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 Technical Services TECH Note RILEM Tube Test Procedures

 Product Data literature for all products evaluated

Submitted Information

For: James Holt
cc: Paul Tessier
Subject: Horizon Stone, LLC.
 Chattanooga, TN

Date:

Project: 0604-01 PTP

Samples Submitted: 10 types of manufactured stone in various sizes, shapes, and colors

Sample	Color	Size
"Autumn Blend – 19 th Century"	Gray/Yellow/Brown	Various
"Bluegrass – 19 th Century"	Gray/Tan/Brown	Various
"Earthblend – 19 th Century"	Yellow/Red	Various
"Hermitage – 19 th Century"	Gray/White	Various
"Misty Mountain – 19 th Century"	Dark Gray	Various
"Mossy Creek – 19 th Century"	Gray/Tan/Brown	Various
"Smoke – 19 th Century"	Gray/White/Tan	Various
"Summertown – 19 th Century"	Red/Orange/Brown	Various
"Valley Forge – 19 th Century"	Red/Brown/Tan	Various
"Westchester – 19 th Century"	Red/Brown/Tan/Gray	Various

Submitted by: James Holt

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

Ten types of manufactured stone were submitted to AMT Laboratories by PROSOCO, Inc. with a request to determine if application of the products evaluated will produce any surface alterations during new construction cleaning operations. Additionally, the effectiveness of water repellents, graffiti control products, stain repellents, and color/sheen enhancement products suitable for manufactured stone were evaluated.

New Construction Cleaning – Sure Klean® Manufactured Stone Cleaner and Enviro Klean® Safety Klean were tested at various dilutions to determine the optimum cleaner/cure time combination for complete removal of laboratory applied Type S mortar from the submitted manufactured stone while limiting surface alterations to the decorative finish. The surface alteration evaluation was visually determined based upon perceived discoloration or erosion/etching of the samples.

To simulate new construction soiling, the 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 the samples and filled with a wet mixture of Type S cementitious 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 S mortar after 3, 7, and 14 days of curing. A visual examination was also made to determine if the tested cleaners caused any surface alterations to the submitted samples based on the following:

Surface Finish Removal is the visual examination of the sample comparing the surface finish of the untreated control surface to the surface finish cleaned with selected product(s) at given dilutions.

Substrate Deterioration is the visual examination of the sample comparing the surface of the untreated control to surfaces cleaned with selected product(s) at given dilutions looking for any potential erosion/digestion of the sample.

Color Change is the visual examination comparing the color of the untreated control surface to color of surfaces cleaned with selected products at given dilutions.

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

Protective Water Repellents – Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II, Sure Klean® Weather Seal Siloxane WB Concentrate, Sure Klean® Weather Seal Siloxane PD, and Stand Off® SLX100 Water & Oil Repellent were evaluated for their ability to provide water repellency to the submitted samples.

Graffiti Control – Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II was evaluated for its ability to repel graffiti from the submitted samples. Sure Klean® Fast Acting Stripper and Defacer Eraser® Graffiti Wipe were evaluated for their ability to remove graffiti from the submitted samples.

Stain Repellency – Stand Off® SLX100 Water & Oil Repellent and Stand Off® Stone, Tile & Masonry Protector (STMP) were evaluated for their ability to repel stains from the submitted samples.

Color and Sheen Enhancement – Stand Off® Gloss 'N Guard WB was evaluated for its ability to provide color and sheen enhancement to the submitted samples.

Products Evaluated**New Construction Cleaning Products Evaluated**

Sample	Product	Dilution
All Submitted Manufactured Stone	Sure Klean® Manufactured Stone Cleaner	(1:2), (1:3)
	Enviro Klean® Safety Klean	(1:2), (1:3)

Protective Water Repellent Products Evaluated

Sample	Product	Dilution
All Submitted Manufactured Stone	Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II	Concentrate
	Sure Klean® Weather Seal Siloxane WB Concentrate	(1:9)
	Sure Klean® Weather Seal Siloxane PD	Concentrate
	Stand Off® SLX100 Water & Oil Repellent	Concentrate

Graffiti Repellent Products Evaluated

Sample	Product	Dilution
All Submitted Manufactured Stone	Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II	Concentrate

Graffiti Removal Products Evaluated

Sample	Product	Dilution
All Submitted Manufactured Stone	Sure Klean® Fast Acting Stripper	Concentrate
	Defacer Eraser® Graffiti Wipe	Concentrate

Color and Sheen Enhancement Products Evaluated

Sample	Product	Dilution
All Submitted Manufactured Stone	Stand Off® Gloss 'N Guard WB	Concentrate

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

New Construction Cleaning

These cleaning trials were conducted to determine the optimal cleaning/cure time combination to most efficiently remove Type S mortar from the submitted samples while limiting surface alterations to the decorative finish.

Type S cementitious mortar was prepared in compliance with the manufacturer’s instructions, applied to the manufactured stone surface and allowed to cure for 3, 7 and 14 days. Mortar removal was accomplished using chemical assistance and a high-pressure water rinse with pressure rinsing equipment. The removal of Type S cementitious mortar was visually evaluated after 3, 7 and 14 days of curing.

Description of Products Evaluated – New Construction Cleaning

Sure Klean® Manufactured Stone Cleaner – Removes common construction and atmospheric staining from custom masonry 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. Manufactured Stone Cleaner adds depth to colors and brightens white matrices and exposed aggregate.

Enviro Klean® 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.

Test Method – New Construction Cleaning

New construction cleaners were evaluated using the following procedure:

1. Pre-wet the surface with water.
2. Apply the cleaner.
3. Allow the appropriate dwell time, as specified:

Sure Klean® Manufactured Stone Cleaner	3-5 minutes
Enviro Klean® Safety Klean.....	3-5 minutes
4. Pressure rinse thoroughly.*

