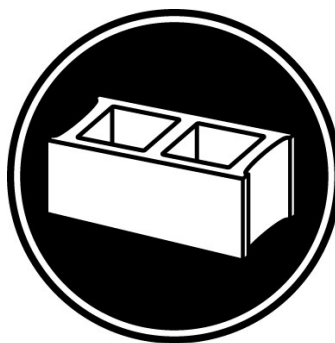




Pallet Tag Program Laboratory Report

Cast Stone Systems, Inc. Warrenton, NC



Project No. 1809-11 PTP

Prepared For:



Prepared By:

J. Lucas Comadoll

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QC/Project Testing Technician
AMT Laboratories

September 2018



LABORATORY REPORT

AMT Laboratories • 3741 Greenway Circle • Lawrence, Kansas 66046 • (888) 376-3600

FOR: Ted Echols, Cast Stone Systems, Inc.
cc: Jake Boyer, PROSOCO, Inc.
Al Morris, PROSOCO, Inc.
Scott Kind

SUBJECT: Cast Stone Systems, Inc.
Warrenton, NC
Pallet Tag Evaluation

DATE: September 28, 2018
PROJECT: 1809-11 PTP

SAMPLES SUBMITTED: 5 VDT Cast Stone

Block	Name	Color	Size
(4) Cast Stone	"Wheat"	Dark Buff	12" x 12" x 1"
(4) Cast Stone	"Natural"	Light Buff	
(4) Cast Stone	"Classic"	White	
(4) Cast Stone	"# 25"	Red	
(4) Cast Stone	"# 116"	Charcoal	

SUBMITTED BY: Ted Echols
Cast Stone Systems, Inc.
532 North Main Street
Warrenton, NC 27589



PURPOSE OF TEST:

- To determine the most appropriate PROSOCO, Inc. new construction cleaner(s) for the submitted samples.
- To determine the most appropriate PROSOCO, Inc. water repellent(s) for the submitted samples.

PRODUCTS EVALUATED:

New Construction Cleaning	Dilution:
Sure Klean® Light Duty Concrete Cleaner	1:2; 1:3
Sure Klean® Vana Trol®	1:8; 1:10
Enviro Klean® Safety Klean	1:2, 1:3

Water Repellency	Dilution:
PROSOCO® SL100 Water Repellent	Concentrate
PROSOCO® SLX100® Water & Oil Repellent	Concentrate
Sure Klean® Weather Seal Siloxane PD	Concentrate
Sure Klean® Weather Seal Siloxane WB Concentrate	1:9

TEST METHODS: New Construction Cleaning

Sure Klean® Light Duty Concrete Cleaner, Sure Klean® Vana Trol®, and Enviro Klean® Safety Klean were evaluated to determine the optimal concentration of cleaner which leaves the external surface looking most like the uncleaned surface of the cast stone.

Color uniformity was evaluated by comparing aggregate exposure and surface pigment alteration/removal of each cleaned surface compared to the uncleaned surface of the cast stone.

Aggregate Exposure is the visual examination comparing aggregate exposure of the uncleaned surface of the cast stone to surfaces cleaned with selected product(s) at given dilutions.

Surface Pigment Alteration/Removal is the visual examination comparing the pigmentation of the uncleaned surface of the cast stone to surfaces cleaned with selected product(s) at given dilutions.

The following is the scale used for reporting results of both categories:

- 0 – **No change** compared to uncleaned surface
- 1 – **Slight change** compared to uncleaned surface
- 2 – **Moderate change** compared to uncleaned surface
- 3 – **Significant change** compared to uncleaned surface

Cleaning Procedure:

1. Pre-wet the surface and apply diluted cleaning solution according to PROSOCO, Inc. Product Guide instructions.
2. Allow for an appropriate dwell time:
 - Light Duty Concrete Cleaner.....5 minutes
 - Vana Trol®.....5 minutes
 - Safety Klean.....5 minutes
3. Reapply cleaning solution; do not let cleaner dry into masonry.
4. Rinse thoroughly with plenty of fresh water.*
5. Allow the sample to dry for at least 18 hours and visually examine.
6. Compare the uncleaned surfaces to the cleaned surfaces for the best match.

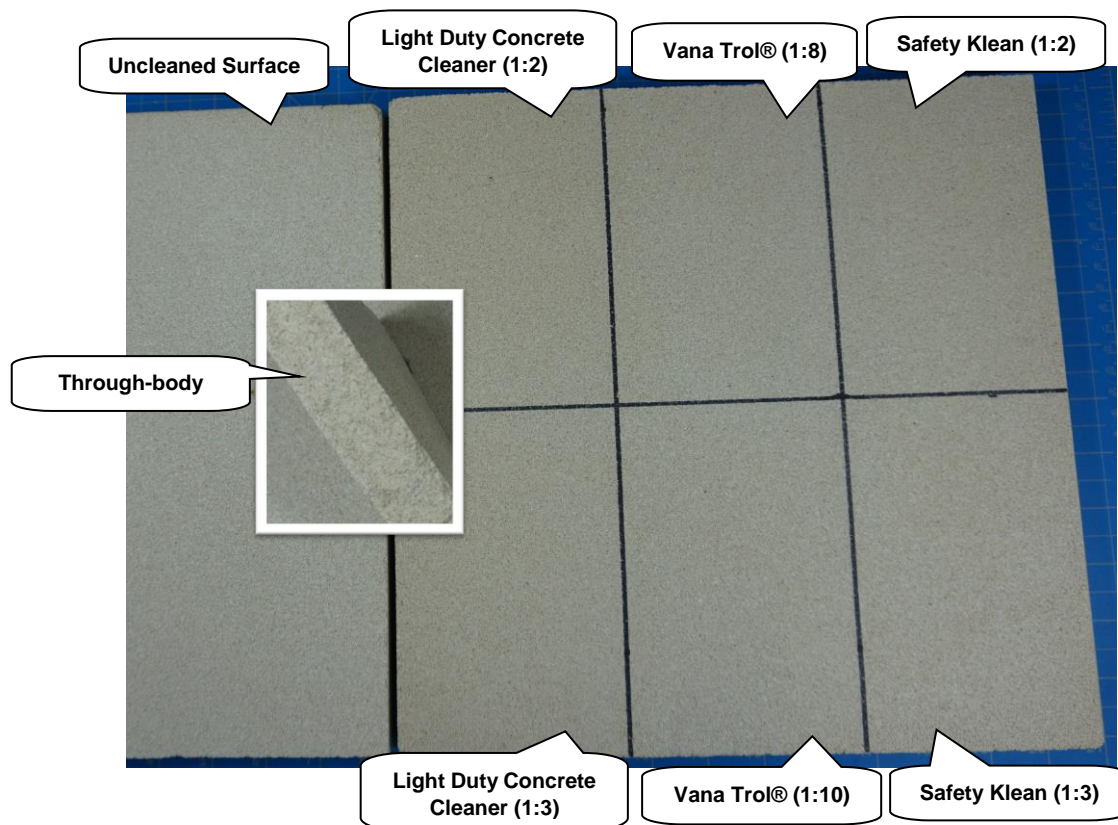
***Rinsing Equipment** – Masonry washing equipment generating approximately 700-800 psi with a water flow rate of 8 gallons per minute delivered through a 45 degree fan spray tip was used for rinsing.

