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#### Attachments

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

For: cc:	Rob Poitevent James Holt
Subject:	Boral Bricks Inc. Roswell, GA
Date:	July 11, 2007
Project:	0706-07 PTP

## Samples Submitted: 4 types of concrete brick

Sample	Name	Color	Size
Concrete Brick	"Rustic Manor"	Red / Black	8 ¼" x 2 ¾" X 1"
Concrete Brick	"Oyster Bay"	Gray / Olive / Rust	8 ¼" x 2 ¾" X 1"
Concrete Brick	"Low Country"	Brown / Black	8 ¼" x 2 ¾" X 1"
Concrete Brick	"Tuscan Blend"	Buff / Olive	8 ¼" x 2 ¾" X 1"

Submitted by: Patrick Day Boral Bricks Inc.

## Introduction

Architectural Materials Testing (AMT) Laboratories is a Boyer Industries company that provides laboratory testing and consulting services for the construction industry. Laboratory testing includes evaluating chemical cleaning products and protective treatments for a variety of new and existing architectural materials.

This report includes descriptions of the PROSOCO, Inc. products and test methods that were used. Following test results and conclusions, the report provides recommendations for the most effective products and procedures.

## Purpose of Testing

Four types of concrete brick, all with large, small and fine aggregate were submitted for testing to AMT Laboratories by PROSOCO, Inc. to determine the optimal concentration of cleaner for complete removal of mortar and related new construction soiling which also leaves the external surface looking most like the uncleaned surface of the concrete brick. The effectiveness of protective water repellents and graffiti control products suitable for concrete brick was also evaluated.

New Construction Cleaning –Sure Klean<sup>®</sup> Concrete Brick Cleaner and Enviro Klean<sup>®</sup> Safety Klean were evaluated to determine the optimal concentration of cleaner for removal of laboratory applied mortar which also leaves the external surface looking most like the uncleaned surface of the concrete brick.

To simulate new construction soiling all samples were placed on a bench with finished surface facing upward. Hollow cylinders measuring 50 mm in diameter and 75 mm tall were positioned on top of each sample and filled with a wet mixture of Type N mortar. The wet, mortar-filled cylinder was allowed to remain in contact with the samples for 10 minutes before removal.

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

Color uniformity was evaluated by comparing aggregate exposure and surface pigment alternation/removal of each cleaned surface with the uncleaned surface of the submitted concrete brick.

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

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

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

- 0 Worst match to uncleaned surface
- 3 Good match to uncleaned surface
- 1 Poor match to uncleaned surface 2 - Fair match to uncleaned surface
- 4 Best match to uncleaned surface

**Protective Water Repellents** – Sure Klean<sup>®</sup> Weather Seal Siloxane PD, Sure Klean<sup>®</sup> Weather Seal Blok-Guard<sup>®</sup> & Graffiti Control, Sure Klean<sup>®</sup> Weather Seal Blok-Guard<sup>®</sup> & Graffiti Control II, Sure Klean<sup>®</sup> Weather Seal Natural Stone Treatment, and Stand Off<sup>®</sup> Limestone & Marble Protector were evaluated for their ability to provide water repellency to the submitted samples.

Graffiti Control – Sure Klean<sup>®</sup> Weather Seal Blok-Guard<sup>®</sup> & Graffiti Control and Sure Klean<sup>®</sup> Weather Seal Blok-Guard<sup>®</sup> & Graffiti Control II were evaluated for their ability to control graffiti on the submitted samples. Sure Klean<sup>®</sup> Fast Acting Stripper and Defacer Eraser<sup>®</sup> Graffiti Wipe were evaluated for their ability to remove graffiti from the submitted samples.

# New Construction Cleaning Products Evaluated

Sample	Product	Dilution
All Submitted Concrete Brick	Sure Klean <sup>®</sup> Concrete Brick Cleaner	(1:2), (1:3)
	Enviro Klean <sup>®</sup> Safety Klean	(1:2), (1:3)

# Protective Water Repellent Products Evaluated

Sample	Product	Dilution
	Sure Klean <sup>®</sup> Weather Seal Siloxane PD	Concentrate
	Sure Klean <sup>®</sup> Weather Seal Blok-Guard <sup>®</sup> & Graffiti Control	Concentrate
All Submitted Concrete Brick	Sure Klean <sup>®</sup> Weather Seal Blok-Guard <sup>®</sup> & Graffiti Control II	Concentrate
	Sure Klean <sup>®</sup> Weather Seal Natural Stone Treatment	Concentrate
	Stand Off <sup>®</sup> Limestone & Marble Protector	Concentrate

# Graffiti Control Products Evaluated

Sample	Product	Dilution
All Submitted Concrete Brick	Sure Klean <sup>®</sup> Weather Seal Blok-Guard <sup>®</sup> & Graffiti Control	Concentrate
All Submitted Conclete Blick	Sure Klean <sup>®</sup> Weather Seal Blok-Guard <sup>®</sup> & Graffiti Control II	Concentrate

# Graffiti Removal Products Evaluated

Sample	Product	Dilution
All Submitted Concrete Brick	Sure Klean <sup>®</sup> Fast Acting Stripper	Concentrate
	Defacer Eraser <sup>®</sup> Graffiti Wipe	Concentrate

These cleaning trials were conducted to determine the optimal concentration of cleaner to most efficiently remove Type N mortar from the submitted samples while providing the best color uniformity when compared to the uncleaned surface of the submitted concrete brick.

