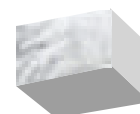




# PALLET TAG PROGRAM LABORATORY REPORT



**PROSOCO, Inc.**

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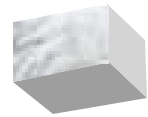
### ATTACHMENTS

Technical Services TECH Note RILEM Test Method No. II.4

Product Data literature for all products evaluated



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**FOR:** Steve Osterfoss  
**Cc:** Paul Tessier

**SUBJECT:** Robinson Brick Company  
Denver, CO

**DATE:** May 10, 2002

**PROJECT:** 0202-12 PTP

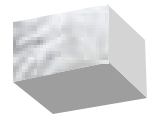
**SAMPLES SUBMITTED:** Seventeen different types of natural stone  
Size: Various sizes

<b>Sample</b>	<b>Type</b>
Buechel	Dolomite
"Pink" Cobblestone	Granite
"Grey" Cobblestone	Granite
Farmer's Rock	Sandstone
Brownstone "Cherokee"	Quartzite
Brownstone "Brownstone"	Sandstone
Rhyolite	Rhyolite
River Rock "Red"	Sandstone
River Rock "Natural"	Sandstone
Colorado Flagstone "Natural"	Quartzite
Colorado Flagstone "Rubble"	Quartzite
Siloam Sienna "Grey"	Sandstone
Siloam Sienna "Buff"	Sandstone
Colorado Flagstone "White"	Quartzite
Colorado Flagstone "Buff/Yellow/Brown"	Quartzite
Canyon Wall	Sandstone
Desert Slab	Sandstone

Submitted by: Paul Tessier



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## PURPOSE OF TESTING:

Seventeen different styles of natural stone were submitted to PROSOCO, Inc.'s Testing Laboratory with a request to determine if application of the products evaluated will produce any surface alteration during new construction cleaning operations. Additionally, the effectiveness of water and stain repellents, suitable for natural stone, will be evaluated.

**A. New Construction Cleaning** – Sure Klean® Burnished Custom Masonry Cleaner diluted with 2 parts fresh water and Sure Klean® Vana Trol® diluted with 10 parts fresh water were evaluated for removal of laboratory applied mortar.

To simulate new construction soiling, all 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 unit and filled with a wet mixture of Ash Grove® Type S cementitious mortar. The wet, mortar-filled cylinder is allowed to remain in contact with the unit for 10 minutes before removal.

Soiled units are allowed to dry before test cleaning.

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

**B. Surface Alteration Testing** – Sure Klean® Burnished Custom Masonry Cleaner diluted with 2 parts fresh water and Sure Klean® Vana Trol® diluted with 10 parts fresh water were tested to determine if a cleaning program implemented to remove excess mortar and related new construction soiling would otherwise alter the appearance of cleaned surfaces. Surface Alteration was evaluated visually based upon perceived discoloration or erosion/etching of the masonry unit.

Surface Finish Removal is the visual examination of the natural stone unit 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 natural stone unit 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 unit.

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.

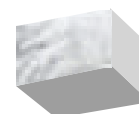
Staining is the visual examination for changes that are the result of a chemical reaction that leaves a staining precipitate.

**C. Water Repellent Evaluation** – Sure Klean® Weather Seal Natural Stone Treatment, Stand Off® Limestone & Masonry Protector, Stand Off® SLX100 Water & Oil Repellent, Sure Klean® Weather Seal Siloxane PD, and Sure Klean® Weather Seal SL100 Water Repellent were evaluated on the appropriate submitted samples for their ability to provide water repellency.

**D. Stain Repellent Evaluation** – Stand Off® Stone, Tile & Masonry Protector, Stand Off® Limestone & Masonry Protector, and Stand Off® SLX100 Water & Oil Repellent were evaluated on the submitted samples for their ability to provide stain repellency.



# PALLET TAG PROGRAM LABORATORY REPORT



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### CLEANING AND SURFACE ALTERATION PRODUCTS EVALUATED

SAMPLE	PRODUCT	DILUTION
All Types of Submitted Natural Stone	Sure Klean <sup>®</sup> Burnished Custom Masonry Cleaner	1:2
	Sure Klean <sup>®</sup> Vana Trol <sup>®</sup>	1:10

### WATER REPELLENT PRODUCTS EVALUATED

SAMPLE	TREATMENT
All Submitted Granite Stone Samples	Sure Klean <sup>®</sup> Weather Seal SL100 Water Repellent
	Stand Off <sup>®</sup> SLX100 Water & Oil Repellent
All Submitted Dolomite Stone Samples	Sure Klean <sup>®</sup> Weather Seal Natural Stone Treatment
All Submitted Sandstone and Quartzite Stone Samples	Sure Klean <sup>®</sup> Weather Seal Natural Stone Treatment
	Sure Klean <sup>®</sup> Weather Seal Siloxane PD

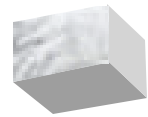
### STAIN REPELLENT PRODUCTS EVALUATED

SAMPLE	TREATMENT
All Submitted Granite Stone Samples	Stand Off <sup>®</sup> SLX100 Water & Oil Repellent
All Submitted Dolomite, Sandstone, & Quartzite Stone Samples	Stand Off <sup>®</sup> Stone, Tile, & Masonry Protector
	Stand Off <sup>®</sup> Limestone & Marble Protector

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



# PALLET TAG PROGRAM LABORATORY REPORT



## SECTION A – NEW CONSTRUCTION CLEANING

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

These cleaning trials were conducted to determine the optimal cleaning/cure time combination to most efficiently remove Ash Grove<sup>®</sup> Type S mortar from the submitted natural stone units.

Ash Grove<sup>®</sup> Type S mortar was prepared in compliance with the manufacturers instructions, applied to the unit and allowed to cure for 3, 7 and 14 days prior to removal with high pressure water rinse using pressure rinsing equipment and chemical assist. The removal of gray Ash Grove<sup>®</sup> Type S masonry cement mortar after 3, 7, and 14 days of curing was visually evaluated.

**Sure Klean<sup>®</sup> Burnished Custom Masonry Cleaner** – A general-purpose, non-etching acidic cleaner removes rust, mud, oil, 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. Liquid concentrate for dilution with 1-3 parts water. Apply by brush or low-pressure spray.