TEST RESULTS AND PHOTOGRAPHS: New Construction Cleaning / Color Uniformity

Scale used for reporting results of both categories:
0 – No change compared to uncleaned surface
1 – Slight change compared to uncleaned surface
2 – Moderate change compared to uncleaned surface
3 – Significant change compared to uncleaned surface

Substrate: Cast Stone	Name: "Wheat"		
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal
Light Duty Concrete Cleaner	1:2	0	0
Light Duty Concrete Cleaner	1:3	0	0
Vana Trol®	1:8	0	0
Vana Trol®	1:10	0	0
Safety Klean	1:2	0	0
Safety Klean	1:3	0	0

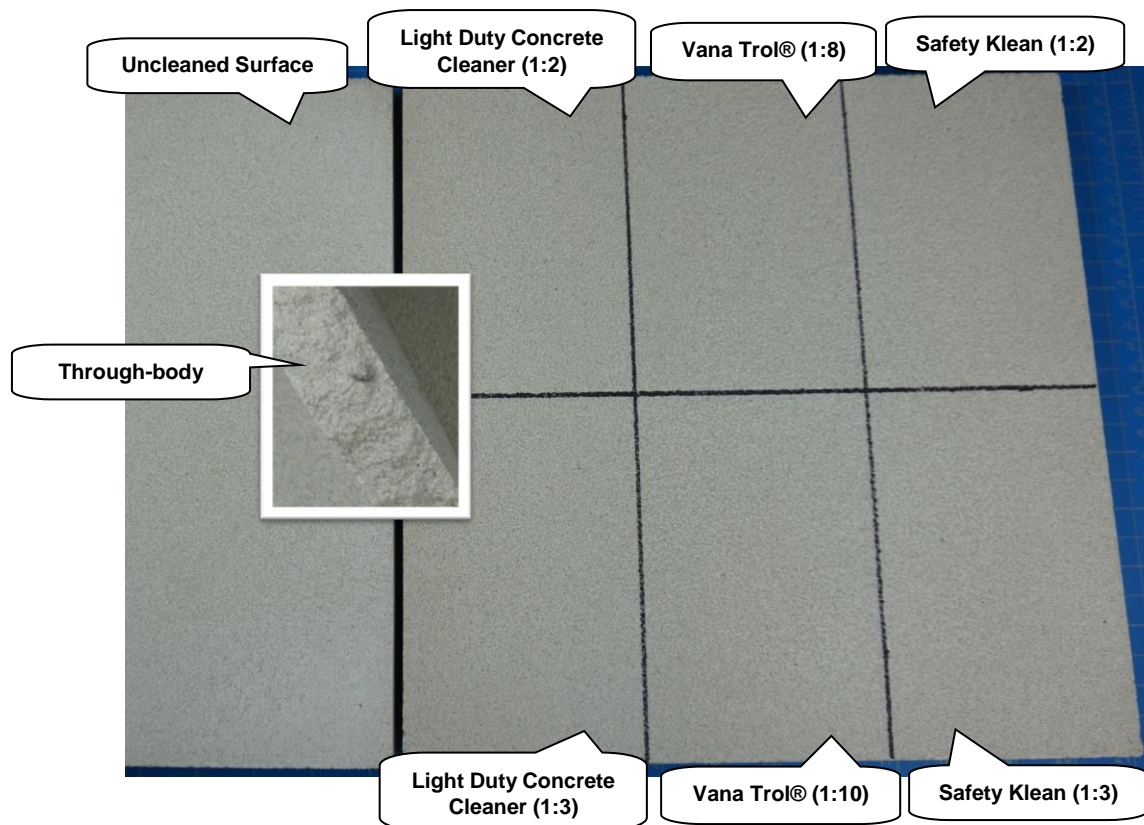
"Wheat" Cast Stone After Cleaning



TEST RESULTS AND PHOTOGRAPHS: New Construction Cleaning / Color Uniformity (cont.)

