

FVICES Salt Lake City, UT 84115-4234 USA

Georgia Stone Industries Inc Page 1 of 15

Report Date: 29 August 2024

Phone: +1 401.232.2040

Report of Test TS-S&T2402118

**TEST REPORT** 

TESTING APPLICANT: Georgia Stone Industries., Inc.

15 Branch Pike

Smithfield, RI 02917-1211 www.granitesofamerica.com

USA

FABRICATOR/QUARRY: Jet Mist®

Route 615, 25515 Rapidan Road

Rapidan, VA 22733

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 August 2024

LOCATION OF SAMPLING: Rapidan, VA 22733 USA

SCOPE / PURPOSE OF Determine Compliance with the requirements of ASTM C 615/C 615M-18

TESTING: "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): 05 - 29 August 2024

PRODUCT DESCRIPTION(S): Natural Stone identified: Jet Mist® Granite

COMPLIANCE SUMMARY: Natural Stone identified above has the following average<sup>2</sup> properties: Tested

Perpendicular to the Rift

Average % Absorption 0.07 (5)Average Bulk Specific Gravity (5) 3 065 kg/m<sup>3</sup> / 191.3 lbs/ft<sup>3</sup>

Modulus of Rupture Perpendicular Dry 3 800 psi (5)Compressive Strength Perpendicular Dry 37 100 psi (5)

Flexural Strength Perpendicular Dry 3 900 psi (5)Abrasion Resistance 61.0 Ha (3)

<sup>1</sup>NOTE: For Igneous Samples we run ASTM C 241 for Sedimentary and Metamorphic Samples

we run ASTM C 1353. Number in Parentheses is Samples tested for the Average.

See Test Results for Further 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. RT Revision 04/2020 Form: TEi-TS

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

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Georgia Stone Industries Inc
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Report Date: 29 August 2024

#### **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:

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

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Report Date: 29 August 2024

#### **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:

Bulk specific gravity = 
$$A$$
 (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
Α	446.30	446.63	299.70	0.0739	3 037.5	189.5
В	465.30	465.52	314.68	0.0473	3 084.9	192.5
С	448.40	448.73	302.33	0.0736	3 062.8	191.1
D	466.93	467.28	415.98	0.0750	3 086.1	192.6
Е	453.32	453.57	305.13	3 953	0.0551	191.3

Average % Absorption – 0.07

Average Bulk Specific Gravity - 3 065 kg/m<sup>3</sup> or 191.3 lb/ft<sup>3</sup>

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#### **TEST REPORT**

#### ASTM C 99

"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.

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#### **TEST REPORT**

# 11.0 CALCULATION

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

R = 3WI

2bd<sup>2</sup>

where R = modulus of rupture, psi W = breaking load, lbf

I = 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)
Α	7.000	4.007	2.273	7418	3762
В	7.000	4.008	2.280	8153	4109
С	7.000	4.008	2.276	7593	3840
D	7.000	4.008	2.261	7593	3891
E	7.000	4.005	2.265	7034	3595

Average Modulus of Rupture Perpendicular - Dry - 3 839 psi

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#### **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:

$$C = W$$

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 in<sup>2</sup>.

Round each individual result to the nearest 100 psi.

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# **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)	
А	2.006	1.976	2.284	151 801	38 296	
В	2.005	2.028	2.282	162 039	39 851	
С	2.006	2.004	2.281	144 452	35 933	
D	2.004	1.991	2.283	137 310	34 414	
E	2.006	2.051	2.283	151 842	36 906	

Average Compressive Strength Perpendicular Dry – 37 080 psi

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#### **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.

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# **TEST REPORT**

# 10.0 CALCULATION

10.1 Calculate the flexural strength,  $\sigma$ , as follows:

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

where:  $\sigma$  = flexural strength (psi) W = maximum load (lbf) L = span, (inches)/10d

b = width of specimen (inches);  $b \ge 1.5d$ 

d = depth of specimen (inches)

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)	Flexural Strength (psi)
Α	12.490	4.005	1.249	2 754	4129
В	12.580	4.004	1.258	2 558	3809
С	12.890	3.998	1.289	2 656	3865
D	12.480	4.002	1.248	2 656	3988
Е	12.970	3.999	1.297	2 623	3793

Average Flexural Strength Perpendicular - Dry - 3 917 psi

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#### **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.