***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**Cleaning Effectiveness (% Type S Mortar Removal)**

“Autumn Blend – 19th Century”				
Product	Dilution	3 day	7 day	14 day
Sure Klean [®] Manufactured Stone Cleaner	1:2	100%	100%	100%
Sure Klean [®] Manufactured Stone Cleaner	1:3	100%	100%	100%
Enviro Klean [®] Safety Klean	1:2	100%	100%	100%
Enviro Klean [®] Safety Klean	1:3	100%	100%	100%
“Bluegrass – 19th Century”				
Product	Dilution	3 day	7 day	14 day
Sure Klean [®] Manufactured Stone Cleaner	1:2	100%	100%	99%
Sure Klean [®] Manufactured Stone Cleaner	1:3	100%	100%	90%
Enviro Klean [®] Safety Klean	1:2	100%	100%	100%
Enviro Klean [®] Safety Klean	1:3	100%	98%	95%
“Earthblend – 19th Century”				
Product	Dilution	3 day	7 day	14 day
Sure Klean [®] Manufactured Stone Cleaner	1:2	98%	98%	95%
Sure Klean [®] Manufactured Stone Cleaner	1:3	98%	95%	95%
Enviro Klean [®] Safety Klean	1:2	100%	100%	100%
Enviro Klean [®] Safety Klean	1:3	100%	99%	95%
“Hermitage – 19th Century”				
Product	Dilution	3 day	7 day	14 day
Sure Klean [®] Manufactured Stone Cleaner	1:2	98%	98%	90%
Sure Klean [®] Manufactured Stone Cleaner	1:3	95%	90%	85%
Enviro Klean [®] Safety Klean	1:2	98%	98%	95%
Enviro Klean [®] Safety Klean	1:3	95%	90%	90%
“Misty Mountain – 19th Century”				
Product	Dilution	3 day	7 day	14 day
Sure Klean [®] Manufactured Stone Cleaner	1:2	98%	98%	98%
Sure Klean [®] Manufactured Stone Cleaner	1:3	98%	80%	80%
Enviro Klean [®] Safety Klean	1:2	98%	98%	95%
Enviro Klean [®] Safety Klean	1:3	95%	95%	95%
“Mossy Creek – 19th Century”				
Product	Dilution	3 day	7 day	14 day
Sure Klean [®] Manufactured Stone Cleaner	1:2	100%	100%	95%
Sure Klean [®] Manufactured Stone Cleaner	1:3	99%	95%	95%
Enviro Klean [®] Safety Klean	1:2	99%	99%	99%
Enviro Klean [®] Safety Klean	1:3	90%	90%	90%
“Smoke – 19th Century”				
Product	Dilution	3 day	7 day	14 day
Sure Klean [®] Manufactured Stone Cleaner	1:2	95%	95%	95%
Sure Klean [®] Manufactured Stone Cleaner	1:3	95%	95%	90%
Enviro Klean [®] Safety Klean	1:2	100%	99%	95%
Enviro Klean [®] Safety Klean	1:3	100%	85%	85%
“Summertown – 19th Century”				
Product	Dilution	3 day	7 day	14 day
Sure Klean [®] Manufactured Stone Cleaner	1:2	100%	98%	98%
Sure Klean [®] Manufactured Stone Cleaner	1:3	98%	98%	98%
Enviro Klean [®] Safety Klean	1:2	100%	98%	98%
Enviro Klean [®] Safety Klean	1:3	100%	98%	98%

Test Results – New Construction Cleaning**Cleaning Effectiveness (% Type S Mortar Removal)**

“Valley Forge – 19th Century”				
Product	Dilution	3 day	7 day	14 day
Sure Klean [®] Manufactured Stone Cleaner	1:2	98%	98%	95%
Sure Klean [®] Manufactured Stone Cleaner	1:3	90%	90%	90%
Enviro Klean [®] Safety Klean	1:2	98%	98%	95%
Enviro Klean [®] Safety Klean	1:3	98%	95%	95%
“Westchester – 19th Century”				
Product	Dilution	3 day	7 day	14 day
Sure Klean [®] Manufactured Stone Cleaner	1:2	100%	100%	80%
Sure Klean [®] Manufactured Stone Cleaner	1:3	90%	85%	80%
Enviro Klean [®] Safety Klean	1:2	100%	100%	95%
Enviro Klean [®] Safety Klean	1:3	98%	98%	90%

Test Results – Limiting Surface Alterations

Substrate: Manufactured Stone		Pigment Color: “Autumn Blend – 19th Century”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean [®] Manufactured Stone Cleaner	1:2	3	2	3	0
Sure Klean [®] Manufactured Stone Cleaner	1:3	2	1	2	0
Enviro Klean [®] Safety Klean	1:2	3	2	3	0
Enviro Klean [®] Safety Klean	1:3	3	2	3	0
Substrate: Manufactured Stone		Pigment Color: “Bluegrass – 19th Century”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean [®] Manufactured Stone Cleaner	1:2	3	2	3	0
Sure Klean [®] Manufactured Stone Cleaner	1:3	3	2	3	0
Enviro Klean [®] Safety Klean	1:2	3	2	3	0
Enviro Klean [®] Safety Klean	1:3	3	2	3	0
Substrate: Manufactured Stone		Pigment Color: “Earthblend – 19th Century”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean [®] Manufactured Stone Cleaner	1:2	2	1	2	0
Sure Klean [®] Manufactured Stone Cleaner	1:3	1	0	1	0
Enviro Klean [®] Safety Klean	1:2	3	2	3	0
Enviro Klean [®] Safety Klean	1:3	3	2	3	0
Substrate: Manufactured Stone		Pigment Color: “Hermitage – 19th Century”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean [®] Manufactured Stone Cleaner	1:2	4	2	2	0
Sure Klean [®] Manufactured Stone Cleaner	1:3	1	0	0	0
Enviro Klean [®] Safety Klean	1:2	4	2	2	0
Enviro Klean [®] Safety Klean	1:3	4	2	2	0

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

- | | |
|---------------|---------------|
| 0 – No Change | 3 – Heavy |
| 1 – Slight | 4 – Excessive |
| 2 – Moderate | |

Test Results – Limiting Surface Alterations

Substrate: Manufactured Stone		Pigment Color: “Misty Mountain – 19 th Century”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean [®] Manufactured Stone Cleaner	1:2	2	1	1	0
Sure Klean [®] Manufactured Stone Cleaner	1:3	1	0	0	0
Enviro Klean [®] Safety Klean	1:2	2	1	1	0
Enviro Klean [®] Safety Klean	1:3	2	1	1	0
Substrate: Manufactured Stone		Pigment Color: “Mossy Creek – 19 th Century”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean [®] Manufactured Stone Cleaner	1:2	3	2	3	0
Sure Klean [®] Manufactured Stone Cleaner	1:3	2	1	2	0
Enviro Klean [®] Safety Klean	1:2	3	2	3	0
Enviro Klean [®] Safety Klean	1:3	3	2	3	0
Substrate: Manufactured Stone		Pigment Color: “Smoke – 19 th Century”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean [®] Manufactured Stone Cleaner	1:2	3	2	3	0
Sure Klean [®] Manufactured Stone Cleaner	1:3	3	2	3	0
Enviro Klean [®] Safety Klean	1:2	3	2	3	0
Enviro Klean [®] Safety Klean	1:3	3	2	3	0
Substrate: Manufactured Stone		Pigment Color: “Summertown – 19 th Century”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean [®] Manufactured Stone Cleaner	1:2	2	1	2	0
Sure Klean [®] Manufactured Stone Cleaner	1:3	1	0	1	0
Enviro Klean [®] Safety Klean	1:2	3	2	3	0
Enviro Klean [®] Safety Klean	1:3	3	2	3	0
Substrate: Manufactured Stone		Pigment Color: “Valley Forge – 19 th Century”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean [®] Manufactured Stone Cleaner	1:2	3	2	3	0
Sure Klean [®] Manufactured Stone Cleaner	1:3	1	0	1	0
Enviro Klean [®] Safety Klean	1:2	3	2	3	0
Enviro Klean [®] Safety Klean	1:3	3	2	3	0
Substrate: Manufactured Stone		Pigment Color: “Westchester – 19 th Century”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean [®] Manufactured Stone Cleaner	1:2	3	2	3	0
Sure Klean [®] Manufactured Stone Cleaner	1:3	1	0	1	0
Enviro Klean [®] Safety Klean	1:2	3	2	3	0
Enviro Klean [®] Safety Klean	1:3	3	2	3	0

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

- | | |
|---------------|---------------|
| 0 – No Change | 3 – Heavy |
| 1 – Slight | 4 – Excessive |
| 2 – Moderate | |