Substrate: Cast Stone	Name: "Natural"		
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal
Light Duty Concrete Cleaner	1:2	0	0
Light Duty Concrete Cleaner	1:3	0	0
Vana Trol®	1:8	0	0
Vana Trol®	1:10	0	0
Safety Klean	1:2	0	0
Safety Klean	1:3	0	0

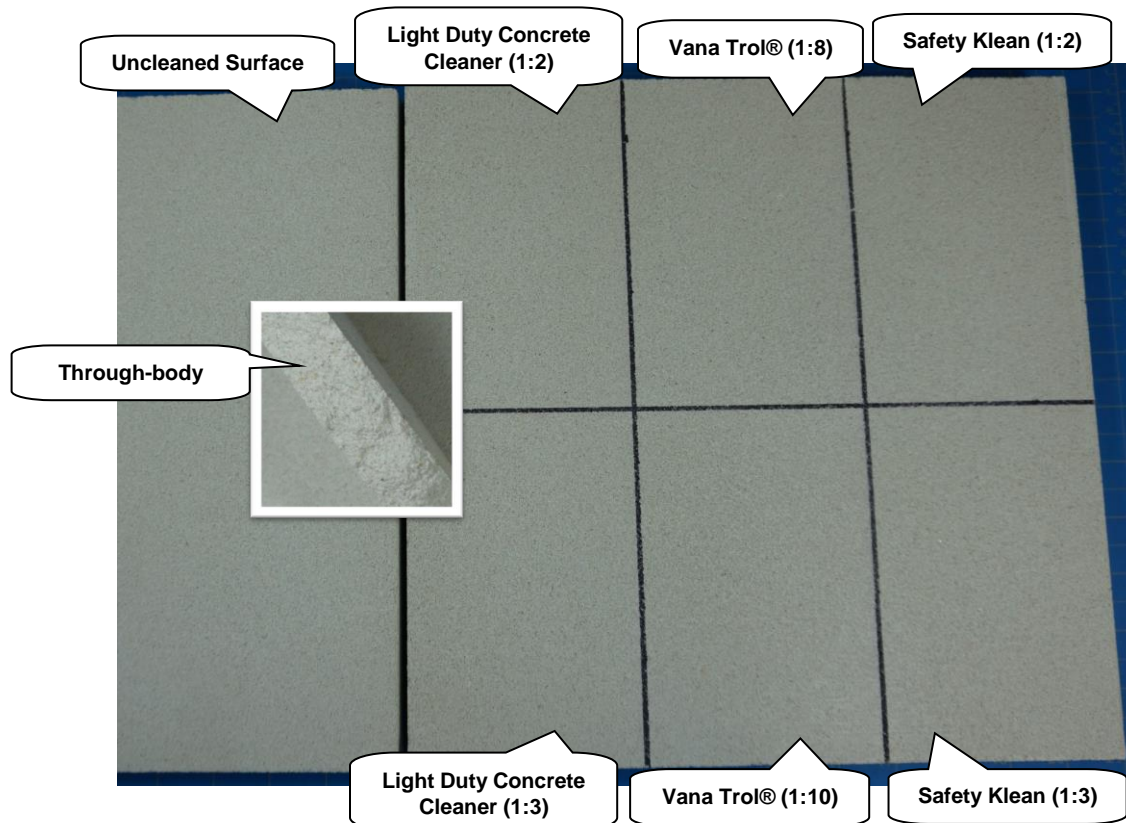
"Natural" Cast Stone After Cleaning



TEST RESULTS AND PHOTOGRAPHS: New Construction Cleaning / Color Uniformity (cont.)

Substrate: Cast Stone	Name: "Classic"		
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal
Light Duty Concrete Cleaner	1:2	0	0
Light Duty Concrete Cleaner	1:3	0	0
Vana Trol®	1:8	0	0
Vana Trol®	1:10	0	0
Safety Klean	1:2	0	0
Safety Klean	1:3	0	0

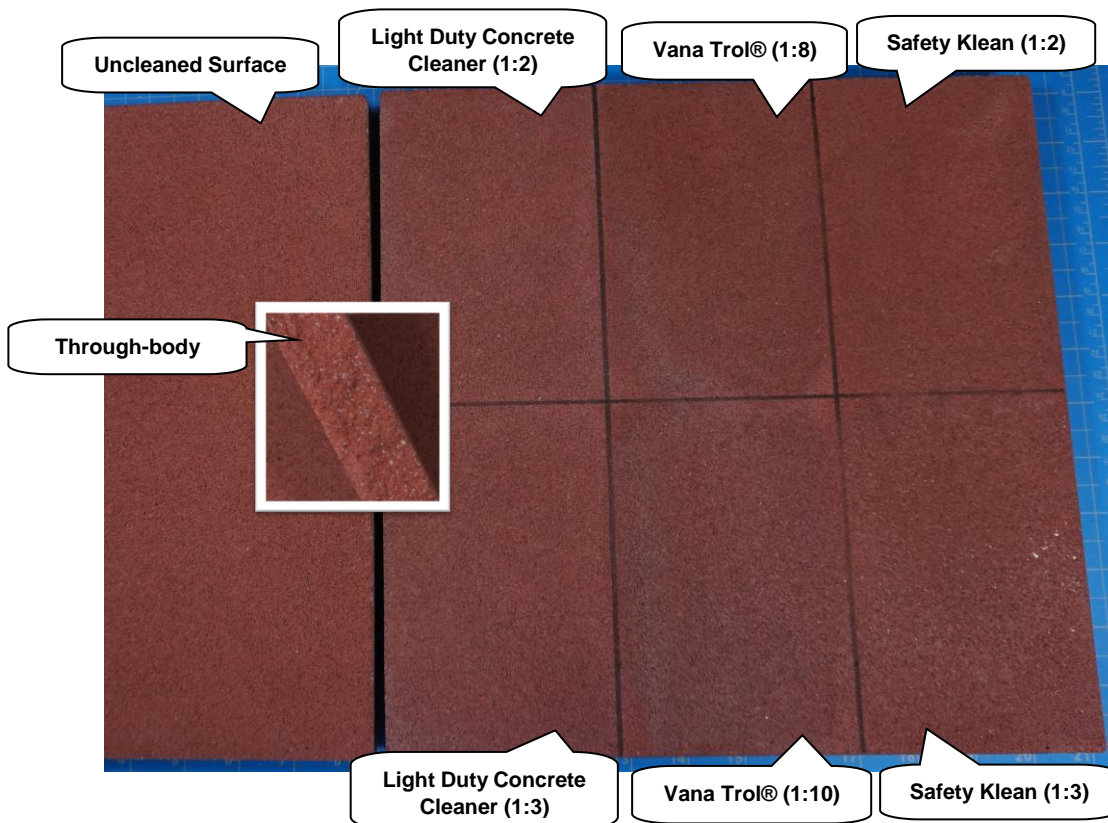
"Classic" Cast Stone After Cleaning



TEST RESULTS AND PHOTOGRAPHS: New Construction Cleaning / Color Uniformity (cont.)

