



# PALLET TAG PROGRAM LABORATORY REPORT



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## ATTACHMENTS

Technical Services TECH Note RILEM Tube Test Procedures  
Product Data literature for all products evaluated



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**FOR:** Kerry Rose  
**cc:** James Holt  
Paul Tessier  
Steve Dean

**SUBJECT:** Alluriam Stone®  
Birmingham, AL

**DATE:** December 22, 2003

**PROJECT:** 0310-24 PTP

**SAMPLES SUBMITTED:**

Sample	Color	Size
Metro Brown Stack	Various	Various
Metro Brown Rubble		
Metro Grey Stack		
Metro Grey Rubble		
Calico Stack		
Calico Rubble		

Submitted by: Kerry Rose



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## PURPOSE OF TESTING:

Six types of cast-stone in various colors and sizes were submitted to PROSOCO, Inc.'s Testing Laboratory with a request to determine if application of the products evaluated would produce any surface alteration during new construction cleaning operations. Additionally, the effectiveness of water repellents, suitable for cast stone, was evaluated.

**A. New Construction Cleaning** – Sure Klean® Vana Trol® was evaluated at various dilutions for removal of laboratory applied mortar.

To simulate new construction soiling, all tiles are placed on a bench with finished surface facing upward. Hollow cylinders measuring 50 mm in diameter and 75 mm tall are positioned on top of each tile and filled with a wet mixture of Ash Grove® Type N or Ash Grove® Type S cementitious mortar. The wet, mortar-filled cylinder is allowed to remain in contact with the tile for 10 minutes before removal.

Soiled tiles are allowed to dry before test cleaning.

Heavy deposits of mortar are removed with dry scraping after 24 hours. Prepared cleaning solutions are then evaluated for their effectiveness in removing residual Ash Grove® Type N or Type S mortar staining after 7 days, 14 days, and 21 days of curing.

**B. Limiting Surface Alterations Testing** – Sure Klean® Vana Trol® was evaluated at various dilutions to determine if a cleaning program implemented to remove excess mortar and related new construction soiling would otherwise alter the appearance of cleaned surfaces. Surface Alteration was evaluated visually based upon perceived discoloration or erosion/etching of the masonry unit.

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

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

Matrix Erosion is the visual examination comparing the untreated control surface to surfaces cleaned with selected products at given dilutions looking for any potential erosion/digestion of the cementitious matrix of the tile.

Staining is the visual examination for changes that are the result of a chemical reaction that leaves a staining precipitate.

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

- |               |               |
|---------------|---------------|
| 0 – no change | 3 – heavy     |
| 1 – slight    | 4 – excessive |
| 2 – moderate  |               |

**C. Protective Water Repellents** - Sure Klean® Custom Masonry Sealer and Sure Klean® Weather Seal Siloxane PD were evaluated for their ability to provide water repellency to the submitted samples.



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## PRODUCTS EVALUATED

### CLEANING AND LIMITING SURFACE ALTERATIONS PRODUCTS EVALUATED

SAMPLE	PRODUCT	DILUTION*
All Submitted Cast-Stone	Sure Klean® Vana Trol®	1:12, 1:16

### WATER REPELLENCY PRODUCTS EVALUATED

SAMPLE	Product	Dilution
All Submitted Cast-Stone	Sure Klean® Custom Masonry Sealer	Concentrate
	Sure Klean® Weather Seal Siloxane PD	Concentrate

\*Dilution ratios refer to mixtures of concentrated product : fresh water.



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## **SECTION A – NEW CONSTRUCTION CLEANING**

### **DESCRIPTION OF PRODUCTS EVALUATED – New Construction Cleaning**

These cleaning trials were conducted to determine the optimal cleaning/cure time combination to most efficiently remove Ash Grove® Type N mortar from the submitted cast stone.