**Sure Klean<sup>®</sup> Vana Trol<sup>®</sup>** – A concentrated acidic cleaner for new masonry surfaces that are subject to vanadium, manganese and other metallic stains. Use on: gray, brown, white and most light-colored brick; natural stone; cast stone. Dissolves mortar smears and construction dirt quickly, leaving the masonry clean and uniform with no acid burning or streaking. Liquid concentrate for dilution with 4-25 parts water. Apply by brush or low-pressure spray.

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

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

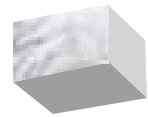
1. Prewet the surface with water.
2. Apply the cleaner.
3. Allow the appropriate dwell time, as specified.
 

Burnished Custom Masonry Cleaner .....	3 minutes
Vana Trol <sup>®</sup> .....	5 minutes
4. Pressure rinse thoroughly.\*

\* 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.**

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**TEST RESULTS – New Construction Cleaning**

**% Mortar Removal**

**“Buechel”**

	<u><b>3 day</b></u>	<u><b>7 day</b></u>	<u><b>14 day</b></u>
Burnished Custom Masonry Cleaner (1:2)	100%	100%	100%
Vana Trol <sup>®</sup> (1:10)	100%	100%	100%

**“Pink Cobblestone”**

	<u><b>3 day</b></u>	<u><b>7 day</b></u>	<u><b>14 day</b></u>
Burnished Custom Masonry Cleaner (1:2)	100%	100%	100%
Vana Trol <sup>®</sup> (1:10)	100%	100%	100%

**“Gray Cobblestone”**

	<u><b>3 day</b></u>	<u><b>7 day</b></u>	<u><b>14 day</b></u>
Burnished Custom Masonry Cleaner (1:2)	100%	100%	100%
Vana Trol <sup>®</sup> (1:10)	100%	100%	100%

**“Farmer’s Rock”**

	<u><b>3 day</b></u>	<u><b>7 day</b></u>	<u><b>14 day</b></u>
Burnished Custom Masonry Cleaner (1:2)	100%	100%	100%
Vana Trol <sup>®</sup> (1:10)	100%	100%	100%

**“Brownstone Cherokee”**

	<u><b>3 day</b></u>	<u><b>7 day</b></u>	<u><b>14 day</b></u>
Burnished Custom Masonry Cleaner (1:2)	100%	100%	100%
Vana Trol <sup>®</sup> (1:10)	100%	100%	100%

**“Brownstone Brownstone”**

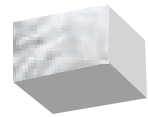
	<u><b>3 day</b></u>	<u><b>7 day</b></u>	<u><b>14 day</b></u>
Burnished Custom Masonry Cleaner (1:2)	99%	99%	98%
Vana Trol <sup>®</sup> (1:10)	100%	100%	99%

**“Rhyolite”**

	<u><b>3 day</b></u>	<u><b>7 day</b></u>	<u><b>14 day</b></u>
Burnished Custom Masonry Cleaner (1:2)	100%	100%	100%
Vana Trol <sup>®</sup> (1:10)	100%	100%	100%



# PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

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## TEST RESULTS – New Construction Cleaning

### % Mortar Removal

#### “Rhyolite”

	<u>3 day</u>	<u>7 day</u>	<u>14 day</u>
Burnished Custom Masonry Cleaner (1:2)	100%	100%	100%
Vana Trol <sup>®</sup> (1:10)	100%	100%	100%

#### “River Rock Red”

	<u>3 day</u>	<u>7 day</u>	<u>14 day</u>
Burnished Custom Masonry Cleaner (1:2)	100%	100%	100%
Vana Trol <sup>®</sup> (1:10)	100%	100%	100%

#### “River Rock Natural”

	<u>3 day</u>	<u>7 day</u>	<u>14 day</u>
Burnished Custom Masonry Cleaner (1:2)	100%	100%	100%
Vana Trol <sup>®</sup> (1:10)	100%	100%	100%

#### “Colorado Flagstone Natural”

	<u>3 day</u>	<u>7 day</u>	<u>14 day</u>
Burnished Custom Masonry Cleaner (1:2)	100%	100%	100%
Vana Trol <sup>®</sup> (1:10)	100%	100%	100%

#### “Colorado Flagstone Rubble”

	<u>3 day</u>	<u>7 day</u>	<u>14 day</u>
Burnished Custom Masonry Cleaner (1:2)	100%	100%	100%
Vana Trol <sup>®</sup> (1:10)	100%	100%	100%

#### “Siloam Sienna Grey”

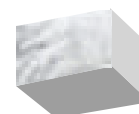
	<u>3 day</u>	<u>7 day</u>	<u>14 day</u>
Burnished Custom Masonry Cleaner (1:2)	100%	100%	100%
Vana Trol <sup>®</sup> (1:10)	100%	100%	100%

#### “Siloam Sienna Buff”

	<u>3 day</u>	<u>7 day</u>	<u>14 day</u>
Burnished Custom Masonry Cleaner (1:2)	100%	100%	100%
Vana Trol <sup>®</sup> (1:10)	100%	100%	100%



# PALLET TAG PROGRAM LABORATORY REPORT



## TEST RESULTS – New Construction Cleaning

### % Mortar Removal

#### “Colorado Flagstone White”

	<u>3 day</u>	<u>7 day</u>	<u>14 day</u>
Burnished Custom Masonry Cleaner (1:2)	100%	100%	100%
Vana Trol <sup>®</sup> (1:10)	100%	100%	100%

#### “Colorado Flagstone Buff/Yellow/Brown”

	<u>3 day</u>	<u>7 day</u>	<u>14 day</u>
Burnished Custom Masonry Cleaner (1:2)	100%	100%	100%
Vana Trol <sup>®</sup> (1:10)	100%	100%	100%

#### “Canyon Wall”

	<u>3 day</u>	<u>7 day</u>	<u>14 day</u>
Burnished Custom Masonry Cleaner (1:2)	99%	99%	98%
Vana Trol <sup>®</sup> (1:10)	100%	100%	100%

#### “Desert Slab”

	<u>3 day</u>	<u>7 day</u>	<u>14 day</u>
Burnished Custom Masonry Cleaner (1:2)	100%	100%	100%
Vana Trol <sup>®</sup> (1:10)	100%	100%	100%

## CONCLUSIONS – New Construction Cleaning

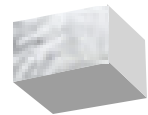
Based on the test results, both cleaners performed extremely well in removing excess mortar smears on the submitted natural stone samples. The cleaners performed well in removing the mortar soils even after allowing the mortar to remain on the surface of the stones for 14 days under ideal curing conditions. Sure Klean<sup>®</sup> Vana Trol<sup>®</sup> performed slightly better than Sure Klean<sup>®</sup> Burnished Custom Masonry Cleaner in terms of total mortar removal on sample types “Brownstone Brownstone” and “Canyon Wall”.

