



# PALLET TAG PROGRAM LABORATORY REPORT



**PROSOCO, Inc.**

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## ATTACHMENTS

Technical Services TECH Note RILEM Tube Test Procedures



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Product Data literature for all products evaluated



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**FOR:** Mark O' Keefe  
**cc:** Paul Tessier

**SUBJECT:** Napa Valley Cast Stone  
American Canyon, CA

**DATE:** October 19, 2004

**PROJECT:** 0406-12 PTP

**SAMPLES SUBMITTED:** Five types of cast stone, four of each type

Sample	Color	Size
"18W"	Light Red	12" x 12" x 1"
"71G"	Light Gray	
"45W"	Tan	
"31W"	White	
"75W"	Gray	

**ALSO SUBMITTED:** 5 types of Napa Valley Type S colored mortar to match each type of cast stone. For example, "18W Light Red" colored mortar was submitted to be used on the "18W Light Red" cast stone.

Submitted by: Mark O'Keefe



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## PURPOSE OF TESTING:

Five types of cast stone were submitted for testing using PROSOCO, Inc.'s new construction cleaning products, water repellents, stain repellents and color enhancement products suitable for cast stone.

**A. New Construction Cleaning** – Enviro Klean<sup>®</sup> Safety Klean, ConcreteScience<sup>®</sup> SafEtch, and Sure Klean<sup>®</sup> Light Duty Concrete Cleaner were evaluated at various dilutions for removal of laboratory applied mortar.

To simulate new construction soiling, samples 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 Napa Valley Cast Stone Type S colored 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 Napa Valley Cast Stone Type S colored mortar staining after 21 days of curing.

**B. Color Uniformity Testing\*** - Enviro Klean<sup>®</sup> Safety Klean, ConcreteScience<sup>®</sup> SafEtch, and Sure Klean<sup>®</sup> Light Duty Concrete Cleaner 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 cast stone. 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 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 – <b>Worst</b> match to through-body | 3 – <b>Good</b> match to through-body |
| 1 – <b>Poor</b> match to through-body  | 4 – <b>Best</b> match to through-body |
| 2 – <b>Fair</b> match to through-body  |                                       |

## NOTE: When cleaning integrally colored cast stone.

Integrally colored cast stone frequently have high amounts of pigments concentrated on the surface of the cured concrete unit. Variation of surface pigment concentrations from one cast stone to the next creates a blotchy appearance in the completed wall. Allowed to remain on the surface of the cast stone, the weakly bound pigment will weather and streak, further detracting from the appearance of the completed cast stone wall.

In addition to removing excess mortar and construction related soiling, the goal of any cleaning operation undertaken on integrally colored cast stone should include removal of unnaturally high concentrations of surface pigment. By revealing the natural through-body color on the integrally colored unit, the overall color uniformity and weathering resistance of the completed cast stone wall is improved.

**C. Protective Water Repellents** - Sure Klean<sup>®</sup> Paver Enhancer, Stand Off<sup>®</sup> SLX100 Water & Oil Repellent, and Sure Klean<sup>®</sup> Weather Seal SL100 Water Repellent were evaluated for their ability to provide water repellency to the submitted samples.

**D. Stain Repellency** – Stand Off<sup>®</sup> Stone, Tile, & Masonry Protector, Stand Off<sup>®</sup> Stain Barrier, and Stand Off<sup>®</sup> SLX100 Water & Oil Repellent were evaluated for their ability to provide stain repellency to the submitted samples.



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**E. Color Enhancement** – Sure Klean<sup>®</sup> Paver Enhancer, Stand Off<sup>®</sup> Gloss 'N Guard WB, and ConcreteScience<sup>®</sup> SpecSeal WB-Flat were evaluated for their ability to provide color enhancement to the submitted samples.



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**PRODUCTS EVALUATED**

**CLEANING AND LIMITING SURFACE ALTERATIONS PRODUCTS EVALUATED**

SAMPLE	PRODUCT	DILUTION
All Submitted Cast Stone	Enviro Klean® Safety Klean	1:2, 1:3
	ConcreteScience® SafEtch	1:2, 1:3
	Sure Klean® Light Duty Concrete Cleaner	1:2, 1:3

**WATER REPELLENCY PRODUCTS EVALUATED**

SAMPLE	Product	Dilution
All Submitted Cast Stone	Stand Off® SLX100 Water & Oil Repellent	Concentrate
	Sure Klean® Weather Seal SL100 Water Repellent	Concentrate
	Sure Klean® Paver Enhancer	Concentrate

**STAIN REPELLENCY PRODUCTS EVALUATED**

SAMPLE	Product	Dilution
All Submitted Cast Stone	Stand Off® Stone, Tile, & Masonry Protector	Concentrate
	Stand Off® SLX100 Water & Oil Repellent	Concentrate
	Stand Off® Stain Barrier	Concentrate

**COLOR ENHANCEMENT PRODUCTS EVALUATED**

SAMPLE	Product	Dilution
All Submitted Cast Stone	Sure Klean® Paver Enhancer	Concentrate
	Stand Off® Gloss 'N Guard WB	Concentrate
	ConcreteScience® SpecSeal WB-Flat	Concentrate

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



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## SECTION A – NEW CONSTRUCTION CLEANING

### DESCRIPTION OF PRODUCTS EVALUATED – New Construction Cleaning

These cleaning trials were conducted to determine the optimal cleaning/cure time combination to most efficiently remove Napa Valley Cast Stone Type S colored mortar from the submitted samples.

The Napa Valley Cast Stone Type S colored mortar was prepared in compliance with the manufacturers instructions, applied to the cast stone and allowed to cure for 21 days. The removal of mortar was visually evaluated.

**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.

**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, or efflorescence and dirt.

**Sure Klean® Light Duty Concrete 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.

### TEST METHOD – New Construction Cleaning

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

1. Prewet the surface with water.
2. Apply the cleaner.
3. Allow the appropriate dwell time, as specified.
 

Safety Klean.....	3-5 minutes
SafEtch.....	3-5 minutes
Light Duty Concrete Cleaner.....	3-5 minutes
4. Rinse thoroughly\*.

