

Table of Contents

Executive Summary	i
Submitted Information	1
Introduction	2
Purpose of Testing.....	2
Products Evaluated.....	3
New Construction Cleaning	4
Description of Products Evaluated – New Construction Cleaning	4
Test Method – New Construction Cleaning	4
Test Results – New Construction Cleaning	5
Test Results – Limiting Surface Alterations	8
Photographs – New Construction Cleaning	11
Photographs – Limiting Surface Alterations	14
Conclusions – New Construction Cleaning	15
Recommendations – New Construction Cleaning	15
Protective Water Repellents.....	16
Description of Products Evaluated – Protective Water Repellents	16
Sample Preparation – Protective Water Repellents.....	16
Test Methods – Protective Water Repellents.....	17
Test Results – Protective Water Repellents	18
Photographs – Protective Water Repellents	19
Conclusions – Protective Water Repellents	20
Recommendations – Protective Water Repellents	20
Stain Repellency	21
Description of Products Evaluated – Stain Repellency	21
Sample Preparation – Stain Repellency	21
Test Method – Stain Repellency	22
Test Results – Surface Beading.....	23
Test Results – Stain Repellency	24
Photographs – Stain Repellency.....	27
Conclusions – Stain Repellency.....	29
Recommendations – Stain Repellency	29
Color and Sheen Enhancement.....	30
Description of Products Evaluated – Color and Sheen Enhancement	30
Test Method – Color and Sheen Enhancement.....	30
Test Results – Color and Sheen Enhancement.....	31
Photographs – Color and Sheen Enhancement	32
Recommendations – Color and Sheen Enhancement.....	33
Attachments	
Technical Services TECH Note RILEM Tube Test Procedures	
Product Data literature for all products evaluate	

Submitted Information

For: Ivonne Cotilla, Claymex Brick & Tile
Cc: Coburn Bond
Steve Dean
Brian Koenings
Al Morris

Subject: Claymex Brick and Tile
Eagle Pass, TX

Date: May 20, 2008

Project: 0804-04 PTP

Samples Submitted: 9 types of clay tile

Name	Orientation	Color	In-Plant Treatment	Size
"Super Colorado Natural"	Horizontal	Red	No	11" x 11" x ½"
"Super Saltillo Natural"	Horizontal	Pink-Yellow	No	11" x 11" x ½"
"Super Terracotta Natural"	Horizontal	Orange	No	11" x 11" x ½"
"Super Colorado Matte"	Horizontal	Red	Yes	11" x 11" x ½"
"Super Saltillo Matte"	Horizontal	Pink-Yellow	Yes	11" x 11" x ½"
"Super Terracotta Matte"	Horizontal	Orange	Yes	11" x 11" x ½"
"Super Colorado Semibrillosa"	Horizontal	Red	Yes	11" x 11" x ½"
"Super Saltillo Semibrillosa"	Horizontal	Pink-Yellow	Yes	11" x 11" x ½"
"Super Terracotta Semibrillosa"	Horizontal	Orange	Yes	11" x 11" x ½"

Submitted by: Coburn Bond

Introduction

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

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

Purpose of Testing

Nine types of clay tile were submitted to AMT Laboratories by PROSOCO, Inc. with a request to determine the optimal cleaning/cure time combination to most efficiently remove sanded grout from the submitted clay tile while limiting surface alterations. Additionally, the effectiveness of water repellents, color enhancers, and stain repellents suitable for clay tile were evaluated.

New Construction Cleaning – Stand Off® Grout & Tile Cleaner and Enviro Klean® Safety Klean were tested at various dilutions to determine the optimal cleaning/cure time combination to most efficiently remove sanded grout from the submitted clay tile while limiting surface alterations. The surface alteration evaluation was visually determined based upon perceived discoloration or erosion/etching of the clay tile.

To simulate new construction soiling, all 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 each tile and filled with a wet mixture of sanded grout. The wet sanded grout-filled cylinder was allowed to remain in contact with the tile for 10 minutes before removal.

Heavy deposits of sanded grout were removed with dry scraping after 24 hours. Prepared cleaning solutions were then evaluated for their effectiveness in removing any residual grout after 1, 3 and 7 days of curing. A visual examination was also made to determine if the tested cleaners caused any surface alterations to the submitted clay tile based on the following:

Surface Finish Removal is the visual examination of the tile 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 clay tile 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 tile.

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 – Stand Off® Gloss 'N Guard WB, Stand Off® SLX 100 Water & Oil Repellent, and Stand Off® Stone, Tile, and Masonry Protector (STMP) were evaluated on the submitted clay tile for their ability to provide water repellency.

Stain Repellency – Stand Off® Gloss 'N Guard WB, Stand Off® SLX 100 Water & Oil Repellent, and Stand Off® Stone, Tile & Masonry Protector (STMP) were evaluated for their ability to repel stains from the submitted clay tile.