It is also recommended that the selected cleaners always be used in the lowest possible concentration. They should be rinsed with the lowest pressure of water as practical. To facilitate easier removal of excess mortar and construction dirt while minimizing any potential adverse affect on the natural stone units, clean within 7 days of construction.





# PALLET TAG PROGRAM LABORATORY REPORT



## RECOMMENDATIONS – New Construction Cleaning

Recommendations for cleaning for each type of natural stone unit submitted by Robinson Brick Company, Denver, CO are provided in the chart below. Recommendations are based on the optimum dilution for complete removal of mortar while limiting surface alterations.

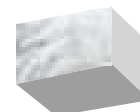
Sample	Sure Klean® Burnished Custom Masonry Cleaner	Sure Klean® Vana Trol®
"Buechel"	1:2	1:10
"Pink Cobblestone"	1:2	1:10
"Grey Cobblestone"	1:2	1:10
"Farmer's Rock"	1:2	1:10
"Brownstone Cherokee"	1:2	1:10
"Brownstone Brownstone"	---	1:10
"Rhyolite"	1:2	1:10
"River Rock Red"	1:2	1:10
"River Rock Natural"	1:2	1:10
"Colorado Flagstone Natural"	1:2	1:10
"Colorado Flagstone Rubble"	1:2	1:10
"Siloam Sienna Grey"	1:2	1:10
"Siloam Sienna Buff"	1:2	1:10
"Colorado Flagstone White"	1:2	1:10
"Colorado Flagstone Buff/Yellow/Brown"	1:2	1:10
"Canyon Wall"	---	1:10
"Desert Slab"	1:2	1:10

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.



# PALLET TAG PROGRAM LABORATORY REPORT



## SECTION B – SURFACE ALTERATIONS

### DESCRIPTION OF PRODUCTS EVALUATED – Surface Alterations

**Sure Klean® Burnished Custom Masonry Cleaner** – A general-purpose, non-etching acidic cleaner removes rust, mud, oil, 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. Liquid concentrate for dilution with 1-3 parts water. Apply by brush or low-pressure spray.

**Sure Klean® Vana Trol®** – A concentrated acidic cleaner for new masonry surfaces that are subject to vanadium, manganese and other metallic stains. Use on: gray, brown, white and most light-colored brick; natural stone; cast stone. Dissolves mortar smears and construction dirt quickly, leaving the masonry clean and uniform with no acid burning or streaking. Liquid concentrate for dilution with 4-25 parts water. Apply by brush or low-pressure spray.

### TEST METHOD – Surface Alterations

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

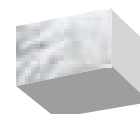
1. Prewet the surface with water.
2. Apply the cleaner.
3. Allow the appropriate dwell time, as specified.
 

Burnished Custom Masonry Cleaner .....	5 minutes
Vana Trol® .....	3 minutes
4. Pressure rinse thoroughly.\*

\* 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



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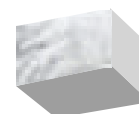
**TEST RESULTS – Surface Alterations**

<b>Substrate: Buechel</b>					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:10	0	1	1	0
Burnished Custom Masonry Cleaner	1:2	0	1	1	0
<b>Substrate: Pink Cobblestone</b>					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:10	0	0	0	0
Burnished Custom Masonry Cleaner	1:2	0	0	0	0
<b>Substrate: Grey Cobblestone</b>					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:10	0	0	0	0
Burnished Custom Masonry Cleaner	1:2	0	0	0	0
<b>Substrate: Farmer's Rock</b>					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:10	0	0	0	0
Burnished Custom Masonry Cleaner	1:2	0	0	0	0
<b>Substrate: Brownstone Cherokee</b>					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:10	0	0	0	0
Burnished Custom Masonry Cleaner	1:2	0	0	0	0
<b>Substrate: Brownstone Brownstone</b>					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:10	0	0	0	0
Burnished Custom Masonry Cleaner	1:2	0	0	0	0
<b>Substrate: Rhyolite</b>					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:10	0	0	0	0
Burnished Custom Masonry Cleaner	1:2	0	0	0	0

<p>Scale used for reporting results of all categories</p> <table style="width: 100%;"> <tr> <td style="width: 50%;">0 – no change</td> <td style="width: 50%;">3 – heavy</td> </tr> <tr> <td>1 – slight</td> <td>4 – excessive</td> </tr> <tr> <td>2 – moderate</td> <td></td> </tr> </table>	0 – no change	3 – heavy	1 – slight	4 – excessive	2 – moderate	
0 – no change	3 – heavy					
1 – slight	4 – excessive					
2 – moderate						



# PALLET TAG PROGRAM LABORATORY REPORT



**PROSOCO, Inc.**

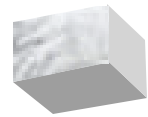
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<b>Substrate: River Rock Red</b>					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:10	0	0	0	0
Burnished Custom Masonry Cleaner	1:2	0	0	0	0
<b>Substrate: River Rock Natural</b>					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:10	0	0	0	0
Burnished Custom Masonry Cleaner	1:2	0	0	0	0
<b>Substrate: Colorado Flagstone Natural</b>					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:10	1	0	1	0
Burnished Custom Masonry Cleaner	1:2	0	0	0	0
<b>Substrate: Colorado Flagstone Rubble</b>					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:10	0	0	0	0
Burnished Custom Masonry Cleaner	1:2	0	0	0	0
<b>Substrate: Siloam Sienna Grey</b>					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:10	0	0	0	0
Burnished Custom Masonry Cleaner	1:2	0	0	0	0
<b>Substrate: Siloam Sienna Buff</b>					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:10	0	0	0	0
Burnished Custom Masonry Cleaner	1:2	0	0	0	0
<b>Substrate: Colorado Flagstone White</b>					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:10	0	0	0	0
Burnished Custom Masonry Cleaner	1:2	0	0	0	0
<b>Substrate: Colorado Flagstone Buff/Yellow/Brown</b>					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:10	0	0	0	0
Burnished Custom Masonry Cleaner	1:2	0	0	0	0