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



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**TEST RESULTS – New Construction Cleaning**

% Removal

<b>“18W Light Red” Cast Stone</b>	
<b><u>“18W Light Red” Type S Colored Mortar</u></b>	<b><u>21 day</u></b>
Safety Klean (1:2)	100%
Safety Klean (1:3)	99%
SafEtch (1:2)	100%
SafEtch (1:3)	99%
Light Duty Concrete Cleaner (1:2)	99%
Light Duty Concrete Cleaner (1:3)	85%
<b>“71G Light Gray” Cast Stone</b>	
<b><u>“71G Light Gray” Type S Colored Mortar</u></b>	<b><u>21 day</u></b>
Safety Klean (1:2)	100%
Safety Klean (1:3)	99%
SafEtch (1:2)	100%
SafEtch (1:3)	99%
Light Duty Concrete Cleaner (1:2)	95%
Light Duty Concrete Cleaner (1:3)	90%
<b>“45W Tan” Cast Stone</b>	
<b><u>“45W Tan” Type S Colored Mortar</u></b>	<b><u>21 day</u></b>
Safety Klean (1:2)	100%
Safety Klean (1:3)	95%
SafEtch (1:2)	95%
SafEtch (1:3)	90%
Light Duty Concrete Cleaner (1:2)	85%
Light Duty Concrete Cleaner (1:3)	80%
<b>“31W White” Cast Stone</b>	
<b><u>“31W White” Type S Colored Mortar</u></b>	<b><u>21 day</u></b>
Safety Klean (1:2)	99%
Safety Klean (1:3)	95%
SafEtch (1:2)	99%
SafEtch (1:3)	95%
Light Duty Concrete Cleaner (1:2)	90%
Light Duty Concrete Cleaner (1:3)	85%
<b>“75W Gray” Cast Stone</b>	
<b><u>“75W Gray” Type S Colored Mortar</u></b>	<b><u>21 day</u></b>
Safety Klean (1:2)	100%
Safety Klean (1:3)	99%
SafEtch (1:2)	99%
SafEtch (1:3)	99%
Light Duty Concrete Cleaner (1:2)	80%
Light Duty Concrete Cleaner (1:3)	80%





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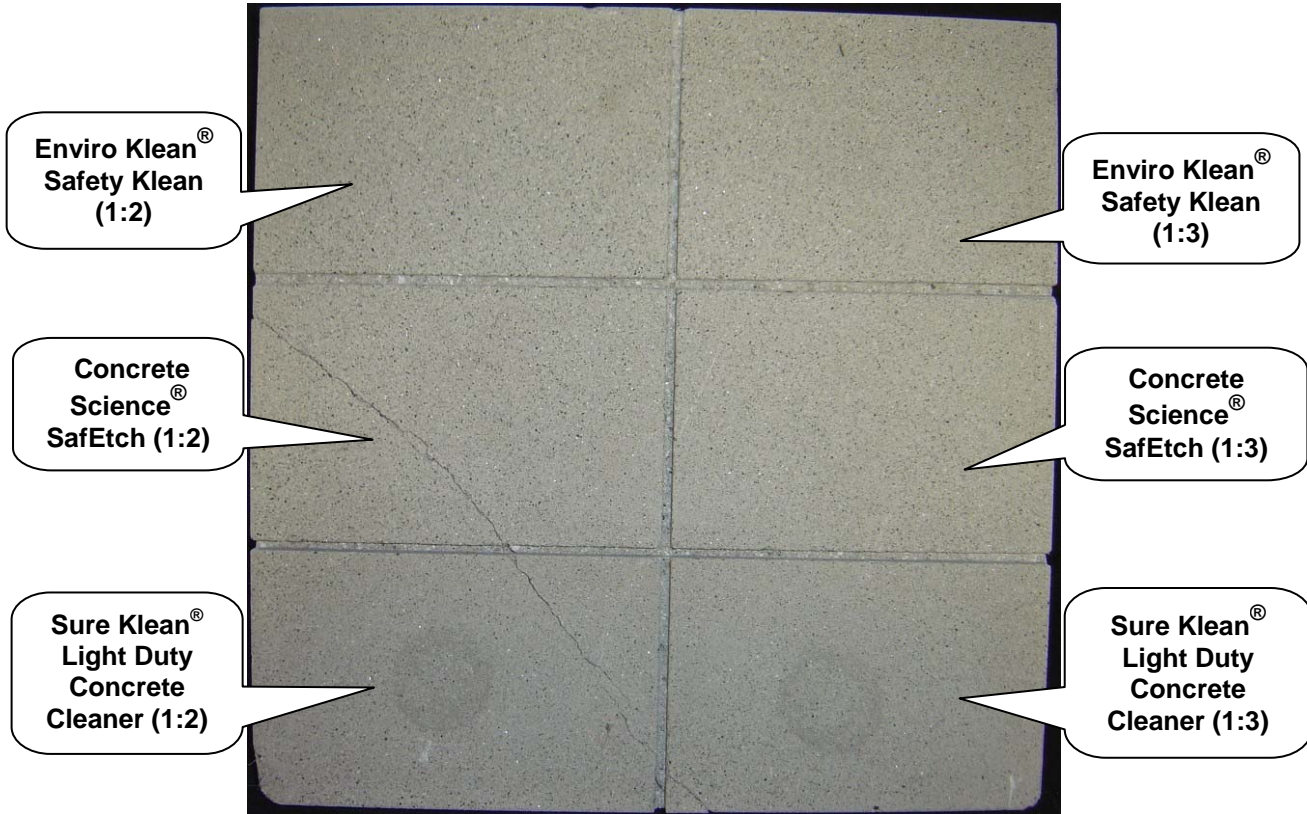


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PHOTOGRAPHS- New Construction Cleaning: Napa Valley Cast Stone Type S Colored Mortar

"75W Gray" – 21 day Cleaning





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## **CONCLUSIONS – New Construction Cleaning**

Based on the test results, all dilutions of Enviro Klean® Safety Klean and ConcreteScience® SafEtch tested performed well in removing excess mortar smears from the submitted samples. The cleaners performed well in removing the mortar even after allowing the mortar to remain on the surface of the cast stone for 21 days under ideal curing conditions.

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

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## **RECOMMENDATIONS – New Construction Cleaning**

Recommendations for cleaning for the cast stone submitted by Napa Valley Cast Stone, American Canyon, CA, are provided in the chart below. Recommendations are based on the optimum dilution for complete removal of mortar.

