



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 1

TABLE OF CONTENTS

SAMPLES SUBMITTED	3
PURPOSE OF TEST	4
PRODUCTS EVALUATED.....	5-6
SECTION A – CLEANING CAST STONE	
DESCRIPTION OF PRODUCTS EVALUATED.....	7
TEST METHOD	7
TEST RESULTS	8-9
PHOTOGRAPHS OF CAST STONE CLEANING.....	10
CONCLUSIONS.....	11
RECOMMENDATIONS.....	11
SECTION B – COLOR UNIFORMITY	
DESCRIPTION OF PRODUCTS EVALUATED.....	12
TEST METHOD	12
TEST RESULTS	13-14
CONCLUSIONS.....	15
RECOMMENDATIONS.....	15
SECTION C - PROTECTIVE WATER REPELLENTS	
DESCRIPTION OF PRODUCTS EVALUATED.....	16
TEST METHODS	16
TEST RESULTS	17
PHOTOGRAPHS OF WATER REPELLENCY	18
CONCLUSIONS.....	19
RECOMMENDATIONS.....	19
SECTION D – GRAFFITI CONTROL	
DESCRIPTION OF PRODUCTS EVALUATED.....	20
TEST METHOD	21
TEST RESULTS	22-23
PHOTOGRAPH OF GRAFFITI TESTING	24
CONCLUSIONS.....	25
RECOMMENDATIONS.....	25



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 2

SECTION E – STAIN REPELLENCY

DESCRIPTION OF PRODUCTS EVALUATED.....	26
TEST METHOD	27
TEST RESULTS	28-30
PHOTOGRAPH OF GRAFFITI TESTING	31
CONCLUSIONS.....	32
RECOMMENDATIONS.....	32

ATTACHMENTS

Technical Services TECH Note RILEM Tube Test Procedures

Product Data literature for all products evaluated



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 3

FOR: Steve Hawkins
cc: Paul Tessier
Steve Dean

SUBJECT: Thunderstone, Inc.
Lincoln, Nebraska

DATE: April 8, 2004

PROJECT: 0403-03 PTP

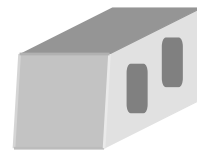
SAMPLES SUBMITTED: Six types of cast stone, all with "Duo-MatrixTM C Latex Integral Water Repellent"

Block Type	Color	Number	Measurements
Cast-stone	White	"T-01"	12" x 12" x ½"
Cast-stone	Gray	"9702R"	
Cast-stone	Brown	"9708"	
Cast-stone	Tan	"9715"	
Cast-stone	Cream	"9817"	
Cast-stone	Brown	"9829"	

Submitted by: Steve Hawkins



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 4

PURPOSE OF TESTING:

Six types of cast stone were submitted for testing using PROSOCO's new construction cleaning, water repellent products, and graffiti control products.

A. Cleaning Concrete Masonry Units: Sure Klean® Custom Masonry Cleaner, Sure Klean® Burnished Custom Masonry Cleaner, Sure Klean® Vana Trol®, Sure Klean® Light Duty Restoration Cleaner and ConcreteScience® SafEtch were evaluated for removal of laboratory applied mortar.

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

Heavy deposits of mortar are removed with dry scraping after 24 hours. Prepared cleaning solutions are then evaluated for their effectiveness in removing residual Ash Grove® Type S mortar staining after 3 days, 7 days, and 14 days of curing*.

B. Color Uniformity Testing* - Sure Klean® Custom Masonry Cleaner, Sure Klean® Burnished Custom Masonry Cleaner, Sure Klean® Vana Trol®, Sure Klean® Light Duty Restoration Cleaner and Concrete Science® SafEtch were evaluated at various dilutions to determine the optimal concentration of cleaner that leaves the external surface looking most like the natural through-body color of the sample. Color uniformity was evaluated by comparing aggregate exposure and surface pigment alternation/removal of each cleaned surface compared to the natural through-body color of the cast stone.

Aggregate Exposure is the visual examination comparing aggregate exposure of the interior, through-body section of the cast stone to surfaces cleaned with selected product(s) at given dilutions.

Surface Pigment Alteration/Removal* is the visual examination comparing the pigmentation of the interior, through-body section of the cast stone to surfaces cleaned with selected product(s) at given dilutions.

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

0 – Worst match to through-body	3 – Good match to through-body
1 – Poor match to through-body	4 – Best match to through-body
2 – Fair match to through-body	

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

D. Graffiti Control – Sure Klean® Custom Masonry Sealer was evaluated for its ability to control graffiti on 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.

E. Stain Repellency – Stand Off® SLX100 Water & Oil Repellent was evaluated for its ability to provide stain repellency to the submitted samples.



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 5

PRODUCTS EVALUATED FOR CLEANING AND COLOR UNIFORMITY

Block Type	Product	Dilution
All Submitted Cast Stone	Sure Klean® Custom Masonry Cleaner	*1:2
	Sure Klean® Burnished Custom Masonry Cleaner	1:2, 1:3
	Sure Klean® Vana Trol®	1:6
	Sure Klean® Light Duty Restoration Cleaner	Concentrate
	ConcreteScience® SafEtch	1:1

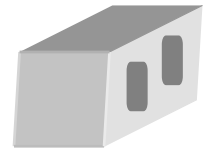
***NOTE:** The dilution of Custom Masonry Cleaner evaluated is stronger than typically used on cast stone. This dilution was evaluated to determine if a strong dilution was effective in removing the mortar smears and in exposing aggregate.

WATER REPELLENT PRODUCTS EVALUATED

Block Type	Product	Dilution
All submitted Cast Stone	Sure Klean® Custom Masonry Sealer	Concentrate
	Sure Klean® Weather Seal Siloxane WB Concentrate	1:9, 1:14



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 6

GRAFFITI CONTROL PRODUCTS EVALUATED

Block Type	Product
All submitted Cast Stone	Sure Klean® Custom Masonry Sealer

GRAFFITI REMOVAL PRODUCTS EVALUATED

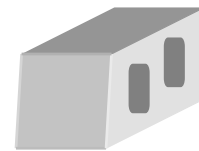
Block Type	Product
All submitted Cast Stone	Sure Klean® Fast Acting Stripper AND Defacer Eraser® Graffiti Wipe

STAIN REPELLENCY PRODUCTS EVALUATED

Block Type	Product
All submitted Cast Stone	Stand Off® SLX100 Water & Oil Repellent



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 7

SECTION A – CLEANING CAST STONE

DESCRIPTION OF PRODUCTS EVALUATED

Sure Klean® Custom Masonry Cleaner – Removes concrete splashes, excess mortar, mud, retarders, heavy efflorescence, embedded stains, rust and surface soiling from textured custom masonry surfaces. This concentrated, general-purpose acidic cleaner improves the color and uniformity of most custom masonry and colored concrete. When used in strong dilutions, Custom Masonry Cleaner can be used for additional aggregate exposure (“weathering”).