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#### **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)	
Α	162.02	161.49	0.53	161.71		62.51	
В	154.79	154.23	0.56	154.51	3.0651	58.96	
С	166.78	166.24	0.54	166.51		61.49	

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

Average Abrasive Hardness Value = 61.0 Ha

<sup>1</sup>NOTE: 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 average<sup>2</sup> properties:

Average % Absorption			0.07	(5)
Average Bulk Specific Gravity			3 065 kg/m <sup>3</sup>	(5)
			191.3 lbs/ft <sup>3</sup>	(5)
Modulus of Rupture	Perpendicular	Dry	3 800 psi	(5)
Compressive Strength	Perpendicular	Dry	37 100 psi	(5)
Flexural Strength	Perpendicular	Dry	3 900 psi	(5)
Abrasion Resistance	·	•	61.00 Ha	(3)

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

**END OF ANALYSIS** 

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# **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/ft³ (kg/m³) (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

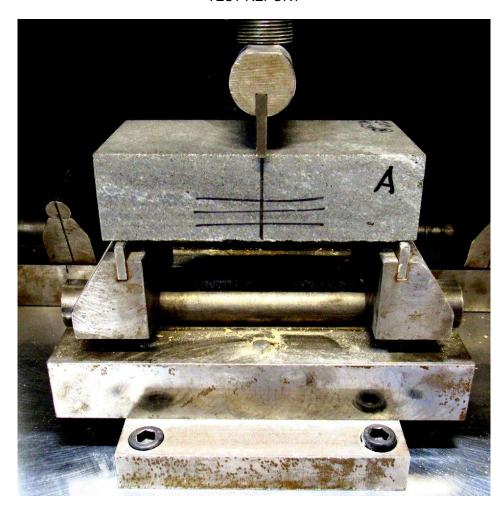


Jet Mist® Granite as received.

3455 South 500 West
SECULCES Salt Lake City, UT 84115-4234 USA
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Laboratory FAX: +1 801 262 9870

Report of Test TS-S&T2402118 Georgia Stone Industries Inc Page 14 of 15 Report Date: 29 August 2024

# **TEST REPORT**



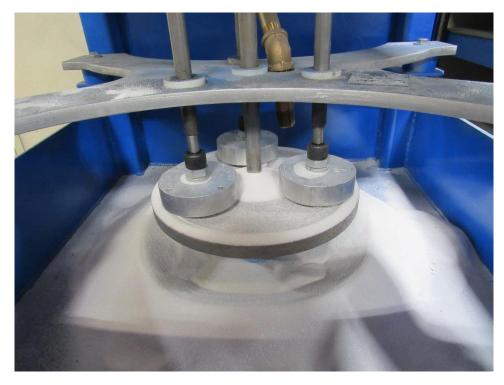
Sample during ASTM C 99 testing.

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# **TEST REPORT**



Sample during ASTM C 170 testing



ASTM C 241 abrasion test





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Analysis No. TS-S&T2402118
Report Date 29 August 2024
Quarry/Fabricator Jet Mist® Quarry
Date Sampled 09 August 2024
Where Sampled Rapidan VA
Sample Received 15 August 2024

Sampled By Client

This is to attest that we have examined Natural Stone Material identified2: Jet Mist® 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 241-21	"Standard Test Method for Abrasion Resistance of Stone Subjected to Foot
	Traffic" <sup>1</sup>

The Natural Stone identified above has the following average<sup>2</sup> properties:

Average % Absorption Average Bulk Specific Gravity	<i>'</i>		0.07 3 065 kg/m <sup>3</sup>	(5) (5)
Modulus of Rupture	Perpendicular	Dry	192.3 lbs/ft³ 3 800 psi	(5) (6)
Compressive Strength	Perpendicular Perpendicular	Drý	37 100 psi	(S)
Flexural Strength Abrasion Resistance	Perpendicular	Dry	3 900 psi 61.00 Ha	(5) (3)

#### **END OF ANALYSIS**

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

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

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

Report of Test S&T2402118 Georgia Stone Industries, Inc Page 2 of 2

Report Date: 29 August 2024

# SUMMATION CERTIFICATE



Jet Mist® Granite as received.





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Analysis No. TS-S&T2402125

Report Date 11 September 2024

Quarry/Fabricator Jet Mist Granite

Date Sampled 09 August 2024

Where Sampled Rapidan, VA USA

Sample Received 15 August 2024

Sampled By Client

This is to attest that we have examined Natural Stone Material identified: Jet Mist® Granite, with Sanded finish.