Photographs – New Construction Cleaning

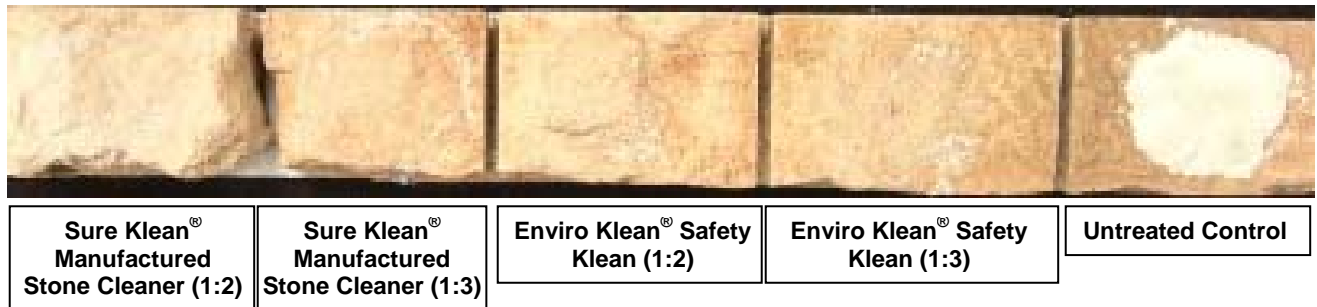
“Valley Forge – 19th Century”; 3 Day Cleaning



“Valley Forge – 19th Century”; 7 Day Cleaning



“Valley Forge – 19th Century”; 14 Day Cleaning



“Valley Forge – 19th Century” Limiting Surface Alterations



Photographs – Limiting Surface Alterations

“Smoke – 19th Century” Limiting Surface Alterations



Conclusions – New Construction Cleaning

Based on the test results, at least one dilution of the PROSOCO, Inc. products tested performed well in removing excess Type S mortar from the submitted samples even after allowing the mortar to remain on the surface of the samples for 14 days.

Sure Klean® Manufactured Stone Cleaner diluted with three parts water removed slight amounts of the pigmented finish from the surface of the following samples: “Earthblend – 19th Century,” “Hermitage – 19th Century,” “Misty Mountain – 19th Century,” “Summertown – 19th Century,” “Valley Forge – 19th Century,” and “Westchester – 19th Century.”

It is recommended that job-site testing be performed in an inconspicuous area before attempting overall cleaning to determine if the change in surface finish of these samples is acceptable.

NOTE: All dilutions of both Sure Klean® Manufactured Stone Cleaner and Enviro Klean® Safety Klean tested removed moderate to heavy amounts of the pigmented finish from the surface of the following samples: “Autumn Blend – 19th Century,” “Bluegrass – 19th Century,” “Mossy Creek – 19th Century,” and “Smoke – 19th Century.” Based on this evaluation, neither Sure Klean® Manufactured Stone Cleaner nor Enviro Klean® Safety Klean is recommended for new construction cleaning on these samples.

It is recommended that the selected cleaners always be used in the lowest possible concentration. It should be rinsed with the lowest pressure of water as practical to minimize removal of the decorative finish. Excessive pressure, water volume, and/or repeated application of the recommended products may combine to damage or remove decorative finishes. To facilitate easier removal of excess mortar and construction dirt while minimizing any potential surface alterations to the decorative finish, clean within 3 days of construction for Type S mortar.

Recommendations – New Construction Cleaning

Recommendations for new construction cleaning for the manufactured stone submitted by Horizon Stone, LLC., Chattanooga, TN are provided in the charts below. Recommendations are based on the optimum dilution for complete removal of mortar while limiting surface alterations.

Sample	New Construction Cleaning (Type S mortar, 14 day cleaning)
“Earthblend – 19 th Century” “Hermitage – 19 th Century” “Misty Mountain – 19 th Century” “Summertown – 19 th Century” “Valley Forge – 19 th Century” “Westchester – 19 th Century”	Sure Klean® Manufactured Stone Cleaner (1:3)
“Autumn Blend – 19 th Century” “Bluegrass – 19 th Century” “Mossy Creek – 19 th Century” “Smoke – 19 th Century”	No Recommendations (See NOTE in Conclusions)

Apply all products in accordance with the manufacturer’s recommendation provided on container labels and product data sheets. On-site testing should always 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
-

Description of Products Evaluated – Protective Water Repellents

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

Sure Klean® Weather Seal Siloxane WB Concentrate – A self-emulsifying water repellent concentrate designed for dilution with fresh water at the job site. This solvent-free blend of silanes and oligomeric alkoxysiloxanes mixes easily with water to produce a penetrating water repellent ideal for application to dense or porous masonry surfaces.

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 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.

Stand Off® SLX100 Water & Oil Repellent – Combines water and oil repellency on most substrates to prevent staining by waterborne and oily substances. This modified “neat” silane system offers invisible protection and low volatility. The small molecular structure of SLX100 allows for maximum penetration at coverage rates higher than that of conventional silanes. Depth of penetration is controlled by the application rate (loading rate). This makes SLX100 ideal for protecting granite and other dense, color-sensitive surfaces.

Sample Preparation – Protective Water Repellents

The submitted samples were scored and allowed to dry for at least 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: Vertical RILEM II.4, 5.0 milliliters, 20 minutes**

The water absorption tube test simulating wind driven and wind blown rain conditions was performed. Tests were run with vertical 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 – Protective Water Repellents**Water Absorption Tube Test: Vertical RILEM II.4, 5.0 milliliters, 20 minutes****AA = Above Average****A = Average****BA = Below Average**

“Autumn Blend – 19th Century”	Results in mL loss	Ranking
Untreated Control	-0.3	--
Sure Klean [®] Weather Seal Blok-Guard [®] & Graffiti Control II	-0.0	<u>AA</u>
Sure Klean [®] Weather Seal Siloxane WB Concentrate (1:9)	-0.0	<u>AA</u>
Sure Klean [®] Weather Seal Siloxane PD	-0.0	<u>AA</u>
Stand Off [®] SLX100 Water & Oil Repellent	-0.0	<u>AA</u>
“Bluegrass – 19th Century”	Results in mL loss	Ranking
Untreated Control	-0.1	--
Sure Klean [®] Weather Seal Blok-Guard [®] & Graffiti Control II	-0.0	<u>AA</u>
Sure Klean [®] Weather Seal Siloxane WB Concentrate (1:9)	-0.0	<u>AA</u>
Sure Klean [®] Weather Seal Siloxane PD	-0.0	<u>AA</u>
Stand Off [®] SLX100 Water & Oil Repellent	-0.0	<u>AA</u>
“Earthblend – 19th Century”	Results in mL loss	Ranking
Untreated Control	-0.3	--
Sure Klean [®] Weather Seal Blok-Guard [®] & Graffiti Control II	-0.0	<u>AA</u>
Sure Klean [®] Weather Seal Siloxane WB Concentrate (1:9)	-0.0	<u>AA</u>
Sure Klean [®] Weather Seal Siloxane PD	-0.0	<u>AA</u>
Stand Off [®] SLX100 Water & Oil Repellent	-0.0	<u>AA</u>
“Hermitage – 19th Century”	Results in mL loss	Ranking
Untreated Control	-0.3	--
Sure Klean [®] Weather Seal Blok-Guard [®] & Graffiti Control II	-0.0	<u>AA</u>
Sure Klean [®] Weather Seal Siloxane WB Concentrate (1:9)	-0.0	<u>AA</u>
Sure Klean [®] Weather Seal Siloxane PD	-0.0	<u>AA</u>
Stand Off [®] SLX100 Water & Oil Repellent	-0.0	<u>AA</u>
“Misty Mountain – 19th Century”	Results in mL loss	Ranking
Untreated Control	-0.6	--
Sure Klean [®] Weather Seal Blok-Guard [®] & Graffiti Control II	-0.0	<u>AA</u>
Sure Klean [®] Weather Seal Siloxane WB Concentrate (1:9)	-0.0	<u>AA</u>
Sure Klean [®] Weather Seal Siloxane PD	-0.0	<u>AA</u>
Stand Off [®] SLX100 Water & Oil Repellent	-0.0	<u>AA</u>
“Mossy Creek – 19th Century”	Results in mL loss	Ranking
Untreated Control	-0.2	--
Sure Klean [®] Weather Seal Blok-Guard [®] & Graffiti Control II	-0.0	<u>AA</u>
Sure Klean [®] Weather Seal Siloxane WB Concentrate (1:9)	-0.0	<u>AA</u>
Sure Klean [®] Weather Seal Siloxane PD	-0.0	<u>AA</u>
Stand Off [®] SLX100 Water & Oil Repellent	-0.0	<u>AA</u>
“Smoke – 19th Century”	Results in mL loss	Ranking
Untreated Control	-0.2	--
Sure Klean [®] Weather Seal Blok-Guard [®] & Graffiti Control II	-0.0	<u>AA</u>
Sure Klean [®] Weather Seal Siloxane WB Concentrate (1:9)	-0.0	<u>AA</u>
Sure Klean [®] Weather Seal Siloxane PD	-0.0	<u>AA</u>
Stand Off [®] SLX100 Water & Oil Repellent	-0.0	<u>AA</u>
“Summertown – 19th Century”	Results in mL loss	Ranking
Untreated Control	-0.2	--
Sure Klean [®] Weather Seal Blok-Guard [®] & Graffiti Control II	-0.0	<u>AA</u>
Sure Klean [®] Weather Seal Siloxane WB Concentrate (1:9)	-0.0	<u>AA</u>
Sure Klean [®] Weather Seal Siloxane PD	-0.0	<u>AA</u>
Stand Off [®] SLX100 Water & Oil Repellent	-0.0	<u>AA</u>