Sure Klean® Burnished Custom Masonry 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, atmospheric dirt, mortar smears and other stains without altering the surface texture. Burnished Custom Masonry Cleaner adds depth to colors and brightens white matrices and exposed aggregate.

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

Sure Klean® Light Duty Restoration Cleaner – Removes though atmospheric soiling and subsurface staining, while minimizing potential for damage to delicate masonry and adjacent substrates. Removes difficult calcium (concrete) stains, white scum and other staining from most window glass.

ConcreteScience® SafEtch – An effective, safe alternative to acidic compounds for cleaning and preparing textured concrete surfaces for clear or pigmented coatings. SafEtch rids textured concrete of excess mortar, embedded oil, grease, efflorescence and dirt. It's ideal for projects where traditional acidic cleaners are not allowed. Non-fuming SafEtch contains no hydrochloric or other traditional inorganic acids and is safe for use on an around most metal surfaces. Additionally, it is up to 70 percent more effective than citric and glycolic acids, and 5 percent more effective than phosphoric acid.

TEST METHOD – Cleaning

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

1. Prewet the surface with water.
 2. Apply each cleaner at the appropriate dilutions.
 1. Allow appropriate dwell time for each cleaner:

Custom Masonry Cleaner	3 minutes
Burnished Custom Masonry Cleaner	3-5 minutes
Vana Trol®	3 minutes
Light Duty Restoration Cleaner	3 minutes
ConcreteScience® SafEtch	3 minutes
 4. Reapply the products and heavily agitate with a brush.
 5. Pressure rinse thoroughly.*
 6. Allow the surface to dry for at least 18 hours and visually examine.
- * Pressure rinsing was conducted at approximately 1300 psi with a warm water flow rate of 1.9 gallons per minute.



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 8

TEST RESULTS – Cleaning

% Removal of Type S Mortar

“T-01” Cast Stone		
Product	Dilution	% Removal
Custom Masonry Cleaner	1:2	30%
Burnished Custom Masonry Cleaner	1:2	20%
Burnished Custom Masonry Cleaner	1:3	20%
Vana Trol [®]	1:6	40%
Light Duty Restoration Cleaner	Concentrate	85%
SafEtch	1:1	90%
“9702R” Cast Stone		
Product	Dilution	% Removal
Custom Masonry Cleaner	1:2	30%
Burnished Custom Masonry Cleaner	1:2	30%
Burnished Custom Masonry Cleaner	1:3	30%
Vana Trol [®]	1:6	30%
Light Duty Restoration Cleaner	Concentrate	80%
SafEtch	1:1	85%
“9708” Cast Stone		
Product	Dilution	% Removal
Custom Masonry Cleaner	1:2	50%
Burnished Custom Masonry Cleaner	1:2	50%
Burnished Custom Masonry Cleaner	1:3	50%
Vana Trol [®]	1:6	50%
Light Duty Restoration Cleaner	Concentrate	95%
SafEtch	1:1	95%



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 9

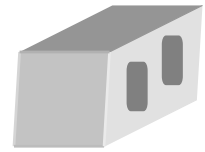
TEST RESULTS- Cleaning

% Removal of Type S Mortar

"9715" Cast Stone		
Product	Dilution	% Removal
Custom Masonry Cleaner	1:2	5%
Burnished Custom Masonry Cleaner	1:2	5%
Burnished Custom Masonry Cleaner	1:3	5%
Vana Trol [®]	1:6	5%
Light Duty Restoration Cleaner	Concentrate	95%
SafEtch	1:1	100%
"9817" Cast Stone		
Product	Dilution	% Removal
Custom Masonry Cleaner	1:2	50%
Burnished Custom Masonry Cleaner	1:2	50%
Burnished Custom Masonry Cleaner	1:3	50%
Vana Trol [®]	1:6	50%
Light Duty Restoration Cleaner	Concentrate	80%
SafEtch	1:1	90%
"9829" Cast Stone		
Product	Dilution	% Removal
Custom Masonry Cleaner	1:2	50%
Burnished Custom Masonry Cleaner	1:2	50%
Burnished Custom Masonry Cleaner	1:3	50%
Vana Trol [®]	1:6	50%
Light Duty Restoration Cleaner	Concentrate	80%
SafEtch	1:1	95%



