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**Attachments**

    Technical Services TECH Note RILEM Tube Test Procedures

    Product Data literature for all products evaluated

**Submitted Information**

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**Cc:** Gene Bollinger  
Steve Dean  
Brian Koenings

**Subject:** Glacier Stone Supply, LLC  
Kalispell, MT

**Date:** April 17, 2008

**Project:** 0803-03 PTP

**Samples Submitted:** 2 types of natural stone

<b>Sample</b>	<b>Type</b>	<b>Color</b>	<b>Size</b>
"Big Horn"	"Argillaceous Metamorphic Sandstone"	Brown, Red, Tan	Various
"Bitterroot"	"Argillaceous Metamorphic Sandstone"	Brown, Red, Tan, Orange	Various

Submitted by: Dave Wilkins, Glacier Stone Supply, LLC

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## **Introduction**

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

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

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## **Purpose of Testing**

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

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

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

Heavy deposits of mortar were removed with dry scraping after 24 hours. Prepared cleaning solutions were then evaluated for their effectiveness in removing residual Type N mortar after 7, 14, and 21 days of curing. A visual examination was also made to determine if the tested cleaners caused any surface alterations to the submitted samples based on the following:

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

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

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

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

**Protective Water Repellents** – Sure Klean® Weather Seal SL100 Water Repellent, Sure Klean® Weather Seal Siloxane PD, Paver Kare® Paver Enhancer, Stand Off® Gloss 'N Guard, Stand Off® Stone, Tile & Masonry Protector (STMP), and Stand Off® SLX100 Water & Oil Repellent were evaluated for their ability to provide water repellency to the submitted natural stone.

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

**Color and Sheen Enhancement** – Stand Off® Gloss 'N Guard and Paver Kare® Paver Enhancer were evaluated on the submitted natural stone for their ability to provide color and/or sheen enhancement.

**Products Evaluated****New Construction Cleaning Products Evaluated**

Sample	Product	Dilution
All Submitted Natural Stone	Sure Klean® Vana Trol®	1:6, 1:8
	Enviro Klean® Safety Klean	1:2, 1:3

**Protective Water Repellent Products Evaluated**

Sample	Product	Dilution
All Submitted Natural Stone	Sure Klean® Weather Seal SL100 Water Repellent	Concentrate
	Sure Klean® Weather Seal Siloxane PD	Concentrate
	Paver Kare® Paver Enhancer	Concentrate
	Stand Off® Gloss 'N Guard	Concentrate
	Stand Off® Stone, Tile & Masonry Protector (STMP)	Concentrate
	Stand Off® SLX100 Water & Oil Repellent	Concentrate

**Stain Repellency Products Evaluated**

Sample	Product	Dilution
All Submitted Natural Stone	Stand Off® Stone, Tile & Masonry Protector (STMP)	Concentrate
	Stand Off® SLX100 Water & Oil Repellent	Concentrate
	Stand Off® Gloss 'N Guard	Concentrate

**Color and Sheen Enhancement Products Evaluated**

Sample	Product	Dilution
All Submitted Natural Stone	Paver Kare® Paver Enhancer	Concentrate
	Stand Off® Gloss 'N Guard	Concentrate

**New Construction Cleaning**

These cleaning trials were conducted to determine the optimal cleaning/cure time combination to most efficiently remove Type N mortar from the submitted natural stone while limiting surface alterations to the natural stone surface.

**Description of Products Evaluated – New Construction Cleaning**

**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 4-10 parts water. Apply by brush or low-pressure spray.

**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.

**Sample Preparation – New Construction Cleaning**

Type N mortar was prepared in compliance with the manufacturer’s instructions, applied to the samples and allowed to cure. Mortar removal was accomplished using chemical assistance and a high-pressure water rinse with pressure rinsing equipment. The removal of Type N masonry mortar was visually evaluated after 7, 14, and 21 days of curing. A visual examination was also made to the natural stone to determine if the products tested caused any change to the surface of the stone.

**Test Method – New Construction Cleaning**

New construction cleaners were evaluated using the following procedure:

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

Sure Klean® Vana Trol® .....	3-5 minutes
Enviro Klean® Safety Klean .....	3-5 minutes
4. Pressure rinse thoroughly.\*

**\*Pressure Rinsing Equipment** – Masonry washing equipment generating approximately 700-800 psi with a water flow rate of 8 gallons per minute delivered through a 45 degree fan spray tip was used for rinsing.

