



|||||
GEORGIA STONE INDUSTRIES INCORPORATED
15 BRANCH PIKE
SMITHFIELD RI 02917-1211
USA

Analysis No. TS-S&T2402121
Report Date 29 August 2024
Quarry/Fabricator Hopkinton Quarry
Date Sampled 09 July 2024
Where Sampled Hopkinton, MA USA
Sample Received 15 August 2024
Sampled By Client

This is to attest that we have examined Natural Stone Material identified: Milford Pink Granite

When examined to the applicable requirements of:

ASTM C 97-18	“Standard Test Method for Absorption and Bulk Specific Gravity of Dimensional Stone”
ASTM C 99-18	“Standard Test Method for Modulus of Rupture of Dimension Stone”
ASTM C 170-17	“Standard Test Method for Compressive Strength of Dimensional Stone”
ASTM C 880-18	“Standard Test Method for Flexural Strength of Dimension Stone”
ASTM C 1353-20	“Standard Test Method for Abrasion Resistance of Dimension Stone Subjected to Foot Traffic Using a Rotary Platform Abraser” ¹

The Natural Stone identified above has the following average² properties:

Average % Absorption		0.27	(5)
Average Bulk Specific Gravity		2 634 kg/m ³	(5)
		164.3 lbs/ft ³	(5)
Modulus of Rupture	Perpendicular Dry	1 500 psi	(5)
Compressive Strength	Perpendicular Dry	26 100 psi	(5)
Flexural Strength	Perpendicular Dry	1 800 psi	(5)
Abrasion Resistance		57.2 lw	(3)

END OF ANALYSIS

The attached Report of Test is an Integral part of this Summation Certificate.

¹NOTE: For Igneous Samples we run ASTM C 241, for Sedimentary and Metamorphic Samples we run ASTM C 1353. ²Number in Parentheses is Samples tested for the Average

Frank Strickland – MS-Geology
Director, Stone & Tile Laboratory

SUMMATION CERTIFICATE



Milford Pink Granite as received.

TEST REPORT

TESTING APPLICANT: Georgia Stone Industries, Incorporated
 15 Branch Pike
 Smithfield, RI 02917-1211
 USA
 Phone: +1 401.232.2040
 Fax: www.granitesofamerica.com

FABRICATOR/QUARRY: Hopkinton Quarry
 Hopkinton, MA 01748
 USA

SAMPLES RECEIVED DATE: 15 August 2024
 SAMPLE PLAN: Natural Stone cut to the sizes stated in the Standards below were received in "NEW" condition. Samples submitted by client.

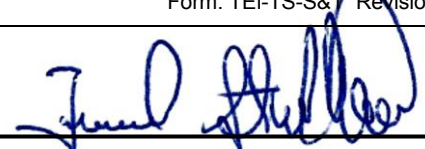
DATE OF SAMPLING: 09 July 2024
 LOCATION OF SAMPLING: Hopkinton, MA USA
 SCOPE / PURPOSE OF TESTING: Determine Compliance with the requirements of ASTM C 615/C 615M-18 "Standard Specification for Granite Dimension Stone"

STANDARD(S) EVALUATED: ASTM C 97-18 "Standard Test Method for Absorption and Bulk Specific Gravity of Dimensional Stone", ASTM C 99-18 "Standard Test Method for Modulus of Rupture of Dimension Stone", ASTM C 170-17 "Standard Test Method for Compressive Strength of Dimensional Stone", ASTM C 880-18 "Standard Test Method for Flexural Strength of Dimension Stone" and ASTM 241¹-21 "Standard Test Method for Abrasion Resistance of Stone Subjected to Foot Traffic"

TESTING DATE(S): 15 March – 29 August 2024
 PRODUCT DESCRIPTION(S): Natural Stone identified: Milford Pink Granite