PALLET TAG PROGRAM LABORATORY REPORT

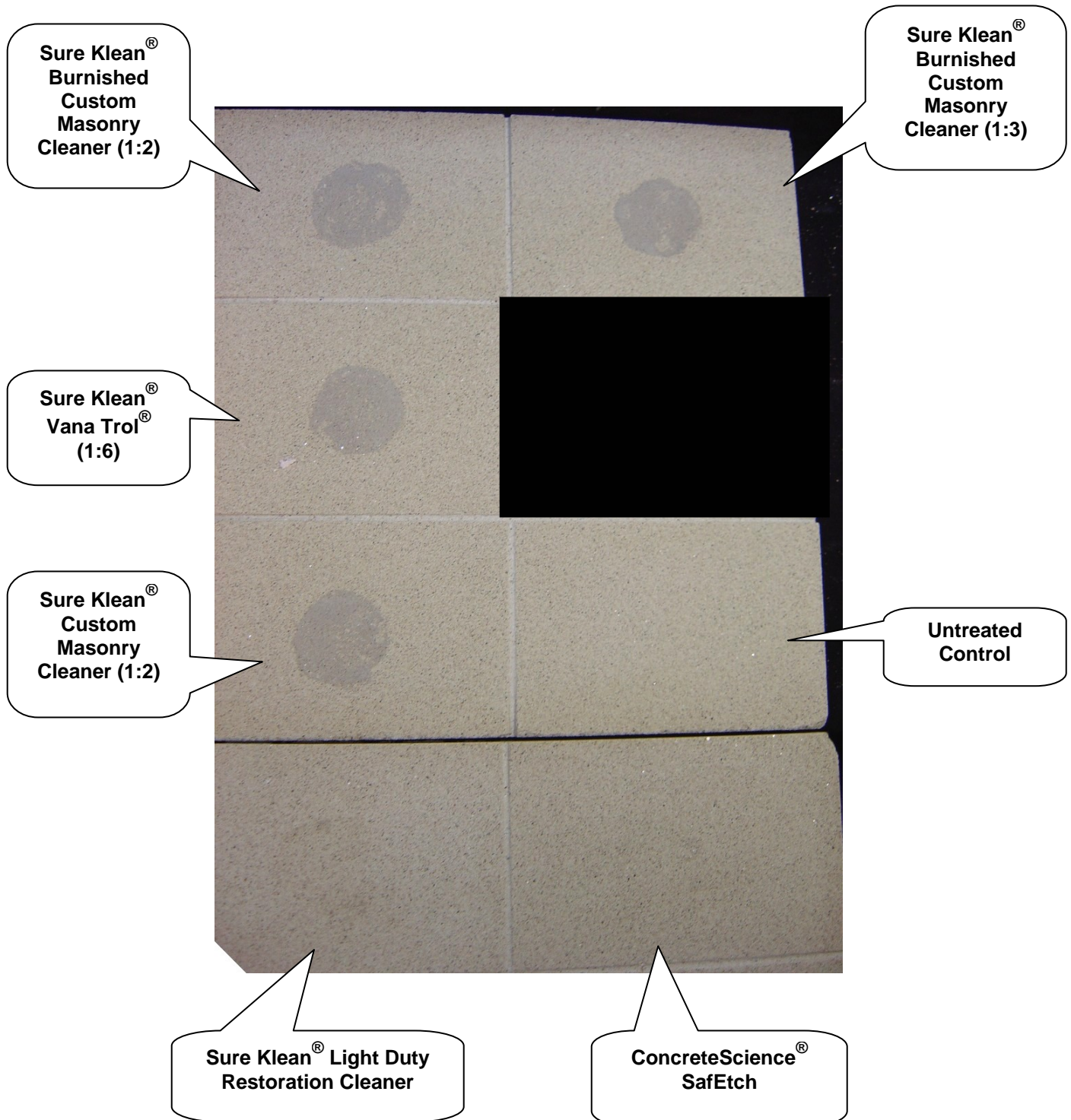


PROSOCO, Inc.

Page 10

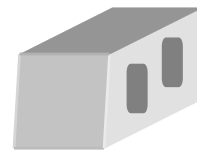
PHOTOGRAPHS- Cleaning

"9715" Cast Stone





PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 11

CONCLUSIONS – Cleaning

Based on the test data, all of the submitted Cast Stone samples were efficiently cleaned with Concrete Science® SafEtch diluted with one part water. Sure Klean® Vana Trol®, Sure Klean® Custom Masonry Cleaner, and Sure Klean® Burnished Custom Masonry Cleaner were not effective in removing the mortar smears. These unusual results may be related to the presence of the integral water repellent. Sure Klean® Light Duty Restoration Cleaner was able to remove the mortar smears, but a white haze appeared on the samples upon drying. Therefore, Sure Klean® Light Duty Restoration Cleaner is not recommended to be used on the submitted cast stone.

RECOMMENDED PRODUCTS AND DILUTIONS – CLEANING

Recommendations for cleaning for each type of cast-stone submitted by Thunderstone Inc., Lincoln, NE, are provided in the chart below. Recommendations are based on the optimum dilution for complete removal of mortar.

Cast Stone	New Construction Cleaning
All submitted Cast Stone	ConcreteScience® SafEtch (1:1)

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. Pressure rinsing equipment providing at least 400 psi at 4-6 gpm delivered through a 15-40 degree fan spray often produces best cleaning 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 cleaning product and procedures for a particular project. See product literature for additional application and product information.



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 12

SECTION B – COLOR UNIFORMITY:

DESCRIPTION OF PRODUCTS EVALUATED – Color Uniformity:

Sure Klean® Custom Masonry Cleaner – Removes concrete splashes, excess mortar, mud, retarders, heavy efflorescence, embedded stains, rust and surface soiling from textured custom masonry surfaces. This concentrated, general-purpose acidic cleaner improves the color and uniformity of most custom masonry and colored concrete. When used in strong dilutions, Custom Masonry Cleaner can be used for additional aggregate exposure (“weathering”)

Sure Klean® Burnished Custom Masonry 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, atmospheric dirt, mortar smears and other stains without altering the surface texture. Burnished Custom Masonry Cleaner adds depth to colors and brightens white matrices and exposed aggregate.

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

Sure Klean® Light Duty Restoration Cleaner – Removes tough atmospheric soiling and subsurface staining, while minimizing potential for damage to delicate masonry and adjacent substrates. Removes difficult calcium (concrete) stains, white scum and other staining from most window glass.

ConcreteScience® SafEtch – An effective, safe alternative to acidic compounds for cleaning and preparing textured concrete surfaces for clear or pigmented coatings. SafEtch rids textured concrete of excess mortar, embedded oil, grease, efflorescence and dirt. It's ideal for projects where traditional acidic cleaners are not allowed. Non-fuming SafEtch contains no hydrochloric or other traditional inorganic acids and is safe for use on an around most metal surfaces. Additionally, it is up to 70 percent more effective than citric and glycolic acids, and 5 percent more effective than phosphoric acid.

TEST METHOD – Cleaning

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

1. Pre-wet the surface with water.
2. Apply each cleaner at the appropriate dilutions.
2. Allow appropriate dwell time for each cleaner:

Custom Masonry Cleaner	3 minutes
Burnished Custom Masonry Cleaner	3-5 minutes
Vana Trol®	3 minutes
Light Duty Restoration Cleaner	3 minutes
SafEtch.....	3 minutes
4. Reapply the products and heavily agitate with a brush.
5. Pressure rinse thoroughly.*
7. Allow the surface to dry for at least 18 hours and visually examine.