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

<b>“Big Horn”</b>				
<b>Product</b>	<b>Dilution</b>	<b>7 day</b>	<b>14 day</b>	<b>21 day</b>
Sure Klean® Vana Trol®	1:6	100%	100%	100%
Sure Klean® Vana Trol®	1:8	100%	100%	100%
Enviro Klean® Safety Klean	1:2	100%	100%	100%
Enviro Klean® Safety Klean	1:3	100%	100%	95%
<b>“Bitterroot”</b>				
<b>Product</b>	<b>Dilution</b>	<b>7 day</b>	<b>14 day</b>	<b>21 day</b>
Sure Klean® Vana Trol®	1:6	100%	100%	100%
Sure Klean® Vana Trol®	1:8	100%	100%	100%
Enviro Klean® Safety Klean	1:2	100%	100%	100%
Enviro Klean® Safety Klean	1:3	100%	100%	100%

**Test Results – Limiting Surface Alterations**

<b>Substrate: “Big Horn”</b>					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean® Vana Trol®	1:6	0	0	0	0
Sure Klean® Vana Trol®	1:8	0	0	0	0
Enviro Klean® Safety Klean	1:2	0	0	0	0
Enviro Klean® Safety Klean	1:3	0	0	0	0
<b>Substrate: “Bitterroot”</b>					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean® Vana Trol®	1:6	0	0	0	0
Sure Klean® Vana Trol®	1:8	0	0	0	0
Enviro Klean® Safety Klean	1:2	0	0	0	0
Enviro Klean® Safety Klean	1:3	0	0	0	0

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

**Photographs – New Construction Cleaning**

**“Bitterroot”; 7 Day Cleaning; Type N Mortar**



<b>Sure Klean® Vana Trol® (1:6)</b>	<b>Sure Klean® Vana Trol® (1:8)</b>	<b>Enviro Klean® Safety Klean (1:2)</b>	<b>Enviro Klean® Safety Klean (1:3)</b>
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**“Bitterroot”; 14 Day Cleaning; Type N Mortar**

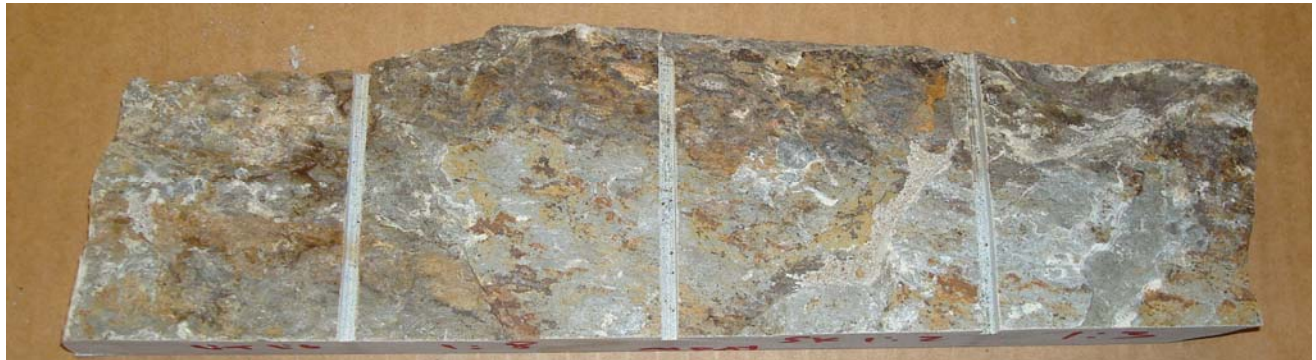


<b>Sure Klean® Vana Trol® (1:6)</b>	<b>Sure Klean® Vana Trol® (1:8)</b>	<b>Enviro Klean® Safety Klean (1:2)</b>	<b>Enviro Klean® Safety Klean (1:3)</b>
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**Photographs – New Construction Cleaning**