<b>Sample</b>	<b>New Construction Cleaning (Napa Valley Cast Stone Type S Colored Mortar, 21 day cleaning)</b>
All Submitted Cast Stone	Enviro Klean® Safety Klean 1:3 OR ConcreteScience® SafEtch 1:3

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



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## SECTION B – COLOR UNIFORMITY:

### DESCRIPTION OF PRODUCTS EVALUATED – Color Uniformity:

**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.

**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, or efflorescence and dirt.

**Sure Klean® Light Duty Concrete 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.

### TEST METHOD – Color Uniformity Testing:

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.
3. Allow appropriate dwell time, as specified.
 

Safety Klean.....	3-5 minutes
SafEtch.....	3-5 minutes
Light Duty Concrete Cleaner.....	3-5 minutes
4. Reapply the products and moderately agitate with a brush.
5. Pressure rinse thoroughly.\*
6. Allow the sample to dry for at least 18 hours and visually examine.
7. Break the sample in half and compare the through-body surfaces to the cleaned surfaces for the best match.

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



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**TEST RESULTS – Color Uniformity**

<b>Substrate: "18W Light Red"</b>			
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal
Safety Klean	1:2	4	3
Safety Klean	1:3	4	3
SafEtch	1:2	4	3
SafEtch	1:3	4	3
Light Duty Concrete Cleaner	1:2	3	3
Light Duty Concrete Cleaner	1:3	3	3
<b>Substrate: "71G Light Gray"</b>			
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal
Safety Klean	1:2	4	3
Safety Klean	1:3	4	3
SafEtch	1:2	4	3
SafEtch	1:3	4	3
Light Duty Concrete Cleaner	1:2	3	3
Light Duty Concrete Cleaner	1:3	3	3
<b>Substrate: "45W Tan"</b>			
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal
Safety Klean	1:2	3	3
Safety Klean	1:3	3	3
SafEtch	1:2	3	3
SafEtch	1:3	3	3
Light Duty Concrete Cleaner	1:2	3	3
Light Duty Concrete Cleaner	1:3	3	3
<b>Substrate: "31W White"</b>			
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal
Safety Klean	1:2	3	3
Safety Klean	1:3	3	3
SafEtch	1:2	3	3
SafEtch	1:3	3	3
Light Duty Concrete Cleaner	1:2	3	3
Light Duty Concrete Cleaner	1:3	3	3

Scale used for reporting results of both categories

- |  |                                       |
|--|---------------------------------------|
| 0 – <b>Worst</b> match to through-body | 3 – <b>Good</b> match to through-body |
| 1 – <b>Poor</b> match to through-body  | 4 – <b>Best</b> match to through-body |
| 2 – <b>Fair</b> match to through-body  |                                       |



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## TEST RESULTS – Color Uniformity

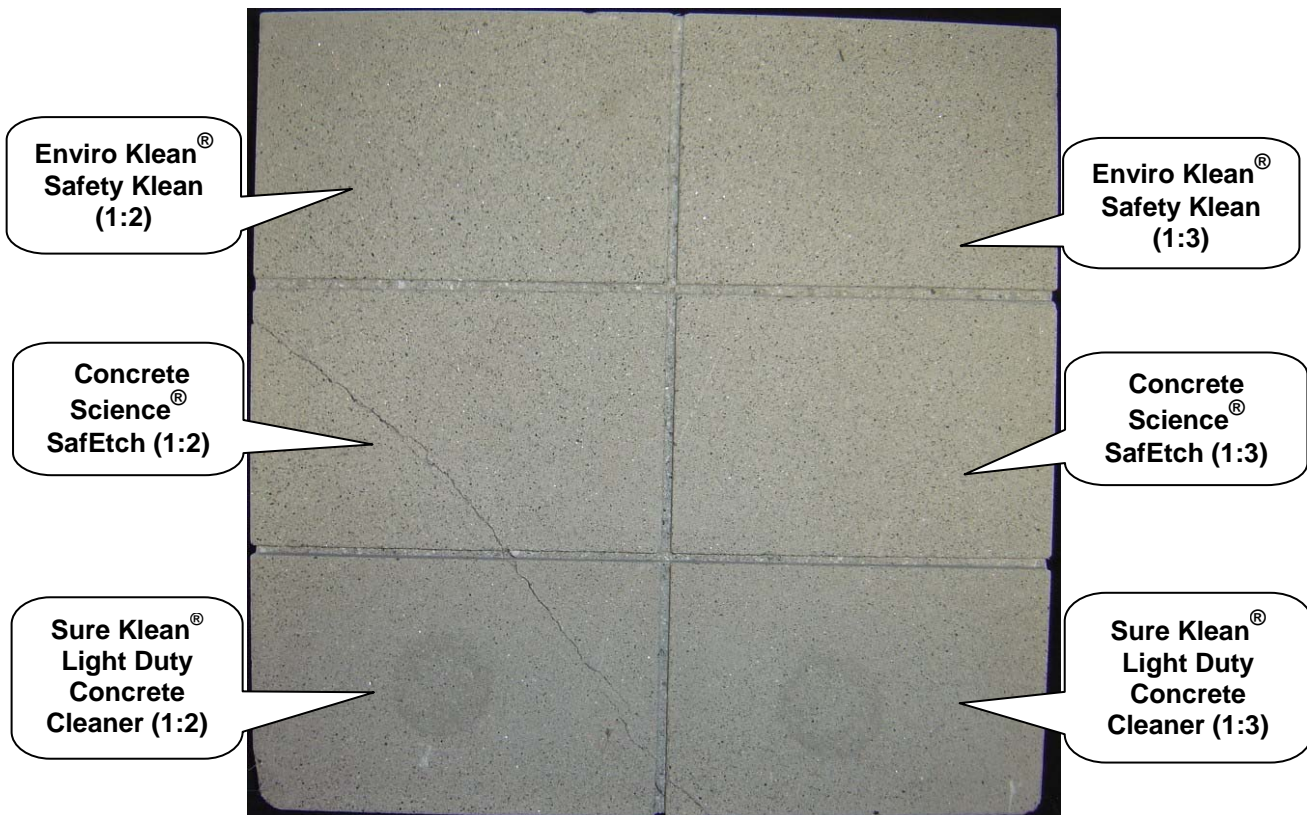
Substrate: "75W Gray"			
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal
Safety Klean	1:2	3	3
Safety Klean	1:3	3	3
SafEtch	1:2	3	3
SafEtch	1:3	3	3
Light Duty Concrete Cleaner	1:2	3	3
Light Duty Concrete Cleaner	1:3	3	3

Scale used for reporting results of both categories

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

## PHOTOGRAPHS- Color Uniformity

"75W Gray" – 21 day Cleaning





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## **CONCLUSIONS – Color Uniformity**

All dilutions of Enviro Klean<sup>®</sup> Safety Klean, ConcreteScience<sup>®</sup> SafEtch, and Sure Klean<sup>®</sup> Light Duty Concrete Cleaner tested affected the substrate in a similar manner, removing slight to moderate amounts of pigmented matrix. All dilutions enhanced the natural appearance of the integrally colored cast stone.