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 13

* Pressure rinsing was conducted at approximately 1300 psi with a warm water flow rate of 1.9 gallons per minute.

TEST RESULTS – Color Uniformity

Substrate: Cast Stone		Pigment Color: "T-01"			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean [®] Custom Masonry Cleaner	1:2	0	0	0	0
Sure Klean [®] Burnished Custom Masonry Cleaner	1:2	0	0	0	0
	1:3	0	0	0	0
Sure Klean [®] Vana Trol [®]	1:6	0	0	0	0
Sure Klean [®] Light Duty Restoration Cleaner	Concentrate	0	0	2	2
Concrete Science [®] SafEtch	1:1	0	0	0	0
Substrate: Cast Stone		Pigment Color: "9702R"			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean [®] Custom Masonry Cleaner	1:2	0	0	0	0
Sure Klean [®] Burnished Custom Masonry Cleaner	1:2	0	0	0	0
	1:3	0	0	0	0
Sure Klean [®] Vana Trol [®]	1:6	0	0	0	0
Sure Klean [®] Light Duty Restoration Cleaner	Concentrate	0	0	2	2
ConcreteScience [®] SafEtch	1:1	0	0	0	0
Substrate: Cast Stone		Pigment Color: "9708"			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean [®] Custom Masonry Cleaner	1:2	0	0	0	0
Sure Klean [®] Burnished Custom Masonry Cleaner	1:2	0	0	0	0
	1:3	0	0	0	0
Sure Klean [®] Vana Trol [®]	1:6	0	0	0	0
Sure Klean [®] Light Duty Restoration Cleaner	Concentrate	0	0	3	3
ConcreteScience [®] SafEtch	1:1	0	0	0	0
0 – No change		3 – change – heavy			
1 – change – slight		4 – change - excessive			
2 – change – moderate					



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 14

TEST RESULTS – Color Uniformity

Substrate: Cast Stone		Pigment Color: “9715”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean [®] Custom Masonry Cleaner	1:2	0	0	0	0
Sure Klean [®] Burnished Custom Masonry Cleaner	1:2	0	0	0	0
	1:3	0	0	0	0
Sure Klean [®] Vana Trol [®]	1:6	0	0	0	0
Sure Klean [®] Light Duty Restoration Cleaner	Concentrate	0	0	2	2
ConcreteScience [®] SafEtch	1:1	0	0	0	0
Substrate: Cast Stone		Pigment Color: “9817”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean [®] Custom Masonry Cleaner	1:2	0	0	0	0
Sure Klean [®] Burnished Custom Masonry Cleaner	1:2	0	0	0	0
	1:3	0	0	0	0
Sure Klean [®] Vana Trol [®]	1:6	0	0	0	0
Sure Klean [®] Light Duty Restoration Cleaner	Concentrate	0	0	2	2
ConcreteScience [®] SafEtch	1:1	0	0	0	0
Substrate: Cast Stone		Pigment Color: “9829”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean [®] Custom Masonry Cleaner	1:2	0	0	0	0
Sure Klean [®] Burnished Custom Masonry Cleaner	1:2	0	0	0	0
	1:3	0	0	0	0
Sure Klean [®] Vana Trol [®]	1:6	0	0	0	0
Sure Klean [®] Light Duty Restoration Cleaner	Concentrate	0	0	2	2
Concrete Science [®] SafEtch	1:1	0	0	0	0
0 – No change		3 – change – heavy			
1 – change – slight		4 – change - excessive			
2 – change – moderate					



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 15

CONCLUSIONS: COLOR UNIFORMITY:

Sure Klean® Light Duty Restoration Cleaner created a white haze on the cast stone samples and is therefore not recommended. None of the products evaluated removed any pigmented matrix, nor did they expose any aggregate. These unusual results may be related to the presence of the integral water repellent. Except for Sure Klean® Light Duty Restoration Cleaner, none of the cleaners caused any change to the appearance of the Cast Stone.

RECOMMENDATIONS – COLOR UNIFORMITY

Recommendations for color uniformity for each type of cast stone submitted by Thunderstone Inc., Lincoln, NE, are provided in the chart below. Recommendations are based on the optimum dilution that provides the best color uniformity.

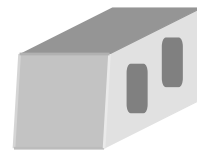
Cast Stone	Color Uniformity
All submitted Cast Stone	ConcreteScience® SafEtch (1:1)

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. Pressure rinsing equipment providing at least 400 psi at 4-6 gpm delivered through a 15-40 degree fan spray often produces best cleaning 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 cleaning product and procedures for a particular project. See product literature for additional application and product information.



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 16

SECTION C – PROTECTIVE WATER REPELLENTS:

The testing described below evaluates the suitability of water repellent treatments.

The surface treatments evaluated were selected for their suitability for application based on the following selection criteria:

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

DESCRIPTIONS OF PRODUCTS EVALUATED – Protective Water Repellents:

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

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

SAMPLE PREPARATION – Protective Water Repellents:

The submitted cast stone were scored, allowed to dry, and to reabsorb atmospheric humidity for 24 hours prior to treatment. The treatment method consisted of a wet-on-wet brush application. All treatments were allowed to cure at least 3 days 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.



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 17

TEST RESULTS – Protective Water Repellents:

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

RESULTS	
"T-01" Cast Stone	
Untreated Control	58 mph
Weather Seal Siloxane WB Concentrate (1:9)	59 mph
Weather Seal Siloxane WB Concentrate (1:14)	59 mph
Custom Masonry Sealer	59 mph
"9702R" Cast Stone	
Untreated Control	56 mph
Weather Seal Siloxane WB Concentrate (1:9)	60 mph
Weather Seal Siloxane WB Concentrate (1:14)	59 mph
Custom Masonry Sealer	60 mph
"9708" Cast Stone	
Untreated Control	54 mph
Weather Seal Siloxane WB Concentrate (1:9)	60 mph
Weather Seal Siloxane WB Concentrate (1:14)	59 mph
Custom Masonry Sealer	60 mph
"9715" Cast Stone	
Untreated Control	56 mph
Weather Seal Siloxane WB Concentrate (1:9)	59 mph
Weather Seal Siloxane WB Concentrate (1:14)	60 mph
Custom Masonry Sealer	59 mph
"9817" Cast Stone	
Untreated Control	59 mph
Weather Seal Siloxane WB Concentrate (1:9)	60 mph
Weather Seal Siloxane WB Concentrate (1:14)	60 mph
Custom Masonry Sealer	60 mph
"9829" Cast Stone	
Untreated Control	56 mph
Weather Seal Siloxane WB Concentrate (1:9)	59 mph
Weather Seal Siloxane WB Concentrate (1:14)	59 mph
Custom Masonry Sealer	58 mph