**“Bitterroot”; 21 Day Cleaning; Type N Mortar**



**Sure Klean®  
Vana Trol® (1:6)**

**Sure Klean®  
Vana Trol® (1:8)**

**Enviro Klean®  
Safety Klean (1:2)**

**Enviro Klean®  
Safety Klean (1:3)**



**Untreated Control**

**Photographs – Limiting Surface Alterations**

**“Bitterroot”**



**Sure Klean®  
Vana Trol® (1:6)**

**Sure Klean®  
Vana Trol® (1:8)**

**Enviro Klean®  
Safety Klean (1:2)**

**Enviro Klean®  
Safety Klean (1:3)**



**Untreated Surface**

**Conclusions – New Construction Cleaning**

Based on the test results, both Sure Klean® Vana Trof® and Enviro Klean® Safety Klean® performed well in removing excess mortar from the submitted natural stone. Both cleaners performed well in removing the mortar soils even after allowing the mortar to remain on the surface of the samples for 21 days under ideal curing conditions. Neither product caused any surface alterations to the submitted natural stone.

It is recommended that the selected cleaners always be used in the lowest possible concentration.

**Recommendations – New Construction Cleaning**

Recommendations for cleaning for the natural stone submitted by Glacier Stone Supply, LLC, Kalispell, MT are provided in the chart below. Recommendations are based on the optimum dilution for complete removal of mortar while limiting surface alterations.

Sample	New Construction Cleaning (Type N mortar, 21 day cleaning)
All Submitted Natural Stone	Sure Klean® Vana Trof® (1:8) or Enviro Klean® Safety Klean® (1:3)

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.

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## **Protective Water Repellents**

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

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

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

### **Description of Products Evaluated – Protective Water Repellents**

**Sure Klean® Weather Seal SL100 Water Repellent** – A modified, “neat” silane system that offers invisible protection and low volatility and complies with all known regulations limiting the Volatile Organic Compound (VOC) content of architectural coatings and sealers. 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 GFRC, integrally colored pre-cast concrete and many types of natural stone.

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

**Paver Kare® 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** – A highly durable protective coating for tile, pavers, terrazzo and other polished and unpolished masonry. Gloss ‘N Guard dries to a high-gloss finish that enhances the natural beauty of treated surfaces.

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

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

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### **Sample Preparation – Protective Water Repellents**

The submitted samples were scored and allowed to dry for at least 24 hours prior to treatment. All treatments were applied by brush in accordance with the current PROSOCO, Inc. Product Data Sheet application instructions. All treatments were allowed to cure for at least 7 days prior to testing.

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**Test Methods – Protective Water Repellents****Water Absorption Tube Test: Horizontal RILEM II.4, 5.0 milliliters, 20 minutes**

The water absorption tube test simulating wind driven and windblown rain conditions was performed. Tests were run with vertical 5.0-milliliter head pressures. Filled to 5.0 milliliters, a water absorption tube produces a 103 mph dynamic wind pressure. See RILEM II.4 Tech Note for additional information.

The ranking system used to evaluate the effectiveness of the products applied to each submitted sample is as follows:

**AA** = "Above Average" correlates to less than or equal to 20% of the maximum untreated absorption.

**A** = "Average" correlates to less than or equal to 50% of the maximum untreated absorption.

**BA** = "Below Average" correlates to greater than 50% of the maximum untreated absorption.

**EXAMPLE:** If RILEM tubes applied to an untreated sample result in loss of 5.0 mL of water or more, then:

A rating of **AA** *Above Average* water repellent performance would be reported for treatments which result in a loss of no more than:

$$5.0 \text{ mL} \times 20\% = \mathbf{1.0 \text{ mL}}$$

A rating of **A** *Average* water repellent performance would be reported for treatments which result in a loss of no more than:

$$5.0 \text{ mL} \times 50\% = \mathbf{2.5 \text{ mL}}$$

A rating of **BA** *Below Average* water repellent performance would be reported for treatments which result in a loss of more than:

$$5.0 \text{ mL} \times 50\% = \mathbf{2.5 \text{ mL}}$$

**Test Results – Protective Water Repellents****Water Absorption Tube Test: Horizontal RILEM II.4, 5.0 milliliters, 20 minutes****AA** = Above Average**A** = Average**BA** = Below Average