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

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

Sample	Product	Dilution
All Submitted Clay Tile	Stand Off® Grout & Tile Cleaner	1:2, 1:3
	Enviro Klean® Safety Klean	1:2, 1:3

Protective Water Repellent Products Evaluated

Sample	Product	Dilution
"Super Colorado Natural" "Super Saltillo Natural" "Super Terracotta Natural"	Stand Off® Gloss 'N Guard WB	Concentrate
	Stand Off® SLX100 Water & Oil Repellent	Concentrate
	Stand Off® Stone, Tile & Masonry Protector (STMP)	Concentrate

Stain Repellency Products Evaluated

Sample	Product	Dilution
"Super Colorado Natural" "Super Saltillo Natural" "Super Terracotta Natural"	Stand Off® Gloss 'N Guard WB	Concentrate
	Stand Off® SLX100 Water & Oil Repellent	Concentrate
	Stand Off® Stone, Tile & Masonry Protector (STMP)	Concentrate

Color and Sheen Enhancement Products Evaluated

Sample	Product	Dilution
"Super Colorado Natural" "Super Saltillo Natural" "Super Terracotta Natural"	Stand Off® Gloss 'N Guard WB	Concentrate

Note: The "Matte" and "Semibrillosa" samples were not evaluated with any Prosoco, Inc. treatments because they have an in-plant treatment.

New Construction Cleaning

These cleaning trials were conducted to determine the optimal cleaning/cure time combination to most efficiently remove sanded grout from the submitted clay tiles while limiting surface alterations.

Sanded grout was prepared in compliance with the manufacturer's instructions, applied to the clay tile surface and allowed to cure for 1, 3 and 7 days. Grout removal was accomplished using chemical assistance and a high-pressure water rinse with pressure rinsing equipment. The removal of grout was visually evaluated after 1, 3 and 7 days of curing. A visual examination was also made to determine if the tested cleaners caused any surface alterations to the submitted clay tile.

Description of Products Evaluated – New Construction Cleaning

Stand Off® Grout & Tile Cleaner – A blend of acids, detergents, and inhibitors designed to remove common cementitious grout stains and installation dirt from quarry tile, brick pavers, ceramic tile and many natural stone surfaces. Safer for use on standard or colored grouts, Grout & Tile Cleaner is also effective for removal of accumulated dirt and staining from existing tile floors.

Enviro Klean® Safety Klean – An effective, safe, alternative to acidic compounds for cleaning brick, tile, and concrete surfaces. Safety Klean rids new masonry construction of excess mortar, dirt and other common job site soiling. It's ideal for projects where traditional acidic cleaners are not allowed. Non-fuming Safety Klean contains no hydrochloric or other traditional inorganic acids and is safe for use on and around most metal surfaces. Always test. Additionally, it is up to 70 percent more effective than citric and glycolic acids and 50 percent more effective than phosphoric acid.

Test Method – New Construction Cleaning

New construction cleaners were evaluated using the following procedure:

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

Stand Off® Grout & Tile Cleaner	3-5 minutes
Enviro Klean® Safety Klean.....	3-5 minutes
4. Pressure rinse thoroughly.*

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

Test Results – New Construction Cleaning**Cleaning Effectiveness (% Sanded Grout Removal)**

“Super Colorado Natural”				
Product	Dilution	1 day	3 day	7 day
Stand Off® Grout & Tile Cleaner	1:2	70%	75%	50%
Stand Off® Grout & Tile Cleaner	1:3	70%	25%	30%
Enviro Klean® Safety Klean	1:2	50%	75%	25%
Enviro Klean® Safety Klean	1:3	70%	80%	40%
“Super Saltillo Natural”				
Product	Dilution	1 day	3 day	7 day
Stand Off® Grout & Tile Cleaner	1:2	70%	60%	80%
Stand Off® Grout & Tile Cleaner	1:3	35%	50%	50%
Enviro Klean® Safety Klean	1:2	80%	50%	15%
Enviro Klean® Safety Klean	1:3	40%	75%	25%
“Super Terracotta Natural”				
Product	Dilution	1 day	3 day	7 day
Stand Off® Grout & Tile Cleaner	1:2	25%	20%	25%
Stand Off® Grout & Tile Cleaner	1:3	10%	10%	10%
Enviro Klean® Safety Klean	1:2	70%	10%	10%
Enviro Klean® Safety Klean	1:3	30%	10%	10%

Test Results – New Construction Cleaning**Cleaning Effectiveness (% Sanded Grout Removal)**

“Super Colorado Matte”				
Product	Dilution	1 day	3 day	7 day
Stand Off® Grout & Tile Cleaner	1:2	70%	90%	90%
Stand Off® Grout & Tile Cleaner	1:3	50%	90%	90%
Enviro Klean® Safety Klean	1:2	90%	90%	90%
Enviro Klean® Safety Klean	1:3	90%	90%	90%
“Super Saltillo Matte”				
Product	Dilution	1 day	3 day	7 day
Stand Off® Grout & Tile Cleaner	1:2	75%	65%	90%
Stand Off® Grout & Tile Cleaner	1:3	65%	70%	90%
Enviro Klean® Safety Klean	1:2	90%	90%	90%
Enviro Klean® Safety Klean	1:3	90%	90%	90%
“Super Terracotta Matte”				
Product	Dilution	1 day	3 day	7 day
Stand Off® Grout & Tile Cleaner	1:2	80%	65%	85%
Stand Off® Grout & Tile Cleaner	1:3	80%	80%	85%
Enviro Klean® Safety Klean	1:2	75%	80%	85%
Enviro Klean® Safety Klean	1:3	75%	50%	85%

Test Results – New Construction Cleaning**Cleaning Effectiveness (% Sanded Grout Removal)**