PALLET TAG PROGRAM LABORATORY REPORT

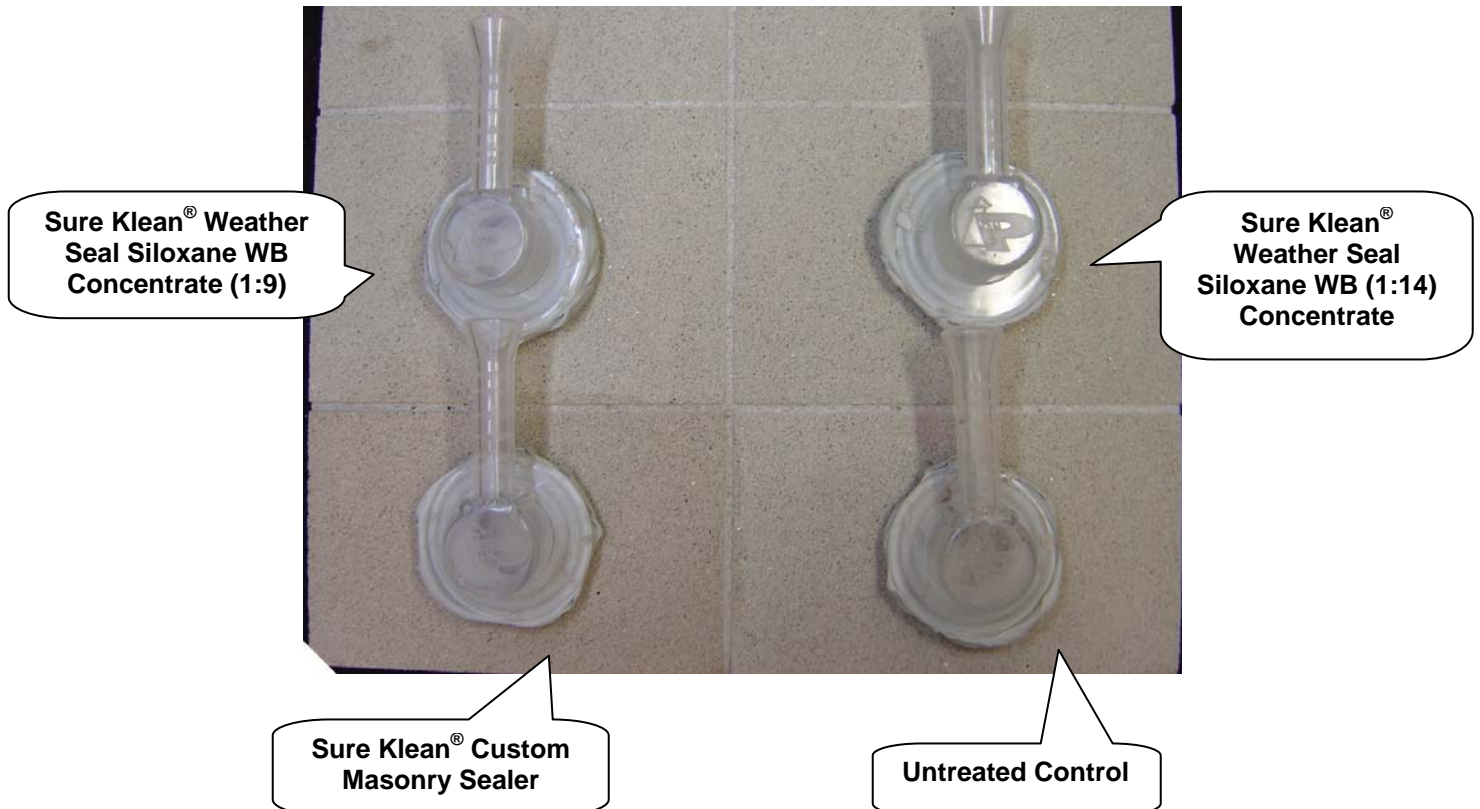


PROSOCO, Inc.

Page 18

PHOTOGRAPHS- Protective Water Repellents

"9708" Cast Stone





PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 19

CONCLUSIONS - Protective Water Repellents

Based upon laboratory evaluations, all of the water repellents tested provided above average water repellency to all submitted samples. In addition, Sure Klean® Custom Masonry Sealer enhanced the appearance of each cast stone.

RECOMMENDATIONS - PROTECTIVE WATER REPELLENTS

Recommendations for water repellency treatment for each type of CMU submitted by Thunderstone, Inc., Lincoln, NE, 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.

Cast Stone	Water Repellents
All Submitted Cast Stone	Sure Klean® Weather Seal Siloxane WB Concentrate (1:9) OR Sure Klean® Weather Seal Siloxane WB Concentrate (1:14) OR Sure Klean® Custom Masonry Sealer

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.



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 20

SECTION D – GRAFFITI CONTROL

DESCRIPTION OF PRODUCTS EVALUATED

These trials were conducted to determine the optimal graffiti control treatment.

Graffiti Control Treatments

Sure Klean® Custom Masonry Sealer – A clear, solvent-based silicone elastomer formulated to weatherproof concrete block and other porous masonry material. Sure Klean® Custom Masonry Sealer protects masonry surfaces from repeated graffiti attacks without altering the natural appearance.

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)



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 21

SAMPLE PREPARATION – Graffiti Control

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

Sections of the cast stone samples were treated with one coat of Sure Klean® Custom Masonry Sealer, in accordance with PROSOCO, Inc.'s Product Guide application instructions and then allowed to cure for at least one day. At the end of the one-day 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® Custom Masonry Sealer. 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 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:
 Graffiti Wipe 5 minutes
 Fast Acting Stripper20 minutes
3. Pressure rinse thoroughly until water runs clear. *
4. Allow the surface to dry thoroughly and visually examine to determine effectiveness.