When examined to the applicable requirements of:

ANSI A326.3-2021 "American National Standard Test Method for Measuring DCOF of Hard Surface

Floor Materials"

The material has the following average properties:

DCOF – Wet 0.82 Average

**END OF ANALYSIS** 

The attached Report of Test is an integral portion of this Summation Certificate.

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



Sanded Finish top surface



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Report Date: 11 September 2024

TESTING APPLICANT: Georgia Stone Industries Incorporated Phone: +1 802 505 2503

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Smithfield, RI 02917-1211 <u>www.Granitesofamerica.com</u>

Fax:

USA

FABRICATOR/QUARRY: Jet Mist Quarry

Rapidan, VA 22733

**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 August 2024

LOCATION OF SAMPLING: Rapidan, VA USA

SCOPE / PURPOSE OF TESTING: To determine the Dynamic Coefficient of Priction Wet value of Natural

Stone Material.

STANDARD(S) EVALUATED: ANSI A326.3-2021 "American National Standard Test Method for

Measuring DCOF of Hard Surface Floor Materials"

TESTING DATE(S): 15 August - 11 September 2024

TOCET

PRODUCT DESCRIPTION(S): Natural Stone Material identified: Jet Mist® Granite, with Sanded finish

SUMMARY STATEMENT: Natural Stone Material identified above cut to shape as required by the

standard(s) listed above:

DCOF – Wet

0.82 Average

## See test results for further 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 certificate 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. © 2020 by TEI-Testing Services, LLC. TEI-Testing Services is a wholly owned LLC of Testing Engineers International, Inc.

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



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Report Date: 11 September 2024

#### 1.0 SCOPE

This standard describes the test method for measuring dynamic coefficient of friction (DCOF) of hard surface flooring materials. This method can be used in the laboratory or in the field.

This standard does not purport to address all of the safety concerns, if any, associated with its use. I tis the responsibility of the user of the standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

#### 2.0 DEFINITION OF TERMS

Coating: A surface application, usually polymer-based, which is applied after firing (for ceramic manufactured products), after fabrication (for non-ceramic manufactured products), or after installation of hard surface flooring materials onsite, typically to protect and/or to enhance the surface. Grout release agents, grout sealers, or products which are not intended to be permanent applications are not considered to be coatings.

Dynamic Coefficient of Friction (DCOF): Sometimes called kinetic coefficient of friction. This is the ratio of the force necessary to keep a surface already in motion sliding over another surface divided by the weight (or normal force) of the sliding object. Different contaminants such as dirt, water, soap, oil, or grease can change this value.

#### 3.0 SPECIFICATION

- $3.1\,\mathrm{DCOF} \ge 0.42$ : Unless otherwise declared by the manufacturer, hard surface flooring materials suitable for level interior spaces expected to be walked on when wet with water shall have a measured wet DCOF value of 0.42 or greater when tested using SBR testfoot material and SLS solution as per this standard. However, hard surface flooring materials with a measured wet DCOF value of  $0.42^*$  or greater are not necessarily suitable for all projects. The specifier shall determine materials appropriate for specific project conditions, considering by way of example, but not in limitation, type of use, traffic, expected contaminants, expected maintenance, expected wear, and manufacturers' guidelines and recommendations.
- 3.2 DCOF < 0.42: When tested using SBR testfoof material and SLS solution as per the procedure in this standard, hard surface flooring materials with a measured wet DCOF value of less than 0.42\* (including by way of example, but not in limitation, polished surfaces), unless otherwise declared by the manufacturer, shall only be installed when the surface will be kept dry when walked upon and proper safety procedures will be followed when cleaning the hard surface flooring materials. Hard surface flooring not intended to be walked upon when wet shall have a dry DCOF value of 0.42\* or greater when tested per Section 10.0 of this Standard
- 3.3 Coatings: Hard surface flooring materials which have a coating applied after firing (for ceramic manufactured products), after fabrication (for non-ceramic manufactured products), or after installation of flooring materials onsite shall only be used in areas that can be kept dry, unless otherwise declared by the coating's manufacturer. If testing data is required after a coating is applied, use the test method specified by the manufacturer, or the dry testing procedure in this standard if no test method is suggested by the manufacturer of the coating.
- 3.4 Manufacturer-Declared Product Use Classification: Manufacturer shall declare product use classification based on manufacturing parameters, internal quality control criteria, their experience with similar surfaces, and the criteria in this standard for all surfaces classified under Sections 4.1.3, 4.1.4 and 4.1.5, mosaic surfaces, and flooring where surface structure (e.g. three-dimensionally patterned or profiled surfaces) results in misleading DCOF measurements due to test device constraints. Optionally, surfaces classified under Section 4.1.2 shall also be permitted to be manufacturer-declared. Hard surface flooring manufacturer shall define internal product selection criteria (for example, but not in limitation, DCOF limit values established using this test method or other test methods, internal reference standards