“Super Colorado Semibrillosa”				
Product	Dilution	1 day	3 day	7 day
Stand Off® Grout & Tile Cleaner	1:2	85%	80%	85%
Stand Off® Grout & Tile Cleaner	1:3	80%	80%	85%
Enviro Klean® Safety Klean	1:2	90%	85%	85%
Enviro Klean® Safety Klean	1:3	80%	75%	85%
“Super Saltillo Semibrillosa”				
Product	Dilution	1 day	3 day	7 day
Stand Off® Grout & Tile Cleaner	1:2	75%	90%	90%
Stand Off® Grout & Tile Cleaner	1:3	80%	90%	90%
Enviro Klean® Safety Klean	1:2	90%	90%	90%
Enviro Klean® Safety Klean	1:3	90%	90%	90%
“Super Terracotta Semibrillosa”				
Product	Dilution	1 day	3 day	7 day
Stand Off® Grout & Tile Cleaner	1:2	100%	100%	90%
Stand Off® Grout & Tile Cleaner	1:3	100%	100%	90%
Enviro Klean® Safety Klean	1:2	100%	100%	90%
Enviro Klean® Safety Klean	1:3	100%	100%	90%

Test Results – Limiting Surface Alterations

Substrate: Clay Tile		Pigment Color: “Super Colorado Natural”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Stand Off® Grout & Tile Cleaner	1:2	2	1	0	1
Stand Off® Grout & Tile Cleaner	1:3	2	1	0	1
Enviro Klean® Safety Klean	1:2	2	1	0	1
Enviro Klean® Safety Klean	1:3	2	1	0	1
Substrate: Clay Tile		Pigment Color: “Super Saltillo Natural”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Stand Off® Grout & Tile Cleaner	1:2	2	1	1	1
Stand Off® Grout & Tile Cleaner	1:3	2	1	1	1
Enviro Klean® Safety Klean	1:2	2	1	1	1
Enviro Klean® Safety Klean	1:3	2	1	1	1
Substrate: Clay Tile		Pigment Color: “Super Terracotta Natural”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Stand Off® Grout & Tile Cleaner	1:2	2	1	0	1
Stand Off® Grout & Tile Cleaner	1:3	2	1	0	1
Enviro Klean® Safety Klean	1:2	2	1	0	1
Enviro Klean® Safety Klean	1:3	2	1	0	1

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

Test Results – Limiting Surface Alterations

Substrate: Clay Tile		Pigment Color: “Super Colorado Matte”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Stand Off® Grout & Tile Cleaner	1:2	0	0	0	1
Stand Off® Grout & Tile Cleaner	1:3	0	0	0	1
Enviro Klean® Safety Klean	1:2	0	0	0	1
Enviro Klean® Safety Klean	1:3	0	0	0	1
Substrate: Clay Tile		Pigment Color: “Super Saltillo Matte”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Stand Off® Grout & Tile Cleaner	1:2	0	0	0	1
Stand Off® Grout & Tile Cleaner	1:3	0	0	0	1
Enviro Klean® Safety Klean	1:2	0	0	0	1
Enviro Klean® Safety Klean	1:3	0	0	0	1
Substrate: Clay Tile		Pigment Color: “Super Terracotta Matte”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Stand Off® Grout & Tile Cleaner	1:2	0	0	0	1
Stand Off® Grout & Tile Cleaner	1:3	0	0	0	1
Enviro Klean® Safety Klean	1:2	0	0	0	1
Enviro Klean® Safety Klean	1:3	0	0	0	1

