

## **ASTM C1670/C1670M-17 Compliance Report**

At Stack-A-Stone, we build each stone to stand up to the most brutal weather conditions. And with our products manufactured in North Carolina and shipped nationwide, we know weather conditions.

### **How do we know Stack-A-Stone Stone is strong and durable?**

We test it under the latest and most intensive standards in the industry, as guided by ASTM C1670/C1670M-17. Our products have been tested to meet and exceed the 2018 IBC (International Building Code and 2018 RBC (Residential Building Code) requirements which states that all manufactured stone veneer shall comply with the ASTM C1670/C1670M-17 test criteria.

### **ASTM C1670/C1670M-17**

The rigorous tests are designed to ascertain the long-lasting durability of manufactured stone veneer. The ASTM C1670/C1670M series of tests encompasses every characteristic of stone veneer necessary to ensure it holds up under exceptionally harsh conditions.

### **Quality Control**

Even though testing to ASTM C1670/C1670M standards is very important- Our Quality Control practices guide everything we do, ensuring that every aspect from our raw materials to our daily manufacturing meets the highest specifications in the industry.

## **Manufactured Materials Warranty 30 Year, Non- Prorated Limited Warranty**

Stack-A-Stone LLC warrants its manufactured products for a period of 30 years from the current date of purchase. All materials covered under the warranty will be remedied by and at the discretion of Stack-A-Stone LLC. Stack-A-Stone LLC requires its products to be installed on structures and surfaces that conform to local building codes.

This limited warranty covers only materials manufactured by Stack-A-Stone LLC that are deemed to be defective by Stack-A-Stone LLC. This warranty does not cover damages resulting from the following: Improper application, installation or maintenance, willful abuse, damage resulting from foundation or substrate movement or shifting, fire, earthquake or wind, Discoloration due to: air pollution, exposure to chemicals, normal weathering, efflorescence or oxidation, contact with paint or chemicals as well as the use of a pressure washer to clean or any other causes beyond the control of the manufacturer.

**NOTE:** This product is not recommended for use on surfaces being used for foot or vehicle traffic or in direct and constant contact with grounds/soil and will not be covered under this warranty when used in this application.

Stack-A-Stone LLC reserves the right to make changes and or discontinue any of its products without notification. In the event a product is deemed defective by Stack-A-Stone LLC and is no longer available, Stack-A-Stone LLC will have the right to substitute the defective product with a product of equal value.

Stack-A Stone LLC does not warranty any real or perceived color differences between products in our brochure, displayed on our sample boards and on our web page, than those that will be installed on your project. We recommend you view product samples before making your selection.

Count stone and accessories and verify color upon arrival. If there is a discrepancy we must be notified at once. Stack-A Stone LLC will not be responsible for removal of any stone and accessories installed, re-installation or freight charges.

Stack-A Stone LLC must be contacted immediately, should such a defect be found, so that an inspection can take place to determine an appropriate course of action.

**ASTM C1670/C1670M-17 Compliance Report**

Job No.: 18-450A  
Report Date: 9/12/2018  
Revision Date: 9/18/2018

Client: Stack-A-Stone  
Address: 2000 K&K Dr.  
Greenville, NC 27858

Testing Agency: National Concrete Masonry Association  
Address: Research and Development Laboratory  
13750 Sunrise Valley Drive  
Herndon, VA 20171-4662

Standard Specification: ASTM C1670/C1670M-17

Sampling Party: Stack-A-Stone

Unit Description: Adhered Manufactured Stone Masonry Veneer Unit

Date Samples Manufactured: 7/18/2018

Date Samples Received: 8/1/2018

**Summary of Test Results**

Physical Property	ASTM C1670-17 Specified Values	Average Test Results	Units	Physical Property	ASTM C1670-17 Specified Values	Maximum Test Results	Units
Net Compressive Strength	2100 min	3560	psi	Net Cross-Sectional Area	5 max	0.41	ft <sup>2</sup>
Density	****	106.1	pcf	Unit Face Dimension	36 max	14.65	in
Absorption	****	19.7	pcf				
Saturated Unit Weight	15 max	10.2	lb/ft <sup>2</sup>				
Average Thickness	2.625 max	1.158	in.				

**Individual Unit Test Results**

Cylinder* Compression Units	Specimen No.	Received Weight	Average Diameter	Average Height	Net Area	Max. Load	Compressive Strength
		lb	in	in	in <sup>2</sup>	lb	psi
	#1	5.99	4.00	7.88	12.55	44080	3510
Date Tested: 8/28/2018	#2	5.97	4.01	7.87	12.61	43890	3480
	#3	6.07	3.99	7.96	12.51	44530	3560
	#4	6.11	4.00	7.92	12.56	46900	3730
Specimen Age at Testing: 41 days	#5	6.05	4.00	7.92	12.59	44320	3520
	Average	6.04	4.00	7.91	12.57	44740	3560

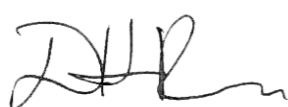
\*4 in. x 8 in. compression cylinder test specimens were provided by client and were to have been made in accordance with the provisions of ASTM C31/C31M-18.