#### Description of Product Evaluated – New Construction Cleaning

**Sure Klean<sup>®</sup> Concrete Brick Cleaner** – Removes common construction and atmospheric staining from concrete brick and other architectural concrete surfaces. This general-purpose, non-etching, acidic cleaner removes rust, mud, oil, atmospheric dirt, mortar smears and other stains without altering the surface texture. Concrete Brick Cleaner adds depth to colors and brightens white matrices and exposed aggregate.

**Enviro Klean<sup>®</sup> Safety Klean** – An effective, safe, alternative to acidic compounds for cleaning brick, tile, and concrete surfaces. Safety Klean rids new masonry construction of excess mortar, dirt and other common job site soiling. It's ideal for projects where traditional acidic cleaners are not allowed. Non-fuming Safety Klean contains no hydrochloric or other traditional inorganic acids and is safe for use on and around most metal surfaces. Always test. Additionally, it is up to 70 percent more effective than citric and glycolic acids and 50 percent more effective than phosphoric acid.

#### Sample Preparation – New Construction Cleaning

Type N mortar was prepared in compliance with the manufacturer's instructions, applied to the sample's surface and allowed to cure for 7, 14, and 21 days. Mortar removal was accomplished using chemical assistance and a high-pressure water rinse with pressure rinsing equipment. The removal of Type N masonry mortar was visually evaluated after 7, 14, and 21 days of curing. A visual examination was also made to determine the optimal dilution of the tested cleaners that provide the best color uniformity when compared to the uncleaned surface of the submitted concrete brick.

## Test Method – New Construction Cleaning

Chemical cleaners were evaluated using the following procedure:

- 1. Pre-wet the surface with water.
- 2. Apply at the appropriate dilutions.
- 4. Reapply the product and moderately agitate with a brush.
- 5. Pressure rinse thoroughly.\*
- 6. Allow the sample to dry for at least 18 hours and visually examine.
- 7. Visually compare the color of the cleaned surfaces of the concrete brick to an uncleaned surface for the best match.

\***Pressure 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 - New Construction Cleaning

"Rustic Manor" Concrete Brick						
Product	Dilution	7 day	14 day	21 day		
Sure Klean <sup>®</sup> Concrete Brick Cleaner	1:2	100%	100%	100%		
Sure Klean <sup>®</sup> Concrete Brick Cleaner	1:3	100%	99%	100%		
Enviro Klean <sup>®</sup> Safety Klean	1:2	100%	100%	100%		
Enviro Klean <sup>®</sup> Safety Klean	1:3	100%	100%	100%		
"Oyster Bay" Co	oncrete Brick					
Product						
Sure Klean <sup>®</sup> Concrete Brick Cleaner	1:2	100%	100%	100%		
Sure Klean <sup>®</sup> Concrete Brick Cleaner	1:3	99%	100%	100%		
Enviro Klean <sup>®</sup> Safety Klean	1:2	100%	100%	100%		
Enviro Klean <sup>®</sup> Safety Klean	1:3	100%	95%	100%		
"Low Country" C	oncrete Brick					
Product	Dilution	7 day	14 day	21 day		
Sure Klean <sup>®</sup> Concrete Brick Cleaner	1:2	99%	100%	100%		
Sure Klean <sup>®</sup> Concrete Brick Cleaner	1:3	99%	99%	99%		
Enviro Klean <sup>®</sup> Safety Klean	1:2	100%	100%	95%		
Enviro Klean <sup>®</sup> Safety Klean	1:3	99%	99%	95%		
"Tuscan Blend" Concrete Brick						
Product	Dilution	7 day	14 day	21 day		
Sure Klean <sup>®</sup> Concrete Brick Cleaner	1:2	100%	100%	100%		
Sure Klean <sup>®</sup> Concrete Brick Cleaner	1:3	100%	100%	100%		
Enviro Klean <sup>®</sup> Safety Klean	1:2	100%	100%	100%		
Enviro Klean <sup>®</sup> Safety Klean	1:3	100%	100%	100%		

#### Cleaning Effectiveness (% Type N Mortar Removal)

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# Test Results - Color Uniformity