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

Test Results – Limiting Surface Alterations

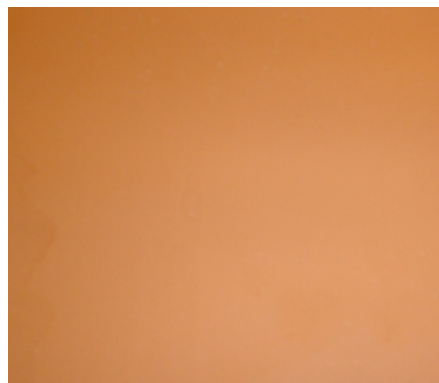
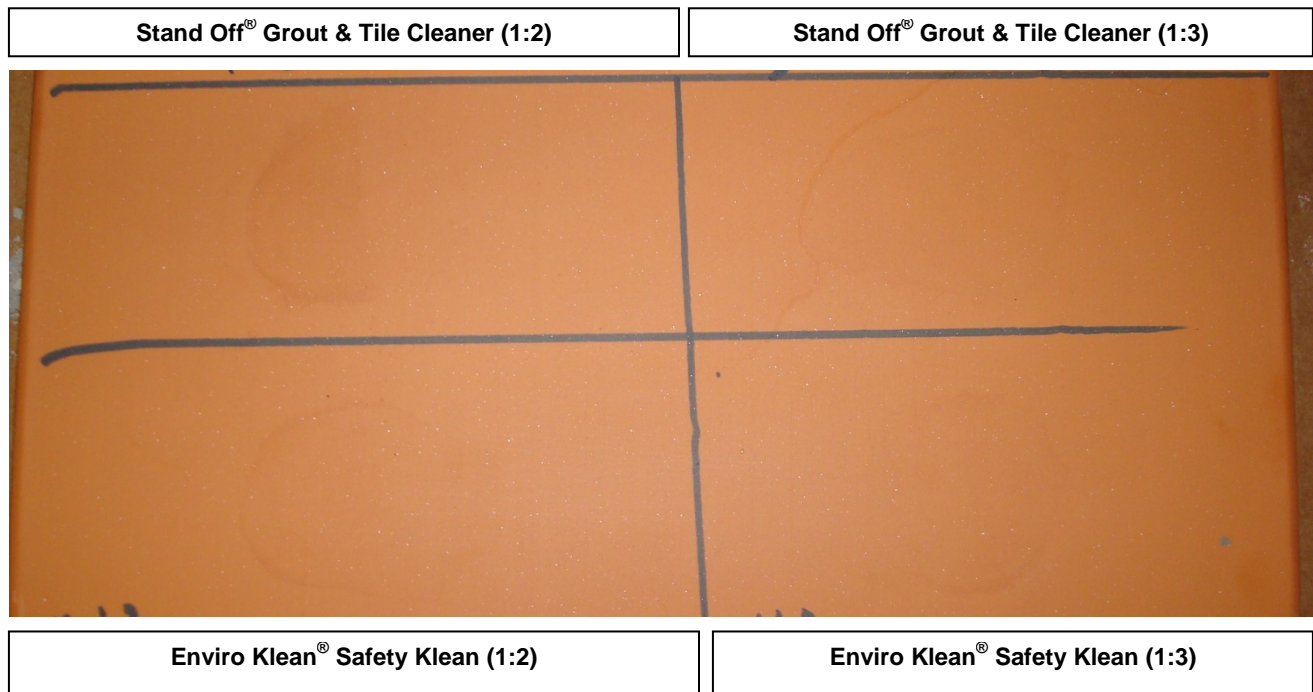
Substrate: Clay Tile		Pigment Color: “Super Colorado Semibrillosa”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Stand Off® Grout & Tile Cleaner	1:2	0	0	0	1
Stand Off® Grout & Tile Cleaner	1:3	0	0	0	1
Enviro Klean® Safety Klean	1:2	0	0	0	1
Enviro Klean® Safety Klean	1:3	0	0	0	1
Substrate: Clay Tile		Pigment Color: “Super Saltillo Semibrillosa”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Stand Off® Grout & Tile Cleaner	1:2	0	0	0	1
Stand Off® Grout & Tile Cleaner	1:3	0	0	0	1
Enviro Klean® Safety Klean	1:2	0	0	0	1
Enviro Klean® Safety Klean	1:3	0	0	0	1
Substrate: Clay Tile		Pigment Color: “Super Terracotta Semibrillosa”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Stand Off® Grout & Tile Cleaner	1:2	0	0	0	1
Stand Off® Grout & Tile Cleaner	1:3	0	0	0	1
Enviro Klean® Safety Klean	1:2	0	0	0	1
Enviro Klean® Safety Klean	1:3	0	0	0	1

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

Photographs – New Construction Cleaning**“Super Colorado Semibrillosa” Clay Tile; Sanded Grout, 1 Day Cleaning**

Photographs – New Construction Cleaning**“Super Colorado Semibrillosa” Clay Tile; Sanded Grout, 3 Day Cleaning****Stand Off[®] Grout & Tile Cleaner (1:2)****Stand Off[®] Grout & Tile Cleaner (1:3)****Enviro Klean[®] Safety Klean (1:2)****Enviro Klean[®] Safety Klean (1:3)**

Photographs – New Construction Cleaning**“Super Colorado Semibrillosa” Clay Tile; Sanded Grout, 7 Day Cleaning****Stand Off® Grout & Tile Cleaner (1:2)****Stand Off® Grout & Tile Cleaner (1:3)****Enviro Klean® Safety Klean (1:2)****Enviro Klean® Safety Klean (1:3)****Untreated Control**

Photographs – Limiting Surface Alterations**“Super Terracotta Matte” Clay Tile**

Uncleaned Surface

Conclusions – New Construction Cleaning

Based on the test results, the “Matte” and “Semibrillosa” clay tile samples were effectively cleaned with Stand Off® Grout & Tile Cleaner and Enviro Klean® Safety Klean. The “Natural” tiles were significantly more difficult to clean. The “Natural” tiles exhibited moderate surface finish removal after cleaning. Therefore, no recommendation can be made for new construction cleaning on the “Natural” tiles.

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 minimize removal of the decorative finish. Excessive pressure and water volume may combine to damage or remove decorative finishes. To facilitate easier removal of excess grout while minimizing any potential surface alterations to the decorative finish, clean within 7 days of construction.

Recommendations – New Construction Cleaning

Recommendations for cleaning for each type of clay tile submitted by Claymex Brick & Tile, Eagle Pass, TX are provided in the charts below. Recommendations are based on the optimum dilution for complete removal of sanded grout while limiting surface alterations.

Sample	New Construction Cleaning (Sanded Grout, 7 day cleaning)
All Submitted “Natural” Clay Tiles	No recommendation due to surface finish removal
All Submitted “Matte” and “Semibrillosa” Clay Tiles	Stand Off® Grout & Tile Cleaner (1:3) 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.

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

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

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

Stand Off® 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.

Sample Preparation – Protective Water Repellents

Stand Off® SLX100 Water & Oil Repellent and Stand Off® Stone, Tile & Masonry Protector (STMP) were applied by brush in accordance with the current PROSOCO, Inc. Product Data Sheet instructions.

Stand Off® Gloss 'N Guard WB was applied with a foam brush to ensure an even application. **A second application was applied approximately 15 minutes after the first application to ensure an even appearance.**

All treatments were allowed to cure for at least 72 hours prior to testing.