COMPLIANCE SUMMARY:	Natural Stone identified above has the following average ² properties: Tested Perpendicular to the Rift		
	Average % Absorption	0.27	(5)
	Average Bulk Specific Gravity	2 634 kg/m ³ / 164.3 lbs/ft ³	(5)
	Modulus of Rupture	Perpendicular Dry 1 500 psi	(5)
	Compressive Strength	Perpendicular Dry 26 100 psi	(5)
	Flexural Strength	Perpendicular Dry 1 800 psi	(5)
	Abrasion Resistance	57.2 Ha	(3)
	¹ NOTE: For Igneous Samples we run ASTM C 241 for Sedimentary and Metamorphic Samples we run ASTM C 1353. ² Number in Parentheses is Samples tested for the Average. See Test Results for details		

Unless specifically noted, all portions of the following tests were conducted by and/or under the continuous direct supervision of TEI-Testing Services, LLC personnel. The paragraph numbers in the report correspond with the paragraph numbers of the standard(s) above. Paragraphs which do not apply to this particular application or are for laboratory use only have been omitted. No deviations from the standard(s) were made unless specifically noted. If applicable, uncertainty measurements are noted in the applicable test paragraph. This report is the confidential property of the Client and TEI-Testing Services, LLC. This report may not be reproduced except in full, without the expressed written consent of TEI-Testing Services, LLC. NOTE: The values in this report are the values obtained under standard test conditions and thus may be used for purposes of demonstrating compliance or for comparison with other units tested under the same standard. Statement of Risk: Client understands and agrees that declarations of conformity are made by directly comparing the measurement results against the test limits given in the standard without consideration to factors that may contribute to measurement uncertainty and accepts the shared risk that arises from this approach. Testing Engineers International, Inc. or its subsidiaries assume no responsibility for variations in quality, composition, appearance, performance, or other feature of similar subject matter produced by persons or under conditions over which Testing Engineers International, Inc. or its subsidiaries have no control. This Report of Test gives the characteristics of the sample(s) submitted for testing only. It does not constitute a recommendation for, endorsement of, or certification of the product or material tested. Testing Engineers International, Inc. and its subsidiaries make no warranty, expressed or implied except that the test has been performed and a report prepared based upon the sample or samples provided by the client. Extrapolation of data from the sample or samples relating to the batch or lot from which it was obtained may not correlate and should be interpreted accordingly with extreme caution. It does not and may not be used to certify the characteristics of the product, nor to imply that the product in general meets the requirements of any standard, nor its acceptability in the marketplace. TEI stylized lettering and logo are registered trademarks and use is by contract and/or written permission only. © 2024 by TEI-Testing Services, LLC. TEI-Testing Services is a wholly owned LLC of Testing Engineers International, Inc. Form: TEI-TS-S&T Revision 04/2020



Frank Strickland, MS-Geology
 Director of Stone & Tile Laboratory

TEST REPORT

TABLE OF CONTENTS

ASTM C 97-18 “Standard Test Method for Absorption and Bulk Specific Gravity of Dimensional Stone”
RESULTS..... Page 4 of 15

ASTM C 99-18³ “Standard Test Method for Modulus of Rupture of Dimensional Stone”
RESULTS..... Page 6 of 15

ASTM C 170-17³ “Standard Test Method for Compressive Strength of Dimensional Stone”
RESULTS..... Page 8 of 15

ASTM C 880-18³ “Standard Test Method for Flexural Strength of Dimension Stone”
RESULTS..... Page 10 of 15

ASTM 241¹-21 “Standard Test Method for Abrasion Resistance of Stone Subjected to Foot Traffic”
RESULTS..... Page 12 of 15

CONCLUSION Page 12 of 15

PICTURE(S)..... Page 13 of 15

¹NOTE: For Igneous Samples we run ASTM C 241 for Sedimentary and Metamorphic Samples we run ASTM C 1353

TEST REPORT

ASTM C 97

“Standard Test Methods for Absorption and Bulk Specific Gravity of Dimensional Stone”

1.0 SCOPE

1.1 These test methods cover the tests for determining the absorption and bulk specific gravity of all types of dimension stone, except slate.

1.2 – 1.3 Omitted, see Standard

2.0 REFERENCED DOUCMENTS – Omitted, see Standard

3.0 TERMINOLOGY

3.1 Definitions - All definitions are in accordance with Terminology C 119.

4.0 SIGNIFICANCE AND USE

4.1 These test methods are useful in indicating the differences in absorption between the various dimension stones. These test methods also provide one element in comparing stones of the same type.