Test Results – Protective Water Repellents

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

AA = Above Average

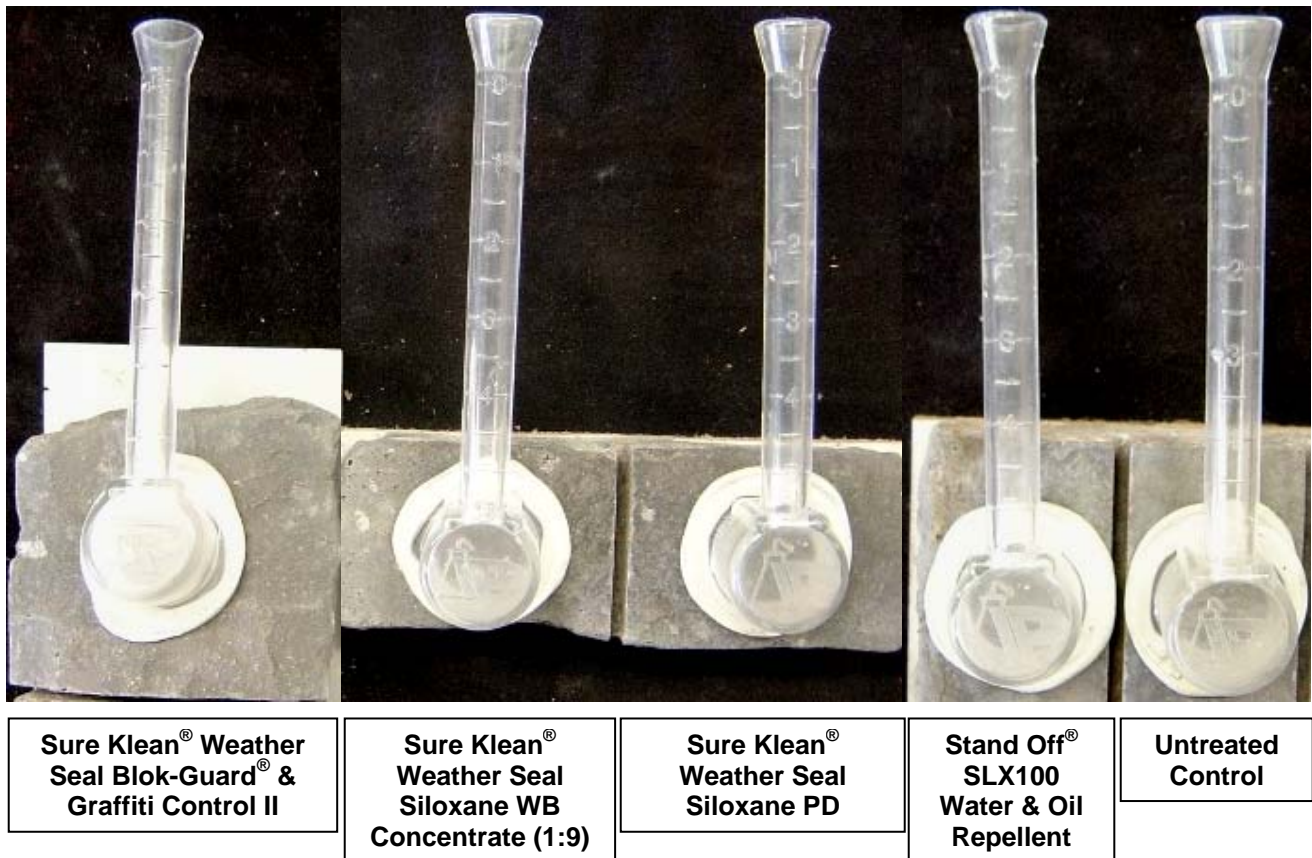
A = Average

BA = Below Average

“Valley Forge – 19 th Century”	Results in mL loss	Ranking
Untreated Control	-0.2	--
Sure Klean [®] Weather Seal Blok-Guard [®] & Graffiti Control II	-0.0	AA
Sure Klean [®] Weather Seal Siloxane WB Concentrate (1:9)	-0.0	AA
Sure Klean [®] Weather Seal Siloxane PD	-0.0	AA
Stand Off [®] SLX100 Water & Oil Repellent	-0.0	AA
“Westchester – 19 th Century”	Results in mL loss	Ranking
Untreated Control	-0.3	--
Sure Klean [®] Weather Seal Blok-Guard [®] & Graffiti Control II	-0.0	AA
Sure Klean [®] Weather Seal Siloxane WB Concentrate (1:9)	-0.0	AA
Sure Klean [®] Weather Seal Siloxane PD	-0.0	AA
Stand Off [®] SLX100 Water & Oil Repellent	-0.0	AA

Photographs – Protective Water Repellents

“Misty Mountain – 19th Century”; Vertical RILEM II.4, 5.0 milliliters, 20 minutes



Conclusions – Protective Water Repellents

Test results indicate that all of the water repellents tested exhibited above average water repellency on the submitted samples. In addition, Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II provided a slight to moderate color enhancement to all of the submitted samples. Sure Klean® Weather Seal Siloxane WB Concentrate diluted with nine parts water, Sure Klean® Weather Seal Siloxane PD and Stand Off® SLX100 Water & Oil Repellent did not alter the appearance of any of the submitted samples.

Recommendations – Protective Water Repellents

Recommendations for water repellent treatments for the manufactured stone submitted by Horizon Stone, LLC., Chattanooga, TN are provided in the chart below. Recommendations are based on the treatments that proved most effective at providing water repellency on the submitted manufactured stone.