Substrate: Concrete Brick	Pigment C	Pigment Color: "Rustic Manor"		
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal	
Sure Klean <sup>®</sup> Concrete Brick Cleaner	1:2	4	3	
Sure Klean <sup>®</sup> Concrete Brick Cleaner	1:3	4	3	
Enviro Klean <sup>®</sup> Safety Klean	1:2	4	3	
Enviro Klean <sup>®</sup> Safety Klean	1:3	4	3	
Substrate: Concrete Brick	Pigment C	<b>Color:</b> "Oyster Bay	33	
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal	
Sure Klean <sup>®</sup> Concrete Brick Cleaner	1:2	4	4	
Sure Klean <sup>®</sup> Concrete Brick Cleaner	1:3	4	4	
Enviro Klean <sup>®</sup> Safety Klean	1:2	4	4	
Enviro Klean <sup>®</sup> Safety Klean	1:3	4	4	
Substrate: Concrete Brick	Pigment C	Pigment Color: "Low Country"		
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal	
Sure Klean <sup>®</sup> Concrete Brick Cleaner	1:2	4	4	
Sure Klean <sup>®</sup> Concrete Brick Cleaner	1:3	4	4	
Enviro Klean <sup>®</sup> Safety Klean	1:2	Λ	4	
LINITO MEAT Safety Mean	1:2	4	4	
Enviro Klean <sup>®</sup> Safety Klean	1:2	4	4	
	1:3		4	
Enviro Klean <sup>®</sup> Safety Klean	1:3	4	4	
Enviro Klean <sup>®</sup> Safety Klean <b>Substrate:</b> Concrete Brick	1:3 Pigment C	4 <b>Color:</b> "Tuscan Ble Aggregate	4 nd" Surface Pigment	
Enviro Klean <sup>®</sup> Safety Klean Substrate: Concrete Brick Product	1:3 Pigment C Dilution	4 <b>Color:</b> "Tuscan Ble Aggregate Exposure	4 nd" Surface Pigment Alteration/Removal	
Enviro Klean <sup>®</sup> Safety Klean <b>Substrate:</b> Concrete Brick Product Sure Klean <sup>®</sup> Concrete Brick Cleaner	1:3   Pigment C   Dilution   1:2	4 Color: "Tuscan Ble Aggregate Exposure 4	4 nd" Surface Pigment Alteration/Removal 4	

Scale used for reporting results of both categories:

- 0 Worst match to uncleaned surface 3 Good match to uncleaned surface 1 – **Poor** match to uncleaned surface
- - 4 **Best** match to uncleaned surface
- 2 **Fair** match to uncleaned surface

#### Photographs – New Construction Cleaning

# "Oyster Bay" Concrete Brick; 7 Day Cleaning



Sure Klean<sup>®</sup> Concrete Brick Cleaner (1:2) Sure Klean<sup>®</sup> Concrete Brick Cleaner (1:3)

**Untreated Control** 

#### Photographs – New Construction Cleaning



Sure Klean<sup>®</sup> Concrete Brick Cleaner (1:2) Sure Klean<sup>®</sup> Concrete Brick Cleaner (1:3)

**Untreated Control** 

"Oyster Bay" Concrete Brick; 14 Day Cleaning

## Photographs – New Construction Cleaning



"Oyster Bay" Concrete Brick; 21 Day Cleaning

## Photographs – Color Uniformity





## Conclusions – New Construction Cleaning

Based on the test results, both of the PROSOCO, Inc. products tested performed well in removing excess Type N mortar from the submitted samples even after allowing the mortar to remain on the surface of the samples for 21 days.

Both dilutions of Sure Klean<sup>®</sup> Concrete Brick Cleaner and Enviro Klean<sup>®</sup> Safety Klean removed slight amounts of pigmented matrix, exposing small and fine aggregate. This effect is hardly noticeable even with direct comparison to an uncleaned concrete brick.

#### **Recommendations** – New Construction Cleaning

Recommendations for cleaning for each type of concrete brick submitted by Boral Bricks Inc., Roswell, GA are provided in the chart below. Recommendations are based on the optimum dilution for complete removal of mortar while providing the best match to the uncleaned surface of the concrete brick.

Sample	New Construction Cleaning (Type N mortar, 21 day cleaning)
All Submitted Concrete Brick	Sure Klean <sup>®</sup> Concrete Brick Cleaner (1:2) OR (1:3) OR Enviro Klean <sup>®</sup> Safety Klean (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.

# **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

#### <u>Description of Products Evaluated</u> – Protective Water Repellents

**Sure Klean<sup>®</sup> 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 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.

**Sure Klean<sup>®</sup> Weather Seal Blok-Guard<sup>®</sup> & Graffiti Control** – A clear, solvent-based silicone elastomer formulated to weatherproof concrete block and other porous masonry materials. Blok-Guard<sup>®</sup> & Graffiti Control protects masonry surfaces from repeated graffiti attacks without altering the natural appearance. Blok-Guard<sup>®</sup> & Graffiti Control penetrates and fills pores to prevent water penetration through exterior walls exposed to normal weathering. Graffiti removal is fast and easy using Defacer Eraser<sup>®</sup> Graffiti Wipe. Blok-Guard<sup>®</sup> & Graffiti Control is easy to apply with low-pressure spray, brush or roller.