Substrate: Cast Stone	Name: "# 25"		
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal
Light Duty Concrete Cleaner	1:2	1	1
Light Duty Concrete Cleaner	1:3	1	1
Vana Trol®	1:8	2	2
Vana Trol®	1:10	2	2
Safety Klean	1:2	1	1
Safety Klean	1:3	1	1

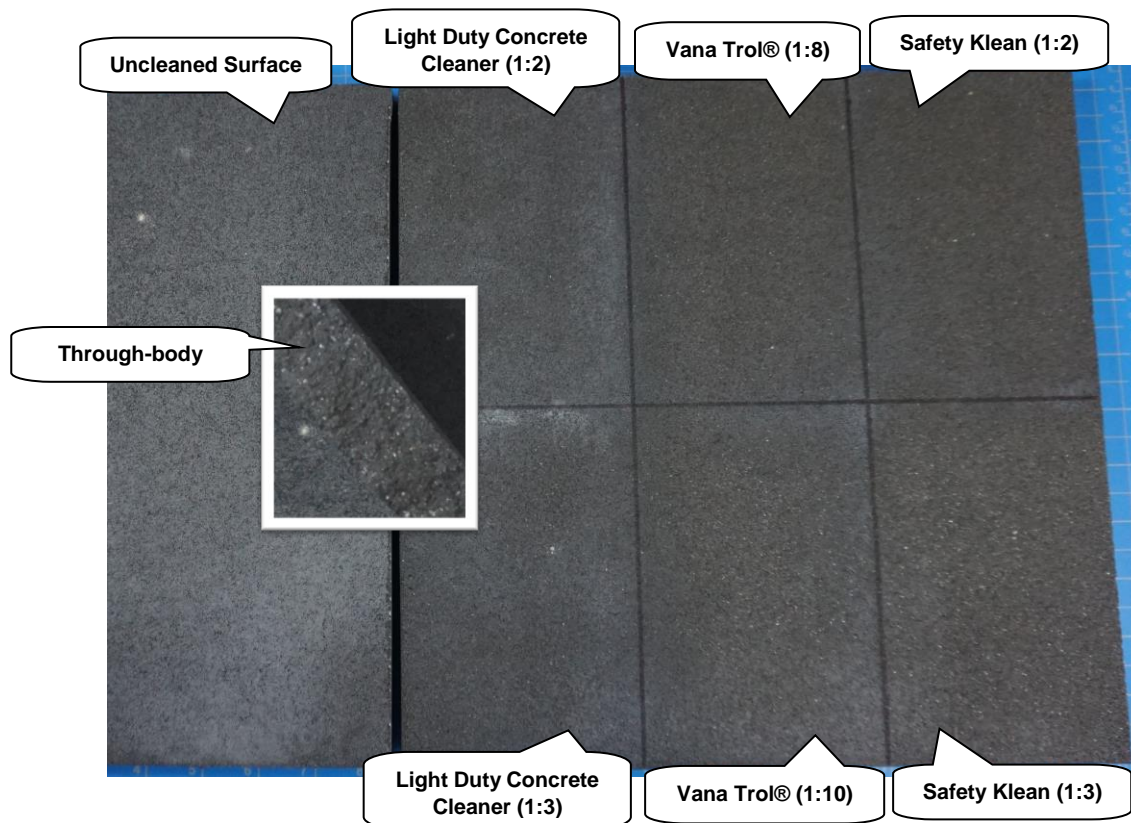
"# 25" Cast Stone After Cleaning



TEST RESULTS AND PHOTOGRAPHS: New Construction Cleaning / Color Uniformity (cont.)

Substrate: Cast Stone	Name: "# 116"		
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal
Light Duty Concrete Cleaner	1:2	1 (very slight)	1 (very slight)
Light Duty Concrete Cleaner	1:3	1 (very slight)	1 (very slight)
Vana Trol®	1:8	1	1
Vana Trol®	1:10	1	1
Safety Klean	1:2	1	1
Safety Klean	1:3	1	1

"# 116" Cast Stone After Cleaning



CONCLUSIONS – New Construction Cleaning

In most of the cleaning tests conducted, all three cleaners at both dilutions evaluated removed little to no surface pigment, exposing little to no aggregate. However, both dilutions of Sure Klean® Vana Trol® removed a moderate amount of surface pigment from the “# 25” cast stone, exposing a moderate amount of aggregate.

Sure Klean® Light Duty Concrete Cleaner provided the best match to the uncleaned surface of all the cast stone.

When choosing the most appropriate product for the desired result, use Sure Klean® Light Duty Concrete Cleaner when minimal aggregate exposure is desired. Use Sure Klean® Vana Trol® for new masonry surfaces that are subject to vanadium, manganese, and other metallic stains. Additionally, Sure Klean® Vana Trol® is designed for use with colored mortar. Use Enviro Klean® Safety Klean as an effective, safe alternative to acidic cleaning compounds.

Use higher concentrations and surface agitation to maximize aggregate exposure. Use low concentration and surface agitation to minimize aggregate exposure.

RECOMMENDATIONS: New Construction Cleaning

Recommendations for cleaning for each cast stone submitted by Cast Stone Systems, Inc., Warrenton, NC are provided in the chart below. Recommendations are based on the cleaner and dilution that provided the best match to the uncleaned surface of the cast stone.