Sample	Protective Water Repellents
All Submitted Manufactured Stone	Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II OR Sure Klean® Weather Seal Siloxane WB Concentrate (1:9) OR Sure Klean® Weather Seal Siloxane PD OR Stand Off® SLX100 Water & Oil Repellent

The ability of a water repellent treatment to prevent the ingress of water is affected by a variety of factors. Therefore, on-site testing should be carried out for all installations with the recommended systems to ensure job site workmanship yields equivalent results.

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

Products Evaluated for Graffiti Repellency

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

Products Evaluated for Graffiti Removal

Defacer Eraser® 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, wood and metal surfaces.

Sure Klean® 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.

Graffiti Agents

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

Sample Preparation – Graffiti Control

Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II was applied in a wet-on-wet brushing application in accordance with the current PROSOCO, Inc. Product Data Sheet application instructions to sections of the manufactured stone samples. The samples were allowed to cure for at least one day. 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® Weather Seal Blok-Guard® & Graffiti Control II. Removal of the graffiti agents was attempted 24 hours after application of the graffiti agents, using Defacer Eraser® Graffiti Wipe and Sure Klean® Fast Acting Stripper.

Test Methods – Graffiti Control

Chemical cleaners were evaluated using the following procedure:

1. Apply the graffiti removal product to a dry surface, soiled with graffiti.
2. Allow appropriate dwell time:

Graffiti Wipe	5 minutes
Fast Acting Stripper.....	20 minutes
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.

Test Results – Graffiti Control

“Autumn Blend – 19th Century”					
Untreated Control	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	90%	99%	85%	85%	90%
Graffiti Wipe	10%	50%	80%	70%	53%
Blok-Guard® & Graffiti Control II	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	100%	100%	90%	95%	96%
Graffiti Wipe	100%	80%	90%	80%	88%
“Bluegrass – 19th Century”					
Untreated Control	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	95%	99%	90%	90%	94%
Graffiti Wipe	10%	60%	90%	80%	60%
Blok-Guard® & Graffiti Control II	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	99%	100%	98%	98%	99%
Graffiti Wipe	100%	80%	95%	90%	91%
“Earthblend – 19th Century”					
Untreated Control	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	98%	100%	85%	95%	95%
Graffiti Wipe	30%	60%	85%	90%	66%
Blok-Guard® & Graffiti Control II	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	100%	100%	90%	100%	98%
Graffiti Wipe	100%	80%	90%	98%	92%
“Hermitage – 19th Century”					
Untreated Control	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	98%	98%	80%	70%	87%
Graffiti Wipe	20%	40%	70%	70%	50%
Blok-Guard® & Graffiti Control II	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	99%	100%	90%	98%	97%
Graffiti Wipe	99%	80%	70%	90%	85%
“Misty Mountain – 19th Century”					
Untreated Control	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	98%	100%	90%	95%	96%
Graffiti Wipe	50%	30%	50%	50%	45%
Blok-Guard® & Graffiti Control II	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	100%	100%	100%	100%	100%
Graffiti Wipe	100%	95%	95%	99%	97%
“Mossy Creek – 19th Century”					
Untreated Control	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	90%	100%	95%	90%	94%
Graffiti Wipe	20%	60%	80%	80%	60%
Blok-Guard® & Graffiti Control II	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	95%	100%	95%	95%	96%
Graffiti Wipe	100%	90%	95%	90%	94%
“Smoke – 19th Century”					
Untreated Control	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	90%	85%	70%	90%	84%
Graffiti Wipe	50%	20%	70%	80%	55%
Blok-Guard® & Graffiti Control II	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	98%	95%	80%	98%	93%
Graffiti Wipe	99%	60%	80%	85%	81%

Test Results – Graffiti Control

“Summertown – 19th Century”					
Untreated Control	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	90%	100%	90%	90%	93%
Graffiti Wipe	40%	60%	90%	80%	68%
Blok-Guard[®] & Graffiti Control II	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	100%	100%	95%	95%	98%
Graffiti Wipe	100%	80%	95%	95%	93%
“Valley Forge – 19th Century”					
Untreated Control	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	95%	100%	95%	95%	96%
Graffiti Wipe	10%	10%	95%	90%	51%
Blok-Guard[®] & Graffiti Control II	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	99%	100%	98%	98%	99%
Graffiti Wipe	99%	100%	98%	98%	99%
“Westchester – 19th Century”					
Untreated Control	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	90%	100%	98%	95%	96%
Graffiti Wipe	70%	50%	98%	90%	77%
Blok-Guard[®] & Graffiti Control II	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	98%	100%	99%	100%	99%
Graffiti Wipe	100%	80%	99%	100%	95%

Photographs – Graffiti Control

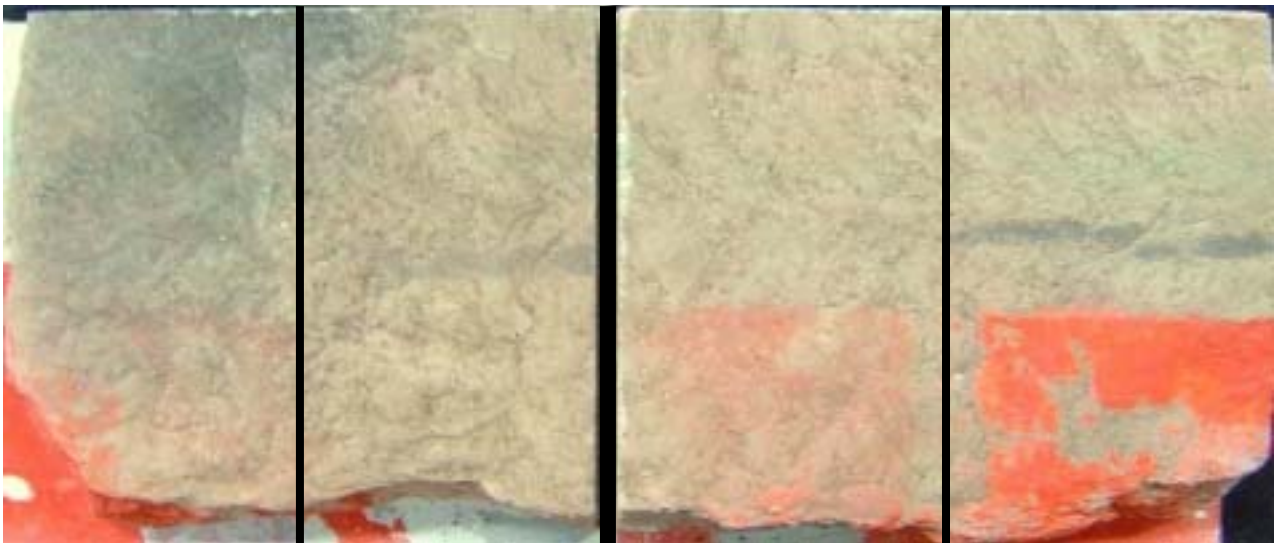
“Bluegrass – 19th Century”; Before Graffiti Removal



**Sure Klean[®] Weather Seal
Blok-Guard[®] & Graffiti Control II**

Untreated Control

“Bluegrass – 19th Century”; After Graffiti Removal



**Sure Klean[®] Fast
Acting Stripper**

**Defacer Eraser[®]
Graffiti Wipe**

**Sure Klean[®] Fast
Acting Stripper**

**Defacer Eraser[®]
Graffiti Wipe**

**Sure Klean[®] Weather Seal Blok-Guard[®] &
Graffiti Control II**

Untreated Control

Conclusions – Graffiti Control

Based upon laboratory evaluations, graffiti removal was improved when the submitted samples were treated with Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II prior to graffiti application. In addition, Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II provided a slight to moderate color enhancement to the submitted samples.