Sure Klean<sup>®</sup> Weather Seal Blok-Guard<sup>®</sup> & Graffiti Control II – A clear-drying, water-based silicone emulsion for weatherproofing concrete block and other porous masonry materials. Blok-Guard<sup>®</sup> & Graffiti Control II also protects masonry surfaces from graffiti attacks without altering the natural appearance. Blok-Guard<sup>®</sup> & Graffiti Control II protects exterior walls exposed to normal weathering. Graffiti removal from treated surfaces is fast and easy using Defacer Eraser<sup>®</sup> Graffiti Wipe. Blok-Guard<sup>®</sup> & Graffiti Control II is easy to apply with low-pressure spray, brush or roller.

**Sure Klean<sup>®</sup> Weather Seal Natural Stone Treatment** – A modified siloxane water repellent developed for limestone, marble and most other traditional masonry surfaces. Natural Stone Treatment penetrates deeply to provide long-lasting protection without altering the natural appearance of the substrate. Unlike conventional siloxane water repellents, Natural Stone Treatment is modified for effectiveness on most limestone, marble and other calcareous surfaces.

**Stand Off**<sup>®</sup> **Limestone & Marble Protector** – A clear, penetrating water and oil repellent suitable for use on interior or exterior calcareous surfaces such as limestone, marble and travertine. It's also suitable for many other types of masonry surfaces. Limestone & Marble Protector penetrates deeply to provide surface and subsurface protection without forming a glossy surface film. Treated surfaces retain their natural color, texture and appearance.

Limestone & Marble Protector combines high quality siloxane resins with "oleophobic" resins to produce a penetrating water and oil repellent ideal for long-term protection against food, oil and waterborne staining. Unlike conventional penetrating oil repellent products, Limestone & Marble Protector has been modified to ensure effectiveness on limestone, marble and other calcareous or neutral pH surfaces.

## Sample Preparation – Protective Water Repellents

The submitted samples were scored and allowed to dry for 24 hours prior to treatment. All treatments were applied by brush in accordance with the current PROSOCO, Inc. Product Data Sheet application instructions. All treatments were allowed to cure for at least 72 hours prior to testing.