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

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

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

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

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

EXAMPLE: If RILEM tubes applied to an untreated sample result in loss of 5 ml of water or more, then:

A rating of **AA** Above Average water repellent performance would require loss of less than or equal to:

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

A rating of **A** Average water repellent performance would require loss of less than or equal to:

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

A rating of **BA** Below Average water repellent performance would require 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**

“Super Colorado Natural”	Results in mL loss	Ranking
Untreated Control	-5.0 mL	--
Stand Off [®] Gloss ‘N Guard WB	-0.0 mL	<u>AA</u>
Stand Off [®] SLX100 Water & Oil Repellent	-0.0 mL	<u>AA</u>
Stand Off [®] Stone, Tile & Masonry Protector (STMP)	-2.0 mL	<u>A</u>
“Super Saltillo Natural”	Results in mL loss	Ranking
Untreated Control	-5.0 mL	--
Stand Off [®] Gloss ‘N Guard WB	-0.0 mL	<u>AA</u>
Stand Off [®] SLX100 Water & Oil Repellent	-0.0 mL	<u>AA</u>
Stand Off [®] Stone, Tile & Masonry Protector (STMP)	-0.0 mL	<u>AA</u>
“Super Terracotta Natural”	Results in mL loss	Ranking
Untreated Control	-5.0 mL	--
Stand Off [®] Gloss ‘N Guard WB	-0.0 mL	<u>AA</u>
Stand Off [®] SLX100 Water & Oil Repellent	-0.0 mL	<u>AA</u>
Stand Off [®] Stone, Tile & Masonry Protector (STMP)	-1.0 mL	<u>AA</u>

Photographs – Protective Water Repellents

“Super Terracotta Natural” Clay Tile; Horizontal RILEM II.4, 5.0 milliliters, 20 minutes



Conclusions – Protective Water Repellents

Test results indicate that Stand Off® Gloss 'N Guard WB, Stand Off® SLX100 Water & Oil Repellent, and Stand Off® Stone, Tile & Masonry Protector (STMP) improved water repellency on each of the samples tested. Each of the treatments enhanced the appearance of each of the clay tile, with Stand Off® Gloss 'N Guard WB providing the most significant enhancement.

Recommendations – Protective Water Repellents

Recommendations for water repellent treatments for the clay tile submitted by Claymex Brick & Tile, Eagle Pass, TX, are provided in the chart below. Recommendations are based on the treatments that proved most effective and can provide water repellency on all types indicated.

Sample	Protective Water Repellents
"Super Colorado Natural"	*Stand Off® Gloss 'N Guard WB or Stand Off® SLX100 Water & Oil Repellent
"Super Saltillo Natural" "Super Terracotta Natural"	*Stand Off® Gloss 'N Guard WB or Stand Off® SLX100 Water & Oil Repellent or Stand Off® Stone, Tile & Masonry Protector (STMP)

*Note: Stand Off® Gloss 'N Guard WB may require two applications for an even appearance. A foam brush is recommended.

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

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

Stand Off® 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.

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 Paver Kare® Weather Seal Siloxane PD overspray from windows.

Staining Agents Evaluated

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

Sample Preparation – Stain Repellency

Stand Off® SLX100 Water & Oil Repellent and Stand Off® Stone, Tile & Masonry Protector (STMP) were applied by brush in accordance with the current PROSOCO, Inc. Product Data Sheet instructions.

Stand Off® Gloss 'N Guard WB was applied with a foam brush to ensure an even application. **A second application was applied approximately 15 minutes after the first application to ensure an even appearance.** All treatments were allowed to cure for at least 72 hours prior to testing.

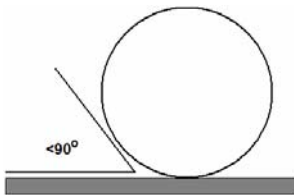
Test Method – Stain Repellency**Surface Beading Evaluation**

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

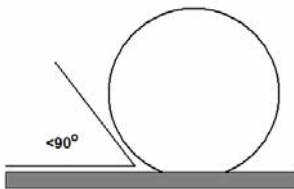
Note: Non-free flowing staining agents such as ketchup and mustard are applied in a globular fashion and therefore are not evaluated for their beading properties.

Rating System (1-5)

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



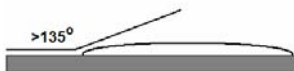
2. Wetting contained to the contact area (slight darkening); angle is less than 90° .



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

“Super Colorado Natural”									
Treatment	Coco-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	3	--	--	4	4	4	5	5	4
Gloss ‘N Guard WB	3	--	--	3	2	3	3	3	3
SLX100 Water & Oil Repellent	2	--	--	2	2	2	3	2	2
Stone, Tile & Masonry Protector (STMP)	2	--	--	3	2	2	3	3	3
“Super Saltillo Natural”									
Treatment	Coco-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	3	--	--	4	4	3	5	5	4
Gloss ‘N Guard WB	3	--	--	3	3	3	3	3	3
SLX100 Water & Oil Repellent	3	--	--	3	2	3	3	3	3
Stone, Tile & Masonry Protector (STMP)	3	--	--	3	3	3	3	3	3
“Super Terracotta Natural”									
Treatment	Coco-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	4	--	--	4	3	3	5	5	4
Gloss ‘N Guard WB	3	--	--	3	3	3	3	3	3
SLX100 Water & Oil Repellent	3	--	--	3	2	3	3	3	3
Stone, Tile & Masonry Protector (STMP)	3	--	--	3	2	3	3	3	3