Recommendations – Graffiti Control

Recommendations for graffiti control treatment for each type of manufactured stone submitted by Horizon Stone, LLC., Chattanooga, TN 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 Type	Graffiti Repellency	Graffiti Removal
All Submitted Manufactured Stone	Sure Klean® Weather Seal Blok-Guard® & Graffiti Control II	Sure Klean® Fast Acting Stripper OR Defacer Eraser® Graffiti Wipe

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.

Stain Repellency

These trials were conducted to determine the effectiveness of treatments in preventing food and oil staining on the submitted samples.

Description of Products Evaluated – Stain Repellency

Stain Repellent Treatments

Stand Off® Stone, Tile & Masonry Protector (STMP) – A penetrating oil and stain repellent that is an easy-to-use, low-VOC, low-odor protective treatment improves the stain resistance and simplifies maintenance cleaning of interior and exterior stone, quarry tile, concrete and masonry surfaces.

Stand Off® SLX100 Water & Oil Repellent – Combines water and oil repellency on most substrates to prevent staining by waterborne and oily substances. This modified “neat” silane system offers invisible protection and low volatility. The small molecular structure of SLX100 allows for maximum penetration at coverage rates higher than that of conventional silanes. Depth of penetration is controlled by the application rate (loading rate). This makes SLX100 ideal for protecting granite and other dense, color-sensitive surfaces.

Maintenance Cleaner

Enviro Klean® 2010 All Surface Cleaner – A “next-generation” product for cleaning and degreasing light-to-heavily soiled stone, tile, masonry and much more. Powerful enough for industrial use, flexible enough for jobs around the home, space-saving EK 2010 replaces a host of individual cleaning agents. It is suitable for home-use on windows, bathroom tub and tile, counter tops and more when diluted with water. It's concentrated enough for the toughest industrial cleaning jobs on concrete, metal and many other plant and warehouse surfaces. EK 2010 also removes Sure Klean® Weather Seal Siloxane PD overspray from windows.

Staining Agents Evaluated

<u>Products</u>	<u>Temperature</u>
Coca Cola	ambient (~70°F)
Ketchup	ambient (~70°F)
Mustard	ambient (~70°F)
Red Wine	ambient (~70°F)
Balsamic Vinegar	ambient (~70°F)
Soy Sauce	ambient (~70°F)
Olive Oil	ambient (~70°F)
Wesson Oil	(~250°F)
Coffee	(~120°F)

Sample Preparation – Stain Repellency

Samples were cleaned with Enviro Klean® 2010 All Surface Cleaner diluted with 10 parts water and allowed to dry for 24 hours prior to treatment. The protective treatments were then applied by brush in accordance with the current PROSOCO, Inc. Product Data Sheet application instructions. The treatments were allowed to cure on the samples for at least 72 hours before testing.

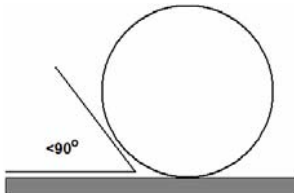
Test Method – Stain Repellency**Surface Beading Evaluation**

The food and oil products were applied to the test areas by using a dropper creating a bead 0.5 – 1.0 cm in diameter. The beading properties of the oils and liquids were visually evaluated within two minutes after application. The results are reported as a rating based on the angle of contact between the base of the droplet and the substrate. A rating of “1 or 2” indicated the smallest angle of contact ($<90^\circ$) which correlates to “above average” repellency. A rating of “3 or 4” indicates “average” repellency. A rating of “5 or greater” indicated that the food or oil quickly absorbed into the substrate and correlates to “below average” repellency.

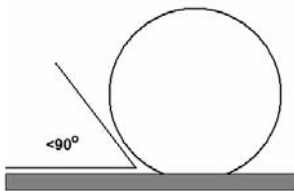
Note: Non-free flowing staining agents such as ketchup and mustard are applied in a globular fashion and therefore are not evaluated for their beading properties.

Rating System (1-5)

1. No wetting of contact area (no darkening); angle less than 90° .



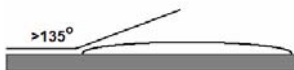
2. Wetting contained to the contact area (slight darkening); angle is less than 90° .



3. Wetting contained to the contact area (slight darkening); angle is greater than 90° , but less than 135° .



4. Wetting beyond the contact area (darkening); angle is greater than 135° .



5. Wetting beyond the contact area (darkening); angle is flat.

**Stain Removal Evaluation**

The soiling agents were allowed to dwell on the treated and untreated substrates for times of 24 hours, 4 hours, 1 hour, and 10 minutes. The test areas were then cleaned with Enviro Klean[®] 2010 All Surface Cleaner diluted 1 part concentrate to 10 parts fresh water and scrubbed under a stream of running water from a faucet. Samples were allowed to dry for 24 hours. Evaluation consisted of a visual examination of the tested areas to determine the percentage of staining removal.

Test Results – Surface Beading

“Autumn Blend – 19 th Century”									
Treatment	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	3	-	-	4	4	4	5	5	4
SLX100	2	-	-	2	2	2	2	2	2
STMP	3	-	-	3	3	3	3	3	3
“Bluegrass – 19 th Century”									
Treatment	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	3	-	-	4	4	4	5	5	4
SLX100	2	-	-	2	2	2	2	2	2
STMP	3	-	-	3	3	3	3	3	3
“Earthblend – 19 th Century”									
Treatment	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	3	-	-	4	4	4	5	5	4
SLX100	2	-	-	2	2	2	2	2	2
STMP	3	-	-	3	3	3	3	3	3
“Hermitage – 19 th Century”									
Treatment	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	3	-	-	4	4	4	5	5	4
SLX100	2	-	-	2	2	2	2	2	2
STMP	3	-	-	3	3	3	3	3	3
“Misty Mountain – 19 th Century”									
Treatment	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	3	-	-	4	4	4	5	5	4
SLX100	2	-	-	2	2	2	2	2	2
STMP	3	-	-	3	3	3	3	3	3
“Mossy Creek – 19 th Century”									
Treatment	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	3	-	-	4	4	4	5	5	4
SLX100	2	-	-	2	2	2	2	2	2
STMP	3	-	-	3	3	3	3	3	3
“Smoke – 19 th Century”									
Treatment	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	3	-	-	4	4	4	5	5	4
SLX100	2	-	-	2	2	2	2	2	2
STMP	3	-	-	3	3	3	3	3	3
“Summertown – 19 th Century”									
Treatment	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	3	-	-	4	4	4	5	5	4
SLX100	2	-	-	2	2	2	2	2	2
STMP	3	-	-	3	3	3	3	3	3

Test Results – Surface Beading

“Valley Forge – 19th Century”									
Treatment	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	3	-	-	4	4	4	5	5	4
SLX100	2	-	-	2	2	2	2	2	2
STMP	3	-	-	3	3	3	3	3	3
“Westchester – 19th Century”									
Treatment	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	3	-	-	4	4	4	5	5	4
SLX100	2	-	-	2	2	2	2	2	2
STMP	3	-	-	3	3	3	3	3	3