## 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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Sure Klean® Weather Siloxane PD   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Natural Stone Treatment   60 mph     Stand Off® Limstone & Marble Protector   60 mph     "Oyster Bay" Concrete Brick   Untreated Control     Untreated Control   54 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Natural Stone Treatment   60 mph     Sure Klean® Weather Seal Natural Stone Treatment   60 mph     Sure Klean® Weather Siloxane PD   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control   9 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control   59 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control   59 mph     Sure Klean® Weather Seal Natural Stone Treatment   59 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal	water Absorption Tube Test: RILEM II.4, 60 mph, 20 Min	RESULTS
Sure Klean® Weather Siloxane PD   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Natural Stone Treatment   60 mph     Stre Klean® Weather Seal Natural Stone Treatment   60 mph     Stre Klean® Weather Seal Natural Stone Treatment   60 mph     "Oyster Bay" Concrete Brick   Untreated Control     Untreated Control   54 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Natural Stone Treatment   60 mph     Sure Klean® Weather Seal Natural Stone Treatment   60 mph     Sure Klean® Weather Siloxane PD   60 mph     Sure Klean® Weather Siloxane PD   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control   59 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control   59 mph     Sure Klean® Weather Seal Natural Stone Treatment   59 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti	"Rustic Manor" Concrete Brick	
Sure Klean® Weather Seal Blok-Guard® & Graffiti Control   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Natural Stone Treatment   60 mph     Stand Off® Limstone & Marble Protector   60 mph     "Oyster Bay" Concrete Brick     Untreated Control   54 mph     Sure Klean® Weather Siloxane PD   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Natural Stone Treatment   60 mph     Sure Klean® Weather Seal Natural Stone Treatment   60 mph     Sure Klean® Weather Siloxane PD   60 mph     Sure Klean® Weather Siloxane PD   60 mph     Sure Klean® Weather Siloxane PD   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control   59 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control   59 mph     Sure Klean® Weather Seal Natural Stone Treatment   59 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph </td <td>Untreated Control</td> <td>52 mph</td>	Untreated Control	52 mph
Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Natural Stone Treatment   60 mph     Stand Off® Limstone & Marble Protector   60 mph     "Oyster Bay" Concrete Brick     Untreated Control   54 mph     Sure Klean® Weather Siloxane PD   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Siloxane PD   60 mph <td< td=""><td>Sure Klean<sup>®</sup> Weather Siloxane PD</td><td>60 mph</td></td<>	Sure Klean <sup>®</sup> Weather Siloxane PD	60 mph
Sure Klean® Weather Seal Natural Stone Treatment   60 mph     Stand Off® Limstone & Marble Protector   60 mph     "Oyster Bay" Concrete Brick     Untreated Control   54 mph     Sure Klean® Weather Siloxane PD   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Natural Stone Treatment   60 mph     Sure Klean® Weather Seal Natural Stone Treatment   60 mph     Stand Off® Limstone & Marble Protector   60 mph     Stand Off® Limstone & Marble Protector   60 mph     Stre Klean® Weather Seal Natural Stone Treatment   60 mph     Stre Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Natural Stone Treatment   59 mph     Stand Off® Limstone & Marble Protector   60 mph     Sure Klean® Weather Seal Natural Stone Treatment   59 mph     Stand Off® Limstone & Marble Protector   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph <t< td=""><td>Sure Klean<sup>®</sup> Weather Seal Blok-Guard<sup>®</sup> &amp; Graffiti Control</td><td>60 mph</td></t<>	Sure Klean <sup>®</sup> Weather Seal Blok-Guard <sup>®</sup> & Graffiti Control	60 mph
Stand Off <sup>®</sup> Limstone & Marble Protector   60 mph     "Oyster Bay" Concrete Brick     Untreated Control   54 mph     Sure Klean <sup>®</sup> Weather Siloxane PD   60 mph     Sure Klean <sup>®</sup> Weather Seal Blok-Guard <sup>®</sup> & Graffiti Control   60 mph     Sure Klean <sup>®</sup> Weather Seal Blok-Guard <sup>®</sup> & Graffiti Control II   60 mph     Sure Klean <sup>®</sup> Weather Seal Natural Stone Treatment   60 mph     Stand Off <sup>®</sup> Limstone & Marble Protector   60 mph     "Low Country" Concrete Brick   Untreated Control     Vuntreated Control   <40 mph	Sure Klean <sup>®</sup> Weather Seal Blok-Guard <sup>®</sup> & Graffiti Control II	60 mph
"Oyster Bay" Concrete Brick     Untreated Control   54 mph     Sure Klean® Weather Siloxane PD   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Natural Stone Treatment   60 mph     Sure Klean® Weather Seal Natural Stone Treatment   60 mph     Stand Off® Limstone & Marble Protector   60 mph     "Low Country" Concrete Brick   Untreated Control     Vuntreated Control   <40 mph	Sure Klean <sup>®</sup> Weather Seal Natural Stone Treatment	60 mph