Sample	New Construction Cleaning
"Wheat" Cast Stone	Sure Klean® Light Duty Concrete Cleaner (1:2) or (1:3) OR Sure Klean® Vana Trol® (1:8) or (1:10) OR Enviro Klean® Safety Klean (1:2) or (1:3)
"Natural" Cast Stone	
"Classic" Cast Stone	
"# 25" Cast Stone	Sure Klean® Light Duty Concrete Cleaner (1:2) or (1:3) OR Enviro Klean® Safety Klean (1:2) or (1:3)
"# 116" Cast Stone	Sure Klean® Light Duty Concrete Cleaner (1:2) or (1:3)

The most appropriate cleaner and dilution should be determined on the specific job-site, and will be dependent primarily on the nature and severity of soiling present at that location.

Apply all products in accordance with the manufacturer's recommendation provided on container labels and product data sheets. On-site testing should be conducted to determine the most appropriate cleaning product and procedures for a particular project. See product literature for additional application and product information.

SAMPLE PREPARATION: Treatment Application

Prior to treatment application, the submitted cast stone samples were cleaned with Sure Klean® Light Duty Concrete Cleaner at a dilution of 1:2 in accordance with the current PROSOCO, Inc. Product Data Sheet instructions. After the samples were allowed to dry for at least 24 hours, PROSOCO® SL100 Water Repellent, PROSOCO® SLX100® Water & Oil Repellent, Sure Klean® Weather Seal Siloxane PD, and Sure Klean® Weather Seal Siloxane WB Concentrate (1:9) were then applied in a brushing application in accordance with the current PROSOCO, Inc. Product Data Sheet instructions. The treatments were allowed to cure for at least 72 hours prior to testing.

TEST METHODS: Protective Water Repellents

Water Absorption Tube Test: Vertical RILEM II.4, 5.0 milliliters, 20 minutes

The water absorption tube test simulating wind driven rain conditions was performed on the submitted cast stone. Tests were run with 5.0-milliliter head pressures. Filled to 5.0 milliliters, a water absorption tube produces a 98 mph dynamic wind pressure. See RILEM II.4 Tech Note for additional information.

The ranking system used to evaluate the effectiveness of the products applied to each submitted sample is as follows:

AA = “Above Average” correlates to less than or equal to 20% of the maximum untreated absorption.

A = “Average” correlates to less than or equal to 50% of the maximum untreated absorption.

BA = “Below Average” correlates to greater than 50% of the maximum untreated absorption.

EXAMPLE: If RILEM tubes applied to an untreated sample result in loss of 5.0 ml of water or more, then:

A rating of **AA** *Above Average* water repellent performance would be reported for treatments which result in a loss of no more than:

$$5.0 \text{ mL} \times 20\% = \mathbf{1.0 \text{ mL}}$$

A rating of **A** *Average* water repellent performance would be reported for treatments which result in a loss of no more than:

$$5.0 \text{ mL} \times 50\% = \mathbf{2.5 \text{ mL}}$$

A rating of **BA** *Below Average* water repellent performance would be reported for treatments which result in a loss of more than:

$$5.0 \text{ mL} \times 50\% = \mathbf{2.5 \text{ mL}}$$

TEST RESULTS AND PHOTOGRAPHS: Protective Water Repellents

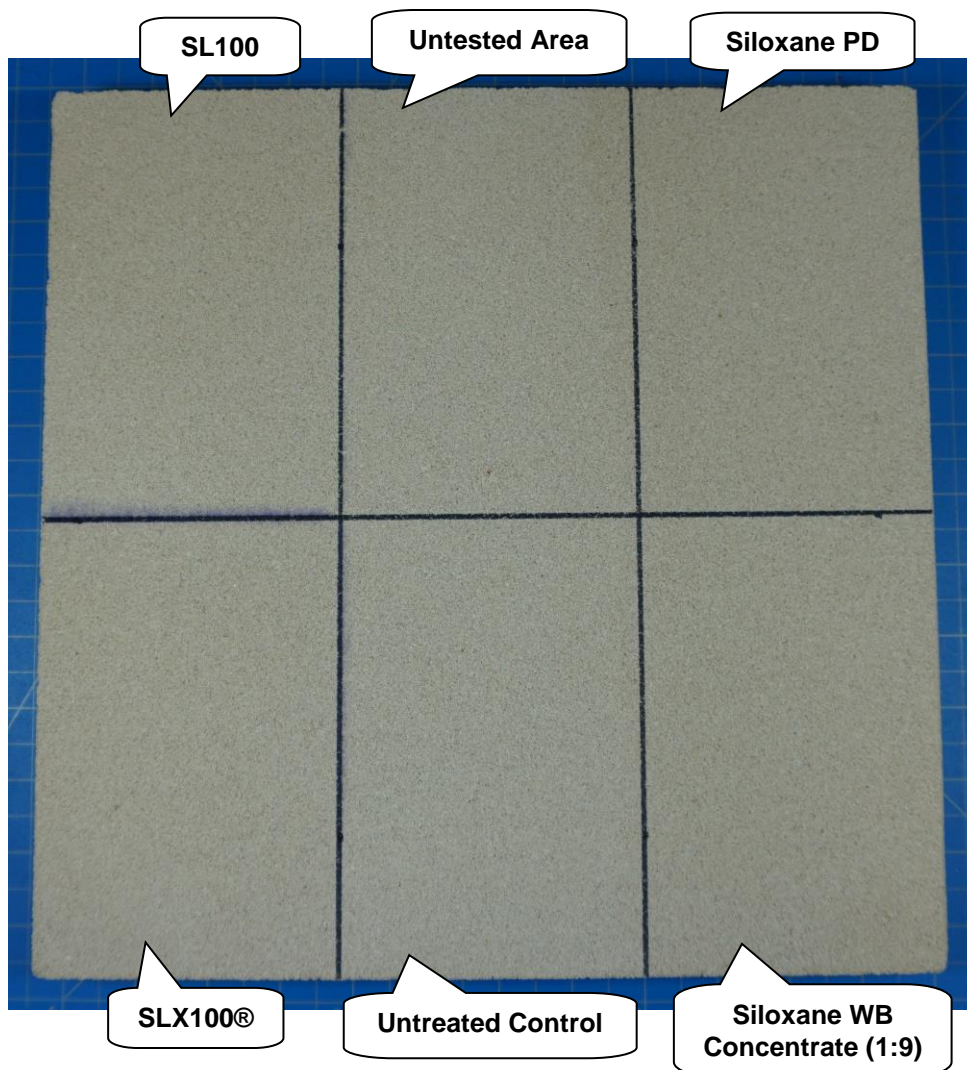
Water Absorption Tube Test: Vertical RILEM II.4, 5.0 milliliters, 20 minutes