Test Results – Stain Repellency**% Removal**

“Autumn Blend – 19th Century”									
Untreated Control									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	80%*	100%*	50%*	50%*	80%	<1%	<1%	80%
4 hour	100%	100%*	100%*	50%*	50%*	80%	<1%	<1%	90%
1 hour	100%	100%*	100%*	50%*	50%*	100%	<1%	<1%	95%
10 min.	100%	100%*	100%*	50%*	50%*	100%	<1%	<1%	100%
Stand Off[®] SLX100 Water & Oil Repellent									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%*	100%*	100%*	100%*	100%	80%	80%	100%
4 hour	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
1 hour	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
10 min.	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
Stand Off[®] Stone, Tile & Masonry Protector (STMP)									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	90%*	100%*	70%*	100%*	100%	100%	100%	100%
4 hour	100%	100%*	100%*	70%*	100%*	100%	100%	100%	100%
1 hour	100%	100%*	100%*	80%*	100%*	100%	100%	100%	100%
10 min.	100%	100%*	100%*	99%*	100%*	100%	100%	100%	100%
“Bluegrass – 19th Century”									
Untreated Control									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	90%*	100%*	50%*	50%*	50%	<1%	<1%	100%
4 hour	100%	95%*	100%*	50%*	50%*	50%	<1%	<1%	100%
1 hour	100%	100%*	100%*	50%*	50%*	50%	<1%	<1%	100%
10 min.	100%	100%*	100%*	50%*	50%*	50%	<1%	<1%	100%
Stand Off[®] SLX100 Water & Oil Repellent									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
4 hour	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
1 hour	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
10 min.	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
Stand Off[®] Stone, Tile & Masonry Protector (STMP)									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%*	100%*	80%*	100%*	100%	100%	100%	100%
4 hour	100%	100%*	100%*	80%*	100%*	100%	100%	100%	100%
1 hour	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
10 min.	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%

*Indicates etching occurred due to the acidic nature of the staining agents.

Test Results – Stain Repellency**% Removal**

“Earthblend – 19th Century”									
Untreated Control									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	90%*	90%*	80%*	50%*	100%	<1%	<1%	100%
4 hour	100%	100%*	100%*	80%*	60%*	100%	<1%	<1%	100%
1 hour	100%	100%*	100%*	80%*	90%*	100%	<1%	<1%	100%
10 min.	100%	100%*	100%*	90%*	90%*	100%	<1%	<1%	100%
Stand Off[®] SLX100 Water & Oil Repellent									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%*	100%*	90%*	100%*	100%	95%	90%	100%
4 hour	100%	100%*	100%*	90%*	100%*	100%	100%	100%	100%
1 hour	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
10 min.	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
Stand Off[®] Stone, Tile & Masonry Protector (STMP)									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%*	100%*	80%*	100%*	100%	100%	100%	100%
4 hour	100%	100%*	100%*	80%*	100%*	100%	100%	100%	100%
1 hour	100%	100%*	100%*	80%*	100%*	100%	100%	100%	100%
10 min.	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
“Hermitage – 19th Century”									
Untreated Control									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	<1%*	100%*	100%*	100%*	90%	<1%	<1%	100%
4 hour	100%	95%*	100%*	100%*	100%*	90%	<1%	<1%	100%
1 hour	100%	95%*	100%*	100%*	100%*	95%	<1%	<1%	100%
10 min.	100%	100%*	100%*	100%*	100%*	100%	<1%	<1%	100%
Stand Off[®] SLX100 Water & Oil Repellent									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	95%*	100%*	100%*	100%*	100%	100%	100%	100%
4 hour	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
1 hour	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
10 min.	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
Stand Off[®] Stone, Tile & Masonry Protector (STMP)									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
4 hour	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
1 hour	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
10 min.	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%

*Indicates etching occurred due to the acidic nature of the staining agents.

Test Results – Stain Repellency

% Removal

“Misty Mountain – 19 th Century”									
Untreated Control									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	90%*	100%*	50%*	50%*	50%	<1%	<1%	100%
4 hour	100%	95%*	100%*	50%*	50%*	50%	<1%	<1%	100%
1 hour	100%	100%*	100%*	50%*	50%*	50%	<1%	<1%	100%
10 min.	100%	100%*	100%*	50%*	50%*	50%	<1%	<1%	100%
Stand Off [®] SLX100 Water & Oil Repellent									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
4 hour	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
1 hour	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
10 min.	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
Stand Off [®] Stone, Tile & Masonry Protector (STMP)									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%*	100%*	80%*	100%*	100%	100%	100%	100%
4 hour	100%	100%*	100%*	80%*	100%*	100%	100%	100%	100%
1 hour	100%	100%*	100%*	80%*	100%*	100%	100%	100%	100%
10 min.	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
“Mossy Creek – 19 th Century”									
Untreated Control									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	90%*	100%*	50%*	50%*	50%	<1%	<1%	100%
4 hour	100%	95%*	100%*	50%*	50%*	50%	<1%	<1%	100%
1 hour	100%	100%*	100%*	50%*	50%*	50%	<1%	<1%	100%
10 min.	100%	100%*	100%*	50%*	50%*	50%	<1%	<1%	100%
Stand Off [®] SLX100 Water & Oil Repellent									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
4 hour	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
1 hour	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
10 min.	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
Stand Off [®] Stone, Tile & Masonry Protector (STMP)									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%*	100%*	80%*	100%*	100%	100%	100%	100%
4 hour	100%	100%*	100%*	80%*	100%*	100%	100%	100%	100%
1 hour	100%	100%*	100%*	80%*	100%*	100%	100%	100%	100%
10 min.	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%

*Indicates etching occurred due to the acidic nature of the staining agents.

Test Results – Stain Repellency**% Removal**

“Smoke – 19th Century”									
Untreated Control									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	90%*	100%*	60%*	100%*	100%	<1%	<1%	100%
4 hour	100%	90%*	100%*	60%*	100%*	100%	<1%	<1%	100%
1 hour	100%	100%*	100%*	80%*	100%*	100%	<1%	<1%	100%
10 min.	100%	100%*	100%*	100%*	100%*	100%	<1%	<1%	100%
Stand Off[®] SLX100 Water & Oil Repellent									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
4 hour	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
1 hour	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
10 min.	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
Stand Off[®] Stone, Tile & Masonry Protector (STMP)									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%*	100%*	80%*	100%*	100%	100%	100%	100%
4 hour	100%	100%*	100%*	80%*	100%*	100%	100%	100%	100%
1 hour	100%	100%*	100%*	90%*	100%*	100%	100%	100%	100%
10 min.	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
“Summertown – 19th Century”									
Untreated Control									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	<1%*	100%*	80%*	80%*	80%	<1%	<1%	100%
4 hour	100%	100%*	100%*	80%*	80%*	80%	<1%	<1%	100%
1 hour	100%	100%*	100%*	80%*	80%*	80%	<1%	<1%	100%
10 min.	100%	100%*	100%*	80%*	80%*	80%	<1%	<1%	100%
Stand Off[®] SLX100 Water & Oil Repellent									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%*	100%*	90%*	100%*	100%	100%	100%	100%
4 hour	100%	100%*	100%*	90%*	100%*	100%	100%	100%	100%
1 hour	100%	100%*	100%*	95%*	100%*	100%	100%	100%	100%
10 min.	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
Stand Off[®] Stone, Tile & Masonry Protector (STMP)									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%*	100%*	95%*	100%*	100%	100%	100%	100%
4 hour	100%	100%*	100%*	95%*	100%*	100%	100%	100%	100%
1 hour	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
10 min.	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%

*Indicates etching occurred due to the acidic nature of the staining agents.