Scale used for reporting results of all categories	
0 – no change	3 – heavy
1 – slight	4 – excessive
2 – moderate	



# PALLET TAG PROGRAM LABORATORY REPORT



**PROSOCO, Inc.**

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**TEST RESULTS:**

**Surface Alterations Evaluation:**

<b>Substrate: Canyon Wall</b>					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:10	0	0	0	0
Burnished Custom Masonry	1:2	0	0	0	0
<b>Substrate: Desert Slab</b>					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:10	0	0	0	0
Burnished Custom Masonry	1:2	0	0	0	0

Scale used for reporting results of all categories

0 – no change 1 – slight 2 – moderate	3 – heavy 4 – excessive
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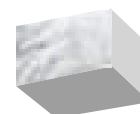
**“Buechel” – after 14 day cleaning**



Untreated Control	Burnished Custom Masonry Cleaner 1:2	Vana Trol® 1:10
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# PALLET TAG PROGRAM LABORATORY REPORT



## CONCLUSIONS – Surface Alterations

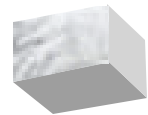
These tests show that surface alterations were caused by both Sure Klean<sup>®</sup> Burnished Custom Masonry Cleaner and Sure Klean<sup>®</sup> Vana Trol<sup>®</sup> on natural stone type “Buechel”. Due to the calcareous nature of this stone, these results are not unexpected. Testing on natural stone type “Colorado Flagstone Natural” indicates that Sure Klean<sup>®</sup> Vana Trol removes some of the loosely bound rust color from the surface of the stone. No other natural stone types were affected by any of the cleaners tested.

It is recommended that the selected cleaners always be used in the lowest possible concentration. They should be rinsed with the lowest pressure of water as practical. To facilitate easier removal of excess mortar and construction dirt while minimizing any potential adverse affect on the natural stone units, clean within 7 days of construction.

## RECOMMENDATIONS – Surface Alterations

Recommendations for surface alterations for each type of natural stone unit submitted by Robinson Brick Company, Denver, CO are provided in the chart below. Recommendations are based on the optimum dilution for complete removal of mortar while limiting surface alterations.

Sample	Sure Klean <sup>®</sup> Burnished Custom Masonry Cleaner	Sure Klean <sup>®</sup> Vana Trol <sup>®</sup>
“Buechel”	1:2	1:10
“Pink Cobblestone”	1:2	1:10
“Grey Cobblestone”	1:2	1:10
“Farmer’s Rock”	1:2	1:10
“Brownstone Cherokee”	1:2	1:10
“Brownstone Brownstone”	---	1:10
“Rhyolite”	1:2	1:10
“River Rock Red”	1:2	1:10
“River Rock Natural”	1:2	1:10
“Colorado Flagstone Natural”	1:2	1:10
“Colorado Flagstone Rubble”	1:2	1:10
“Siloam Sienna Grey”	1:2	1:10
“Siloam Sienna Buff”	1:2	1:10
“Colorado Flagstone White”	1:2	1:10
“Colorado Flagstone Buff/Yellow/Brown”	1:2	1:10
“Canyon Wall”	---	1:10
“Desert Slab”	1:2	1:10



### **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<sup>®</sup> Weather Seal Natural Stone Treatment** - A modified siloxane water repellent developed for limestone, marble and most other traditional masonry surfaces. Natural Stone Treatment penetrates deeply to provide long-lasting protection without altering the natural appearance of the substrate.

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

**Sure Klean<sup>®</sup> Weather Seal 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.

**Stand Off<sup>®</sup> SLX100 Water & Oil Repellent** – Combines water and oil repellency to prevent staining by waterborne or oily substances and many types of graffiti. This modified “neat” silane system offers invisible protection and low volatility.

### **SAMPLE PREPARATION – Protective Water Repellents**

The submitted natural stone units were cut, oven dried and allowed to reabsorb atmospheric humidity for 24 hours prior to treatment. The treatment method consisted of a wet-on-wet saturating brush application.

Sample treated with Sure Klean<sup>®</sup> Weather Seal Siloxane PD were allowed to cure for 14 days prior to testing. All other treatments were allowed to cure for 72 hours prior to testing.

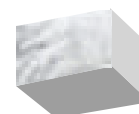
### **TEST METHODS – Protective Water Repellents**

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

The water absorption tube test simulating wind driven and wind blown rain conditions was also performed. Tests were run with 5.0-milliliter head pressures. Filled to 5 milliliters, a water absorption tube produces a 98 mph dynamic wind pressure. See RILEM II.4 Tech Note for additional information.



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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 ml of water or more, then:

A rating of **AA** *Above Average* water repellent performance would require loss of no more than 5 ml X 20% = 1 ml.

A rating of **A** *Average* water repellent performance would require loss of no more than 5 ml X 50% = 2.5ml.

A rating of **BA** *Below Average* water repellent performance would be reported for treatments which result in a loss of more than 50% X 5ml = 2.5ml+

## TEST RESULTS – Protective Water Repellents

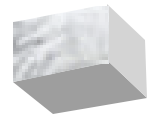
### Water Absorption Tube Test: RILEM II.4, 5.0 milliliters, 20 Minutes Water Absorption

<b>"Buechel"</b>		
	<b>mL loss</b>	<b>RANKING</b>
Untreated Control	2.0 mL	---
Natural Stone Treatment	0.0 mL	<b>AA</b>
Limestone & Marble Protector	0.1 mL	<b>AA</b>
<b>"Pink Cobblestone"</b>		
	<b>mL loss</b>	<b>RANKING</b>
Untreated Control	0.2 mL	---
SL100	0.0 mL	<b>AA</b>
SLX 100	0.0 mL	<b>AA</b>
<b>"Grey Cobblestone"</b>		
	<b>mL loss</b>	<b>RANKING</b>
Untreated Control	0.1 mL	---
SL100	0.0 mL	<b>AA</b>
SLX 100	0.0 mL	<b>AA</b>
<b>"Farmer's Rock"</b>		
	<b>mL loss</b>	<b>RANKING</b>
Untreated Control	0.2 mL	---
Natural Stone Treatment	0.0 mL	<b>AA</b>
Siloxane PD	0.1 mL	<b>A</b>





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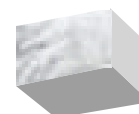
**TEST RESULTS – Protective Water Repellents**