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and practices, and/or the presence of abrasive grain and/or surface structure) for each product where the manufacturer-declared product use classification is not based on DCOF criteria developed per this standard. Regardless of declared product use classification, specifier shall determine materials appropriate for specific project conditions, considering by way of example, but not in limitation, type of use, traffic, expected contaminants, expected maintenance, expected wear, and manufacturers' quidelines and recommendations.

INFORMATIVE NOTES: Omitted, see Standard

#### 4.0 PRODUCT USE CATEGORIES

- 4.1 Product Use Classification: Hard surface flooring products shall be classified into one or more of the product use categories provided in Table 1 and described in Sections 4.1.1 through 4.1.5
  - 4.1.1 Interior, Dry: Product shall be kept dry, level, and free of contaminants when in use.

INFORMATIVE NOTE: Omitted, see Standard

4.1.2 Interior, Wet: See Section 3.1. Product shall have a minimum measured wet DCOF value of 0.42 or greater when tested per this standard or be manufacturer-declared for this category base on manufacturing parameters, internal quality control criteria, and manufacturer experience with similar surfaces (see Section 3.4). Attributes to consider for products manufacturer-declared for this category include, but are not limited to, product size, texture, structure and drainage.

INFORMATIVE NOTE: Omitted, see Standard

4.1.3 Interior, Wet Plus: See Section 3.4. Product shall be manufacturer-declared for this category based on manufacturing parameters, internal quality control criteria, and manufacturer experience with similar surfaces. Attributes to consider include, but are not limited to, product size, texture, structure, and drainage. Products meeting Interior, Wet Plus criteria may require frequent maintenance to keep clean.

INFORMATIVE NOTE: Omitted, see Standard

4.1.4 Exterior, Wet: See Section 3.4. Product shall be manufacturer-declared for this category based on manufacturing parameters, internal quality control criteria, and manufacturer experience with similar surfaces. Attributes to consider include, but are not limited to, product size, texture, structure, and additionally in wet applications, drainage. Products meeting Exterior, Wet criteria may require frequent maintenance to keep clean.

INFORMATIVE NOTE: Omitted, see Standard

4.1.5 Oil and Grease: See Section 3.4. Product shall be manufacturer-declared for this category where oil, grease, and/or fats may be present, based on manufacturing parameters, internal quality control criteria, and manufacturer experience with similar surfaces. Attributes to consider include, but are not limited to, product size, texture, structure, and additionally in wet applications, drainage. Products meeting Oils/Greases may require frequent maintenance to keep clean.

INFORMATIVE NOTE: Omitted, see Standard

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Report Date: 11 September 2024

**Table 1: Product Use Classification** 

Classification	Reference Category	Criteria
Interior, Dry	ID	≥ 0.42 dry DCOF* (per Section 10.1)
Interior, Wet	IW	≥ 0.42 wet DCOF* (per Section 9.1) or Manufacturer-Declared
Interior, Wet Plus	IW+	Manufacturer-Declared
Exterior, Wet	EW	Manufacturer-Declared
Oils/Greases	O/G	Manufacturer-Declared

#### 5.0 APPARATUS

5.1 Testing Device – Omitted, see Standard

NOTE: Testing was conducted with a BOT 3000E

5.2 SBR Testfoot - Omitted, see Standard

NOTE: The SBR Testfoot was in accordance with the Requirements of this Section.

5.3 Testfoot Reconditioning Tool – Omitted, see Standard

NOTE: The SBR Testfoot was reconditioned as required using the Testfoot Reconditioning Tool described in this Section.

5.4 ANSI A326.3 Validation Surface – Omitted, see Standard

NOTE: The Validation Surface was used as necessary as described in this Section.

6.0 REAGENTS AND MATERIALS - Omitted, see Standard

NOTE: The Reagents and Materials described in the Section were used in the Testing.