Absorption Units	Specimen No.	Avg Width	Avg Length	Max Face Dimension	Net** Area	Average Thickness
		in.	in.	in.	ft <sup>2</sup>	in.
	#6	4.09	14.61	14.65	0.41	1.246
	#7	4.05	10.29	10.32	0.29	1.041
	#8	4.18	8.31	8.32	0.24	1.293
	#9	4.29	9.98	10.00	0.30	0.827
Date Tested: 8/21/2018	#10	4.64	11.66	11.67	0.38	1.382
	Average	4.25	10.97	10.99	0.32	1.158

\*\*For non-rectangular units, net area is determined by reference paper method outlined in the Annex of ASTM C1670/C1670M-17.

Date Tested:	Specimen No.	Received Weight	Immersed Weight	Saturated Weight	Oven-Dry Weight	Saturated Unit Weight	Absorption	Density	Net Volume
		lb	lb	lb	lb	lb/ft <sup>2</sup>	pcf	pcf	ft <sup>3</sup>
8/24/2018	#6	4.11	1.85	4.54	3.91	10.9	19.4	105.4	0.0431
to	#7	2.37	1.08	2.64	2.27	9.1	19.8	105.3	0.0251
8/26/2018	#8	2.52	1.15	2.77	2.39	11.5	18.9	106.6	0.0260
	#9	1.98	0.93	2.21	1.89	7.4	20.6	107.9	0.0205
	#10	4.11	1.86	4.55	3.90	12.1	19.8	105.3	0.0432
	Average	3.02	1.37	3.34	2.87	10.2	19.7	106.1	0.0316

Comments: 1) These units meet or exceed the compressive strength, unit weight, and dimensional requirements of ASTM C1670-17.  
2) Revised to correct average thickness.



Douglas H. Ross  
Manager, Research and Development Laboratory



Jason J. Thompson  
Vice President of Engineering

**ASTM C482-02 (2014) Test Report**  
**Standard Test Method for Bond Strength of Ceramic Tile to Portland Cement Paste**

Client: Stack-A-Stone  
2000 K&K Dr.  
Greenville, NC 27858

Job No: 18-450B  
Report Date: 9/12/2018

Unit Description: Adhered Manufactured Stone Masonry Veneer Unit

Testing Agency: National Concrete Masonry Assoc.  
Research and Development Laboratory  
Address: 13750 Sunrise Valley Drive  
Herndon, VA 20171-4662

Date Received: 8/1/2018

Sampling Party: Stack-A-Stone

The client provided five manufactured stone veneer units for shear bond testing. Shear bond assemblies were constructed in accordance with ASTM C482-02 (2014) utilizing the mortar substrate for non-vitreous tile, as modified by ASTM C1670/C1670M-17, and portland cement paste substrate as a bonding matrix. Each assembly was tested for shear bond strength in accordance with ASTM C482-02 (2014).

**Individual Unit Test Results**

Date Tested: 9/7/2018

*Shear Bond Specimens*

	Stone Sample		Shear Bond Area* (in. <sup>2</sup> )	Maximum Load (lb)	Shear Bond Strength (psi)
	Avg. Width (in.)	Avg. Height (in.)			
Unit #1	4.20	4.08	17.15	2830	165
Unit #2	4.08	4.04	16.45	2420	147
Unit #3	4.33	4.10	17.73	3070	173
Unit #4	4.13	4.05	16.70	3000	180
Unit #5	4.08	4.07	16.62	3490	210
Average	4.16	4.07	16.93	2962	175

\* Shear bond area calculated by multiplying the width and length of manufactured stone sample.



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**ASTM C666/C666M-15 Test Report  
Freeze-Thaw Durability**

Job No.: 18-450C  
Report Date: 9/18/2018

Client: Stack-a-Stone  
Address: 2000 K&K Dr.  
Greenville, NC 27858

Testing Agency: National Concrete Masonry Association  
Research and Development Laboratory  
Address: 13750 Sunrise Valley Drive  
Herndon, VA 20171-4662

Unit Specification: ASTM C1670-17

Sampling Party: Adhered Manufactured Stone Masonry Veneer Unit

Unit Designation/Description:  
Adhered Manufactured Stone Masonry Veneer Unit

Date Samples Received: 8/1/2018  
Date of Casting: 7/20/2018

Date Testing Began: 9/4/2018

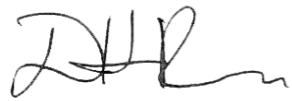
Test Specimen Dimensions: 3 x 3 x 11 in.  
Specimen Sample Type: Cast Beam

The client delivered five freeze-thaw beam specimens to the laboratory for testing. Each beam was tested in accordance with Procedure A of ASTM C666/C666M-15, as modified by ASTM C1670-17. Specimens were subjected to 50 consecutive cycles of freezing and thawing.

**Test Media: WATER**

Unit No.	Initial Saturated Weight (g)	Final Saturated Weight (g)	Mass Loss (g)	Percent Mass Loss (%)
1	5320.1	5362.8	-42.7	-0.8
2	5341.9	5394.5	-52.6	-1.0
3	5179.4	5253.1	-73.7	-1.4
4	5347.6	5381.1	-33.5	-0.6
5	5343.1	5374.5	-31.4	-0.6

Comments: 1) These units comply with freeze thaw durability requirement of ASTM C1670-17 for adhered manufactured stone masonry veneer units. That criterion requires that the individual percent mass loss for all tested specimens is less than 1.5% after 50 consecutive cycles of freezing and thawing.



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