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## **RECOMMENDATIONS – Color Uniformity**

Recommendations for color uniformity for each type of cast stone submitted by Napa Valley Cast Stone, American Canyon, CA, are provided in the chart below. Recommendations are based on the optimum dilution that provides the best color uniformity.

<b>Sample</b>	<b>Recommended Products for Color Uniformity</b>
All Submitted Cast Stone	Enviro Klean <sup>®</sup> Safety Klean 1:3 OR ConcreteScience <sup>®</sup> SafEtch 1:3 OR Sure Klean <sup>®</sup> Light Duty Concrete Cleaner 1:3

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



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## SECTION C - PROTECTIVE WATER REPELLENTS:

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

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

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

**Sure Klean® Weather Seal SL100 Water Repellent** – A modified, “neat” silane system that offers invisible protection and low volatility. SL100 protects horizontal and vertical concrete and masonry surfaces against water and waterborne contaminants. The small molecular structure of SL100 ensures maximum penetration and colorless protection of dense, color-sensitive surfaces. Ideal for GRFC, integrally colored pre-cast concrete and many types of natural stone.

**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.

**Sure Klean® Paver Enhancer** – A solvent-based blend of high-quality siloxanes modified to provide excellent water repellency and color enhancement to interlocking concrete, fired clay, porous tile and many types of natural stone surfaces. Paver Enhancer penetrates and reacts with the surface to form a chemical bond, providing long-term durability, alkali resistance and superior breatheability.

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### SAMPLE PREPARATION - Protective Water Repellents:

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

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### TEST METHODS - Protective Water Repellents:

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

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



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## TEST RESULTS - Protective Water Repellents:

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

	RESULTS
<b>"18W Light Red" Cast Stone</b>	
Untreated Control	60 mph
Weather Seal SL100 Water Repellent	60 mph
SLX100 Water & Oil Repellent	60 mph
Paver Enhancer	60 mph
<b>"71G Light Gray" Cast Stone</b>	
Untreated Control	57 mph
Weather Seal SL100 Water Repellent	60 mph
SLX100 Water & Oil Repellent	60 mph
Paver Enhancer	60 mph
<b>"45W Tan" Cast Stone</b>	
Untreated Control	60 mph
Weather Seal SL100 Water Repellent	60 mph
SLX100 Water & Oil Repellent	60 mph
Paver Enhancer	60 mph
<b>"31W White" Cast Stone</b>	
Untreated Control	58 mph
Weather Seal SL100 Water Repellent	60 mph
SLX100 Water & Oil Repellent	60 mph
Paver Enhancer	60 mph
<b>"75W Gray" Cast Stone</b>	
Untreated Control	60 mph
Weather Seal SL100 Water Repellent	60 mph
SLX100 Water & Oil Repellent	60 mph
Paver Enhancer	60 mph





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## PHOTOGRAPHS – Protective Water Repellents

“31W White”- RILEM testing



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

**Untreated Control**

**Sure Klean® Weather  
Seal SL100 Water  
Repellent**

**Sure Klean®  
Paver Enhancer**



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## **CONCLUSIONS - Protective Water Repellents**

Based upon laboratory evaluations, all of the tested PROSOCO products provided excellent water repellency to each of the submitted samples.

## **RECOMMENDATIONS – Protective Water Repellents**

Recommendations for water repellency treatment for each type of cast stone submitted by Napa Valley Cast Stone, American Canyon, CA, 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.

<b>Block Type</b>	<b>Water Repellents</b>
All Submitted Cast Stone	Stand Off® SLX100 Water & Oil Repellent OR Sure Klean® Weather Seal SL100 Water Repellent OR *Sure Klean® Paver Enhancer

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.

**\*NOTE:** Sure Klean® Paver Enhancer is not available for sale or use in the state of California or in Maricopa County, Arizona.



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## SECTION D – STAIN REPELLENCY

### **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.

**Stand Off® Stone, Tile & Masonry Protector** – A penetrating oil and stain repellent. 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.

**Stand Off® Stain Barrier** – A penetrating oil and stain repellent. This easy-to-use, low-VOC, low-odor protective treatment improves stain resistance and simplifies maintenance cleaning of interior and exterior stone, quarry tile, concrete and masonry surfaces. Surfaces treated with Stain Barrier resist staining from oil, food, and waterborne matter while retaining their natural color, texture, and breatheability. Stain Barrier Volatile Organic Compound (VOC) content is less than 400 g/L.

### **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 (~70°F)  
(~250°F)  
(~120°F)

### **SAMPLE PREPARATION – Stain Repellency**

The method of application for protective treatments followed the PROSOCO, Inc. 2004 Product Guide.



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## TEST METHOD – Stain Repellency

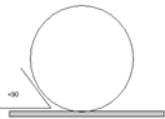
### Surface Beading Evaluation

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°) 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 or liquid quickly absorbed into the substrate and correlates to “below average” repellency.