7.0 TESTFOOT RECONDITIONING PROCEDURE - Omitted, see Standard

NOTE: The SBR Testfoot used in testing was Reconditioned in accordance with the Procedure found in this Section as Required.

8.0 VALIDATION PROCEDURE - Omitted, see Standard

NOTE: The Testing was Validated prior to recording values as outlined in this Section.

9.0 TEST PROCEDURE - DYNAMIC COF WITH 0.05% SLS WATER

9.1 Laboratory Test – Omitted, see Standard

NOTE: The Unit Under Test was evaluated as detailed in this Section. See RESULTS

9.2 Field Test - Omitted, see Standard

NOTE: Not Applicable to the Evaluation of the Unit Under Test

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Report Date: 11 September 2024

10.0 DRY DYNAMIC CEFFICIENT OF FRICTION (DCOF) - IF DESIRED - Omitted, see Standard

NOTE: Not Applicable to the Evaluation of the Unit Under Test

11.0 REPORT – Omitted, see Standard and RESULTS

12.0 DISCUSSION OF WET DCOF METHOD PRECISION - Omitted, see Standard

APPENDIX A (INFORMATIVE) - Omitted, see Standard

RESULTS: Jet Mist® Granite with Sanded Finish – Overall Average

0°	180°	270°	90°
0.84	0.89	0.89	0.91
			•
0°	180°	270°	90°
0.76	0.75	0.75	0.78
0°	180°	270°	90°
0.83	0.88	0.77	0.73

DCOF - Wet 0.82

NOTE: Prior to testing the equipment was tested for accuracy using Reference tile. The equipment was within +1% of the stated value of the Reference tile. Sample Standard Deviation 0.080

# CONCLUSION:

The material has the following average properties:

DCOF – Wet 0.82 Average

**END OF ANALYSIS** 



Report of Test TS-S&T2402125 Georgia Stone Industries, Inc. Page 7 of 8

Report Date: 11 September 2024



Jet Mist® Granite Sanded Finish.





Sample during testing





PO Box 572455 / Salt Lake City UT 84157-2455 / USA TEL +1 801 262 2448 · FAX +1 801 262 9870 · www.TEi-TS.com

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

Analysis No. TS-S&T2402126

Report Date 11 September 2024

Quarry/Fabricator Jet Mist Granite

Date Sampled 09 August 2024

Where Sampled Rapidan, VA USA

Sample Received 15 August 2024

Sampled By Client

This is to attest that we have examined Natural Stone Material identified: Jet Mist® Granite, with Flame finish.

When examined to the applicable requirements of:

ANSI A326.3-2021 "American National Standard Test Method for Measuring DCOF of Hard Surface

Floor Materials"

The material has the following average properties:

DCOF – Wet 0.75 Average

**END OF ANALYSIS** 

The attached Report of Test is an integral portion of this Summation Certificate.

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



Jet Mist with Flamed Finish top surface



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Page 1 of 8

Report Date: 11 September 2024

TESTING APPLICANT: Georgia Stone Industries Incorporated Ph

15 Branch Pike

Smithfield, RI 02917-1211

USA

Phone: +1 802 505 2503

Fax: +1

www.Granitesofamerica.com

FABRICATOR/QUARRY: Jet Mist Quarry

Rapidan, VA 22733

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 August 2024

LOCATION OF SAMPLING: Rapidan, VA USA

SCOPE / PURPOSE OF TESTING: To determine the Dynamic Coefficient of Friction Wet value of Natural

Stone Material.

STANDARD(S) EVALUATED: ANSI A326.3-2021 "American National Standard Test Method for

Measuring DCOF of Hard Surface Floor Materials"

TESTING DATE(S): 15 August - 11 September 2024

TYCETT

PRODUCT DESCRIPTION(S): Natural Stone Material identified: Jet Mist® Granite, with Flamed finish

SUMMARY STATEMENT: Natural Stone Material identified above cut to shape as required by the

standard(s) listed above:

DCOF - Wet

0.75 Average

## See test results for further 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 certificate 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. © 2020 by TEI-Testing Services, LLC. TEI-Testing Services is a wholly owned LLC of Testing Engineers International, Inc.

Form: TEi-TS-S&T002 Revision 05/2020

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

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Report Date: 11 September 2024

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# ANSI A326.3-2021

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Report Date: 11 September 2024

#### 1.0 SCOPE

This standard describes the test method for measuring dynamic coefficient of friction (DCOF) of hard surface flooring materials. This method can be used in the laboratory or in the field.