AA = Above Average A = Average

BA = Below Average

"Wheat" Cast Stone	Results in mL loss	Ranking
Untreated Control	-0.0	--
PROSOCO® SL100 Water Repellent	-0.0	<u>AA</u>
PROSOCO® SLX100® Water & Oil Repellent	-0.0	<u>AA</u>
Sure Klean® Weather Seal Siloxane PD	-0.0	<u>AA</u>
Sure Klean® Weather Seal Siloxane WB Concentrate (1:9)	-0.0	<u>AA</u>

"Wheat" Cast Stone With Treatments

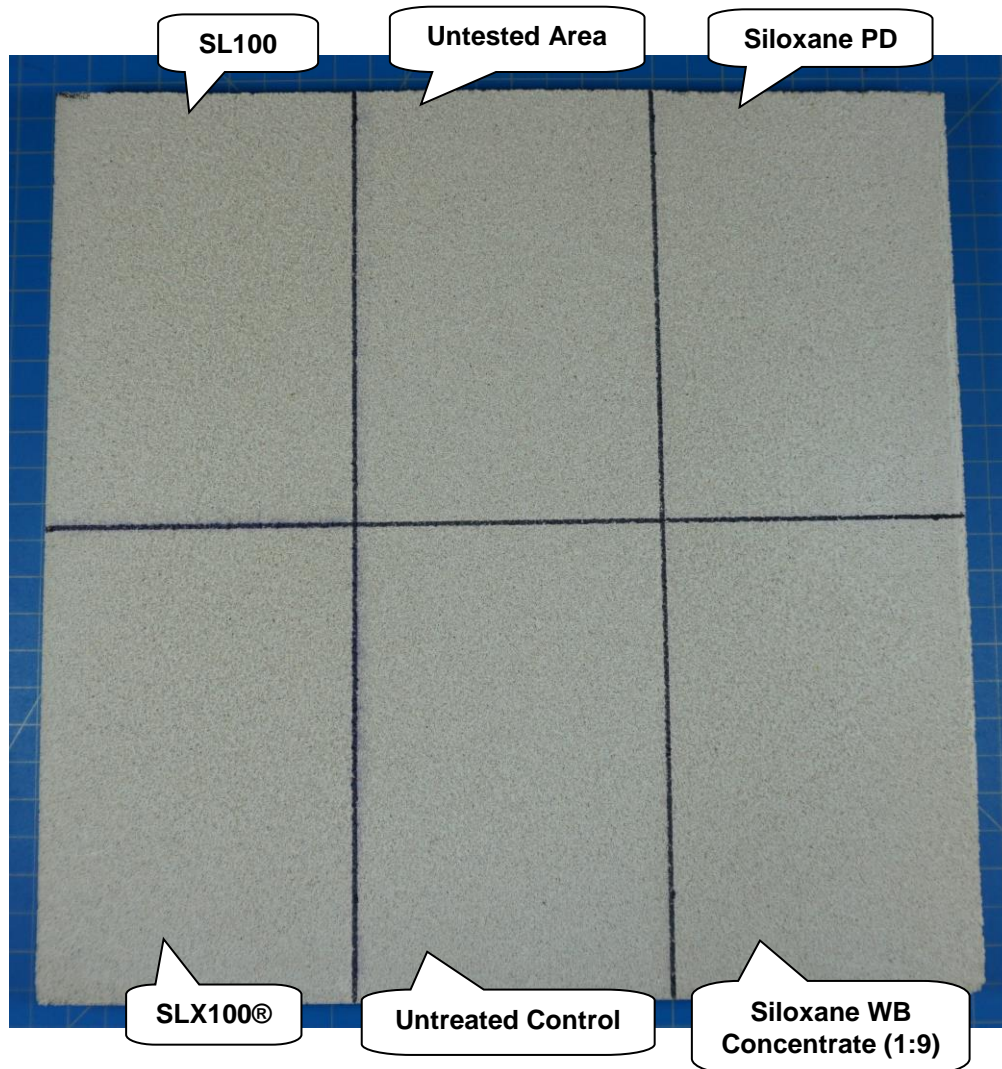


TEST RESULTS AND PHOTOGRAPHS: Protective Water Repellents (cont.)

Water Absorption Tube Test: Vertical RILEM II.4, 5.0 milliliters, 20 minutes

"Natural" Cast Stone	Results in mL loss	Ranking
Untreated Control	-0.1	--
PROSOCO® SL100 Water Repellent	-0.0	<u>AA</u>
PROSOCO® SLX100® Water & Oil Repellent	-0.0	<u>AA</u>
Sure Klean® Weather Seal Siloxane PD	-0.0	<u>AA</u>
Sure Klean® Weather Seal Siloxane WB Concentrate (1:9)	-0.0	<u>AA</u>