Test Results – Stain Repellency**% Removal**

“Valley Forge – 19th Century”									
Untreated Control									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	90%*	30%*	50%*	80%*	80%	<1%	<1%	100%
4 hour	100%	100%*	100%*	100%*	80%*	80%	<1%	<1%	100%
1 hour	100%	100%*	100%*	100%*	80%*	80%	<1%	<1%	100%
10 min.	100%	100%*	100%*	100%*	100%*	80%	<1%	<1%	100%
Stand Off[®] SLX100 Water & Oil Repellent									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
4 hour	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
1 hour	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
10 min.	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
Stand Off[®] Stone, Tile & Masonry Protector (STMP)									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
4 hour	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
1 hour	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
10 min.	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
“Westchester – 19th Century”									
Untreated Control									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	90%*	100%*	60%*	60%*	100%	<1%	<1%	100%
4 hour	100%	100%*	100%*	60%*	90%*	100%	<1%	<1%	100%
1 hour	100%	100%*	100%*	60%*	90%*	100%	<1%	<1%	100%
10 min.	100%	100%*	100%*	60%*	90%*	100%	<1%	<1%	100%
Stand Off[®] SLX100 Water & Oil Repellent									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
4 hour	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
1 hour	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
10 min.	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%
Stand Off[®] Stone, Tile & Masonry Protector (STMP)									
	Coca-Cola	Mustard	Ketchup	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%*	100%*	90%*	100%*	100%	100%	100%	100%
4 hour	100%	100%*	100%*	90%*	100%*	100%	100%	100%	100%
1 hour	100%	100%*	100%*	90%*	100%*	100%	100%	100%	100%
10 min.	100%	100%*	100%*	100%*	100%*	100%	100%	100%	100%

*Indicates etching occurred due to the acidic nature of the staining agents.

Photographs – Stain Repellency

“Autumn Blend – 19th Century”; Stains Applied



**Stand Off[®] SLX100
Water & Oil Repellent**

**Stand Off[®] Stone,
Tile & Masonry
Protector (STMP)**

Untreated Control

“Autumn Blend”; Stains Removed



**Stand Off[®] SLX100
Water & Oil Repellent**

**Stand Off[®] Stone,
Tile & Masonry
Protector (STMP)**

Untreated Control

Conclusions – Stain Repellency

Based upon laboratory evaluations, both Stand Off® SLX100 Water & Oil Repellent and Stand Off® Stone, Tile & Masonry Protector (STMP) improved the surface beading of the samples. In addition, both treatments were effective in improving the samples' resistance to the applied stains, especially to the oils. Stand Off® SLX100 Water & Oil Repellent and Stand Off® Stone, Tile & Masonry Protector (STMP) caused no noticeable color change to any of the submitted samples.

Recommendations – Stain Repellency

Recommendations for stain resistance treatment for the manufactured stone submitted by Horizon Stone, LLC., Chattanooga, TN are provided in the chart below. Recommendations are based on the treatments that proved most effective for providing stain repellency on the submitted samples.

Sample	Stain Repellent	Maintenance Cleaner
"Earthblend – 19 th Century" "Hermitage – 19 th Century" "Summertown – 19 th Century" "Valley Forge – 19 th Century"	Stand Off® SLX100 Water & Oil Repellent OR Stand Off® Stone, Tile & Masonry Protector (STMP)	Enviro Klean® 2010 All Surface Cleaner (1:10)
"Autumn Blend – 19 th Century" "Bluegrass – 19 th Century" "Misty Mountain – 19 th Century" "Mossy Creek – 19 th Century" "Smoke – 19 th Century" "Westchester – 19 th Century"	Stand Off® SLX100 Water & Oil Repellent	Enviro Klean® 2010 All Surface Cleaner (1:10)

The ability of a stain repellent treatment to prevent staining is affected by a variety of factors. Therefore, on-site testing should be carried out for all installations with the recommended systems to ensure job site workmanship yields equivalent results.

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

Color and Sheen Enhancement

This evaluation compares the effectiveness of the evaluated products in providing color and sheen enhancement to the submitted samples.

Description of Products Evaluated – Color and Sheen Enhancement

Stand Off® Gloss 'N Guard WB – A highly durable protective coating for tile, pavers, terrazzo and other polished and unpolished masonry. Gloss 'N Guard WB dries to a satin-gloss finish which enhances the natural beauty of treated surfaces. The water-borne acrylic formula complies with all known AIM VOC regulations nationwide.

Sample Preparation – Color and Sheen Enhancement

Samples were cleaned with Enviro Klean® 2010 All Surface Cleaner diluted with 10 parts water and allowed to dry for at least 24 hours prior to treatment.

Test Method – Color and Sheen Enhancement

Stand Off® Gloss 'N Guard WB was applied by brush in accordance with the current PROSOCO, Inc. Product Data Sheet application instructions. After 24 hours, a visual evaluation was made comparing the untreated surface to the treated surfaces.

Test Results – Color and Sheen Enhancement

“Autumn Blend – 19th Century”		
Treatment	Color Enhancement	Sheen Enhancement
Stand Off® Gloss 'N Guard WB	1	3
“Bluegrass – 19th Century”		
Treatment	Color Enhancement	Sheen Enhancement
Stand Off® Gloss 'N Guard WB	1	3
“Earthblend – 19th Century”		
Treatment	Color Enhancement	Sheen Enhancement
Stand Off® Gloss 'N Guard WB	2	3
“Hermitage – 19th Century”		
Treatment	Color Enhancement	Sheen Enhancement
Stand Off® Gloss 'N Guard WB	2	3
“Misty Mountain – 19th Century”		
Treatment	Color Enhancement	Sheen Enhancement
Stand Off® Gloss 'N Guard WB	2	3
“Mossy Creek – 19th Century”		
Treatment	Color Enhancement	Sheen Enhancement
Stand Off® Gloss 'N Guard WB	3	3
“Smoke – 19th Century”		
Treatment	Color Enhancement	Sheen Enhancement
Stand Off® Gloss 'N Guard WB	2	3
“Summertown – 19th Century”		
Treatment	Color Enhancement	Sheen Enhancement
Stand Off® Gloss 'N Guard WB	2	3

Test Results – Color and Sheen Enhancement

“Valley Forge – 19 th Century”		
Treatment	Color Enhancement	Sheen Enhancement
Stand Off [®] Gloss ‘N Guard WB	2	3

“Westchester – 19 th Century”		
Treatment	Color Enhancement	Sheen Enhancement
Stand Off [®] Gloss ‘N Guard WB	2	3

Scale: 0 – No Enhancement; Dull
1 – Slight Enhancement
2 – Moderate Enhancement
3 – Significant Enhancement

Photographs – Color and Sheen Enhancement

“Mossy Creek – 19th Century”; Color Enhancement Products Applied



Recommendations – Color and Sheen Enhancement

Recommendations for color and sheen enhancement for the manufactured stone submitted by Horizon Stone, LLC., Chattanooga, TN are provided in the chart below. Recommendations are based on the treatment that proved most effective in providing color and/or sheen enhancement to the submitted samples.

Sample	Color Enhancement	Sheen Enhancement
All Submitted Manufactured Stone	Stand Off® Gloss 'N Guard WB	Stand Off® Gloss 'N Guard WB

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



Christopher A. Moore
Project Testing Laboratory Technician
CAM



PALLET TAG PROGRAM
Laboratory Report

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Project No. 0604-01 PTP

Prepared For:
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SINCE 1939

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AMT Laboratories
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