* Pressure rinsing was conducted at approximately 1300 psi with a warm water flow rate of 1.9 gallons per minute.



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 22

TEST RESULTS – Graffiti Control

“T-01” Cast Stone					
Untreated Control	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	65%	70%	70%	70%	69%
Graffiti Wipe	90%	85%	85%	85%	86%
Custom Masonry Sealer	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	80%	90%	90%	90%	88%
Graffiti Wipe	95%	95%	95%	95%	95%
“9702R” Cast Stone					
Untreated Control	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	75%	80%	80%	80%	79%
Graffiti Wipe	90%	80%	80%	80%	88%
Custom Masonry Sealer	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	90%	90%	95%	90%	91%
Graffiti Wipe	95%	95%	95%	95%	95%
“9708” Cast Stone					
Untreated Control	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	80%	75%	75%	75%	76%
Graffiti Wipe	90%	85%	85%	85%	86%
Custom Masonry Sealer	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	80%	90%	90%	90%	88%
Graffiti Wipe	95%	95%	95%	95%	95%
“9715” Cast Stone					
Untreated Control	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	65%	70%	70%	70%	69%
Graffiti Wipe	95%	60%	60%	60%	69%
Custom Masonry Sealer	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	90%	95%	95%	95%	94%
Graffiti Wipe	100%	95%	95%	95%	95%



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 23

TEST RESULTS – Graffiti Control

“9817” Cast Stone					
Untreated Control	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	65%	85%	85%	85%	80%
Graffiti Wipe	90%	85%	85%	85%	86%
Custom Masonry Sealer	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	85%	95%	95%	95%	93%
Graffiti Wipe	100%	95%	95%	95%	96%
“9829” Cast Stone					
Untreated Control	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	90%	70%	70%	70%	75%
Graffiti Wipe	95%	70%	70%	70%	76%
Custom Masonry Sealer	Red Paint	Black Marker	Green Marker	Red Marker	% Avg. Removal
Fast Acting Stripper	95%	95%	95%	95%	95%
Graffiti Wipe	100%	95%	95%	95%	99%



PALLET TAG PROGRAM LABORATORY REPORT

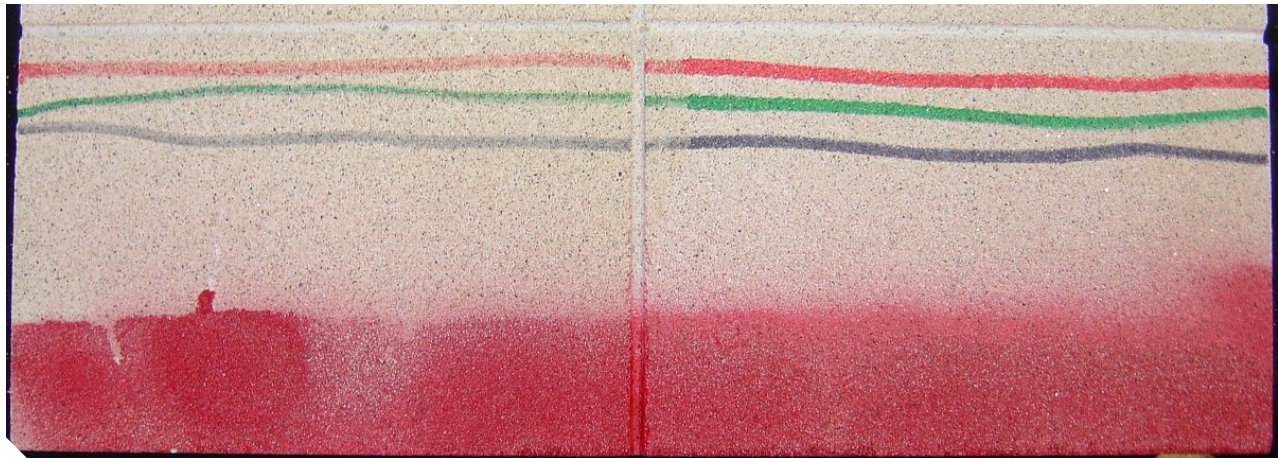


PROSOCO, Inc.

Page 24

PHOTOGRAPHS – Graffiti Control

“9715” Cast Stone Before Graffiti Removal



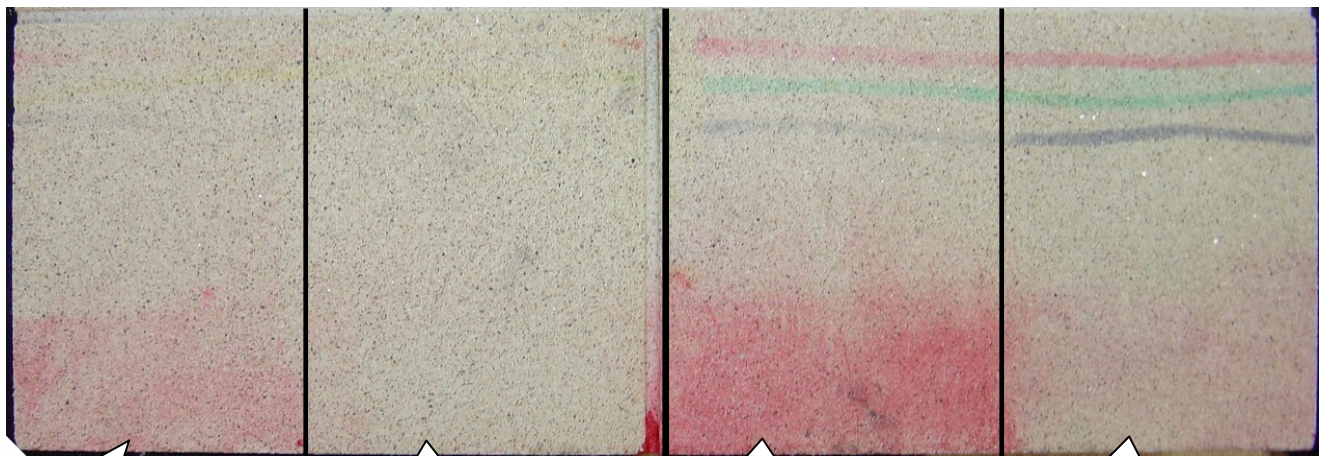
**Sure Klean® Custom
Masonry Sealer**

**Untreated
Control**

“9715” Cast Stone After Graffiti Removal

**Sure Klean®
Custom Masonry Sealer**

**Untreated
Control**



**Sure Klean® Fast
Acting Stripper**

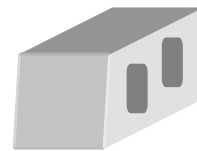
**Defacer Eraser®
Graffiti Wipe**

**Sure Klean® Fast
Acting Stripper**

**Defacer Eraser®
Graffiti Wipe**



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 25

CONCLUSIONS – Graffiti Control

Based upon laboratory evaluations, graffiti removal was improved when the submitted samples were treated with Sure Klean® Custom Masonry Sealer prior to graffiti application. In addition, Sure Klean® Custom Masonry Sealer enhanced the appearance of the cast stone.