"Natural" Cast Stone With Treatments

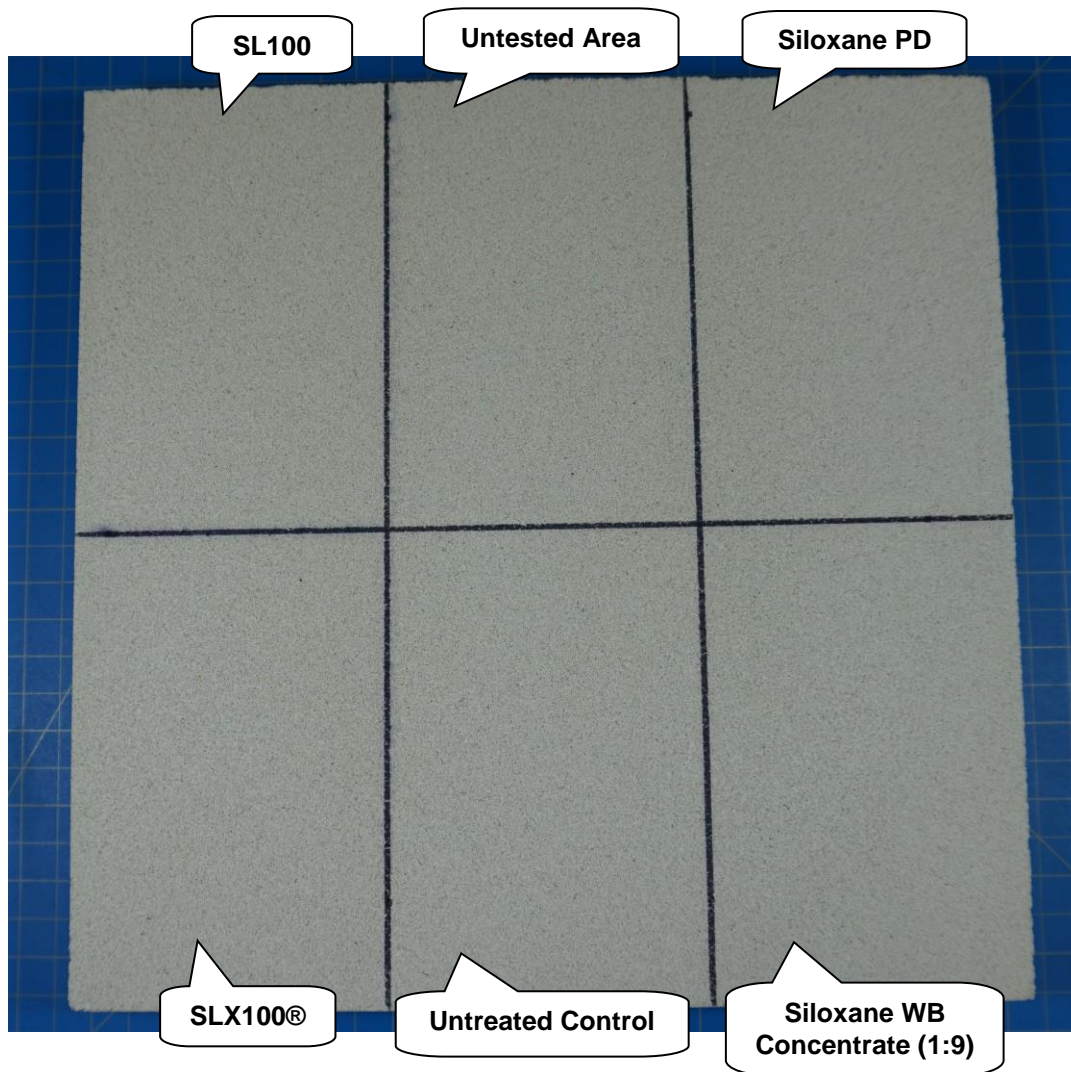


TEST RESULTS AND PHOTOGRAPHS: Protective Water Repellents (cont.)

Water Absorption Tube Test: Vertical RILEM II.4, 5.0 milliliters, 20 minutes

"Classic" Cast Stone	Results in mL loss	Ranking
Untreated Control	-0.0	--
PROSOCO® SL100 Water Repellent	-0.0	<u>AA</u>
PROSOCO® SLX100® Water & Oil Repellent	-0.0	<u>AA</u>
Sure Klean® Weather Seal Siloxane PD	-0.0	<u>AA</u>
Sure Klean® Weather Seal Siloxane WB Concentrate (1:9)	-0.0	<u>AA</u>

"Classic" Cast Stone With Treatments



TEST RESULTS AND PHOTOGRAPHS: Protective Water Repellents (cont.)

Water Absorption Tube Test: Vertical RILEM II.4, 5.0 milliliters, 20 minutes

"# 25" Cast Stone	Results in mL loss	Ranking
Untreated Control	-5.0	--
PROSOCO® SL100 Water Repellent	-0.0	<u>AA</u>
PROSOCO® SLX100® Water & Oil Repellent	-0.0	<u>AA</u>
Sure Klean® Weather Seal Siloxane PD	N/A	<u>AA</u>
Sure Klean® Weather Seal Siloxane WB Concentrate (1:9)	N/A	<u>AA</u>