<b>“Big Horn”</b>	<b>Results in mL loss</b>	<b>Ranking</b>
Untreated Control	-0.0 mL	--
Sure Klean® Weather Seal SL100 Water Repellent	-0.0 mL	<b><u>AA</u></b>
Sure Klean® Weather Seal Siloxane PD	-0.0 mL	<b><u>AA</u></b>
Paver Kare® Paver Enhancer	-0.0 mL	<b><u>AA</u></b>
Stand Off® Gloss ‘N Guard	-0.0 mL	<b><u>AA</u></b>
Stand Off® Stone, Tile & Masonry Protector (STMP)	-0.0 mL	<b><u>AA</u></b>
Stand Off® SLX100 Water & Oil Repellent	-0.0 mL	<b><u>AA</u></b>
<b>“Bitterroot”</b>	<b>Results in mL loss</b>	<b>Ranking</b>
Untreated Control	-0.0 mL	--
Sure Klean® Weather Seal SL100 Water Repellent	-0.0 mL	<b><u>AA</u></b>
Sure Klean® Weather Seal Siloxane PD	-0.0 mL	<b><u>AA</u></b>
Paver Kare® Paver Enhancer	-0.0 mL	<b><u>AA</u></b>
Stand Off® Gloss ‘N Guard	-0.0 mL	<b><u>AA</u></b>
Stand Off® Stone, Tile & Masonry Protector (STMP)	-0.0 mL	<b><u>AA</u></b>
Stand Off® SLX100 Water & Oil Repellent	-0.0 mL	<b><u>AA</u></b>

**Photographs – Protective Water Repellents**

**“Bitterroot”; Horizontal RILEM II.4, 5.0 milliliters, 20 minutes**



**Paver Kare®  
Paver Enhancer**

**Stand Off®  
Gloss 'N Guard**

**Untreated  
Control**



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

**Sure Klean®  
Weather Seal  
Siloxane PD**

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

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

### **Conclusions – Protective Water Repellents**

In the RILEM tests, test results indicate that each of the water repellents tested exhibited above average water repellency on the submitted natural stone, although even the untreated sections of stone did not absorb any water.

Sections of the natural stone treated with Stand Off® Gloss 'N Guard, Paver Kare® Paver Enhancer, and Stand Off® SLX100 Water & Oil Repellent each exhibited a slight to moderate color enhancement on the samples evaluated.

### **Recommendations – Protective Water Repellents**

Recommendations for water repellent treatments for the natural stone submitted by Glacier Stone Supply, LLC, Kalispell, MT are provided in the chart below. Recommendations are based on the treatments that proved most effective at providing water repellency on the submitted samples.

Sample	Protective Water Repellents
All Submitted Natural Stone	Sure Klean® Weather Seal SL100 Water Repellent or Sure Klean® Weather Seal Siloxane PD or *Paver Kare® Paver Enhancer or *Stand Off® Gloss 'N Guard or Stand Off® Stone, Tile & Masonry Protector (STMP) or Stand Off® SLX100 Water & Oil Repellent

**\*NOTE:** Paver Kare® Paver Enhancer and Stand Off® Gloss 'N Guard are manufactured and marketed in compliance with USEPA AIM VOC regulations (40 CFR 59.403). These products may not be suitable for sale in states and districts with more restrictive AIM VOC regulations.

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

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



## **Stain Repellency**

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

### **Description of Products Evaluated – Stain Repellency**

#### **Stain Repellent Treatments**

**Stand Off® Gloss 'N Guard** – A highly durable protective coating for tile, pavers, terrazzo and other polished and unpolished masonry. Gloss 'N Guard dries to a high-gloss finish that enhances the natural beauty of treated surfaces.

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

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

#### **Maintenance Cleaner**

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

#### **Staining Agents Evaluated**

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

### **Sample Preparation – Stain Repellency**

The protective treatments were then applied by brush in accordance with the current PROSOCO, Inc. Product Data Sheet application instructions. The treatments were allowed to cure on the samples for at least 72 hours before testing.