This standard does not purport to address all of the safety concerns, if any, associated with its use. I tis the responsibility of the user of the standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

#### 2.0 DEFINITION OF TERMS

Coating: A surface application, usually polymer-based, which is applied after firing (for ceramic manufactured products), after fabrication (for non-ceramic manufactured products), or after installation of hard surface flooring materials onsite, typically to protect and/or to enhance the surface. Grout release agents, grout sealers, or products which are not intended to be permanent applications are not considered to be coatings.

Dynamic Coefficient of Friction (DCOF): Sometimes called kinetic coefficient of friction. This is the ratio of the force necessary to keep a surface already in motion sliding over another surface divided by the weight (or normal force) of the sliding object. Different contaminants such as dirt, water, soap, oil, or grease can change this value.

#### 3.0 SPECIFICATION

- $3.1\,\mathrm{DCOF} \ge 0.42$ : Unless otherwise declared by the manufacturer, hard surface flooring materials suitable for level interior spaces expected to be walked on when wet with water shall have a measured wet DCOF value of 0.42 or greater when tested using SBR testfoot material and SLS solution as per this standard. However, hard surface flooring materials with a measured wet DCOF value of 0.42\* or greater are not necessarily suitable for all projects. The specifier shall determine materials appropriate for specific project conditions, considering by way of example, but not in limitation, type of use, traffic, expected contaminants, expected maintenance, expected wear, and manufacturers' guidelines and recommendations.
- 3.2 DCOF < 0.42: When tested using SBR testfoof material and SLS solution as per the procedure in this standard, hard surface flooring materials with a measured wet DCOF value of less than 0.42\* (including by way of example, but not in limitation, polished surfaces), unless otherwise declared by the manufacturer, shall only be installed when the surface will be kept dry when walked upon and proper safety procedures will be followed when cleaning the hard surface flooring materials. Hard surface flooring not intended to be walked upon when wet shall have a dry DCOF value of 0.42\* or greater when tested per Section 10.0 of this Standard
- 3.3 Coatings: Hard surface flooring materials which have a coating applied after firing (for ceramic manufactured products), after fabrication (for non-ceramic manufactured products), or after installation of flooring materials onsite shall only be used in areas that can be kept dry, unless otherwise declared by the coating's manufacturer. If testing data is required after a coating is applied, use the test method specified by the manufacturer, or the dry testing procedure in this standard if no test method is suggested by the manufacturer of the coating.
- 3.4 Manufacturer-Declared Product Use Classification: Manufacturer shall declare product use classification based on manufacturing parameters, internal quality control criteria, their experience with similar surfaces, and the criteria in this standard for all surfaces classified under Sections 4.1.3, 4.1.4 and 4.1.5, mosaic surfaces, and flooring where surface structure (e.g. three-dimensionally patterned or profiled surfaces) results in misleading DCOF measurements due to test device constraints. Optionally, surfaces classified under Section 4.1.2 shall also be permitted to be manufacturer-declared. Hard surface flooring manufacturer shall define internal product selection criteria (for example, but not in limitation,

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DCOF limit values established using this test method or other test methods, internal reference standards and practices, and/or the presence of abrasive grain and/or surface structure) for each product where the manufacturer-declared product use classification is not based on DCOF criteria developed per this standard. Regardless of declared product use classification, specifier shall determine materials appropriate for specific project conditions, considering by way of example, but not in limitation, type of use, traffic, expected contaminants, expected maintenance, expected wear, and manufacturers' guidelines and recommendations.

INFORMATIVE NOTES: Omitted, see Standard

#### 4.0 PRODUCT USE CATEGORIES

- 4.1 Product Use Classification: Hard surface flooring products shall be classified into one or more of the product use categories provided in Table 1 and described in Sections 4.1.1 through 4.1.5
  - 4.1.1 Interior, Dry: Product shall be kept dry, level, and free of contaminants when in use.

INFORMATIVE NOTE: Omitted, see Standard

4.1.2 Interior, Wet: See Section 3.1. Product shall have a minimum measured wet DCOF value of 0.42 or greater when tested per this standard or be manufacturer-declared for this category base on manufacturing parameters, internal quality control criteria, and manufacturer experience with similar surfaces (see Section 3.4). Attributes to consider for products manufacturer-declared for this category include, but are not limited to, product size, texture, structure and drainage.