ABSORPTION

5.0 SAMPLING – Omitted, see Standard

NOTE: Sampling was done by the Client.

6.0 TEST SPECIMENS – Omitted, see Standard

NOTE: The test specimens were tested “As Received”. See RESULTS

7.0 PROCEDURE – Omitted, see Standard

NOTE: The specimens were tested in accordance with the requirements of this Section

8.0 CALCULATION

8.1 Calculate the weight percentage absorption for each specimen as follows:

$$\text{Absorption, weight \%} = [(B-A)/A] \times 100$$

where A = weight of the dried specimen, and
B = weight of the specimen after immersion

9.0 REPORT – Omitted, see Standard and RESULTS

TEST REPORT

BULK SPECIFIC GRAVITY

10.0 PROCEDURE – Omitted, see Standard

NOTE: The specimens were tested in accordance with the requirements of this Section

11.0 CALCULATION

11.1 Calculate the bulk specific gravity as follows:

$$\text{Bulk specific gravity} = \frac{A}{(B-C)}$$

where: A = weight of the dried specimen,
 B = weight of the soaked and surface dried specimen in air,
 C = weight of soaked specimen in water.

11.2 Calculate the results to three decimal places and round off to two. Report the Average, Maximum and Minimum values.

12.0 REPORT – Omitted, see Standard and RESULTS

13.0 PRECISION AND BIAS – Omitted, see Standard

14.0 KEYWORDS – Omitted, see Standard

RESULTS

Results – As Received						
Sample	Dry Weight	Soaked/Dried Weight	Wet Weight	% Absorption	Bulk Specific Gravity X 1 000	Bulk Specific Gravity X 62.4
A	383.97	384.95	238.93	0.2550	2 629.6	164.1
B	387.83	388.89	241.4	0.2733	2 629.5	164.1
C	384.72	385.77	239.58	0.2729	2 631.6	164.2
D	379.22	380.25	236.19	0.2716	2 632.4	164.3
E	382.52	382.52	237.87	0.2667	2 644.5	165.0

Average % Absorption – 0.2679

Average Bulk Specific Gravity – 2 633.9 kg/m³ or 164.3 lb/ft³

TEST REPORT

ASTM C99 "Standard Test Methods for Modulus of Rupture of Dimensional Stone"

1.0 SCOPE

1.1 This test method covers the determination of the modulus of rupture of all types of dimensional stone except slate.

1.2 - 1.3 Omitted, see Standard

2.0 REFERENCED DOCUMENTS – Omitted, see Standard

3.0 TERMINOLOGY

3.1 Definitions - All definitions are in accordance with Terminology C 119.

4.0 SIGNIFICANCE AND USE

4.1 This test method is useful in indicating the differences in modulus of rupture between the various dimension stones. These test methods also provide one element in comparing stones of the same type.

5.0 APPARATUS

5.1 Testing Machine

NOTE: The equipment used is in accordance with the requirements of this Section.

6.0 SAMPLING

NOTE: Sampling was done by the Client.

7.0 TEST SPECIMENS

NOTE: The test specimens were tested "As Received". See RESULTS

8.0 MARKING AND MEASURING SPECIMENS

NOTE: The Specimens were measured and marked in accordance with the requirements of this Section.

9.0 CONDITIONING

NOTE: The specimens were conditioned in accordance with the requirements of this Section. The specimens were tested "Dry", Perpendicular to the Rift.

10.0 PROCEDURE

NOTE: The procedures outlined were followed without exception in accordance with the requirements of this Section.

TEST REPORT

11.0 CALCULATION

11.1 Calculate the modulus of rupture of each specimen as follows:

$$R = \frac{3WI}{2bd^2}$$

where R = modulus of rupture, psi
 W = breaking load, lbf
 l = length of span, in.
 b = width of specimen, in. and
 d = thickness of specimen, in.