Ash Grove® Type N and Ash Grove® Type S cementitious mortar were prepared in compliance with the manufacturers instructions, applied to the cast stone and allowed to cure for 7, 14 and 21 days in the case of Type N, and 3, 7, and 14 days in the case of type S. The removal of both types of cementitious masonry cement mortar after each day of curing was visually evaluated.

**Sure Klean® Vana Trol®** - A concentrated acidic cleaner for new masonry surfaces that are subject to vanadium, manganese and other metallic stains. Vana Trol® is designed to simplify rinsing and reduces potential for efflorescence.

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### **TEST METHOD – New Construction Cleaning**

Dilution ratios refer to mixtures of concentrated cleaner : fresh water. Chemical cleaners were evaluated using the following procedure:

1. Prewet the surface with water.
2. Apply the cleaner.
3. Allow the appropriate dwell time, as specified.  
Vana Trol® ..... 3 minutes
4. Rinse thoroughly.\*

\* Rinsing was conducted using garden-hose strength water pressure.



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## TEST RESULTS – New Construction Cleaning

### % Removal

#### “Metro Brown Stack” Cast Stone

<b>Type N Mortar</b>	<b><u>7 day</u></b>	<b><u>14 day</u></b>	<b><u>21 day</u></b>
Vana Trol <sup>®</sup> (1:12)	100%	100%	100%
Vana Trol <sup>®</sup> (1:16)	100%	100%	100%

<b>Type S Mortar</b>	<b><u>3 day</u></b>	<b><u>7 day</u></b>	<b><u>14 day</u></b>
Vana Trol <sup>®</sup> (1:12)	100%	100%	100%
Vana Trol <sup>®</sup> (1:16)	100%	100%	100%

#### “Metro Brown Rubble” Cast Stone

<b>Type N Mortar</b>	<b><u>7 day</u></b>	<b><u>14 day</u></b>	<b><u>21 day</u></b>
Vana Trol <sup>®</sup> (1:12)	95%	100%	100%
Vana Trol <sup>®</sup> (1:16)	95%	100%	100%

<b>Type S Mortar</b>	<b><u>3 day</u></b>	<b><u>7 day</u></b>	<b><u>14 day</u></b>
Vana Trol <sup>®</sup> (1:12)	90%	95%	95%
Vana Trol <sup>®</sup> (1:16)	90%	95%	95%

#### “Metro Grey Stack” Cast Stone

<b>Type N Mortar</b>	<b><u>7 day</u></b>	<b><u>14 day</u></b>	<b><u>21 day</u></b>
Vana Trol <sup>®</sup> (1:12)	95%	95%	95%
Vana Trol <sup>®</sup> (1:16)	95%	95%	95%

<b>Type S Mortar</b>	<b><u>3 day</u></b>	<b><u>7 day</u></b>	<b><u>14 day</u></b>
Vana Trol <sup>®</sup> (1:12)	90%	95%	95%
Vana Trol <sup>®</sup> (1:16)	90%	95%	95%



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## TEST RESULTS Continued – New Construction Cleaning

### % Removal

#### “Metro Grey Rubble” Cast Stone

<u>Type N Mortar</u>	<u>7 day</u>	<u>14 day</u>	<u>21 day</u>
Vana Trol <sup>®</sup> (1:12)	90%	95%	95%
Vana Trol <sup>®</sup> (1:16)	90%	95%	95%

<u>Type S Mortar</u>	<u>3 day</u>	<u>7 day</u>	<u>14 day</u>
Vana Trol <sup>®</sup> (1:12)	90%	95%	95%
Vana Trol <sup>®</sup> (1:16)	90%	95%	95%

#### “Calico Stack” Cast Stone

<u>Type N Mortar</u>	<u>7 day</u>	<u>14 day</u>	<u>21 day</u>
Vana Trol <sup>®</sup> (1:12)	95%	100%	100%
Vana Trol <sup>®</sup> (1:16)	95%	100%	100%

<u>Type S Mortar</u>	<u>3 day</u>	<u>7 day</u>	<u>14 day</u>
Vana Trol <sup>®</sup> (1:12)	90%	95%	95%
Vana Trol <sup>®</sup> (1:16)	90%	95%	95%