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

<b>“Brownstone Cherokee”</b>		
	<b>mL loss</b>	<b>RANKING</b>
Untreated Control	0.4 mL	---
Natural Stone Treatment	0.0 mL	<u>AA</u>
Siloxane PD	0.1 mL	A
<b>“Brownstone Brownstone”</b>		
	<b>mL loss</b>	<b>RANKING</b>
Untreated Control	2.4 mL	---
Natural Stone Treatment	0.7 mL	A
Siloxane PD	1.0 mL	A
<b>“Rhyolite”</b>		
	<b>mL loss</b>	<b>RANKING</b>
Untreated Control	5.0 mL	---
Natural Stone Treatment	0.6 mL	<u>AA</u>
Siloxane PD	0.2 mL	<u>AA</u>
<b>“River Rock Red”</b>		
	<b>mL loss</b>	<b>RANKING</b>
Untreated Control	0.0 mL	---
Natural Stone Treatment	0.0 mL	<u>AA</u>
Siloxane PD	0.0 mL	<u>AA</u>
<b>“River Rock Natural”</b>		
	<b>mL loss</b>	<b>RANKING</b>
Untreated Control	0.0 mL	---
SL100	0.0 mL	<u>AA</u>
SLX 100	0.0 mL	<u>AA</u>
<b>“Colorado Flagstone Natural”</b>		
	<b>mL loss</b>	<b>RANKING</b>
Untreated Control	0.7 mL	---
Natural Stone Treatment	0.1 mL	<u>AA</u>
Siloxane PD	0.0 mL	<u>AA</u>
<b>“Colorado Flagstone Rubble”</b>		
	<b>mL loss</b>	<b>RANKING</b>
Untreated Control	0.5 mL	---
Natural Stone Treatment	0.0 mL	<u>AA</u>
Siloxane PD	0.1 mL	<u>AA</u>
<b>“Siloam Sienna Grey”</b>		
	<b>mL loss</b>	<b>RANKING</b>
Untreated Control	5.0 mL	---
Natural Stone Treatment	0.5 mL	<u>AA</u>
Siloxane PD	0.4 mL	<u>AA</u>



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## TEST RESULTS- Protective Water Repellents

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

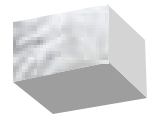
<b>“Siloam Sienna Buff”</b>		
	<b>mL loss</b>	<b>RANKING</b>
Untreated Control	0.3 mL	---
Natural Stone Treatment	0.1 mL	<b>A</b>
Siloxane PD	0.1 mL	<b>A</b>
<b>“Colorado Flagstone White”</b>		
	<b>mL loss</b>	<b>RANKING</b>
Untreated Control	0.9 mL	---
Natural Stone Treatment	0.3 mL	<b>A</b>
Siloxane PD	0.2 mL	<b>A</b>
<b>“Colorado Flagstone Buff/Yellow/Brown”</b>		
	<b>mL loss</b>	<b>RANKING</b>
Untreated Control	0.3 mL	---
Natural Stone Treatment	0.1 mL	<b>A</b>
Siloxane PD	0.1 mL	<b>A</b>
<b>“Canyon Wall”</b>		
	<b>mL loss</b>	<b>RANKING</b>
Untreated Control	0.5 mL	---
Natural Stone Treatment	0.0 mL	<b><u>AA</u></b>
Siloxane PD	0.1 mL	<b><u>AA</u></b>
<b>“Desert Slab”</b>		
	<b>mL loss</b>	<b>RANKING</b>
Untreated Control	0.5 mL	---
Natural Stone Treatment	0.1 mL	<b><u>AA</u></b>
Siloxane PD	0.1 mL	<b><u>AA</u></b>

## CONCLUSIONS – Protective Water Repellents

Based upon RILEM tube testing, all of the treatments tested were able to provide adequate water repellency when applied to the submitted natural stone units.



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## RECOMMENDATIONS – Protective Water Repellents

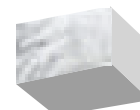
Recommendations for protective water repellents for each type of natural stone units submitted by Robinson Brick Company, Denver, CO are provided in the chart below. Recommendations are based on the treatment that proved most effective and can provide water repellency on all types submitted if possible.

Sample	Water Repellents
“Buechel”	Sure Klean® Weather Seal Natural Stone Treatment Stand Off® Limestone & Marble Protector
“Pink Cobblestone”	Sure Klean® Weather Seal SL100 Water Repellent Stand Off® SLX100 Water & Oil Repellent
“Grey Cobblestone”	Sure Klean® Weather Seal SL100 Water Repellent Stand Off® SLX100 Water & Oil Repellent
“Farmer’s Rock”	Sure Klean® Weather Seal Natural Stone Treatment
“Brownstone Cherokee”	Sure Klean® Weather Seal Natural Stone Treatment
“Brownstone Brownstone”	Sure Klean® Weather Seal Natural Stone Treatment Sure Klean® Weather Seal Siloxane PD
“Rhyolite”	Sure Klean® Weather Seal Natural Stone Treatment Sure Klean® Weather Seal Siloxane PD
“River Rock Red”	Sure Klean® Weather Seal Natural Stone Treatment Sure Klean® Weather Seal Siloxane PD
“River Rock Natural”	Sure Klean® Weather Seal SL100 Water Repellent Stand Off® SLX100 Water & Oil Repellent
“Colorado Flagstone Natural”	Sure Klean® Weather Seal Natural Stone Treatment Sure Klean® Weather Seal Siloxane PD
“Colorado Flagstone Rubble”	Sure Klean® Weather Seal Natural Stone Treatment Sure Klean® Weather Seal Siloxane PD
“Siloam Sienna Grey”	Sure Klean® Weather Seal Natural Stone Treatment Sure Klean® Weather Seal Siloxane PD
“Siloam Sienna Buff”	Sure Klean® Weather Seal Natural Stone Treatment Sure Klean® Weather Seal Siloxane PD
“Colorado Flagstone White”	Sure Klean® Weather Seal Natural Stone Treatment Sure Klean® Weather Seal Siloxane PD
“Colorado Flagstone Buff/Yellow/Brown”	Sure Klean® Weather Seal Natural Stone Treatment Sure Klean® Weather Seal Siloxane PD
“Canyon Wall”	Sure Klean® Weather Seal Natural Stone Treatment Sure Klean® Weather Seal Siloxane PD
“Desert Slab”	Sure Klean® Weather Seal Natural Stone Treatment Sure Klean® Weather Seal Siloxane PD

Apply all products in accordance with the manufacturer's recommendation provided on container labels and product data sheets. On-site testing should be conducted to determine the most appropriate water-repellent product and procedures for a particular project. See product literature for additional application and product information.