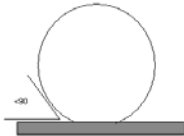
**Note: Non-free flowing staining agents such as ketchup and mustard are applied in a blob and not evaluated for their beading properties.**

#### Rating System (1-5)

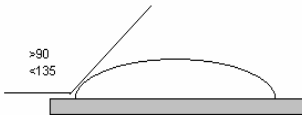
1. No wetting of contact area (no darkening); angle less than 90°



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



**TEST RESULTS – Surface Beading**

<b>“18W Light Red”</b>									
	<b>Coco-Cola</b>	<b>Ketchup</b>	<b>Mustard</b>	<b>Red Wine</b>	<b>Balsamic Vinegar</b>	<b>Soy Sauce</b>	<b>Olive Oil</b>	<b>Wesson Oil</b>	<b>Hot Coffee</b>
<b>Untreated Control</b>	3	-	-	3	3	3	3	3	3
<b>SLX100</b>	2	-	-	2	2	2	2	2	2
<b>STMP</b>	2	-	-	2	2	2	2	2	2
<b>Stain Barrier</b>	2	-	-	2	2	2	2	2	2
<b>“71G Light Gray”</b>									
	<b>Coco-Cola</b>	<b>Ketchup</b>	<b>Mustard</b>	<b>Red Wine</b>	<b>Balsamic Vinegar</b>	<b>Soy Sauce</b>	<b>Olive Oil</b>	<b>Wesson Oil</b>	<b>Hot Coffee</b>
<b>Untreated Control</b>	4	-	-	4	4	4	4	4	4
<b>SLX100</b>	2	-	-	2	2	2	2	2	2
<b>STMP</b>	3	-	-	3	3	3	3	3	3
<b>Stain Barrier</b>	2	-	-	2	2	2	2	2	2
<b>“45W Tan”</b>									
	<b>Coco-Cola</b>	<b>Ketchup</b>	<b>Mustard</b>	<b>Red Wine</b>	<b>Balsamic Vinegar</b>	<b>Soy Sauce</b>	<b>Olive Oil</b>	<b>Wesson Oil</b>	<b>Hot Coffee</b>
<b>Untreated Control</b>	3	-	-	3	3	3	3	3	3
<b>SLX100</b>	3	-	-	3	3	3	3	3	3
<b>STMP</b>	3	-	-	3	3	3	3	3	3
<b>Stain Barrier</b>	3	-	-	3	3	3	3	3	3
<b>“31W White”</b>									
	<b>Coco-Cola</b>	<b>Ketchup</b>	<b>Mustard</b>	<b>Red Wine</b>	<b>Balsamic Vinegar</b>	<b>Soy Sauce</b>	<b>Olive Oil</b>	<b>Wesson Oil</b>	<b>Hot Coffee</b>
<b>Untreated Control</b>	2	-	-	3	3	3	3	3	3
<b>SLX100</b>	2	-	-	2	2	2	2	2	2
<b>STMP</b>	2	-	-	2	2	2	2	2	2
<b>Stain Barrier</b>	2	-	-	2	2	2	2	2	2
<b>“75W Gray”</b>									
	<b>Coco-Cola</b>	<b>Ketchup</b>	<b>Mustard</b>	<b>Red Wine</b>	<b>Balsamic Vinegar</b>	<b>Soy Sauce</b>	<b>Olive Oil</b>	<b>Wesson Oil</b>	<b>Hot Coffee</b>
<b>Untreated Control</b>	2	-	-	3	3	3	3	3	3
<b>SLX100</b>	2	-	-	2	2	2	2	2	2
<b>STMP</b>	2	-	-	2	2	2	2	2	2
<b>Stain Barrier</b>	2	-	-	2	2	2	2	2	2



# PALLET TAG PROGRAM LABORATORY REPORT



**TEST RESULTS – STAINING REMOVAL**

% Removal

**“18W Light Red”**

<b>Untreated Control</b>									
	<b>Coca-Cola</b>	<b>Ketchup</b>	<b>Mustard</b>	<b>Red Wine</b>	<b>Balsamic Vinegar</b>	<b>Soy Sauce</b>	<b>Olive Oil</b>	<b>Wesson Oil</b>	<b>Hot Coffee</b>
<b>24 hr</b>	100%	100%	95%	100%	100%	80%	80%	80%	80%
<b>4 hour</b>	100%	100%	100%	100%	100%	80%	80%	80%	90%
<b>1 hour</b>	100%	99%	100%	100%	100%	80%	80%	80%	90%
<b>10 min.</b>	100%	99%	100%	100%	100%	80%	80%	80%	100%
<b>Stand Off® Stone, Tile, &amp; Masonry Protector</b>									
	<b>Coca-Cola</b>	<b>Ketchup</b>	<b>Mustard</b>	<b>Red Wine</b>	<b>Balsamic Vinegar</b>	<b>Soy Sauce</b>	<b>Olive Oil</b>	<b>Wesson Oil</b>	<b>Hot Coffee</b>
<b>24 hr</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>4 hour</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>1 hour</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>10 min.</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>Stand Off® SLX100 Water &amp; Oil Repellent</b>									
	<b>Coca-Cola</b>	<b>Ketchup</b>	<b>Mustard</b>	<b>Red Wine</b>	<b>Balsamic Vinegar</b>	<b>Soy Sauce</b>	<b>Olive Oil</b>	<b>Wesson Oil</b>	<b>Hot Coffee</b>
<b>24 hr</b>	100%	100%	95%	100%	100%	100%	100%	100%	100%
<b>4 hour</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>1 hour</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>10 min.</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>Stand Off® Stain Barrier</b>									
	<b>Coca-Cola</b>	<b>Ketchup</b>	<b>Mustard</b>	<b>Red Wine</b>	<b>Balsamic Vinegar</b>	<b>Soy Sauce</b>	<b>Olive Oil</b>	<b>Wesson Oil</b>	<b>Hot Coffee</b>
<b>24 hr</b>	100%	100%	95%	100%	100%	100%	80%	80%	100%
<b>4 hour</b>	100%	100%	100%	100%	100%	100%	80%	80%	100%
<b>1 hour</b>	100%	100%	100%	100%	100%	100%	80%	80%	100%
<b>10 min.</b>	100%	100%	100%	100%	100%	100%	80%	80%	100%