INFORMATIVE NOTE: Omitted, see Standard

4.1.3 Interior, Wet Plus: See Section 3.4. Product shall be manufacturer-declared for this category based on manufacturing parameters, internal quality control criteria, and manufacturer experience with similar surfaces. Attributes to consider include, but are not limited to, product size, texture, structure, and drainage. Products meeting Interior, Wet Plus criteria may require frequent maintenance to keep clean.

INFORMATIVE NOTE: Omitted, see Standard

4.1.4 Exterior, Wet: See Section 3.4. Product shall be manufacturer-declared for this category based on manufacturing parameters, internal quality control criteria, and manufacturer experience with similar surfaces. Attributes to consider include, but are not limited to, product size, texture, structure, and additionally in wet applications, drainage. Products meeting Exterior, Wet criteria may require frequent maintenance to keep clean.

INFORMATIVE NOTE: Omitted, see Standard

4.1.5 Oil and Grease: See Section 3.4. Product shall be manufacturer-declared for this category where oil, grease, and/or fats may be present, based on manufacturing parameters, internal quality control criteria, and manufacturer experience with similar surfaces. Attributes to consider include, but are not limited to, product size, texture, structure, and additionally in wet applications, drainage. Products meeting Oils/Greases may require frequent maintenance to keep clean.

INFORMATIVE NOTE: Omitted, see Standard

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Report Date: 11 September 2024

**Table 1: Product Use Classification** 

Classification	Reference Category	Criteria	
Interior, Dry	ID	≥ 0.42 dry DCOF* (per Section 10.1)	
Interior, Wet	IW	≥ 0.42 wet DCOF* (per Section 9.1) or Manufacturer-Declared	
Interior, Wet Plus	IW+	Manufacturer-Declared	
Exterior, Wet	EW	Manufacturer-Declared	
Oils/Greases	O/G	Manufacturer-Declared	

#### 5.0 APPARATUS

5.1 Testing Device – Omitted, see Standard

NOTE: Testing was conducted with a BOT 3000E

5.2 SBR Testfoot - Omitted, see Standard

NOTE: The SBR Testfoot was in accordance with the Requirements of this Section.

5.3 Testfoot Reconditioning Tool – Omitted, see Standard

NOTE: The SBR Testfoot was reconditioned as required using the Testfoot Reconditioning Tool described in this Section.

5.4 ANSI A326.3 Validation Surface - Omitted, see Standard

NOTE: The Validation Surface was used as necessary as described in this Section.

6.0 REAGENTS AND MATERIALS - Omitted, see Standard

NOTE: The Reagents and Materials described in the Section were used in the Testing.

7.0 TESTFOOT RECONDITIONING PROCEDURE - Omitted, see Standard

NOTE: The SBR Testfoot used in testing was Reconditioned in accordance with the Procedure found in this Section as Required.

8.0 VALIDATION PROCEDURE - Omitted, see Standard

NOTE: The Testing was Validated prior to recording values as outlined in this Section.

9.0 TEST PROCEDURE - DYNAMIC COF WITH 0.05% SLS WATER

9.1 Laboratory Test – Omitted, see Standard

NOTE: The Unit Under Test was evaluated as detailed in this Section. See RESULTS

9.2 Field Test – Omitted, see Standard

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Report Date: 11 September 2024

NOTE: Not Applicable to the Evaluation of the Unit Under Test

10.0 DRY DYNAMIC CEFFICIENT OF FRICTION (DCOF) - IF DESIRED - Omitted, see Standard

NOTE: Not Applicable to the Evaluation of the Unit Under Test

11.0 REPORT - Omitted, see Standard and RESULTS

12.0 DISCUSSION OF WET DCOF METHOD PRECISION - Omitted, see Standard

APPENDIX A (INFORMATIVE) - Omitted, see Standard

RESULTS: Jet Mist Granite with a Flamed Finish - Overall Average

0°	180°	270°	90°
0.74	0.73	0.72	0.73
0°	180°	270°	90°
0.76	0.80	0.75	0.76
0°	180°	270°	90°
0.74	0.72	0.76	0.77

**DCOF - Wet 0.75** 

NOTE: Prior to testing the equipment was tested for accuracy using Reference tile. The equipment was within +1% of the stated value of the Reference tile. Sample Standard Deviation 0.023

# CONCLUSION:

The material has the following average properties:

DCOF – Wet 0.75 Average

**END OF ANALYSIS** 



Jet Mist Granite Flame surface.





Sample during testing