#### “Calico Rubble” Cast Stone

<u>Type N Mortar</u>	<u>7 day</u>	<u>14 day</u>	<u>21 day</u>
Vana Trol <sup>®</sup> (1:12)	95%	95%	95%
Vana Trol <sup>®</sup> (1:16)	95%	95%	95%

<u>Type S Mortar</u>	<u>3 day</u>	<u>7 day</u>	<u>14 day</u>
Vana Trol <sup>®</sup> (1:12)	90%	95%	95%
Vana Trol <sup>®</sup> (1:16)	90%	95%	95%



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## PHOTOGRAPHS- New Construction Cleaning: Type S Mortar

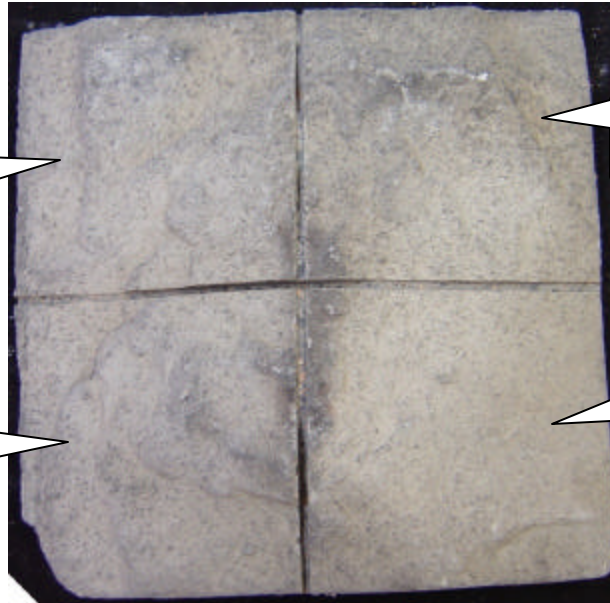
### "Metro Grey Rubble"

**Sure Klean® Vana  
Trol® 1:12 (7 Day  
Cleaning)**

**Sure Klean® Vana Trol®  
1:16 (7 Day Cleaning)**

**Sure Klean® Vana  
Trol 1:12 (3 Day  
Cleaning)**

**Sure Klean® Vana Trol®  
1:16 (3 Day Cleaning)**



### "Metro Grey Rubble" - 14 day Cleaning

**Sure Klean®  
Vana Trol® 1:16**

**Sure Klean®  
Vana Trol® 1:12**







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## PHOTOGRAPHS – New Construction Cleaning: Type N Mortar

**“Metro Grey Rubble”**



**Sure Klean®  
Vana Trol® 1:12  
(7 Day Cleaning)**

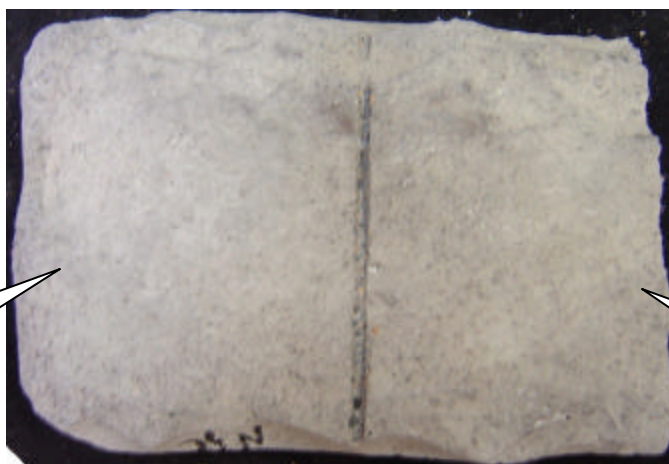
**Sure Klean®  
Vana Trol® 1:16  
(7 Day Cleaning)**