# PALLET TAG PROGRAM LABORATORY REPORT



**TEST RESULTS – STAINING REMOVAL**

% Removal

**“71G Light Gray”**

<b>Untreated Control</b>									
	<b>Coca-Cola</b>	<b>Ketchup</b>	<b>Mustard</b>	<b>Red Wine</b>	<b>Balsamic Vinegar</b>	<b>Soy Sauce</b>	<b>Olive Oil</b>	<b>Wesson Oil</b>	<b>Hot Coffee</b>
<b>24 hr</b>	100%	100%	95%	100%	100%	90%	90%	90%	90%
<b>4 hour</b>	100%	100%	100%	100%	100%	100%	90%	90%	90%
<b>1 hour</b>	100%	100%	100%	100%	100%	100%	90%	90%	90%
<b>10 min.</b>	100%	100%	100%	100%	100%	100%	90%	90%	90%
<b>Stand Off® Stone, Tile, &amp; Masonry Protector</b>									
	<b>Coca-Cola</b>	<b>Ketchup</b>	<b>Mustard</b>	<b>Red Wine</b>	<b>Balsamic Vinegar</b>	<b>Soy Sauce</b>	<b>Olive Oil</b>	<b>Wesson Oil</b>	<b>Hot Coffee</b>
<b>24 hr</b>	100%	100%	98%	100%	100%	100%	100%	100%	100%
<b>4 hour</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>1 hour</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>10 min.</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>Stand Off® SLX100 Water &amp; Oil Repellent</b>									
	<b>Coca-Cola</b>	<b>Ketchup</b>	<b>Mustard</b>	<b>Red Wine</b>	<b>Balsamic Vinegar</b>	<b>Soy Sauce</b>	<b>Olive Oil</b>	<b>Wesson Oil</b>	<b>Hot Coffee</b>
<b>24 hr</b>	100%	100%	95%	100%	100%	100%	100%	100%	100%
<b>4 hour</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>1 hour</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>10 min.</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>Stand Off® Stain Barrier</b>									
	<b>Coca-Cola</b>	<b>Ketchup</b>	<b>Mustard</b>	<b>Red Wine</b>	<b>Balsamic Vinegar</b>	<b>Soy Sauce</b>	<b>Olive Oil</b>	<b>Wesson Oil</b>	<b>Hot Coffee</b>
<b>24 hr</b>	100%	100%	95%	100%	100%	90%	90%	90%	100%
<b>4 hour</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>1 hour</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>10 min.</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%



# PALLET TAG PROGRAM LABORATORY REPORT



**TEST RESULTS – STAINING REMOVAL**

% Removal

“45W Tan”

Untreated Control									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
<b>24 hr</b>	100%	100%	99%	100%	100%	100%	90%	90%	95%
<b>4 hour</b>	100%	100%	100%	100%	100%	100%	90%	90%	95%
<b>1 hour</b>	100%	100%	100%	100%	100%	100%	90%	90%	95%
<b>10 min.</b>	100%	100%	100%	100%	100%	100%	90%	90%	99%
Stand Off® Stone, Tile, & Masonry Protector									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
<b>24 hr</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>4 hour</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>1 hour</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>10 min.</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
Stand Off® SLX100 Water & Oil Repellent									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
<b>24 hr</b>	100%	100%	80%	100%	100%	100%	100%	100%	100%
<b>4 hour</b>	100%	100%	90%	100%	100%	100%	100%	100%	100%
<b>1 hour</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>10 min.</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
Stand Off® Stain Barrier									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
<b>24 hr</b>	100%	100%	90%	100%	100%	100%	95%	90%	100%
<b>4 hour</b>	100%	100%	100%	100%	100%	100%	95%	90%	100%
<b>1 hour</b>	100%	100%	100%	100%	100%	100%	95%	90%	100%
<b>10 min.</b>	100%	100%	100%	100%	100%	100%	99%	99%	100%





# PALLET TAG PROGRAM LABORATORY REPORT



## TEST RESULTS – STAINING REMOVAL

% Removal

“31W White”

Untreated Control									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%	95%	100%	90%	90%	90%	90%	90%
4 hour	100%	100%	99%	100%	99%	99%	99%	95%	99%
1 hour	100%	100%	99%	100%	99%	99%	99%	99%	99%
10 min.	100%	100%	99%	100%	100%	99%	99%	100%	100%
Stand Off® Stone, Tile, & Masonry Protector									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%	99%	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® SLX100 Water & Oil Repellent									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%	95%	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® Stain Barrier									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%	95%	100%	100%	100%	100%	100%	95%
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%



# PALLET TAG PROGRAM LABORATORY REPORT



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# PALLET TAG PROGRAM LABORATORY REPORT



**TEST RESULTS – STAINING REMOVAL**

% Removal

“75W Gray”

<b>Untreated Control</b>									
	<b>Coca-Cola</b>	<b>Ketchup</b>	<b>Mustard</b>	<b>Red Wine</b>	<b>Balsamic Vinegar</b>	<b>Soy Sauce</b>	<b>Olive Oil</b>	<b>Wesson Oil</b>	<b>Hot Coffee</b>
<b>24 hr</b>	100%	30%	80%	100%	95%	100%	95%	95%	95%
<b>4 hour</b>	100%	100%	95%	100%	99%	100%	95%	95%	95%
<b>1 hour</b>	100%	100%	99%	100%	99%	100%	95%	95%	95%
<b>10 min.</b>	100%	100%	99%	100%	100%	100%	95%	95%	95%
<b>Stand Off® Stone, Tile, &amp; Masonry Protector</b>									
	<b>Coca-Cola</b>	<b>Ketchup</b>	<b>Mustard</b>	<b>Red Wine</b>	<b>Balsamic Vinegar</b>	<b>Soy Sauce</b>	<b>Olive Oil</b>	<b>Wesson Oil</b>	<b>Hot Coffee</b>
<b>24 hr</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>4 hour</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>1 hour</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>10 min.</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>Stand Off® SLX100 Water &amp; Oil Repellent</b>									
	<b>Coca-Cola</b>	<b>Ketchup</b>	<b>Mustard</b>	<b>Red Wine</b>	<b>Balsamic Vinegar</b>	<b>Soy Sauce</b>	<b>Olive Oil</b>	<b>Wesson Oil</b>	<b>Hot Coffee</b>
<b>24 hr</b>	100%	100%	95%	100%	100%	100%	100%	100%	100%
<b>4 hour</b>	100%	100%	99%	100%	100%	100%	100%	100%	100%
<b>1 hour</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>10 min.</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>Stand Off® Stain Barrier</b>									
	<b>Coca-Cola</b>	<b>Ketchup</b>	<b>Mustard</b>	<b>Red Wine</b>	<b>Balsamic Vinegar</b>	<b>Soy Sauce</b>	<b>Olive Oil</b>	<b>Wesson Oil</b>	<b>Hot Coffee</b>
<b>24 hr</b>	100%	100%	90%	100%	100%	100%	90%	90%	100%
<b>4 hour</b>	100%	100%	100%	100%	100%	100%	95%	95%	100%
<b>1 hour</b>	100%	100%	100%	100%	100%	100%	99%	99%	100%
<b>10 min.</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%