RECOMMENDATIONS – GRAFFITI CONTROL

Recommendations for graffiti control treatment for each type of cast-stone submitted by Thunderstone Inc, Lincoln, NE, 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.

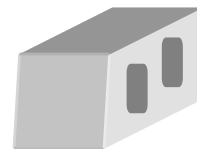
Cast Stone	Graffiti Repellents	Graffiti Removers
All submitted Cast Stone	Sure Klean® Custom Masonry Sealer	Sure Klean® Fast Acting Stripper OR Defacer Eraser® Graffiti Wipe

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.

For the most severe graffiti cases Sure Klean® Fast Acting Stripper is recommended for job-site testing. For mild graffiti cases, Defacer Eraser® Graffiti Wipe is recommended for job-site testing. See product literature for additional application and product information.



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 26

SECTION E – STAIN RESISTANCE

DESCRIPTION OF PRODUCTS EVALUATED

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

Products Evaluated for Stain Protection:

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.

Kitchen Products Evaluated:

Coca Cola
Ketchup
Mustard
Red wine
Balsamic Vinegar
Soy Sauce
Olive Oil
Wesson Oil
Coffee

Temperature:

ambient (~ 70°F)
ambient (~ 70°F)
ambient (~ 70°F)
ambient (~ 70°F)
ambient (~ 70°F)
ambient (~ 70°F)
ambient (~ 70°F)
ambient (~250°F)
ambient (~120°F)

SAMPLE PREPARATION – Stain Resistance

Samples were cleaned with Enviro Klean® 2010 All Surface Cleaner diluted with 10 parts water, allowed to dry and absorb atmospheric moisture for 24 hours prior to treatment. The method of application for protective treatments consisted of a wet-on-wet saturating brush application. Samples were allowed to cure for at least 3 days prior to testing.



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 27

TEST METHOD – Stain Resistance

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 oil quickly absorbed into the substrate and correlates to “below average” repellency.

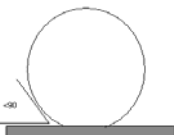
Note: Non-free flowing staining agents such as ketchup and mustard are applied in a blob and not evaluated for their beading properties.

Rating System (1-5)

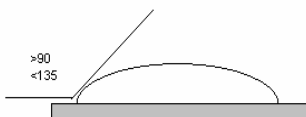
1. No wetting of contact area (no darkening); angle less than 90°



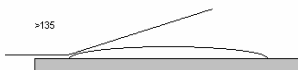
2. Wetting contained to the contact area (slight darkening); angle is less than 90°



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.



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 28

TEST RESULTS – Surface Beading

“T-01” Cast Stone									
	Coco-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	2	-	-	3	3	3	5	5	3
SLX 100	2	-	-	2	2	2	2	2	2
“9702R” Cast Stone									
	Coco-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	4	-	-	4	4	4	5	5	5
SLX 100	2	-	-	2	2	2	2	2	2
“9708” Cast Stone									
	Coco-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	3	-	-	3	3	3	5	5	3
SLX 100	2	-	-	2	2	2	2	2	2
“9715” Cast Stone									
	Coco-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	3	-	-	3	3	3	5	5	3
SLX 100	2	-	-	2	2	2	2	2	2
“9817” Cast Stone									
	Coco-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	3	-	-	3	3	3	5	5	3
SLX 100	2	-	-	2	2	2	2	2	2
“9829” Cast Stone									
	Coco-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	2	-	-	4	3	3	5	5	5
SLX 100	2	-	-	2	2	2	2	2	2



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 29

TEST RESULTS – STAINING REMOVAL

% Removal

“T-01” Cast Stone

	Untreated Control								
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	70%	70%	60%	60%	60%	80%	<1%	<1%	60%
4 hour	70%	95%	70%	60%	60%	80%	<1%	<1%	60%
1 hour	80%	100%	80%	60%	60%	90%	<1%	<1%	60%
10 min.	90%	100%	90%	90%	70%	90%	<1%	<1%	90%
	Stand Off [®] SLX100 Water & Oil Repellent								
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	95%	80%	90%	90%	90%	90%	90%	70%
4 hour	100%	100%	80%	95%	95%	95%	90%	90%	70%
1 hour	100%	100%	90%	95%	100%	100%	90%	90%	90%
10 min.	100%	100%	95%	100%	100%	100%	90%	90%	100%

“9702R” Cast Stone

	Untreated Control								
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	80%	50%	50%	70%	70%	70%	<1%	<1%	60%
4 hour	95%	100%	80%	80%	75%	75%	<1%	<1%	65%
1 hour	100%	100%	90%	90%	80%	80%	<1%	<1%	70%
10 min.	100%	100%	100%	100%	85%	85%	<1%	<1%	75%
	Stand Off [®] SLX100 Water & Oil Repellent								
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	70%	70%	95%	100%	100%	90%	90%	80%
4 hour	100%	100%	70%	100%	100%	100%	90%	90%	90%
1 hour	100%	100%	100%	100%	100%	100%	90%	90%	100%
10 min.	100%	100%	100%	100%	100%	100%	90%	90%	100%

“9708” Cast Stone

	Untreated Control								
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	70%	60%	80%	80%	80%	<1%	<1%	90%
4 hour	100%	90%	70%	85%	85%	85%	<1%	<1%	95%
1 hour	100%	100%	85%	90%	90%	90%	<1%	<1%	100%
10 min.	100%	100%	100%	95%	95%	95%	<1%	<1%	100%
	Stand Off [®] SLX100 Water & Oil Repellent								
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	70%	70%	95%	95%	95%	90%	90%	95%
4 hour	100%	100%	90%	100%	100%	100%	90%	90%	100%
1 hour	100%	100%	90%	100%	100%	100%	90%	90%	100%
10 min.	100%	100%	100%	100%	100%	100%	90%	90%	100%