Test Results – Stain Repellency**% Removal**

“Super Colorado Natural”									
Untreated Control									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	75%	*50%	*35%	30%	50%	50%	10%	10%	50%
4 hour	80%	*60%	*35%	45%	50%	50%	10%	10%	50%
1 hour	80%	*80%	*45%	40%	50%	50%	10%	10%	60%
10 min.	90%	*80%	*45%	45%	50%	50%	10%	10%	75%
Stand Off® Gloss ‘N Guard WB									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%	20%	100%	100%	100%	100%	100%	100%
4 hour	100%	100%	25%	100%	100%	100%	100%	100%	100%
1 hour	100%	100%	100%	100%	100%	100%	100%	100%	100%
10 min.	100%	100%	100%	100%	100%	100%	100%	100%	100%
Stand Off® SLX100 Water & Oil Repellent									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	60%	50%	10%	50%	75%	50%	25%	25%	70%
4 hour	75%	50%	25%	75%	75%	60%	50%	60%	90%
1 hour	75%	75%	70%	75%	75%	70%	70%	70%	90%
	80%	75%	70%	75%	75%	80%	75%	70%	90%
Stand Off® Stone, Tile & Masonry Protector (STMP)									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	75%	60%	30%	80%	80%	80%	50%	25%	75%
4 hour	75%	70%	40%	90%	90%	80%	70%	50%	80%
1 hour	90%	70%	60%	90%	90%	90%	70%	70%	90%
10 min.	90%	70%	60%	90%	90%	90%	70%	75%	90%

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

Test Results – Stain Repellency**% Removal**

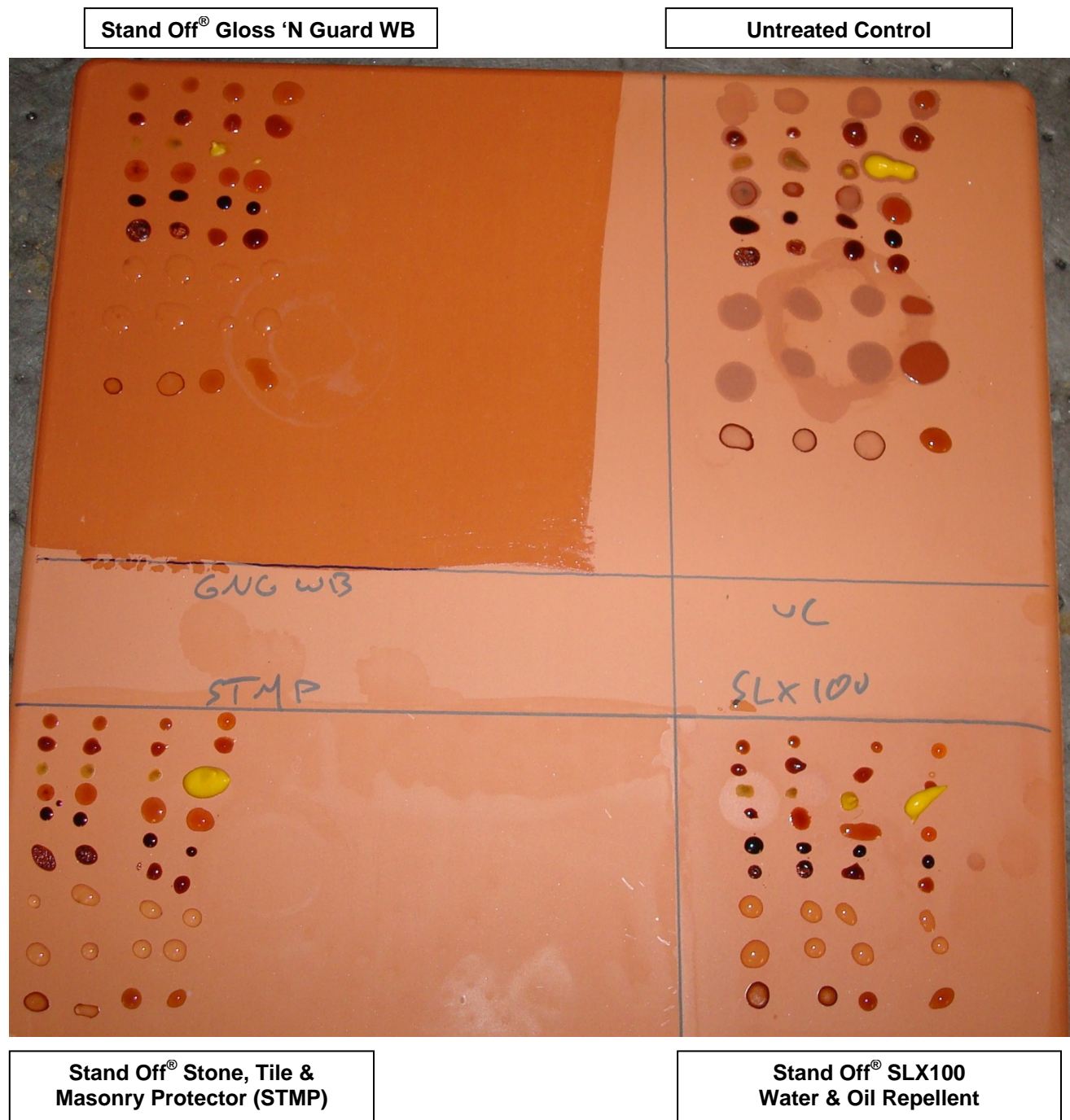
“Super Saltillo Natural”									
Untreated Control									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	60%	*15%	*25%	15%	*50%	50%	10%	10%	50%
4 hour	75%	*25%	*25%	40%	*50%	50%	10%	10%	75%
1 hour	75%	*50%	*30%	60%	*50%	50%	10%	10%	75%
10 min.	75%	*50%	*45%	60%	50%	50%	10%	10%	75%
Stand Off® Gloss ‘N Guard WB									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	75%	50%	50%	100%	100%	100%	75%	75%	100%
4 hour	100%	100%	100%	100%	100%	100%	100%	100%	100%
1 hour	100%	100%	100%	100%	100%	100%	100%	100%	100%
10 min.	100%	100%	100%	100%	100%	100%	100%	100%	100%
Stand Off® SLX100 Water & Oil Repellent									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	75%	50%	50%	60%	60%	50%	50%	50%	70%
4 hour	75%	75%	75%	75%	75%	100%	70%	80%	100%
1 hour	100%	100%	100%	100%	100%	100%	80%	80%	100%
10 min.	100%	100%	100%	100%	100%	100%	90%	80%	100%
Stand Off® Stone, Tile & Masonry Protector (STMP)									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	80%	25%	10%	50%	60%	80%	25%	25%	70%
4 hour	90%	50%	25%	70%	75%	90%	50%	50%	70%
1 hour	100%	50%	25%	80%	80%	100%	50%	50%	70%
10 min.	100%	50%	25%	80%	80%	100%	50%	50%	90%

