu ft	3	3-1/2"
1 cu ft	2½	4"

ADDITIONAL NSI RESOURCES

MIA Technical Bulletin Series:

Tolerances in the Dimension Stone Industry
(Sept 2014)*

Dimension Stone Test Methods Guides and
Standards (June 2014)

Calcareous Onyx (December 2011)

Cement Types and Usage with Natural Stone
(October 2010)

Joint Sealants (May 2010)

Dimension Stone Anchorage Theory Practice
Components (January 2010)

The Truth about Granite Radon Radiation
(March 2007)

Countertop Sanitation Study Compares
Natural with Engineered Stone (February
2006)

OSHA Bulletin Hazards Associated With
Transporting Granite and Marble Slabs
(September 2005)

Marble Soundness Classification (January
2005)

R-Value for Natural Stone (August 2004)

MIA Technical Modules:

Illustrated Glossary of Stone Industry Terms*

Installation of Modular Stone Floor Tile:
Thin-Set Method *

Interior Stone Wall Cladding *

Q&A: Expert Answers to Technical Questions
about Working with Natural Stone

Residential Stone Countertop Installations *

Safety in the Stone Business (also available in
Spanish)

Silicosis: An Industry Guide to Awareness and
Prevention

Stone Selection & Stone Testing *

Wet Areas*

*Information contained in these technical publications was taken directly from the *Dimension Stone Design Manual*. Additional illustrations and pictures have been added in these stand-alone publications.

ASTM Classification Index

ASTM	Dimension Stones	C97	C97	C99	C120	C121	C170	C241	C880
		Density lb/ft ³ (minimum)	Absorption (max %)	Modulus of Rupture psi (min)	Flexural Strength (Slate) psi (min)	Water Absorption (Slate) (max %)	Compressive Strength psi (min)	Abrasive Resistance (minimum)	Flexural Strength psi (min)
C503	Marble Calcite	162	0.20	1,000	na	na	7,500	10	1,000
C503	Marble Dolomite	175	0.20	1,000	na	na	7,500	10	1,000
C1526	Serpentine	160	0.20 exterior 0.60 interior	1,000	na	na	10,000	10	1,000
C1527	Travertine (exterior) ³	144	2.50	700	na	na	7,500	10	500
C1527	Travertine (interior) ³	144	2.50	700	na	na	5,000	10	500
C568	Limestone (low density) ^{1,2}	110	12.00	400	na	na	1,800	10	none est.
C568	Limestone (med density) ^{1,2}	135	7.50	500	na	na	4,000	10	none est.
C568	Limestone (high density) ¹	160	3.00	1,000	na	na	8,000	10	none est.
C615	Granite	160	0.40	1,500	na	na	19,000	25	1,200
C629	Slate (interior)	170-190 ⁴	na	na	5,500 along grain 7,200 across grain	0.45	none est.	8	none est.
C629	Slate (exterior)	170-190 ⁴	na	na	7,200 along grain 9,000 across grain	0.25	none est.	8	none est.
Quartz-based Stones									
C616	Sandstone	125	8.00	350	na	na	4,000	2	none est.
C616	Quartzitic Sandstone	150	3.00	1,000	na	na	10,000	8	none est.
C616	Quartzite	160	1.00	2,000	na	na	20,000	8	none est.

Notes:

1. Limestone shall be sound, durable, and free of visible defects or concentrations of materials that will cause objectionable staining or weakening in normal environments of use.
2. Limestone that is of low or medium density may not be suitable for use in all interior and exterior applications.
3. Travertine that is fleuri-cut (cross cut) can be vulnerable to certain problems because some areas of the exposed surface will consist of only a thin layer of stone covering a void in the stone.
4. Historical data not established by ASTM.