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 30

TEST RESULTS – STAINING REMOVAL

% Removal

“9713” Cast Stone

Untreated Control									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	90%	70%	60%	70%	70%	70%	<1%	<1%	80%
4 hour	100%	80%	70%	80%	80%	80%	<1%	<1%	90%
1 hour	100%	100%	100%	90%	90%	90%	<1%	<1%	95%
10 min.	100%	100%	100%	95%	95%	95%	<1%	<1%	100%
Stand Off® SLX100 Water & Oil Repellent									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%	70%	90%	100%	100%	90%	90%	90%
4 hour	100%	100%	70%	95%	100%	100%	90%	90%	90%
1 hour	100%	100%	100%	95%	100%	100%	90%	90%	100%
10 min.	100%	100%	100%	100%	100%	100%	90%	90%	100%

“9817” Cast Stone

Untreated Control									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	70%	70%	60%	60%	60%	80%	<1%	<1%	60%
4 hour	70%	95%	70%	60%	60%	80%	<1%	<1%	60%
1 hour	80%	100%	80%	60%	60%	90%	<1%	<1%	60%
10 min.	90%	100%	90%	90%	70%	90%	<1%	<1%	90%
Stand Off® SLX100 Water & Oil Repellent									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	90%	70%	70%	70%	70%	70%	<1%	<1%	70%
4 hour	95%	95%	75%	80%	80%	80%	<1%	<1%	80%
1 hour	100%	100%	90%	90%	90%	90%	<1%	<1%	90%
10 min.	100%	100%	100%	100%	100%	100%	<1%	<1%	95%

“9829” Cast Stone

Untreated Control									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	80%	70%	60%	70%	70%	70%	<1%	<1%	80%
4 hour	90%	85%	70%	80%	80%	80%	<1%	<1%	85%
1 hour	95%	100%	100%	90%	90%	90%	<1%	<1%	90%
10 min.	100%	100%	100%	95%	100%	100%	<1%	<1%	95%
Stand Off® SLX100 Water & Oil Repellent									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	80%	70%	90%	90%	90%	90%	90%	90%
4 hour	100%	100%	80%	95%	95%	95%	90%	90%	95%
1 hour	100%	100%	100%	100%	100%	100%	100%	100%	100%
10 min.	100%	100%	100%	100%	100%	100%	100%	100%	100%



PALLET TAG PROGRAM LABORATORY REPORT

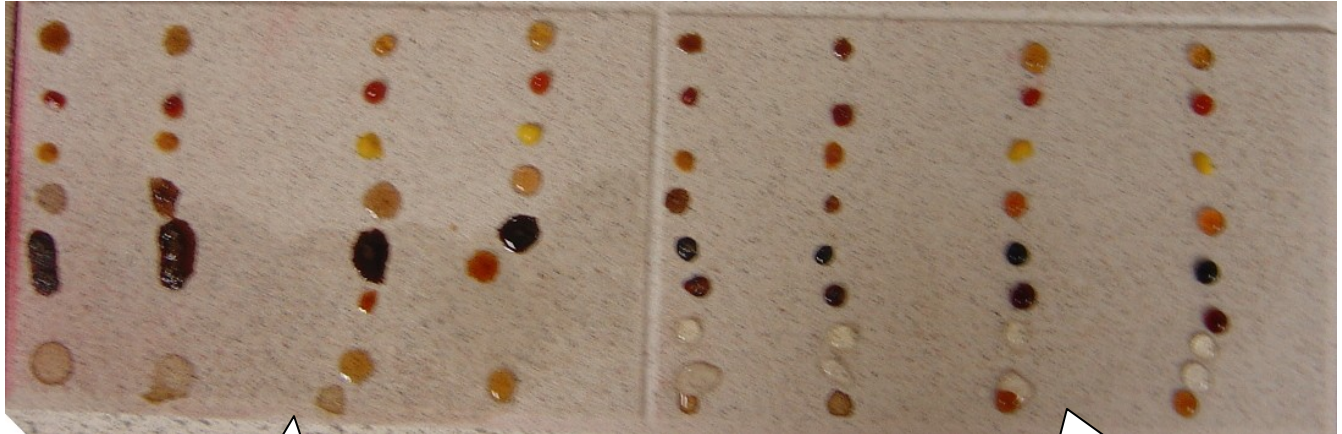


PROSOCO, Inc.

Page 31

PHOTOGRAPHS- STAIN RESISTANCE

"T-01" Cast Stone: Stains Applied



Untreated Control

**Stand Off® SLX 100
Water & Oil Repellent**

"T-01" Cast Stone: Stains Removed

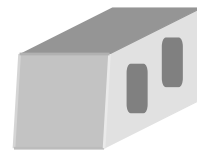


**Untreated
Control**

**Stand Off® SLX 100
Water & Oil Repellent**



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

Page 32

CONCLUSIONS – Stain Resistance

Based upon laboratory evaluations, Stand Off® SLX100 Water & Oil Repellent provided effective treatment in repelling the staining agents on the submitted cast stone samples.

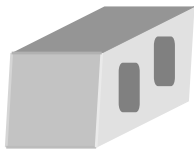
RECOMMENDATIONS – Stain Resistance

Recommendations for stain resistance treatment for each type of Cast Stone submitted by Thunderstone Inc, Lincoln, NE, are provided in the charts below. Recommendations are based on the treatments that proved most effective for providing stain repellency on all types submitted.

Sample	Stain Repellent	Maintenance Cleaner
All submitted Cast Stone	Stand Off® SLX 100 Water & Oil Repellent	Enviro Klean® 2010 All Surface Cleaner (1:10)

Nathan R. Colaner
Technical Analyst

NRC/



Laboratory Report

Pallet Tag Program Evaluation

**Thunderstone Inc.
Lincoln, NE**

Project No. 0403-03 PTP

Prepared For:

**Thunderstone Inc.
Lincoln, NE**

Prepared By:



***PROSOCO, Inc.
April 2004***