Untreated Control   54 mph     Sure Klean® Weather Siloxane PD   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Natural Stone Treatment   60 mph     Stand Off® Limstone & Marble Protector   60 mph     "Low Country" Concrete Brick   Untreated Control     Untreated Control   <40 mph	Stand Off <sup>®</sup> Limstone & Marble Protector	60 mph
Sure Klean® Weather Siloxane PD   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Natural Stone Treatment   60 mph     Sure Klean® Weather Seal Natural Stone Treatment   60 mph     Stand Off® Limstone & Marble Protector   60 mph     "Low Country" Concrete Brick   Untreated Control     Vuntreated Control   <40 mph	"Oyster Bay" Concrete Brick	
Sure Klean® Weather Seal Blok-Guard® & Graffiti Control   60 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Natural Stone Treatment   60 mph     Stand Off® Limstone & Marble Protector   60 mph <b>"Low Country" Concrete Brick</b> Untreated Control   <40 mph	Untreated Control	54 mph
Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Natural Stone Treatment   60 mph     Stand Off® Limstone & Marble Protector   60 mph <b>"Low Country" Concrete Brick</b> Untreated Control   <40 mph	Sure Klean <sup>®</sup> Weather Siloxane PD	60 mph
Sure Klean® Weather Seal Natural Stone Treatment   60 mph     Stand Off® Limstone & Marble Protector   60 mph     "Low Country" Concrete Brick   "Low Country" Concrete Brick     Untreated Control   <40 mph	Sure Klean <sup>®</sup> Weather Seal Blok-Guard <sup>®</sup> & Graffiti Control	60 mph
Stand Off <sup>®</sup> Limstone & Marble Protector   60 mph     "Low Country" Concrete Brick     Untreated Control   <40 mph	Sure Klean <sup>®</sup> Weather Seal Blok-Guard <sup>®</sup> & Graffiti Control II	60 mph
"Low Country" Concrete Brick     Untreated Control   <40 mph	Sure Klean <sup>®</sup> Weather Seal Natural Stone Treatment	60 mph
Untreated Control<40 mphSure Klean® Weather Siloxane PD60 mphSure Klean® Weather Seal Blok-Guard® & Graffiti Control59 mphSure Klean® Weather Seal Blok-Guard® & Graffiti Control II60 mphSure Klean® Weather Seal Natural Stone Treatment59 mphStand Off® Limstone & Marble Protector60 mph"Tuscan Blend" Concrete BrickUntreated Control<40 mph	Stand Off <sup>®</sup> Limstone & Marble Protector	60 mph
Sure Klean® Weather Siloxane PD60 mphSure Klean® Weather Seal Blok-Guard® & Graffiti Control59 mphSure Klean® Weather Seal Blok-Guard® & Graffiti Control II60 mphSure Klean® Weather Seal Natural Stone Treatment59 mphStand Off® Limstone & Marble Protector60 mph"Tuscan Blend" Concrete BrickUntreated Control<40 mphSure Klean® Weather Siloxane PD60 mphSure Klean® Weather Seal Blok-Guard® & Graffiti Control60 mphSure Klean® Weather Seal Blok-Guard® & Graffiti Control60 mphSure Klean® Weather Seal Blok-Guard® & Graffiti Control59 mphSure Klean® Weather Seal Blok-Guard® & Graffiti Control II59 mphSure Klean® Weather Seal Blok-Guard® & Graffiti Control II59 mph	"Low Country" Concrete Brick	
Sure Klean® Weather Seal Blok-Guard® & Graffiti Control   59 mph     Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II   60 mph     Sure Klean® Weather Seal Natural Stone Treatment   59 mph     Stand Off® Limstone & Marble Protector   60 mph <b>"Tuscan Blend" Concrete Brick</b> Untreated Control   <40 mph	Untreated Control	<40 mph
Sure Klean <sup>®</sup> Weather Seal Blok-Guard <sup>®</sup> & Graffiti Control II   60 mph     Sure Klean <sup>®</sup> Weather Seal Natural Stone Treatment   59 mph     Stand Off <sup>®</sup> Limstone & Marble Protector   60 mph <b>"Tuscan Blend" Concrete Brick</b> Untreated Control   <40 mph	Sure Klean <sup>®</sup> Weather Siloxane PD	60 mph
Sure Klean® Weather Seal Natural Stone Treatment   59 mph     Stand Off® Limstone & Marble Protector   60 mph <b>"Tuscan Blend" Concrete Brick</b> Untreated Control   <40 mph	Sure Klean <sup>®</sup> Weather Seal Blok-Guard <sup>®</sup> & Graffiti Control	59 mph
Stand Off <sup>®</sup> Limstone & Marble Protector   60 mph <b>"Tuscan Blend" Concrete Brick</b> Untreated Control   <40 mph	Sure Klean <sup>®</sup> Weather Seal Blok-Guard <sup>®</sup> & Graffiti Control II	60 mph
"Tuscan Blend" Concrete BrickUntreated Control<40 mph	Sure Klean <sup>®</sup> Weather Seal Natural Stone Treatment	59 mph
Untreated Control<40 mphSure Klean® Weather Siloxane PD60 mphSure Klean® Weather Seal Blok-Guard® & Graffiti Control60 mphSure Klean® Weather Seal Blok-Guard® & Graffiti Control II59 mphSure Klean® Weather Seal Natural Stone Treatment59 mph	Stand Off <sup>®</sup> Limstone & Marble Protector	60 mph
Sure Klean® Weather Siloxane PD60 mphSure Klean® Weather Seal Blok-Guard® & Graffiti Control60 mphSure Klean® Weather Seal Blok-Guard® & Graffiti Control II59 mphSure Klean® Weather Seal Natural Stone Treatment59 mph	"Tuscan Blend" Concrete Brick	
Sure Klean® Weather Seal Blok-Guard® & Graffiti Control60 mphSure Klean® Weather Seal Blok-Guard® & Graffiti Control II59 mphSure Klean® Weather Seal Natural Stone Treatment59 mph	Untreated Control	<40 mph
Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II59 mphSure Klean® Weather Seal Natural Stone Treatment59 mph	Sure Klean <sup>®</sup> Weather Siloxane PD	60 mph
Sure Klean <sup>®</sup> Weather Seal Natural Stone Treatment 59 mph	Sure Klean <sup>®</sup> Weather Seal Blok-Guard <sup>®</sup> & Graffiti Control	60 mph
	Sure Klean <sup>®</sup> Weather Seal Blok-Guard <sup>®</sup> & Graffiti Control II	59 mph
Stand Off <sup>®</sup> Limstone & Marble Protector 60 mph	Sure Klean <sup>®</sup> Weather Seal Natural Stone Treatment	59 mph
	Stand Off <sup>®</sup> Limstone & Marble Protector	60 mph