**Sure Klean®  
Vana Trol® 1:12  
(7 Day Cleaning)**

**Sure Klean®  
Vana Trol® 1:16 (14 Day Cleaning)**

**Untreated  
Control**

**“Metro Grey Rubble” – 21 Day Cleaning**



**Sure Klean®  
Vana Trol® 1:12**

**Sure Klean®  
Vana Trol®  
1:16**



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## CONCLUSIONS – New Construction Cleaning

Based on the test results, all cleaners and all dilutions performed well in removing excess mortar smears on the submitted cast stone. The cleaners performed well in removing the mortar soils even after allowing the mortar to remain on the surface of the cast stone for 21 days under ideal curing conditions.

It is also recommended that the selected cleaners always be used in the lowest possible concentration. To facilitate easier removal of excess mortar and construction dirt while minimizing any potential adverse affect on the cast stone, clean within 7 days of construction.

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## RECOMMENDATIONS – New Construction Cleaning

Recommendations for cleaning for the cast stone submitted by Alluriam Stone<sup>®</sup>, Birmingham, AL, are provided in the chart below. Recommendations are based on the optimum dilution for complete removal of mortar.

Sample	New Construction Cleaning (Type N mortar, 14 day cleaning) OR (Type S mortar, 21 day cleaning)
All Submitted Cast-stone	Sure Klean <sup>®</sup> Vana Trol <sup>®</sup> (1:12) OR Sure Klean <sup>®</sup> Vana Trol <sup>®</sup> (1:16)

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. Rinsing with garden-hose pressure spray is recommended.

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.



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## **SECTION B – LIMITING SURFACE ALTERATIONS**

### **DESCRIPTION OF PRODUCTS EVALUATED – Limiting Surface Alterations**

**Sure Klean® Vana Trol®** - A concentrated acidic cleaner for new masonry surfaces that are subject to vanadium, manganese and other metallic stains. Vana Trol® is designed to simplify rinsing and reduces potential for efflorescence.

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### **TEST METHOD – Limiting Surface Alterations**

Dilution ratios refer to mixtures of concentrated cleaner : fresh water. Chemical cleaners were evaluated using the following procedure:

1. Prewet the surface with water.
2. Apply the cleaner.
3. Allow the appropriate dwell time, as specified.  
Vana Trol® ..... 3 minutes
4. Rinse thoroughly.\*

\* Rinsing was conducted using garden-hose strength pressure.



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## TEST RESULTS – Limiting Surface Alterations

<b>Substrate:</b> “Metro Brown Stack” *					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:12	1	0	1	0
Vana Trol®	1:16	0	0	0	0
<b>Substrate:</b> “Metro Brown Rubble”					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:12	1	0	1	0
Vana Trol®	1:16	0	0	0	0
<b>Substrate:</b> “Metro Grey Stack”					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:12	1	0	1	0
Vana Trol®	1:16	0	0	0	0
<b>Substrate:</b> “Metro Grey Rubble”					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:12	0	0	0	0
Vana Trol®	1:16	0	0	0	0
<b>Substrate:</b> “Calico Stack”					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:12	1	0	1	0
Vana Trol®	1:16	0	0	0	0
<b>Substrate:</b> “Calico Rubble”					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:12	1	0	1	0
Vana Trol®	1:16	0	0	0	0

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

0 – no change

3 – heavy

1 – slight

4 – excessive

2 – moderate

\* There are some “Metro Brown Stack” samples that were darker in color than the others. On these darker samples, pigment was removed using both dilutions of Vana Trol®. Surface finish removal and color change were heavy on these samples.



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## RECOMMENDATIONS – Limiting Surface Alterations

Recommendations for limiting surface alterations for the cast stone submitted by Alluriam Stone<sup>®</sup>, Birmingham, AL, are provided in the chart below. Recommendations are based on the optimum dilution for removal of mortar while limiting surface alterations. Acidic cleaners are not recommended for “Metro Brown Stack” cast-stone due to pigment removal and surface alteration.