## **Test Method – Stain Repellency**

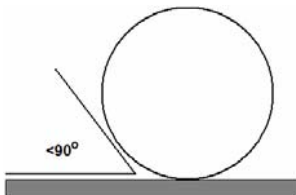
### **Surface Beading Evaluation**

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

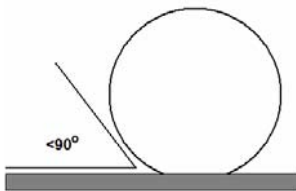
**Note: Non-free flowing staining agents such as ketchup and mustard are applied in a globular fashion and therefore are not evaluated for their beading properties.**

### **Rating System (1-5)**

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



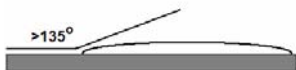
2. Wetting contained to the contact area (slight darkening); angle is less than 90°.



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



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



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



### **Stain Removal Evaluation**

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

**Test Results – Surface Beading**

<b>“Big Horn”</b>									
<b>Treatment</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	5	5	5
<b>Gloss ‘N Guard</b>	3	--	--	3	3	3	3	3	3
<b>Stone, Tile &amp; Masonry Protector (STMP)</b>	2	--	--	2	2	2	2	2	2
<b>SLX100 Water &amp; Oil Repellent</b>	2	--	--	2	2	2	3	2	2
<b>“Bitterroot”</b>									
<b>Treatment</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	5	5	5	4
<b>Gloss ‘N Guard</b>	3	--	--	3	3	3	3	4	3
<b>Stone, Tile &amp; Masonry Protector (STMP)</b>	2	--	--	3	2	2	3	2	3
<b>SLX100 Water &amp; Oil Repellent</b>	2	--	--	2	3	2	2	3	2

**Test Results – Stain Repellency**

<b>% Removal</b>									
<b>“Big Horn”</b>									
<b>Untreated Control</b>									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	80%	50%	25%	75%	75%	75%	25%	10%	25%
4 hour	80%	75%	75%	75%	75%	80%	25%	10%	50%
1 hour	90%	75%	75%	80%	75%	85%	25%	25%	50%
10 min.	90%	75%	75%	90%	90%	90%	25%	25%	60%
<b>Stand Off® Gloss ‘N Guard</b>									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	90%	50%	50%	90%	90%	95%	80%	80%	80%
4 hour	90%	75%	75%	90%	100%	100%	80%	90%	80%
1 hour	90%	75%	85%	100%	100%	100%	90%	90%	90%
10 min.	100%	85%	90%	100%	100%	100%	90%	90%	90%
<b>Stand Off® Stone, Tile &amp; Masonry Protector (STMP)</b>									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	75%	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%
<b>Stand Off® SLX100 Water &amp; Oil Repellent</b>									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	60%	90%	100%	100%	100%	100%	100%	100%
4 hour	100%	85%	100%	100%	100%	100%	100%	100%	100%
1 hour	100%	100%	100%	100%	100%	100%	100%	100%	100%
10 min.	100%	100%	100%	100%	100%	100%	100%	100%	100%