# PALLET TAG PROGRAM LABORATORY REPORT

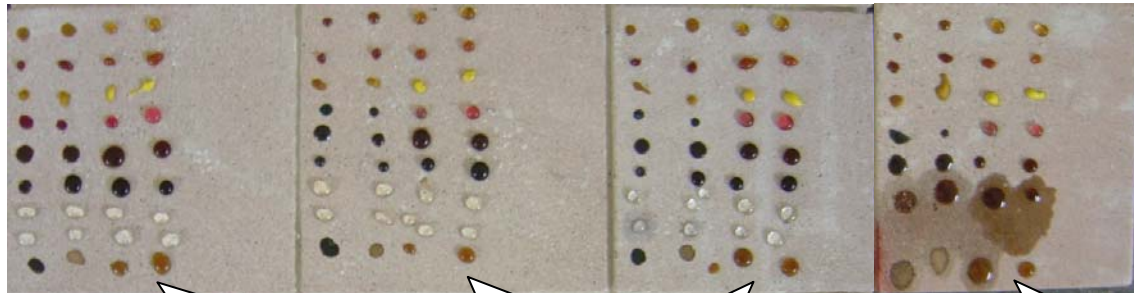


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## PHOTOGRAPHS- Stain Results

"75W Gray"; Stains applied



Stand Off<sup>®</sup> Stone,  
Tile, & Masonry  
Protector

Stand Off<sup>®</sup> SLX100  
Water & Oil  
Repellent

Stand Off<sup>®</sup>  
Stain Barrier

Untreated  
Control

"75W Gray"; Stains removed



Stand Off<sup>®</sup> Stone,  
Tile, & Masonry  
Protector

Stand Off<sup>®</sup>  
SLX100 Water &  
Oil Repellent

Stand Off<sup>®</sup>  
Stain Barrier

Untreated  
Control



# PALLET TAG PROGRAM LABORATORY REPORT



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## **CONCLUSIONS – Stain Repellency**

Based upon laboratory evaluations, Stand Off® Stone, Tile, and Masonry Protector, Stand Off® SLX100 Water & Oil Repellent, and Stand Off® Stain Barrier were extremely effective in repelling the staining agents from the samples tested.

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## **RECOMMENDATIONS – STAIN REPELLENCY**

Recommendations for stain repellency for Napa Valley Cast Stone, American Canyon, CA, are provided in the chart below. Recommendations are based on the treatments that proved most effective for providing stain repellency on all types submitted.

<b>Sample</b>	<b>Stain Repellent</b>	<b>Maintenance Cleaner</b>
All Submitted Cast Stone	Stand Off® Stone, Tile, and Masonry Protector OR Stand Off® SLX100 Water & Oil Repellent OR Stand Off® Stain Barrier	Enviro Klean® 2010 All Surface Cleaner (1:10)



# PALLET TAG PROGRAM LABORATORY REPORT



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## SECTION E – COLOR ENHANCEMENT:

### DESCRIPTION OF PRODUCTS EVALUATED – Color Enhancement:

**Sure Klean® Paver Enhancer** - A solvent-based blend of high-quality siloxanes modified to provide excellent water repellency and color enhancement to interlocking concrete, fired clay, porous tile and many types of natural stone surfaces. Paver Enhancer penetrates and reacts with the surface to form a chemical bond, providing long-term durability, alkali resistance and superior breatheability.

**Stand Off® Gloss 'N Guard WB** - A highly durable polyurethane protective coating for tile, pavers, terrazzo and other polished and unpolished masonry. Gloss 'N Guard WB dries to a high-gloss finish, which enhances the natural beauty of treated surfaces, both horizontal and vertical. Gloss 'N Guard WB's water-based formula offers several improvements on similar solvent-based products. No solvent odor, easy soap and water cleanup, and reduced fire-hazards make the treatment safe and easy to use, as well as effective. In addition, Gloss 'N Guard WB complies with all known regulations limiting Volatile Organic Compound (VOC) content.

**ConcreteScience® SpecSeal WB-Flat** - A stabilized styrene acrylic co-polymer-based curing, sealing, compound. It's tough, chemical resistant, long lasting and non-yellowing. A surface coated with SpecSeal WB-Flat will bead water much like a freshly waxed car. The product is effective on vertical and horizontal, exterior and interior, above- and below-grade architectural concrete and masonry. SpecSeal WB-Flat is formulated from styrene acrylic co-polymer resin emulsions specially manufactured to yield a non-yellowing film and VOC compliance. Independent lab analysis confirms that the product's non-yellowing characteristics outlast and outperform competitive products and equal the performance of pure acrylic systems.

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## TEST METHOD – COLOR ENHANCEMENT

The color enhancing products were applied in accordance with the 2004 PROSOCO, Inc. Product Guide application instructions.



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## TEST RESULTS- COLOR ENHANCEMENT

Sample	*Sure Klean® Paver Enhancer	Stand Off® Gloss 'N Guard WB	ConcreteScience® SpecSeal WB-Flat
"18W Light Red"	1	0	3
"71G Light Gray"	0	0	3
"45W Tan"	1	0	3
"31W White"	1	0	3
"75W Gray"	0	0	3

**Scale: 0- No enhancement; dull**

**1- Slight Enhancement**

**2- Moderate Enhancement**

**3- Significant Enhancement**

**\*NOTE:** Sure Klean® Paver Enhancer is not available for sale or use in the state of California or in Maricopa County, Arizona.