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## **SECTION D – PROTECTIVE STAIN REPELLENTS**

The testing described below evaluates the suitability of stain protection treatments.

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

1. Ease of application
2. Color change
3. Removal of staining substances

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## **DESCRIPTIONS OF PRODUCTS EVALUATED – Protective Stain Repellents**

**Stand Off<sup>®</sup> SLX100 Water & Oil Repellent** – Combines water and oil repellency to prevent staining by waterborne or oily substances and many types of graffiti. This modified “neat” silane system offers invisible protection and low volatility.

**Stand Off<sup>®</sup> Stone, Tile & Masonry Protector** – 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 STMP resist staining from oil, food and waterborne matter while retaining their natural color, texture, and breathability.

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

### **Products Evaluated for Stain Removal:**

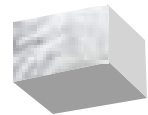
**Enviro Klean<sup>®</sup> 2010 All Surface Cleaner** – Dilution: 1 part concentrate : 10 parts water

### **Food and Oil Products Evaluated:**

Coke (~70°F)  
Hot Coffee (120°F)  
Hand Lotion (~70°F)  
Red Wine (~70°F)



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## **SAMPLE PREPARATION – Protective Stain Repellents**

The submitted natural stone units were cleaned, 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 Stain Repellents**

### **Surface Beading Evaluation**

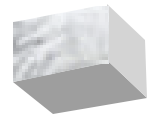
The food and oil products were applied to the test areas. The beading properties of the oils and liquids were visually evaluated within two minutes after application. The results are reported as a rating based on the angle of contact between the base of the droplet and the substrate. A rating of “1 or 2” indicates 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” indicates that the oil quickly absorbed into the substrate and correlates to “below average” repellency.

### **Stain Resistance**

The soiling agents were allowed to dwell on the treated and untreated substrate for times of 24 hours, 4 hours, 1 hour, and 10 minutes. The test areas were then cleaned with Enviro Klean<sup>®</sup> 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.



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**TEST RESULTS – Surface Beading**

<b>“Buechel”</b>			
	<u>Untreated Control</u>	<u>Stone, Tile &amp; Masonry Protector</u>	<u>Limestone &amp; Marble Protector</u>
Coke	5	3	2
Hot Coffee	5	3	3
Hand Lotion	N/A	N/A	N/A
Red Wine	5	3	3

<b>“Pink Cobblestone”</b>		
	<u>Untreated Control</u>	<u>SLX100 Water &amp; Oil Repellent</u>
Coke	4	2
Hot Coffee	5	4
Hand Lotion	N/A	N/A
Red Wine	5	3

<b>“Gray Cobblestone”</b>		
	<u>Untreated Control</u>	<u>SLX100 Water &amp; Oil Repellent</u>
Coke	5	2
Hot Coffee	5	4
Hand Lotion	N/A	N/A
Red Wine	4	2

<b>“Farmer’s Rock”</b>			
	<u>Untreated Control</u>	<u>Stone, Tile &amp; Masonry Protector</u>	<u>Limestone &amp; Marble Protector</u>
Coke	5	3	2
Hot Coffee	5	4	3
Hand Lotion	N/A	N/A	N/A
Red Wine	5	2	2

**N/A – This substance is not a free-flowing liquid**

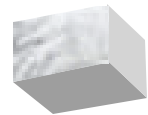
**Rating System:**

1 & 2  
3 & 4  
5

**Above Average**  
**Average**  
**Below Average**



# PALLET TAG PROGRAM LABORATORY REPORT



**TEST RESULTS – Surface Beading**

<b>“Brownstone Cherokee”</b>			
	<u>Untreated Control</u>	<u>Stone, Tile &amp; Masonry Protector</u>	<u>Limestone &amp; Marble Protector</u>
<b>Coke</b>	5	2	2
<b>Hot Coffee</b>	5	3	3
<b>Hand Lotion</b>	N/A	N/A	N/A
<b>Red Wine</b>	4	3	2

<b>“Brownstone Brownstone”</b>			
	<u>Untreated Control</u>	<u>Stone, Tile &amp; Masonry Protector</u>	<u>Limestone &amp; Marble Protector</u>
<b>Coke</b>	4	2	2
<b>Hot Coffee</b>	4	3	3
<b>Hand Lotion</b>	N/A	N/A	N/A
<b>Red Wine</b>	5	2	2

<b>“Rhyolite”</b>			
	<u>Untreated Control</u>	<u>Stone, Tile &amp; Masonry Protector</u>	<u>Limestone &amp; Marble Protector</u>
<b>Coke</b>	5	3	2
<b>Hot Coffee</b>	5	3	3
<b>Hand Lotion</b>	N/A	N/A	N/A
<b>Red Wine</b>	5	3	2

<b>“River Rock Red”</b>			
	<u>Untreated Control</u>	<u>Stone, Tile &amp; Masonry Protector</u>	<u>Limestone &amp; Marble Protector</u>
<b>Coke</b>	5	3	2
<b>Hot Coffee</b>	4	4	3
<b>Hand Lotion</b>	N/A	N/A	N/A
<b>Red Wine</b>	5	3	2

**N/A – This substance is not a free-flowing liquid**

**Rating System:**

**1 & 2**

**Above Average**

**3 & 4**

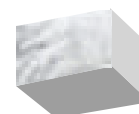
**Average**

**5**

**Below Average**



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**TEST RESULTS – Surface Beading**

“River Rock Natural”		
	<u>Untreated Control</u>	<u>SLX100 Water &amp; Oil Repellent</u>
Coke	5	2
Hot Coffee	5	3
Hand Lotion	N/A	N/A
Red Wine	5	2

“Colorado Flagstone Natural”			
	<u>Untreated Control</u>	<u>Stone, Tile &amp; Masonry Protector</u>	<u>Limestone &amp; Marble Protector</u>
Coke	5	3	2
Hot Coffee	5	3	3
Hand Lotion	N/A	N/A	N/A
Red Wine	5	2	2