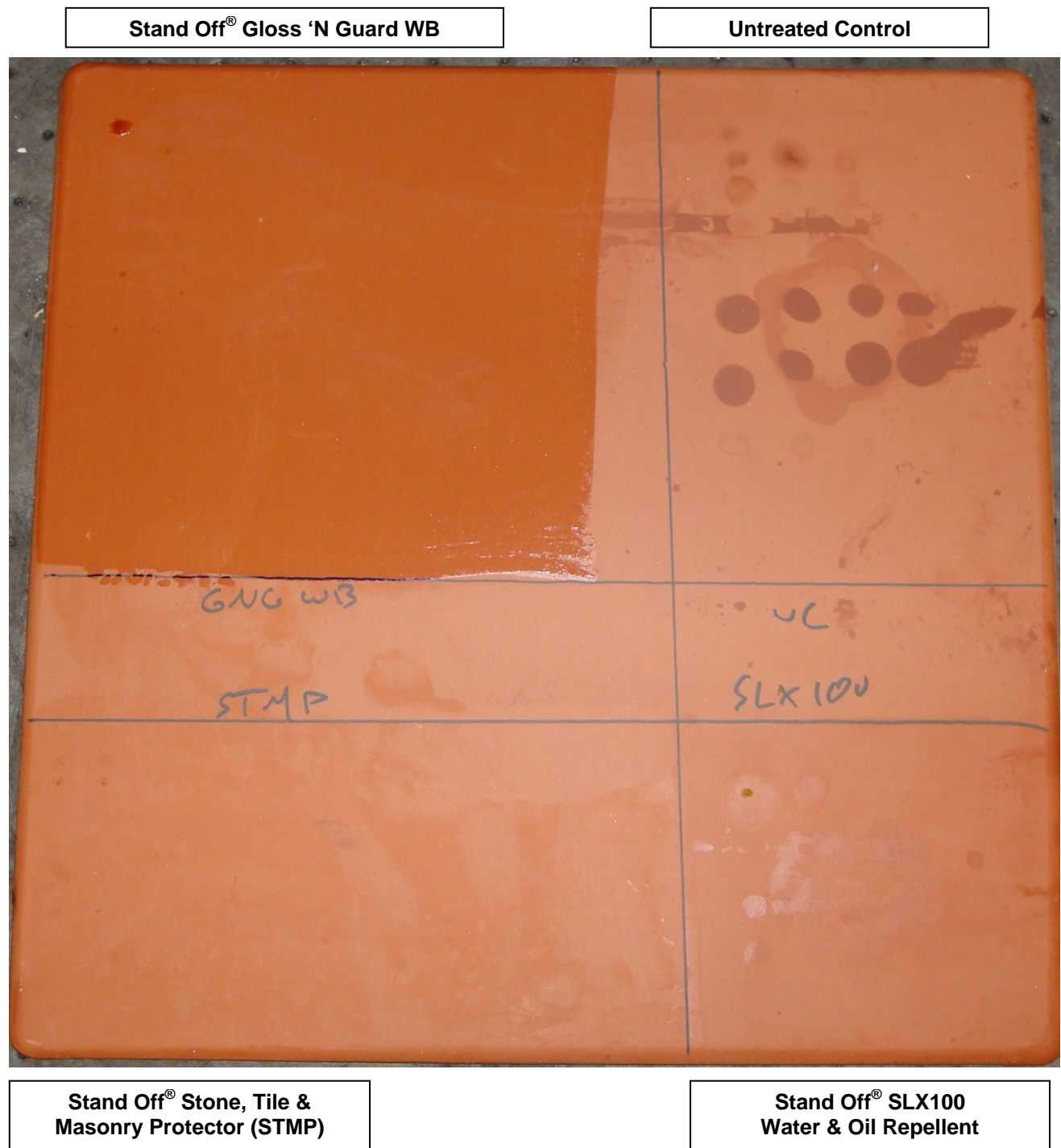
*Indicates etching occurred due to the acidic nature of the staining agents.

