



13750 Sunrise Valley Drive
Herndon, VA 20171- 4662
703. 713. 1900 Main
703. 713. 1910 Fax
www.ncma.org

April 12, 2018

Fred Dunand
Saturn Materials
350 Yorkville Park Square
Columbus, MS 39702

Mr. Dunand,

Enclosed please find a report of testing performed by the National Concrete Masonry Association Research and Development Laboratory on the following products:

Report Number	Unit Description
18-202	4 x 8 inch Concrete Paving Unit

Please note that the contents of this report are not to be reproduced, except in full, without the written approval of the NCMA Research and Development Laboratory.

We are constantly improving our services and would greatly appreciate any feedback regarding your experience with NCMA's Research and Development Laboratory. We have set up an online survey, which can be found at: <http://www.surveymonkey.com/s/DDFPZT9>. After taking the online survey, make use of the many resources available at our website, www.ncma.org. There you will find the latest industry news and events, a searchable directory of products and services, a vast collection of literature on the design, implementation, and marketing of manufactured concrete products and hardscape systems, as well as a list of the available laboratory services for future testing.

The National Concrete Masonry Association Research and Development Laboratory is dedicated to the scientific testing and research of concrete masonry products and systems. We take pride in meeting your product certification and evaluation requirements and look forward to continuing to service your testing needs for years to come.

Thank you for choosing NCMA's Research and Development Laboratory. Please feel free to contact me directly with any comments or questions at 703-713-1900 or dross@ncma.org.

Sincerely,

A handwritten signature in black ink, appearing to read 'DHR'.

Douglas H. Ross
Manager, Research and Development Laboratory

ASTM C140/C140M-17a Test Report
Sampling and Testing Concrete Masonry Units and Related Units

Job No: 18-202A
Report Date: 1/11/2018

Client: Saturn Materials
Address: 350 Yorkville Park Square
Columbus, MS 39702

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

Unit Specification: ASTM C936/C936M-16
Unit Description: 4 x 8 inch Concrete Paving Unit

Sampling Party: Saturn Materials
Date Samples Received: 1/2/2018

Specified Height (mm): 60

Summary of Test Results

	ASTM C936		%		ASTM C140 Required Compression	
	Required	Actual			Specimen	Actual
Absorption:	5 max	3.0		Length/Width Ratio:	2.1 max	2.02
Density (Oven Dry Condition):	---	125.4	lb/ft ³	Aspect Ratio (R_g):	0.60 - 1.20	0.62

Individual Unit Test Results

Full Size Unit Measurements

	Avg. Width (in.)	Avg. Height (in.)	Avg. Length (in.)	Sample Weight (lb)
Unit #1	3.881	2.392	7.815	5.32
Unit #2	3.881	2.413	7.828	5.42
Unit #3	3.881	2.394	7.822	5.33
Average	3.881	2.400	7.821	5.36

Absorption Specimens

	Received Weight W_R (lb)	Immersed Weight W_I (lb)	SSD Weight W_S (lb)	Oven-Dry Weight W_D (lb)	Absorption (%)	Density (pcf)	Net Volume (ft ³)
Unit #4	5.32	2.78	5.39	5.23	3.1	124.9	0.0418
Unit #5	5.42	2.85	5.47	5.32	2.9	126.3	0.0421
Unit #6	5.33	2.78	5.40	5.23	3.2	124.9	0.0419
Average	5.36	2.80	5.42	5.26	3.0	125.4	0.0419

Comments: These units meet the absorption requirements of ASTM C936/C936M-16.



Douglas H. Ross
Manager, Research and Development Laboratory



Jason J. Thompson
Vice President of Engineering

ASTM C1645/C1645M-16 Test Report
Freeze-Thaw and De-icing Salt Durability of
Solid Concrete Interlocking Paving Units

Job No: 18-202B
Report Date: 4/12/2018

Client: Saturn Materials
350 Yorkville Park Square
Columbus, MS 39702

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

Unit Specification: ASTM C936/C936M-16

Sampling Party: Saturn Materials

Name/Description of Unit:
4 x 8 inch Concrete Paving Unit

Date Samples Received: 1/2/2018

Specified Height (mm): 60

Summary of Test Results

	Required	Actual
Surface Area	****	0.08 m ²
7 Cycle Mass Loss	****	----- g/m ²
28 Cycle Mass Loss	225 max	3.99 g/m ²

Test Solution: Saline

Individual Unit Test Results

	Avg. Width (mm)	Avg. Height (mm)	Avg. Length (mm)	Surface Area (mm ²)	Surface Area (m ²)
Unit #1	98.5	60.8	198.4	75224	0.08
Unit #2	98.6	61.0	198.4	75324	0.08
Unit #3	98.4	61.0	198.4	75288	0.08
Average	98.5	60.9	198.4	75279	0.08

Date Tested:
1/10/2018

	7 Cycle Mass Loss (g)	7 Cycle Mass Loss (g/m ²)	28 Cycle Mass Loss (g)	28 Cycle Mass Loss (g/m ²)
Unit #1	0.0	0.00	0.4	5.32
Unit #2	0.0	0.00	0.3	3.98
Unit #3	0.0	0.00	0.2	2.66
Average	0.0	0.00	0.3	3.99

Date Tested:
1/24/2018
to
3/30/2018

Comments: 1) These units comply with the resistance to freezing and thawing requirements of ASTM C936/C936M-16.



Douglas H. Ross
Manager, Research and Development Laboratory



Jason J. Thompson
Vice President of Engineering