12.0 REPORT – Omitted, see Standard and RESULTS

13.0 PRECISION AND BIAS – Omitted, see Standard

14. KEYWORDS – Omitted, see Standard

RESULTS

Perpendicular Dry					
Sample	Length	Width	Thickness	Load (lbf)	Modulus of Rupture (psi)
A	7.000	3.994	2.216	2 851	1 526
B	7.000	3.965	2.217	3 259	1 756
C	7.000	3.995	2.217	2 689	1 438
D	7.000	4.005	2.229	2 689	1 419
E	7.000	4.020	2.226	2 722	1 435

Average Modulus of Rupture Perpendicular - Dry – 1 515 psi

TEST REPORT

ASTM C 170

“Standard Test Methods for Compressive Strength of Dimensional Stone”

1.0 SCOPE

1.1 This test method covers the sampling, preparation of specimens, and determination of the compressive strength of dimensional stone.

2.0 REFERENCED DOCUMENTS – Omitted, see Standard

3.0 TERMINOLOGY

3.1 Definitions - All definitions are in accordance with Terminology C 119.

4.0 SIGNIFICANCE AND USE

4.1 This test method is useful in indicating the differences in compressive strength between the various dimension stones. These test methods also provide one element in comparing stones of the same type.

5.0 APPARATUS

5.1 Testing Machine NOTE: The equipment used is in accordance with the requirements of this Section.

6.0 SAMPLING

NOTE: Sampling was done by the Client.

7.0 TEST SPECIMENS

NOTE: The test specimens were tested “As Received”. See RESULTS

8.0 CONDITIONING

NOTE: The specimens were conditioned in accordance with the requirements of this Section. The specimens were tested “Dry”, Perpendicular to the Rift.

9.0 PROCEDURE

NOTE: The specimens were tested in accordance with the requirements of this Section.

10.0 CALCULATION

10.1 Calculate the compressive strength for each specimen as follows:

$$C = \frac{W}{A}$$

where C = compressive strength of the specimen, psi
W = total load, lbf on the specimen at failure, and
A = calculated area of the bearing surface in in².

Round each individual result to the nearest 100 psi.

TEST REPORT

11.0 REPORT – Omitted, see Standard and RESULTS

12.0 PERCISION AND BIAS – Omitted, see Standard

13.0 KEYWORDS – Omitted, see Standard

RESULTS

Perpendicular – Dry					
Sample	Length	Width	Thickness	Load (lbf)	Compressive Strength (psi)
A	2.001	1.992	2.254	95 115	23 862
B	2.001	2.007	2.254	115 636	28 784
C	2.002	2.007	2.254	101 269	25 204
D	2.100	1.965	2.255	113 737	27 563
E	2.000	2.009	2.255	99 783	24 834

Average Compressive Strength Perpendicular Dry – 26 051 psi

*Sample had pre-existing crack (see photo)

TEST REPORT

ASTM C 880 “Standard Test Method for Flexural Strength of Dimension Stone”

1.0 SCOPE

1.1 This test method covers the procedure for determining the flexural strength of stone by use of a simple beam using quarter-point loading.

1.2 Stone test shall be made when pertinent for the situation when the load is perpendicular to the bedding plane and when the load is parallel to the bedding plane.

1.3 As required, the flexural tests shall also be conducted under wet conditions.

1.4 Omitted, see Standard

2.0 REFERENCE DOCUMENTS – Omitted, see Standard

3.0 TERMINOLOGY

3.1 Definitions - All definitions are in accordance with Terminology C 119.

4.0 SIGNIFICANCE AND USE

4.1 This test method is useful in indicating the differences in flexural strength between the various dimension stones. This test method also provides one element in comparing stones of the same type.

5.0 APPARATUS

5.1 Testing Machine – Omitted, see Standard

NOTE: The equipment used is in accordance with the requirements of this Section.

6.0 SAMPLING – Omitted, see Standard

NOTE: Sampling was done by the Client.

7.0 TEST SPECIMENS – Omitted, see Standard

NOTE: The test specimens were tested “As Received”. See RESULTS

8.0 CONDITIONING – Omitted, see Standard

NOTE: The specimens were conditioned in accordance with the requirements of this Section. The specimens were tested “Dry”, Perpendicular to the Rift.

9.0 PROCEDURE – Omitted, see Standard

NOTE: The specimens were tested in accordance with the requirements of this Section.