Test Results – Stain Repellency**% Removal**

“Super Terracotta Natural”									
Untreated Control									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	50%	*10%	*10%	75%	70%	70%	10%	10%	50%
4 hour	50%	*25%	*25%	75%	70%	70%	10%	10%	60%
1 hour	50%	*50%	*50%	75%	70%	70%	10%	10%	*25%
10 min.	50%	*50%	*60%	75%	70%	70%	10%	10%	60%
Stand Off® Gloss ‘N Guard WB									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	75%	75%	70%	100%	100%	100%	60%	75%	100%
4 hour	100%	75%	80%	100%	100%	100%	70%	75%	100%
1 hour	100%	100%	100%	100%	100%	100%	100%	100%	100%
10 min.	100%	100%	100%	100%	100%	100%	100%	100%	100%
Stand Off® SLX100 Water & Oil Repellent									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	75%	75%	90%	90%	90%	95%	75%	75%	100%
4 hour	90%	90%	90%	100%	95%	95%	75%	75%	100%
1 hour	90%	90%	90%	100%	95%	95%	75%	75%	100%
10 min.	90%	90%	90%	100%	95%	95%	75%	75%	100%
Stand Off® Stone, Tile & Masonry Protector (STMP)									
	Coca-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	75%	25%	25%	75%	75%	75%	40%	25%	50%
4 hour	75%	80%	25%	75%	75%	75%	40%	40%	75%
1 hour	90%	90%	70%	75%	75%	75%	75%	60%	75%
10 min.	90%	90%	70%	75%	75%	75%	75%	60%	75%

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

Photographs – Stain Repellency**“Super Colorado Natural” Clay Tile; Stains Applied**

Photographs – Stain Repellency**“Super Colorado Natural” Clay Tile; Stains Removed**

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 evaluated were effective in improving stain repellency on the submitted clay tiles. However, Stand Off® Gloss 'N Guard WB was the most effective treatment evaluated.

Recommendations – Stain Repellency

Recommendations for stain resistance treatment for the clay tile submitted by Claymex Brick & Tile, Eagle Pass, TX are provided in the chart below. Recommendations are based on the treatments that proved most effective for providing stain repellency on the submitted clay tiles.

Sample	Stain Repellent	Maintenance Cleaner
"Super Colorado Natural" "Super Saltillo Natural" "Super Terracotta Natural"	*Stand Off® Gloss 'N Guard WB	Enviro Klean® 2010 All Surface Cleaner

*Note: Stand Off® Gloss 'N Guard WB may require two applications for an even appearance. A foam brush is recommended.

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

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

Color and Sheen Enhancement

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

Description of Products Evaluated – Color and Sheen Enhancement

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

Test Method – Color and Sheen Enhancement

Stand Off® Gloss 'N Guard WB was applied with a foam brush to ensure an even application. **A second application was applied approximately 15 minutes after the first application to ensure an even appearance.**

Stand Off® Gloss 'N Guard WB was allowed to cure for at least 72 hours prior to testing.

Test Results – Color and Sheen Enhancement

“Super Colorado Natural”		
Treatment	Color Enhancement	Sheen Enhancement
Stand Off® Gloss ‘N Guard WB	2	3
“Super Saltillo Natural”		
Treatment	Color Enhancement	Sheen Enhancement
Stand Off® Gloss ‘N Guard WB	2	3
“Super Terracotta Natural”		
Treatment	Color Enhancement	Sheen Enhancement
Stand Off® Gloss ‘N Guard WB	2	3

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

Photographs – Color and Sheen Enhancement

“Super Saltillo Natural”; Treatment Applied



Untreated Control

Stand Off[®] Gloss 'N Guard WB

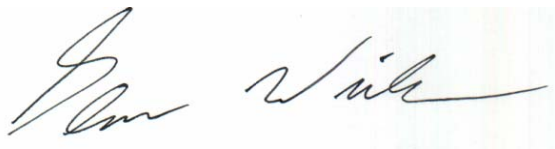
Recommendations – Color and Sheen Enhancement

Recommendations for color and sheen enhancement for the clay tile submitted by Claymex Brick & Tile, Eagle Pass, TX are provided in the chart below. Recommendations are based on the treatment that proved most effective in providing color and sheen enhancement to the submitted samples.

Sample	Color Enhancement	Sheen Enhancement
“Super Colorado Natural” “Super Saltillo Natural” “Super Terracotta Natural”	*Stand Off® Gloss ‘N Guard WB	*Stand Off® Gloss ‘N Guard WB

*Note: Stand Off® Gloss ‘N Guard WB may require two applications for an even appearance. A foam brush is recommended.

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.

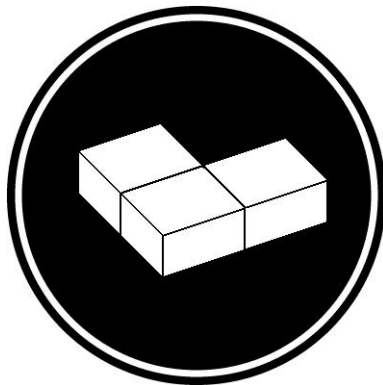


Glenn Winkler
Project Testing Laboratory Technician



Claymex Brick & Tile

2224 Del Rio Hwy
Eagle Pass, TX 78852



Project No. 0804-04 PTP

Prepared For:
PROSOCO
SINCE 1939

Prepared By:
AMT Laboratories
May 2008