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

## Photographs - Protective Water Repellents



"Tuscan Blend" Concrete Brick; RILEM II.4, 60 mph, 20 Minutes

Stand Off<sup>®</sup> Limestone & Marble Protector Sure Klean<sup>®</sup> Weather Seal Siloxane PD Sure Klean<sup>®</sup> Weather Seal Natural Stone Treatment

**Untreated Control** 

\*Note: Sure Klean<sup>®</sup> Weather Seal Blok-Guard<sup>®</sup> & Graffiti Control and Sure Klean<sup>®</sup> Weather Seal Blok-Guard<sup>®</sup> & Graffiti Control II not pictured.

## **<u>Conclusions</u> – Protective Water Repellents**

Based upon laboratory evaluations, all of the PROSOCO, Inc. products tested provided excellent water repellency to each of the submitted samples. None of the products caused any change in appearance of any of the submitted concrete brick.

## **Recommendations** – Protective Water Repellents

Recommendations for water repellency for each type of concrete brick submitted by Boral Bricks Inc., Roswell, GA 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.

Sample	Protective Water Repellents
All Submitted Concrete Brick	Sure Klean <sup>®</sup> Weather Seal Siloxane PD OR *Sure Klean <sup>®</sup> Weather Seal Blok-Guard <sup>®</sup> & Graffiti Control OR Sure Klean <sup>®</sup> Weather Seal Blok-Guard <sup>®</sup> & Graffiti Control II OR *Sure Klean <sup>®</sup> Weather Seal Natural Stone Treatment OR *Stand Off <sup>®</sup> Limestone & Marble Protector

**\*NOTE:** Sure Klean<sup>®</sup> Weather Seal Blok-Guard<sup>®</sup> & Graffiti Control, Sure Klean<sup>®</sup> Weather Seal Natural Stone Treatment and Stand Off<sup>®</sup> Limestone & Marble Protector are manufactured and marketed in compliance with USEPA AIM VOC regulations (40 CFR 59.403). These products may not be suitable for sale in states and districts with more restrictive AIM VOC regulations.

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.

# **Graffiti Control**

This evaluation compares the effectiveness of graffiti control treatments in preventing staining of enamel spray paint and permanent markers.

#### Description of Products Evaluated – Graffiti Control

#### Graffiti Control Treatments

**Sure Klean<sup>®</sup> Weather Seal Blok-Guard<sup>®</sup> & Graffiti Control** – A clear, solvent-based silicone elastomer formulated to weatherproof concrete block and other porous masonry materials. Blok-Guard<sup>®</sup> & Graffiti Control protects masonry surfaces from repeated graffiti attacks without altering the natural appearance. Blok-Guard<sup>®</sup> & Graffiti Control penetrates and fills pores to prevent water penetration through exterior walls exposed to normal weathering. Graffiti removal is fast and easy using Defacer Eraser<sup>®</sup> Graffiti Wipe. Blok-Guard<sup>®</sup> & Graffiti Control is easy to apply with low-pressure spray, brush or roller.

Sure Klean<sup>®</sup> Weather Seal Blok-Guard<sup>®</sup> & Graffiti Control II – A clear-drying, water-based silicone emulsion for weatherproofing concrete block and other porous masonry materials. Blok-Guard<sup>®</sup> & Graffiti Control II also protects masonry surfaces from graffiti attacks without altering the natural appearance. Blok-Guard<sup>®</sup> & Graffiti Control II protects exterior walls exposed to normal weathering. Graffiti removal from treated surfaces is fast and easy using Defacer Eraser<sup>®</sup> Graffiti Wipe. Blok-Guard<sup>®</sup> & Graffiti Control II is easy to apply with low-pressure spray, brush or roller.

#### Products Evaluated for Graffiti Removal

**Sure Klean<sup>®</sup> Fast Acting Stripper** – A thixotropic stripping compound formulated specifically for removal of high strength paints and coatings such as epoxies, polyurethanes, and floor enamels. Additionally, Fast Acting Stripper dissolves most spray paints, marking pens, lacquers and other graffiti.

**Defacer Eraser**<sup>®</sup> **Graffiti Wipe** – An easy-to-use graffiti remover that does not contain methanol, methylene chloride or other halogenated solvents prohibited on many projects. Graffiti Wipe removes a variety of graffiti stains from most smooth masonry, split-face concrete block, wood and metal surfaces.

#### Graffiti Agents

Interior/Exterior Spray Paint (Red) Permanent Marker (Green) Permanent Marker (Red) Permanent Marker (Black)

#### Sample Preparation – Graffiti Control

Sections of the concrete brick samples were treated with Sure Klean<sup>®</sup> Weather Seal Blok-Guard<sup>®</sup> & Graffiti Control and Sure Klean<sup>®</sup> Weather Seal Blok-Guard<sup>®</sup> & Graffiti Control II in accordance with the current PROSOCO, Inc. Product Data Sheet application instructions and were then allowed to cure for at least one day. At the end of the cure period, a visual adverse effects evaluation was made and then the graffiti agents were applied to the substrates.

Spray paint and markers were applied as graffiti agents to all treated surfaces no sooner than one day following application of Sure Klean<sup>®</sup> Weather Seal Blok-Guard<sup>®</sup> & Graffiti Control and Sure Klean<sup>®</sup> Weather Seal Blok-Guard<sup>®</sup> & Graffiti Control II. Removal of the graffiti agents was attempted 24 hours after application of the graffiti agents, using Sure Klean<sup>®</sup> Fast Acting Stripper and Defacer Eraser<sup>®</sup> Graffiti Wipe.

## Test Method – Graffiti Control

Chemical cleaners were evaluated using the following procedure:

- 1. Apply the product to a dry surface, soiled with graffiti.
- 2. Allow appropriate dwell time:
- 3. Pressure rinse thoroughly until water runs clear.\*
- 4. Allow the surface to dry thoroughly and visually examine to determine effectiveness.

\***Pressure 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.