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

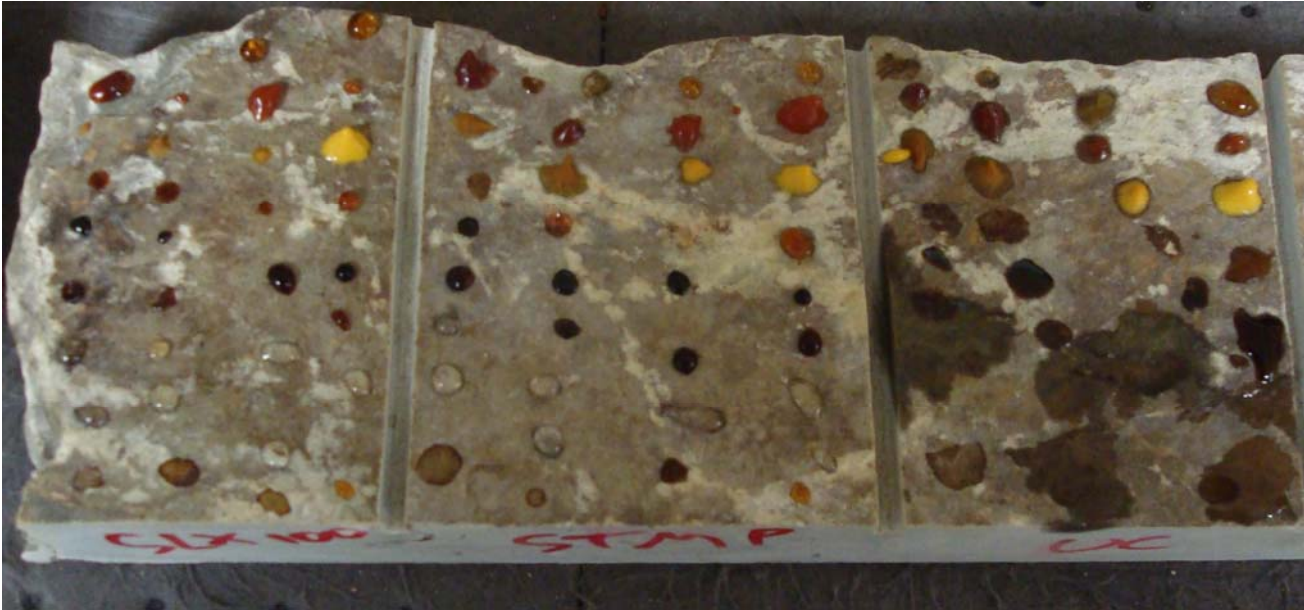
**Test Results – Stain Repellency**

									<b>% Removal</b>
<b>“Bitterroot”</b>									
<b>Untreated Control</b>									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
<b>24 hr</b>	50%	25%	20%	75%	75%	75%	25%	25%	50%
<b>4 hour</b>	75%	50%	25%	75%	75%	75%	25%	25%	50%
<b>1 hour</b>	75%	75%	55%	75%	75%	75%	25%	50%	60%
<b>10 min.</b>	75%	80%	65%	75%	75%	75%	35%	50%	60%
<b>Stand Off® Gloss ‘N Guard</b>									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
<b>24 hr</b>	75%	40%	50%	90%	90%	95%	50%	65%	80%
<b>4 hour</b>	80%	50%	60%	90%	95%	95%	75%	75%	85%
<b>1 hour</b>	90%	75%	75%	90%	95%	100%	75%	80%	85%
<b>10 min.</b>	90%	85%	85%	100%	100%	100%	75%	80%	85%
<b>Stand Off® Stone, Tile &amp; Masonry Protector (STMP)</b>									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
<b>24 hr</b>	100%	75%	65%	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>									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
<b>24 hr</b>	100%	75%	70%	100%	100%	100%	100%	100%	100%
<b>4 hour</b>	100%	85%	75%	100%	100%	100%	100%	100%	100%
<b>1 hour</b>	100%	100%	85%	100%	100%	100%	100%	100%	100%
<b>10 min.</b>	100%	100%	90%	100%	100%	100%	100%	100%	100%

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

**Photographs – Stain Repellency**

**“Bitterroot”; Stains Applied**



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

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

**Untreated Control**



**Stand Off® Gloss 'N Guard**

**Photographs – Stain Repellency**

**“Bitterroot”; Stains Removed**



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

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

**Untreated Control**



**Stand Off® Gloss 'N Guard**

### **Conclusions – Stain Repellency**

Based upon laboratory evaluations, each of the treatments evaluated improved the surface beading of the samples. In addition, each of the treatments were effective in improving the samples' resistance to the applied stains. The samples treated with Stand Off® SLX100 Water & Oil Repellent and Stand Off® Stone, Tile & Masonry Protector (STMP) were more resistant to the oils applied. Both Stand Off® SLX100 Water & Oil Repellent and Stand Off® Stone, Tile & Masonry Protector (STMP) caused a moderate color enhancement to the submitted samples.

### **Recommendations – Stain Repellency**

Recommendations for stain resistance treatment for the natural stone submitted by Glacier Stone Supply, LLC, Kalispell, MT, are provided in the chart below. Recommendations are based on the treatments that proved most effective for providing stain repellency on the submitted samples.

Sample	Stain Repellent	Maintenance Cleaner
All Submitted Natural Stone	Stand Off® Gloss 'N Guard or Stand Off® Stone, Tile & Masonry Protector (STMP) or Stand Off® SLX100 Water & Oil Repellent	Enviro Klean® 2010 All Surface Cleaner

**\*NOTE:** Stand Off® Gloss 'N Guard is manufactured and marketed in compliance with USEPA AIM VOC regulations (40 CFR 59.403). This product may not be suitable for sale in states and districts with more restrictive AIM VOC regulations.