Sample	Product
“Metro Brown Stack”, darker pigments	Acidic cleaners are not recommended
All Other Submitted Cast-stone	Sure Klean <sup>®</sup> Vana Trol <sup>®</sup> (1:16)

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. Using garden hose strength water pressure may help to minimize any surface alterations.

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.



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## **SECTION C - PROTECTIVE WATER REPELLENTS:**

The testing described below evaluates the suitability of water repellent treatments. The surface treatments evaluated were selected for their suitability for application based on the following selection criteria:

1. Weatherproofing properties
  2. Color change
  3. Ease of application
- 

### **DESCRIPTIONS OF PRODUCTS EVALUATED - Protective Water Repellents:**

**Sure Klean® Custom Masonry Sealer** – A clear, solvent-based silicone elastomer formulated to weatherproof custom masonry units, cast stone, architectural concrete block, precast concrete, wood and porous masonry. Custom Masonry Sealer penetrates and fills pores to prevent water penetration through exterior walls exposed to normal weathering.

**Sure Klean® Weather Seal Siloxane PD** – A ready-to-use, water-based silane/siloxane water repellent for concrete, GFRC, and most masonry and stucco surfaces. Siloxane PD penetrates more deeply than conventional water repellents. It helps masonry surfaces resist cracking, spalling, staining and other damage related to water intrusion. Low odor and alkaline stable, Siloxane PD is ideal for field and in-plant application.

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### **SAMPLE PREPARATION - Protective Water Repellents:**

The submitted cast-stone were scored, allowed to dry, and to reabsorb atmospheric humidity for 24 hours prior to treatment. The treatment method consisted of a wet-on-wet brush application. All treatments were allowed to cure at least 72 hours prior to testing.

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### **TEST METHODS - Protective Water Repellents:**

#### **Water Absorption Tube Test: RILEM II.4, 60 mph, 20 Minutes**

The water absorption tube test simulating wind driven rain conditions was performed. This test simulates 60 mile per hour wind driven rain conditions for a period of 20 minutes. See Technical Services TECH Note RILEM Tube Test Procedures.



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**TEST RESULTS - Protective Water Repellents:**

**Water Absorption Tube Test: RILEM II.4, 60 mph, 20 Minutes**

<b>RESULTS</b>	
<b>"Metro Brown Stack"</b>	
Untreated Control	< 40 mph
Custom Masonry Sealer	59 mph
Siloxane PD	59 mph
<b>"Metro Brown Rubble"</b>	
Untreated Control	52 mph
Custom Masonry Sealer	59 mph
Siloxane PD	59 mph
<b>"Metro Grey Stack"</b>	
Untreated Control	56 mph
Custom Masonry Sealer	59 mph
Siloxane PD	58 mph
<b>"Metro Grey Rubble"</b>	
Untreated Control	57 mph
Custom Masonry Sealer	59 mph
Siloxane PD	60 mph
<b>"Calico Stack"</b>	
Untreated Control	45 mph
Custom Masonry Sealer	59 mph
Siloxane PD	59 mph
<b>"Calico Rubble"</b>	
Untreated Control	55 mph
Custom Masonry Sealer	59 mph
Siloxane PD	59 mph