"Rustic Manor" Concrete Brick					
Untreated Control	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	60%	95%	95%	100%	88%
Graffiti Wipe	50%	90%	90%	100%	83%
Blok-Guard <sup>®</sup> & Graffiti Control	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	80%	100%	100%	100%	95%
Graffiti Wipe	90%	100%	100%	100%	98%
Blok-Guard <sup>®</sup> & Graffiti Control II	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	95%	100%	100%	100%	99%
Graffiti Wipe	98%	100%	100%	100%	100%
"Oyster Bay" Concrete Brick					
Untreated Control	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	60%	98%	90%	90%	85%
Graffiti Wipe	50%	90%	90%	90%	80%
Blok-Guard <sup>®</sup> & Graffiti Control	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	98%	100%	100%	100%	100%
Graffiti Wipe	98%	100%	100%	100%	100%
Blok-Guard <sup>®</sup> & Graffiti Control II	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	98%	98%	95%	95%	97%
Graffiti Wipe	98%	98%	95%	95%	97%
"Low Country" Concrete Brick					
Untreated Control	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	60%	95%	95%	95%	86%
Graffiti Wipe	60%	90%	90%	90%	83%
Blok-Guard <sup>®</sup> & Graffiti Control	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	80%	95%	90%	95%	90%
Graffiti Wipe	80%	95%	90%	95%	90%
Blok-Guard <sup>®</sup> & Graffiti Control II	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	95%	90%	95%	95%	94%
Graffiti Wipe	98%	90%	95%	95%	95%
"Tuscan Blend" Concrete Brick					
Untreated Control	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	70%	95%	80%	100%	86%
Graffiti Wipe	60%	90%	80%	90%	80%
Blok-Guard <sup>®</sup> & Graffiti Control	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	80%	100%	80%	100%	90%
Graffiti Wipe	90%	95%	80%	95%	90%
Blok-Guard <sup>®</sup> & Graffiti Control II	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	95%	100%	80%	100%	94%
Graffiti Wipe	98%	95%	80%	95%	92%

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# Photographs – Graffiti Control

# "Oyster Bay" Concrete Brick; Before Graffiti Removal



Sure Klean<sup>®</sup> Weather Seal Blok-Guard<sup>®</sup> & Graffiti Control Sure Klean<sup>®</sup> Weather Seal Blok-Guard<sup>®</sup> & Graffiti Control II

**Untreated Control** 

# "Oyster Bay" Concrete Brick; After Graffiti Removal



Fast Acting Eraser® **Fast Acting** Eraser® Eraser® **Fast Acting** Stripper **Graffiti Wipe** Stripper Graffiti Wipe Graffiti Wipe Stripper Sure Klean<sup>®</sup> Weather Seal Blok-Guard<sup>®</sup> & Graffiti Control Sure Klean<sup>®</sup> Weather Seal Blok-Guard<sup>®</sup> & Graffiti **Untreated Control** Control II

## Conclusions – Graffiti Control

Based upon laboratory evaluations, graffiti removal was improved when the submitted samples were treated with Sure Klean<sup>®</sup> Weather Seal Blok-Guard<sup>®</sup> & Graffiti Control and Sure Klean<sup>®</sup> Weather Seal Blok-Guard<sup>®</sup> & Graffiti Control II prior to graffiti application.

#### Recommendations – Graffiti Control

Recommendations for graffiti control treatment for each type of concrete brick submitted by Boral Bricks Inc. Roswell, GA are provided in the chart below. Recommendations are based on the treatment that proved most effective for providing graffiti repellency and the product that was most effective at removing the graffiti on all types submitted.

Sample	Graffiti Repellents	Graffiti Removers	
All Submitted Concrete Brick	*Sure Klean <sup>®</sup> Weather Seal Blok-Guard <sup>®</sup> & Graffiti Control OR Sure Klean <sup>®</sup> Weather Seal Blok-Guard <sup>®</sup> & Graffiti Control II	Sure Klean <sup>®</sup> Fast Acting Stripper OR Defacer Eraser <sup>®</sup> Graffiti Wipe	

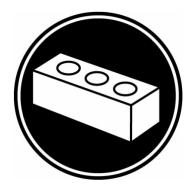
**\*NOTE:** Sure Klean<sup>®</sup> Weather Seal Blok-Guard<sup>®</sup> & Graffiti Control is manufactured and marketed in compliance with USEPA AIM VOC regulations (40 CFR 59.403). This product may not be suitable for sale in states and districts with more restrictive AIM VOC regulations.

Apply all products in accordance with the manufacturer's recommendation provided on container labels and product data sheets. Because the severity of graffiti varies from location to location, on-site testing should be conducted to determine the most appropriate graffiti control product and procedure for a particular project.

John Lancaster Project Testing Laboratory Technician



# Boral Bricks Inc. 200 Mansell Ct. East Ste. 305 Roswell, GA 30076 Concrete Brick



# Project No. 0706-01 PTP



*Prepared By:* AMT Laboratories July 2007

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