“Colorado Flagstone Rubble”			
	<u>Untreated Control</u>	<u>Stone, Tile &amp; Masonry Protector</u>	<u>Limestone &amp; Marble Protector</u>
Coke	5	3	2
Hot Coffee	5	3	3
Hand Lotion	N/A	N/A	N/A
Red Wine	5	3	2

“Siloam Sienna Grey”			
	<u>Untreated Control</u>	<u>Stone, Tile &amp; Masonry Protector</u>	<u>Limestone &amp; Marble Protector</u>
Coke	5	2	2
Hot Coffee	5	3	3
Hand Lotion	N/A	N/A	N/A
Red Wine	5	3	3

**N/A – This substance is not a free-flowing liquid**

Rating System:

1 & 2

Above Average

3 & 4

Average

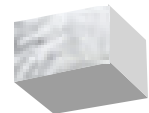
5

Below Average





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**TEST RESULTS – Surface Beading**

<b>“Siloam Sienna Buff”</b>			
	<u>Untreated Control</u>	<u>Stone, Tile &amp; Masonry Protector</u>	<u>Limestone &amp; Marble Protector</u>
<b>Coke</b>	4	2	2
<b>Hot Coffee</b>	5	3	3
<b>Hand Lotion</b>	N/A	N/A	N/A
<b>Red Wine</b>	4	3	2

<b>“Colorado Flagstone White”</b>			
	<u>Untreated Control</u>	<u>Stone, Tile &amp; Masonry Protector</u>	<u>Limestone &amp; Marble Protector</u>
<b>Coke</b>	5	2	2
<b>Hot Coffee</b>	4	3	3
<b>Hand Lotion</b>	N/A	N/A	N/A
<b>Red Wine</b>	4	3	3

<b>“Colorado Flagstone Buff/Yellow/Brown”</b>			
	<u>Untreated Control</u>	<u>Stone, Tile &amp; Masonry Protector</u>	<u>Limestone &amp; Marble Protector</u>
<b>Coke</b>	4	2	2
<b>Hot Coffee</b>	5	3	3
<b>Hand Lotion</b>	N/A	N/A	N/A
<b>Red Wine</b>	5	3	2

<b>“Canyon Wall”</b>			
	<u>Untreated Control</u>	<u>Stone, Tile &amp; Masonry Protector</u>	<u>Limestone &amp; Marble Protector</u>
<b>Coke</b>	4	2	2
<b>Hot Coffee</b>	5	3	3
<b>Hand Lotion</b>	N/A	N/A	N/A
<b>Red Wine</b>	5	2	2

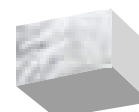
<b>“Desert Slab”</b>			
	<u>Untreated Control</u>	<u>Stone, Tile &amp; Masonry Protector</u>	<u>Limestone &amp; Marble Protector</u>
<b>Coke</b>	5	3	2
<b>Hot Coffee</b>	4	3	3
<b>Hand Lotion</b>	N/A	N/A	N/A
<b>Red Wine</b>	5	2	2

**N/A – This substance is not a free-flowing liquid**

Rating System:	1 & 2	Above Average
	3 & 4	Average
	5	Below Average



# PALLET TAG PROGRAM LABORATORY REPORT



**TEST RESULTS – Stain Resistance**

**“Buechel”**

Untreated Control				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	40%	20%
<b>4 HR.</b>	100%	100%	95%	30%
<b>1 HR.</b>	100%	100%	100%	50%
<b>10 MIN.</b>	100%	100%	100%	99%
Stone, Tile & Masonry Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	20%
<b>4 HR.</b>	100%	100%	100%	30%
<b>1 HR.</b>	100%	100%	100%	50%
<b>10 MIN.</b>	100%	100%	100%	99%
Limestone & Marble Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%

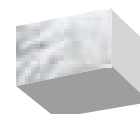
**“Pink Cobblestone”**

Untreated Control				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
SLX100 Water & Oil Repellent				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%

% - percent removal of staining



# PALLET TAG PROGRAM LABORATORY REPORT



**PROSOCO, Inc.**

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**TEST RESULTS – Stain Resistance Continued**

**“Grey Cobblestone”**

Untreated Control				
	<b>Coke</b>	<b>Hot Coffee</b>	<b>Hand Lotion</b>	<b>Red Wine</b>
<b>24 HR.</b>	99%	90%	100%	90%
<b>4 HR.</b>	100%	95%	100%	95%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
SLX100 Water & Oil Repellent				
	<b>Coke</b>	<b>Hot Coffee</b>	<b>Hand Lotion</b>	<b>Red Wine</b>
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%

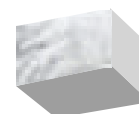
**“Farmer’s Rock”**

Untreated Control				
	<b>Coke</b>	<b>Hot Coffee</b>	<b>Hand Lotion</b>	<b>Red Wine</b>
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
Stone, Tile & Masonry Protector				
	<b>Coke</b>	<b>Hot Coffee</b>	<b>Hand Lotion</b>	<b>Red Wine</b>
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
Limestone & Marble Protector				
	<b>Coke</b>	<b>Hot Coffee</b>	<b>Hand Lotion</b>	<b>Red Wine</b>
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%

% - percent removal of staining



# PALLET TAG PROGRAM LABORATORY REPORT



**TEST RESULTS – Stain Resistance Continued**

**“Brownstone Cherokee”**

Untreated Control				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	90%
<b>4 HR.</b>	100%	100%	100%	95%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
Stone, Tile & Masonry Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
Limestone & Marble Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%

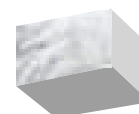
**“Brownstone Brownstone”**

Untreated Control				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	95%	90%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
Stone, Tile & Masonry Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
Limestone & Marble Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%

% - percent removal of staining



# PALLET TAG PROGRAM LABORATORY REPORT



**TEST RESULTS – Stain Resistance Continued**

**“Rhyolite”**

Untreated Control				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	98%
<b>4 HR.</b>	100%	100%	100%	99%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
Stone, Tile & Masonry Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
Limestone & Marble Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	90%
<b>4 HR.</b>	100%	100%	100%	95%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%

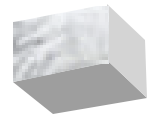
**“River Rock Red”**

Untreated Control				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
Stone, Tile & Masonry Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
Limestone & Marble Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%

% - percent removal of staining



# PALLET TAG PROGRAM LABORATORY REPORT



**PROSOCO, Inc.**

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**TEST RESULTS – Stain Resistance Continued**