TEST REPORT

10.0 CALCULATION

10.1 Calculate the flexural strength, σ , as follows:

$$\sigma = \frac{3WL}{4bd^2}$$

where: σ = flexural strength (psi)
 W = maximum load (lbf)
 L = span, (inches)/10d
 b = width of specimen (inches); $b \geq 1.5d$
 d = depth of specimen (inches)

11.0 REPORT – Omitted, see Standard and RESULTS

12.0 PRECISION AND BIAS – Omitted, see Standard

13.0 KEYWORDS – Omitted, see Standard

RESULTS

Perpendicular - Dry					
Sample	Length	Width	Thickness	Load (lbf)	Flexural Strength (psi)
A	12.360	4.046	1.236	1 196	1 794
B	12.570	4.046	1.257	1 311	1 833
C	12.550	4.092	1.255	1262	1 843
D	12.310	4.003	1.231	1 229	1 871
E	12.450	4.033	1.245	1 180	1 763

Average Flexural Strength Perpendicular - Dry – 1 841 psi

TEST REPORT

ASTM C 241¹

“Standard Test Method for Abrasion Resistance of Stone Subjected to Foot Traffic”

1.0 SCOPE

1.1 This test method covers the determination of the abrasion resistance of all types of stones for floors, steps, and similar uses where the wear is caused by the abrasion of foot traffic.

1.2 – 1.3 Omitted, see Standard

2.0 REFERENCED DOCUMENTS – Omitted, see Standard

3.0 TERMINOLOGY

3.1 3.1 Definitions—All definitions are in accordance with Terminology C 119.

4.0 SIGNIFICANCE AND USE

4.1 This test method is useful in indicating the differences in abrasion resistance between the various building stones. This test method also provides one element in comparing stones of the same type.

5.0 APPARATUS

5.1 NOTE: The Test Equipment used is in accordance with the Specifications found in the Section

6.0 SAMPLING

6.1 NOTE: Sampling was done in accordance with the requirements of this Section. Sampling and Sample preparation was done by the Client.

7.0 TEST SPECIMENS

7.1 NOTE: The test specimens were tested “As Received”. Sample preparation was done by the Client. See RESULTS

8.0 CONDITIONING

8.1 NOTE: Conditioning of the Test Specimens was followed without exception as described in this Section.

9.0 PROCEDURE

NOTE: The Test Procedure was followed without exception as described in this Section. See RESULTS

10.0 CALCULATION

10.1 Calculate the abrasion resistance of each specimen as follows:

$$Ha = \frac{10G(2000 + Ws)}{2000Wa}$$

where:

G = bulk specific gravity of the sample

Ws = average weight of the specimen (original weight plus final weight divided by 2)

Wa = loss of weight during the grinding operation.

TEST REPORT

11.0 REPORT – Omitted, see Standard and RESULTS

12.0 PERCISION AND BIAS – Omitted, see Standard

13.0 KEYWORDS – Omitted, see Standard

RESULTS

Results						
Sample	Before Abrasion Weight	After Abrasion Weight	Weight Loss	Ws	Bulk Density	Abrasive Hardness Value (Ha)
A	140.37	139.88	0.49	140.13	2.6335	57.51
B	140.47	139.97	0.50	140.22		56.36
C	143.72	143.23	0.49	143.48		57.60

The tests were conducted at 38% Relative Humidity @ 74 °F

Average Abrasive Hardness Value = 57.2 Ha

¹NOTE: For Igneous Samples we run ASTM C 241 for Sedimentary and Metamorphic Samples we run ASTM C 1353. For Manufactured Stone we used the best suited of the 2 Standards

CONCLUSION:

The Natural Stone identified above has the following average² properties:

Average % Absorption			0.27	(5)
Average Bulk Specific Gravity			2 634 kg/m ³	(5)
			164.3 lbs/ft ³	(5)
Modulus of Rupture	Perpendicular	Dry	1 500 psi	(5)
Compressive Strength	Perpendicular	Dry	26 100 psi	(5)
Flexural Strength	Perpendicular	Dry	1 800 psi	(5)
Abrasion Resistance			57.2 Ha	(3)

¹NOTE: For Igneous Samples we run ASTM C 241 for Sedimentary and Metamorphic Samples we run ASTM C 1353. ²Number in Parentheses is Samples tested for the Average