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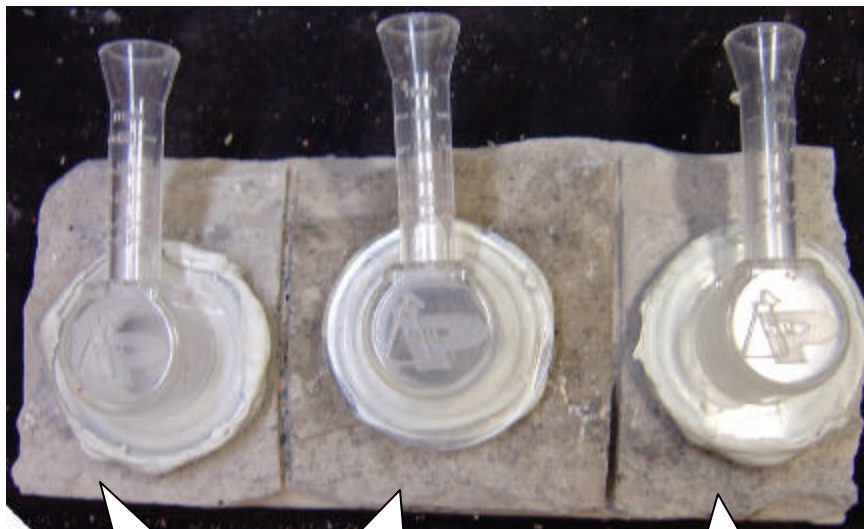


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## PHOTOGRAPHS – Protective Water Repellents

### “Metro Grey Rubble” - RILEM testing

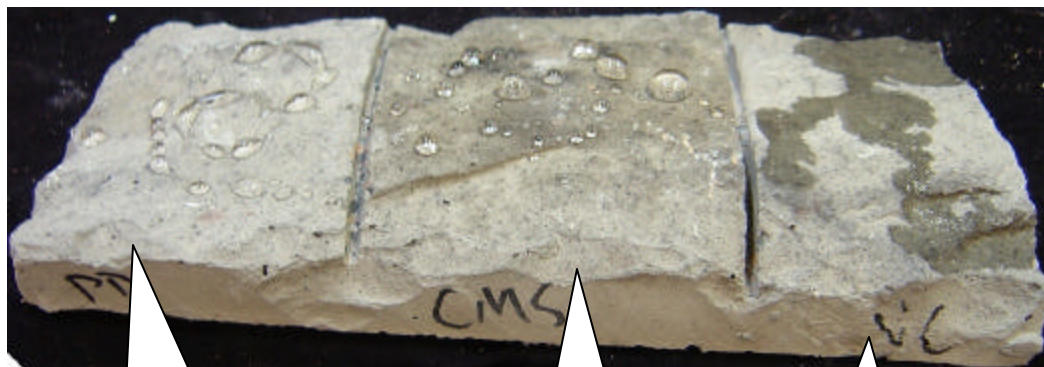


**Sure Klean®  
Weather Seal  
Siloxane PD**

**Sure Klean® Custom  
Masonry Sealer**

**Untreated  
Control**

### “Metro Grey Rubble” - Surface Beading



**Sure Klean® Weather  
Seal Siloxane PD**

**Sure Klean®  
Custom Masonry  
Sealer**

**Untreated  
Control**





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## CONCLUSIONS - Protective Water Repellents

Based upon laboratory evaluations, all of the tested PROSOCO products provided above average water repellency to each of the submitted samples. In addition, Sure Klean<sup>®</sup> Custom Masonry Sealer enhanced the natural color of the cast-stone.

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## RECOMMENDATIONS – Protective Water Repellents

Recommendations for water repellency treatment for each type of cast-stone submitted by Alluriam Stone<sup>®</sup>, Birmingham, AL, are provided in the chart below. Recommendations are based on the treatment that proved most effective and can provide water repellency on all types submitted.

Block Type	Water Repellents
All Submitted Cast-stone	Sure Klean <sup>®</sup> Custom Masonry Sealer OR Sure Klean <sup>®</sup> Weather Seal Siloxane PD

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 water repellent product and procedures for a particular project. See product literature for additional application and product information.

Nathan R. Colaner  
Technical Analyst

NRC/csm



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***Laboratory Report***

**Pallet Tag Program Evaluation**

**Alluriam Stone<sup>®</sup>  
Birmingham, AL**

***Project No.    0310-24 PTP***

***Prepared For:***

**Kerry Rose**

**Alluriam Stone<sup>®</sup>  
1032 Second Ave. South  
Birmingham, AL**

***Prepared By:***



***PROSOCO, Inc.  
December 2003***