**“River Rock Natural”**

Untreated Control				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	50%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
SLX100 Water & Oil Repellent				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	60%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%

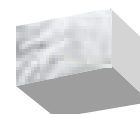
**“Colorado Flagstone Natural”**

Untreated Control				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	50%	100%
<b>4 HR.</b>	100%	100%	60%	100%
<b>1 HR.</b>	100%	100%	70%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
Stone, Tile & Masonry Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
Limestone & Marble Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	50%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%

% - percent removal of staining



# PALLET TAG PROGRAM LABORATORY REPORT



**PROSOCO, Inc.**

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**TEST RESULTS – Stain Resistance Continued**

**“Colorado Flagstone Rubble”**

Untreated Control				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	40%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
Stone, Tile & Masonry Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	40%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
Limestone & Marble Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	50%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%

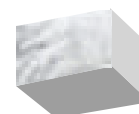
**“Siloam Sienna Grey”**

Untreated Control				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
Stone, Tile & Masonry Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
Limestone & Marble Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%

% - percent removal of staining



# PALLET TAG PROGRAM LABORATORY REPORT



**TEST RESULTS – Stain Resistance Continued**

**“Siloam Sienna Buff”**

Untreated Control				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	50%	100%
<b>4 HR.</b>	100%	100%	60%	100%
<b>1 HR.</b>	100%	100%	70%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
Stone, Tile & Masonry Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
Limestone & Marble Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%

**“Colorado Flagstone White”**

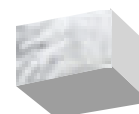
Untreated Control				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	<1%
<b>4 HR.</b>	100%	100%	100%	<1%
<b>1 HR.</b>	100%	100%	100%	10%
<b>10 MIN.</b>	100%	100%	100%	85%
Stone, Tile & Masonry Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	95%	85%	99%
<b>4 HR.</b>	100%	98%	100%	99%
<b>1 HR.</b>	100%	100%	100%	99%
<b>10 MIN.</b>	100%	100%	100%	100%
Limestone & Marble Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	99%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%

% - percent removal of staining





# PALLET TAG PROGRAM LABORATORY REPORT



**TEST RESULTS – Stain Resistance Continued**

**“Colorado Flagstone Buff/Yellow/Brown”**

Untreated Control				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	90%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
Stone, Tile & Masonry Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
Limestone & Marble Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%

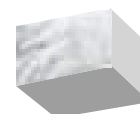
**“Canyon Wall”**

Untreated Control				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	95%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
Stone, Tile & Masonry Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
Limestone & Marble Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	95%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%

% - percent removal of staining



# PALLET TAG PROGRAM LABORATORY REPORT



**TEST RESULTS – Stain Resistance Continued**

**“Desert Slab”**

Untreated Control				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	50%	98%
<b>4 HR.</b>	100%	100%	60%	99%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
Stone, Tile & Masonry Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	100%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%
Limestone & Marble Protector				
	Coke	Hot Coffee	Hand Lotion	Red Wine
<b>24 HR.</b>	100%	100%	95%	100%
<b>4 HR.</b>	100%	100%	100%	100%
<b>1 HR.</b>	100%	100%	100%	100%
<b>10 MIN.</b>	100%	100%	100%	100%

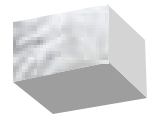
% - percent removal of staining

**CONCLUSION – Protective Stain Repellents**

Based on beading characteristics, Stand Off<sup>®</sup> SLX100 Water & Oil Repellent, Stand Off<sup>®</sup> Limestone & Marble Protector performed slightly better overall than Stand Off<sup>®</sup> Stone, Tile & Masonry Protector. Based on laboratory evaluations, all of the stain repellents tested performed extremely well at protecting the natural stone units from the staining agents.



# PALLET TAG PROGRAM LABORATORY REPORT



**RECOMMENDATION – Protective Stain Repellents**

Recommendations for protective stain repellents for each type of natural stone units submitted by Robinson Brick Company, Denver, CO are provided in the chart below. Recommendations are based on the treatment that proved most effective at repelling the staining agents.

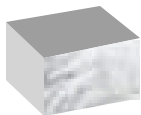
Sample	Water Repellents
“Buechel”	Stand Off® Limestone & Marble Protector
“Pink Cobblestone”	Stand Off® SLX100 Water & Oil Repellent
“Grey Cobblestone”	Stand Off® SLX100 Water & Oil Repellent
“Farmer’s Rock”	Stand Off® Stone, Tile & Masonry Protector Stand Off® Limestone & Marble Protector
“Brownstone Cherokee”	Stand Off® Stone, Tile & Masonry Protector Stand Off® Limestone & Marble Protector
“Brownstone Brownstone”	Stand Off® Stone, Tile & Masonry Protector Stand Off® Limestone & Marble Protector
“Rhyolite”	Stand Off® Stone, Tile & Masonry Protector
“River Rock Red”	Stand Off® Stone, Tile & Masonry Protector Stand Off® Limestone & Marble Protector
“River Rock Natural”	Stand Off® SLX100 Water & Oil Repellent
“Colorado Flagstone Natural”	Stand Off® Stone, Tile & Masonry Protector
“Colorado Flagstone Rubble”	Stand Off® Limestone & Marble Protector
“Siloam Sienna Grey”	Stand Off® Stone, Tile & Masonry Protector Stand Off® Limestone & Marble Protector
“Siloam Sienna Buff”	Stand Off® Stone, Tile & Masonry Protector Stand Off® Limestone & Marble Protector
“Colorado Flagstone White”	Stand Off® Limestone & Marble Protector
“Colorado Flagstone Buff/Yellow/Brown”	Stand Off® Stone, Tile & Masonry Protector Stand Off® Limestone & Marble Protector
“Canyon Wall”	Stand Off® Stone, Tile & Masonry Protector
“Desert Slab”	Stand Off® Stone, Tile & Masonry Protector

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 stain repellent and procedures for a particular project.

See product literature for additional application and product information.

Carmen M. Niven  
Project Testing Coordinator

CMN/



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***Laboratory Report***

**Pallet Tag Program**

**Robinson Brick Company  
Denver, CO**

***Project No. 0202-12 PTP***

***Prepared For:***

**Steve Osterfoss  
Robinson Brick Company  
1845 West Dartmouth Ave.  
Denver, CO 80110-1308**

***Prepared By:***



***PROSOCO, Inc.  
May 2002***