END OF ANALYSIS

TEST REPORT

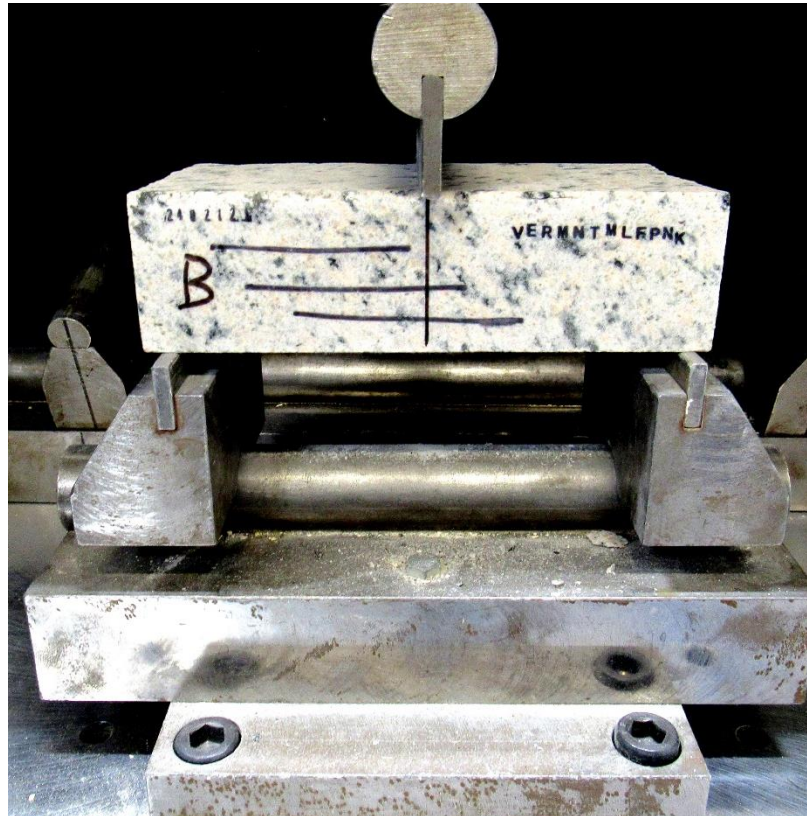
Requirements for Granite According to ASTM C 615

Physical Property	Test Requirement	Test Method(s)
Average % Absorption (Max.)	0.40	C 97
Average Density lbs/ft ³ (kg/m ³) (Min.)	160.0 (2 560)	C 97
Modulus of Rupture psi (MPa) (Min.)	1 500 (10.34)	C 99
Compressive Strength psi (MPa) (Min.)	19 000 (131)	C 170
Abrasion Resistance (Min.)	25 Ha	C 241 / C 1353
Flexural Strength psi (MPa) (Min.)	1 200 (8.27)	C 880

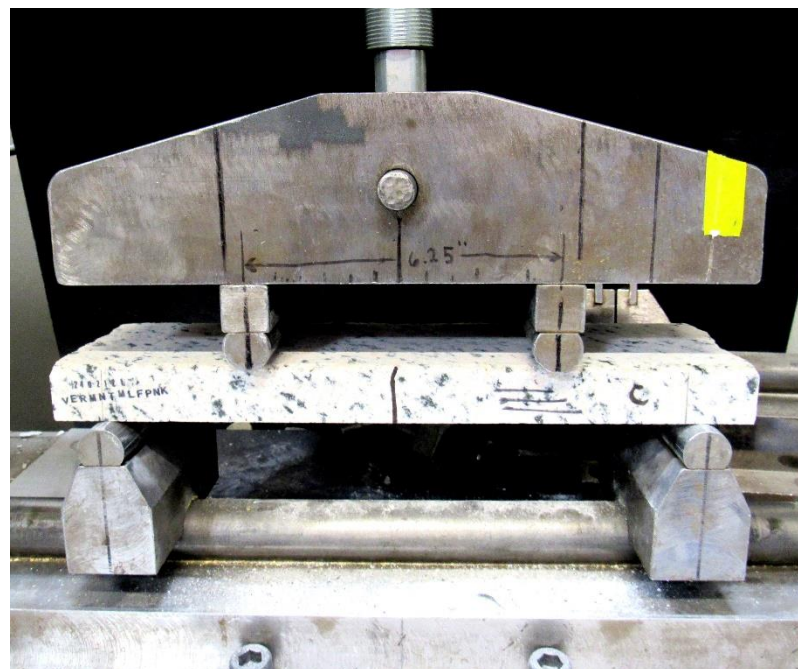


Milford Pink Granite as received.