"# 25" Cast Stone With Treatments



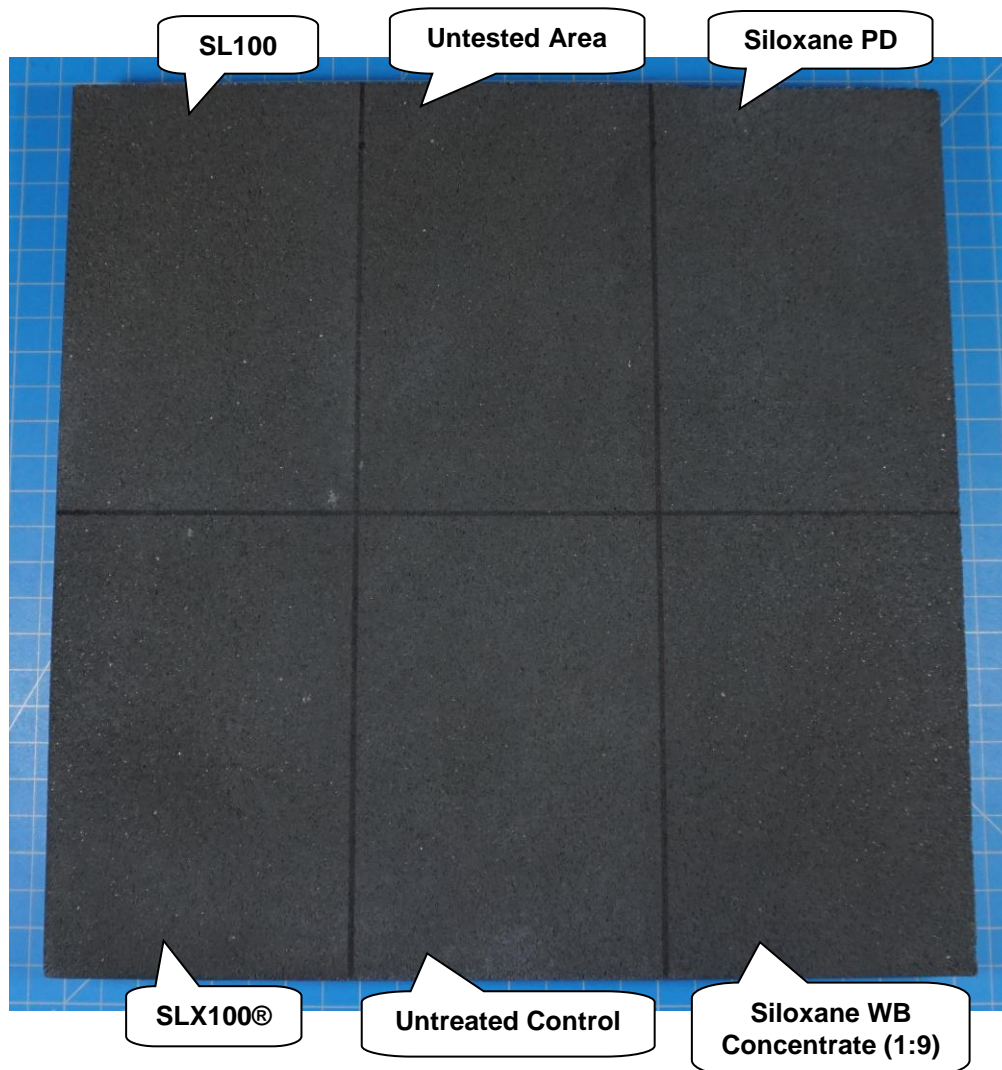
*N/A – A seal between the RILEM tube and the sample was unattainable.

TEST RESULTS AND PHOTOGRAPHS: Protective Water Repellents (cont.)

Water Absorption Tube Test: Vertical RILEM II.4, 5.0 milliliters, 20 minutes

"# 116" Cast Stone	Results in mL loss	Ranking
Untreated Control	-0.2	--
PROSOCO® SL100 Water Repellent	-0.0	<u>AA</u>
PROSOCO® SLX100® Water & Oil Repellent	-0.0	<u>AA</u>
Sure Klean® Weather Seal Siloxane PD	-0.0	<u>AA</u>
Sure Klean® Weather Seal Siloxane WB Concentrate (1:9)	-0.0	<u>AA</u>

"# 116" Cast Stone With Treatments



CONCLUSIONS: Protective Water Repellents

Based on the laboratory evaluations, all the treatments provided good water repellent protection to the submitted cast stone. Data for Sure Klean® Weather Seal Siloxane PD and Sure Klean® Weather Seal Siloxane WB Concentrate (1:9) on the “# 25” cast stone was unattainable. After several vertical RILEM tests were performed on multiple “# 25” cast stone samples, it was determined that a seal with the RILEM putty could not be achieved on those two water repellents. Additionally, the “# 25” cast stone was the only sample where the untreated control absorbed over 5.0 mL of water.

PROSOCO® SL100 Water Repellent, PROSOCO® SLX100® Water & Oil Repellent, Sure Klean® Weather Seal Siloxane PD, and Sure Klean® Weather Seal Siloxane WB Concentrate (1:9) all provided a slight color enhancement to each cast stone, with the exception of Sure Klean® Weather Seal Siloxane WB Concentrate (1:9) providing a moderate color enhancement to the “# 25” cast stone.

RECOMMENDATIONS: Water Repellency

Recommendations for water repellency for each cast stone sample submitted by Cast Stone Systems, Inc., Warrenton, NC are provided in the chart below. Recommendations are based on the treatment(s) that proved most effective.

Sample	Water Repellency
"Wheat" Cast Stone	PROSOCO® SL100 Water Repellent OR PROSOCO® SLX100® Water & Oil Repellent OR Sure Klean® Weather Seal Siloxane PD OR Sure Klean® Weather Seal Siloxane WB Concentrate (1:9)
"Natural" Cast Stone	
"Classic" Cast Stone	
"# 25" Cast Stone	PROSOCO® SL100 Water Repellent OR PROSOCO® SLX100® Water & Oil Repellent OR Sure Klean® Weather Seal Siloxane PD OR Sure Klean® Weather Seal Siloxane WB Concentrate (1:9) (Recommended if moderate color enhancement is desired)
"# 116" Cast Stone	PROSOCO® SL100 Water Repellent OR PROSOCO® SLX100® Water & Oil Repellent OR Sure Klean® Weather Seal Siloxane PD OR Sure Klean® Weather Seal Siloxane WB Concentrate (1:9)

Apply all products in accordance with the manufacturer's recommendation provided on container labels and product data sheets. On-site testing should be conducted to determine the most treatment and procedures for a particular project. See product literature for additional application and product information.



J. Lucas Comadoll
QC/Project Testing Technician

ALL SAMPLES SUPPLIED FOR THE ABOVE EVALUATION WILL BE DISPOSED OF THIRTY (30) DAYS AFTER THE ISSUE DATE OF THIS REPORT. IF SAMPLES ARE TO BE RETAINED FOR ADDITIONAL TESTING OR RETURNED TO THE SENDER, PROVIDE WRITTEN INSTRUCTIONS TO THE LABORATORY WITHIN THIRTY (30) DAYS OF THE ISSUE DATE OF THIS REPORT.

Recommendations made within this report are based on laboratory test applications and observations. Final determination of the suitability of a product and/or procedure should be made only after thorough job testing on actual surfaces.