# PALLET TAG PROGRAM LABORATORY REPORT



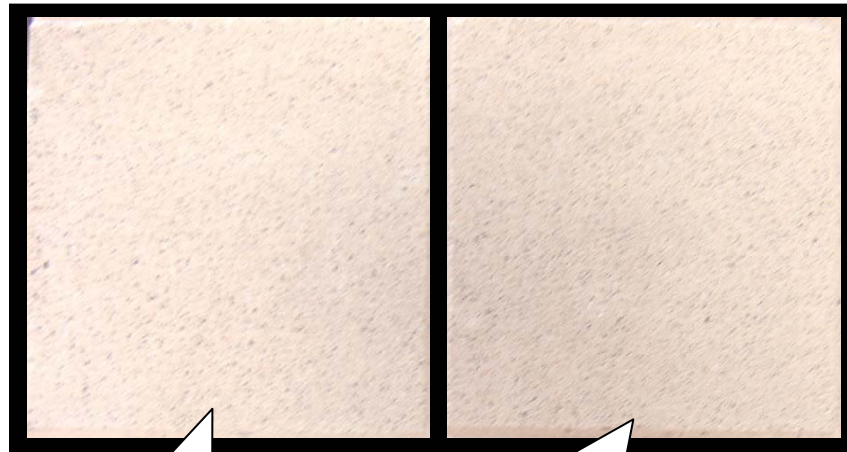
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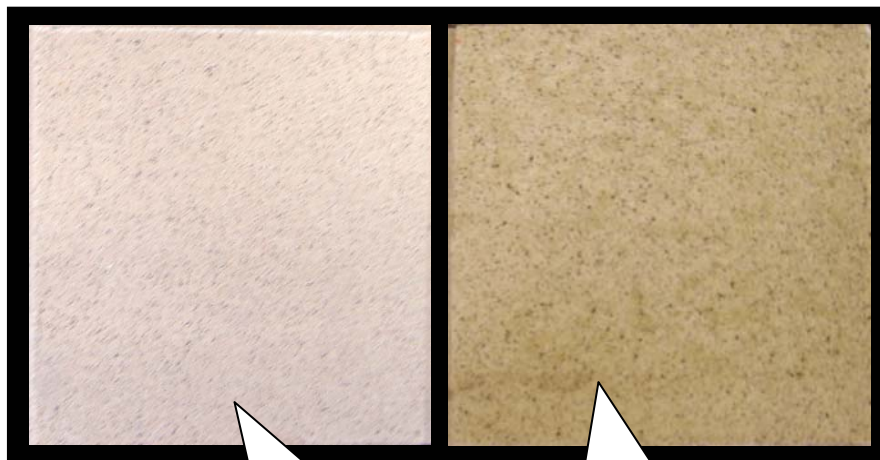
## PHOTOGRAPHS- Color Enhancement

### "31W White" With Treatments



Untreated  
Control

Stand Off<sup>®</sup> Gloss  
N' Guard WB



Sure Klean<sup>®</sup>  
Paver Enhancer

ConcreteScience<sup>®</sup>  
SpecSeal WB-Flat





# PALLET TAG PROGRAM LABORATORY REPORT



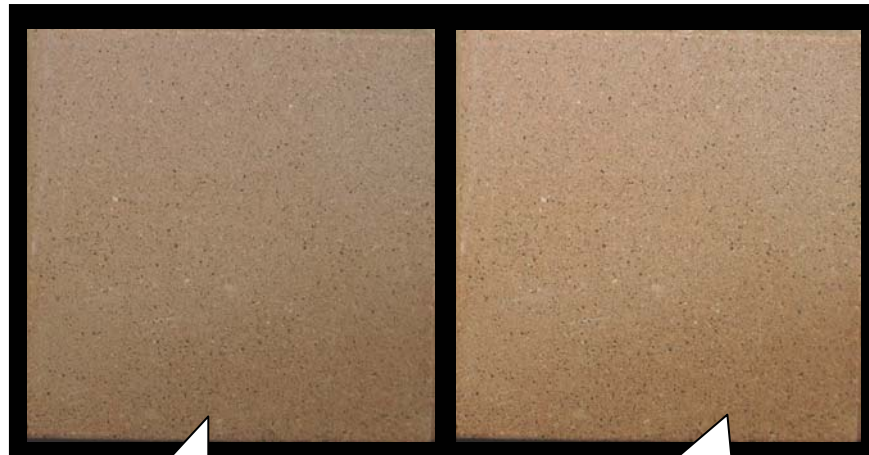
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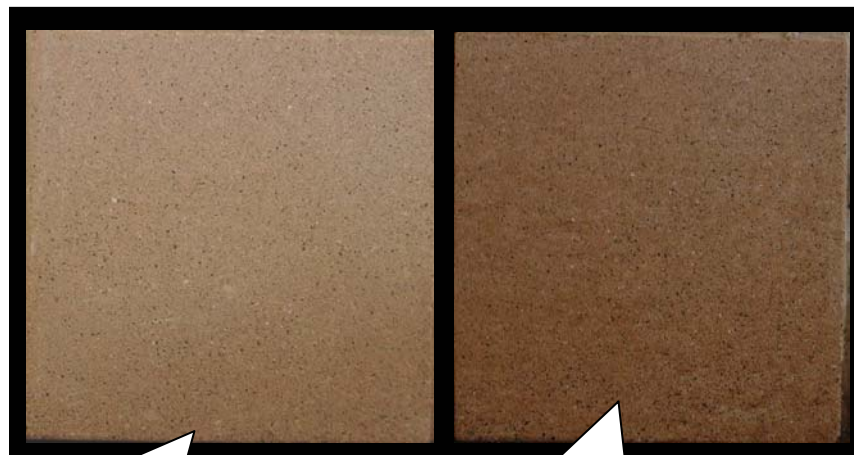
## PHOTOGRAPHS- Color Enhancement

### "18W Red" With Treatments



Untreated  
Control

Stand Off<sup>®</sup> Gloss  
N' Guard WB



Sure Klean<sup>®</sup>  
Paver Enhancer

ConcreteScience<sup>®</sup>  
SpecSeal WB-Flat



# PALLET TAG PROGRAM LABORATORY REPORT



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## RECOMMENDATIONS – Color Enhancement

Recommendations for color enhancement for each type of cast stone submitted by Napa Valley Cast Stone, American Canyon, CA, are provided in the chart below. Recommendations are based on the treatment that proved most effective in providing color enhancement to each sample.

Sample	Color Enhancement
"71G Light Gray" "75W Gray"	ConcreteScience® SpecSeal WB-Flat
"18W Light Red" "45W Tan" "31W White"	*Sure Klean® Paver Enhancer OR ConcreteScience® SpecSeal WB-Flat

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.

**\*NOTE:** Sure Klean® Paver Enhancer is not available for sale or use in the state of California or in Maricopa County, Arizona.

Christopher A. Moore  
Project Testing Laboratory Technician

CAM



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***Laboratory Report***

**Pallet Tag Program Evaluation**

**Napa Valley Cast Stone  
American Canyon, CA**

***Project No. 0406-12 PTP***

***Prepared For:***

**Napa Valley Cast Stone  
1111 Green Island Road  
American Canyon, CA 94503**

***Prepared By:***



***PROSOCO, Inc.  
July 2004***