TEST REPORT

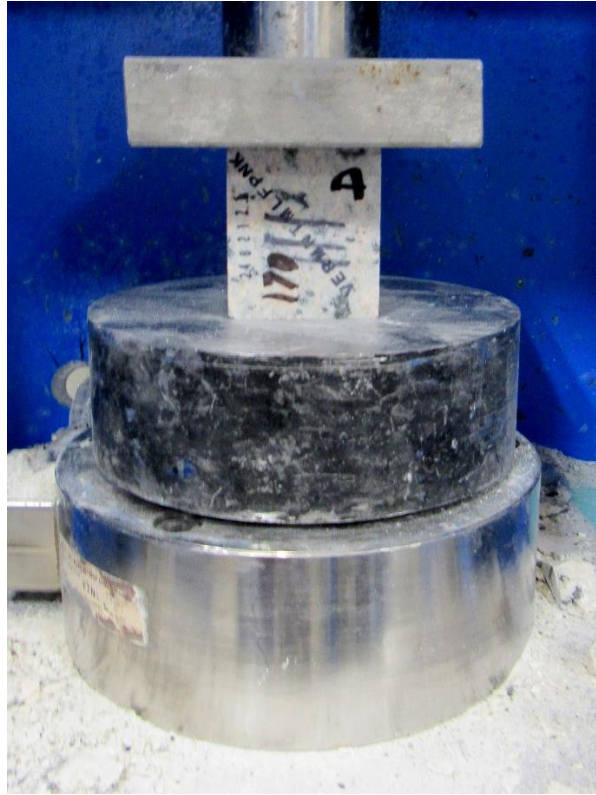


Sample during ASTM C 99 testing.

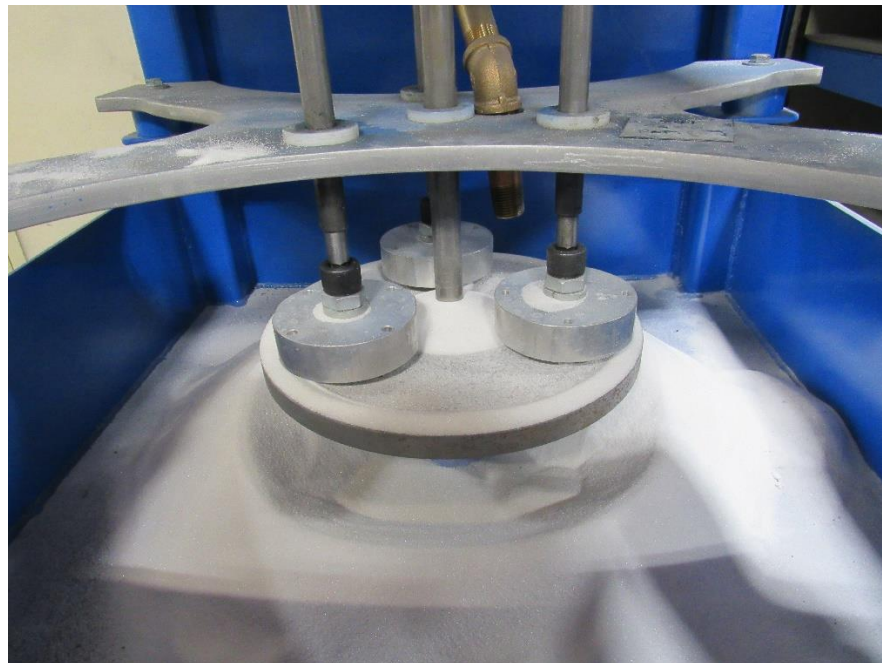


Picture of sample ready for ASTM C 880 testing

TEST REPORT



Sample during ASTM C 170 testing



ASTM C 241 abrasion test