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

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



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## **Color and Sheen Enhancement**

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

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### **Description of Products Evaluated – Color and Sheen Enhancement**

**Stand Off® Gloss 'N Guard** – A highly durable protective coating for tile, pavers, terrazzo and other polished and unpolished masonry. Gloss 'N Guard dries to a high-gloss finish that enhances the natural beauty of treated surfaces.

**Paver Kare® 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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### **Test Method – Color and Sheen Enhancement**

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

**Test Results – Color and Sheen Enhancement**

<b>“Big Horn”</b>		
<b>Treatment</b>	<b>Color Enhancement</b>	<b>Sheen Enhancement</b>
Stand Off® Gloss ‘N Guard	3	3
Paver Kare® Paver Enhancer	3	1
<b>“Bitterroot”</b>		
<b>Treatment</b>	<b>Color Enhancement</b>	<b>Sheen Enhancement</b>
Stand Off® Gloss ‘N Guard	3	3
Paver Kare® Paver Enhancer	3	1

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

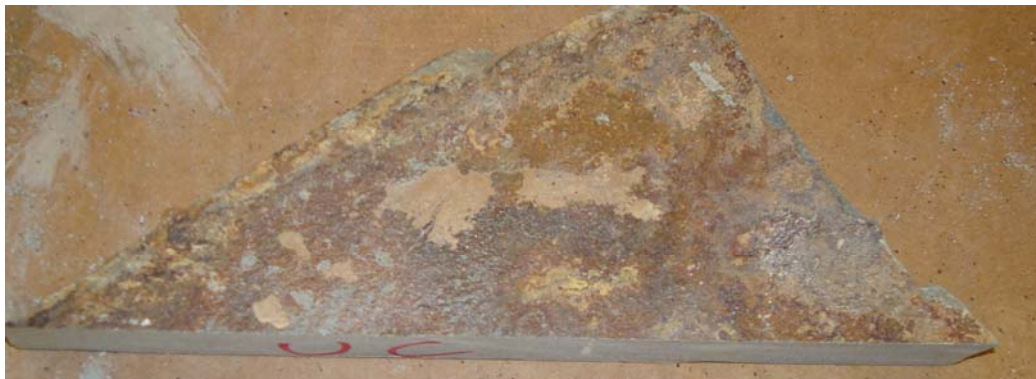
**Photographs – Color and Sheen Enhancement**

**“Big Horn”; Treatments Applied**



**Paver Kare® Paver Enhancer**

**Stand Off® Gloss 'N Guard**



**Untreated Surface**

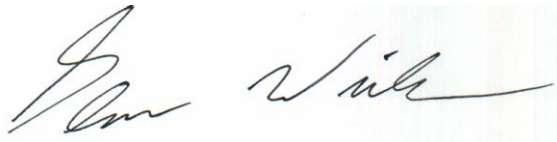
**Recommendations – Color and Sheen Enhancement**

Recommendations for color and sheen enhancement for the natural stone submitted by Glacier Stone Supply, LLC, Kalispell MT, are provided in the chart below. Recommendations are based on the treatment that proved most effective in providing color and/or sheen enhancement to the submitted samples.

Sample	Color Enhancement	Sheen Enhancement
All Submitted Natural Stone	*Stand Off® Gloss 'N Guard or *Paver Kare® Paver Enhancer	*Stand Off® Gloss 'N Guard

**\*NOTE:** Paver Kare® Paver Enhancer and Stand Off® Gloss 'N Guard are manufactured and marketed in compliance with USEPA AIM VOC regulations (40 CFR 59.403). These products may not be suitable for sale in states and districts with more restrictive AIM VOC regulations.

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



Glenn Winkler  
Project Testing Laboratory Technician



***PALLET TAG PROGRAM***  
*Laboratory Report*

Glacier Stone Supply, LLC  
955 Whitefish Stage Road  
Kalispell, MT 59901



*Project No. 0803-03 PTP*

***Prepared For:***  
**PROSOCO**  
SINCE 1939

***Prepared By:***  
AMT Laboratories  
April 2008