



PALLET TAG PROGRAM LABORATORY REPORT

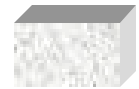


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- Technical Services TECH Note RILEM Tube Test Procedures
- Product Data literature for all products evaluated



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FOR: Scott Pelham
cc: Paul Tessier
Steve Dean

SUBJECT: Liberty Classic Stone
Whitney, TX

DATE: May 15, 2003

PROJECT: 0304-01 PTP

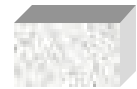
SAMPLES SUBMITTED:

Sample	Color	Size
(10) Rock-face cast stone	"Mist"	Various
(10) Rock-face cast stone	"Autumn"	Various
(10) Rock-face cast stone	"Marble"	Various
(10) Rock-face cast stone	"Smoke"	Various
(10) Rock-face cast stone	"Copper"	10" x 7.5" x 3"
(10) Rock-face cast stone	"Natural"	10 x 7.5 x 3"

Submitted by: Scott Pelham



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PURPOSE OF TESTING:

Six types of rock-face cast stone were submitted to PROSOCO, Inc.'s Testing Laboratory with a request to determine if application of the products evaluated would produce any surface alteration during new construction cleaning operations. A request was made to determine if PROSOCO, Inc.'s brick cleaners would be compatible on the submitted cast stone, as the cast stone is commonly used as an accent for brick. Additionally, the effectiveness of water repellents and stain repellents, suitable for cast stone, were evaluated.

A. New Construction Cleaning – Sure Klean® Burnished Custom Masonry Cleaner, Enviro Klean® Safety Klean, and Sure Klean® Vana Trol® were evaluated at various dilutions for removal of laboratory applied mortar.

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

Soiled tiles 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 N mortar staining after 7 days, 14 days, and 21 days of curing.

B. Limiting Surface Alterations Testing – Sure Klean® Burnished Custom Masonry Cleaner, Enviro Klean® Safety Klean, and Sure Klean® Vana Trol® were evaluated at various dilutions 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.

Aggregate Exposure is the visual examination of the tile comparing aggregate exposure of the untreated control surface to surfaces cleaned with selected product(s) at given dilutions.

Surface Pigment Alteration/Removal is the visual examination of the tile comparing the surface pigmentation of the untreated control to surfaces cleaned with selected product(s) at given dilutions.

Matrix Erosion is the visual examination comparing the untreated control surface to surfaces cleaned with selected products at given dilutions looking for any potential erosion/digestion of the cementitious matrix of the tile.

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

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

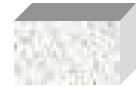
0 – no change	3 – heavy
1 – slight	4 – excessive
2 – moderate	

C. Water Repellent Evaluation – Sure Klean® Weather Seal Siloxane WB Concentrate, Sure Klean® Custom Masonry Sealer and Sure Klean® Weather Seal Siloxane PD were evaluated on the submitted samples for their ability to provide water repellency.

E. Stain Resistance – Stand Off® Stone, Tile & Masonry Protector, Stand Off® SLX100 Water & Oil Repellent, and Stand Off® Impregnator were evaluated for its ability to resist staining agents applied to the submitted samples. Enviro Klean® 2010 All Surface Cleaner diluted with 10 parts fresh water was evaluated for its ability to remove the staining agents from the treated samples.



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PRODUCTS EVALUATED

CLEANING AND LIMITING SURFACE ALTERATIONS PRODUCTS EVALUATED

SAMPLE	PRODUCT	DILUTION
All submitted samples	Sure Klean® Burnished Custom Masonry Cleaner	1:2, 1:3
	Enviro Klean® Safety Klean	1:3
	Sure Klean® Vana Trol®	1:8, 1:10

WATER REPELLENT PRODUCTS EVALUATED

SAMPLE	TREATMENT	DILUTION
All submitted samples	Sure Klean® Weather Seal Siloxane WB Concentrate	1:9, 1:14
	Sure Klean® Custom Masonry Sealer	Concentrate
	Sure Klean® Weather Seal Siloxane PD	Concentrate

STAIN REPELLENCY PRODUCTS EVALUATED

Block Type	Product
All submitted samples	Stand Off® Stone, Tile & Masonry Protector
	Stand Off® SLX100 Water & Oil Repellent
	Stand Off® Impregnator

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



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SECTION A – NEW CONSTRUCTION CLEANING

DESCRIPTION OF PRODUCTS EVALUATED – New Construction Cleaning

These cleaning trials were conducted to determine the optimal cleaning/cure time combination to most efficiently remove Ash Grove[®] Type N mortar from the submitted cast stone.

Ash Grove[®] Type N cementitious mortar was prepared in compliance with the manufacturers instructions, applied to the cast stone and allowed to cure for 7, 14 and 21 days prior to removal with high pressure water rinse using pressure rinsing equipment and chemical assist. The removal of gray Ash Grove[®] Type N cementitious masonry cement mortar after 7, 14 and 21 days of curing was visually evaluated.

Sure Klean[®] Burnished Custom Masonry Cleaner – A general purpose, nonetching acidic cleaner for custom masonry and colored concrete. Removes rust, mud, oil, atmospheric dirt, and other stains without altering the surface texture. Liquid concentrate for dilution with 2-3 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 metal surfaces. Liquid concentrate for dilution with up to three parts fresh water. Apply by brush, roller, 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 – New Construction Cleaning

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

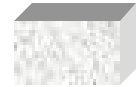
1. Prewet the surface with water.
2. Apply the cleaner.
3. Allow the appropriate dwell time, as specified.

Burnished Custom Masonry Cleaner	3-5 minutes
Safety Klean	3 minutes
Vana Trol [®]	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.



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TEST RESULTS – New Construction Cleaning

% Removal

“Mist” Cast Stone

	<u>7 day</u>	<u>14 day</u>	<u>21 day</u>
Burnished Custom Masonry Cleaner (1:2)	100%	100%	95%
Burnished Custom Masonry Cleaner (1:3)	100%	100%	85%
Safety Klean (1:3)	100%	100%	100%
Vana Trol [®] (1:8)	100%	100%	100%
Vana Trol [®] (1:10)	100%	100%	100%

“Autumn” Cast Stone

	<u>7 day</u>	<u>14 day</u>	<u>21 day</u>
Burnished Custom Masonry Cleaner (1:2)	90%	90%	90%
Burnished Custom Masonry Cleaner (1:3)	90%	90%	90%
Safety Klean (1:3)	95%	95%	95%
Vana Trol [®] (1:8)	95%	95%	100%
Vana Trol [®] (1:10)	90%	90%	95%

“Marble” Cast Stone

	<u>7 day</u>	<u>14 day</u>	<u>21 day</u>
Burnished Custom Masonry Cleaner (1:2)	90%	100%	90%
Burnished Custom Masonry Cleaner (1:3)	90%	90%	90%
Safety Klean (1:3)	95%	95%	95%
Vana Trol [®] (1:8)	100%	100%	95%
Vana Trol [®] (1:10)	90%	95%	95%

“Smoke” Cast Stone

	<u>7 day</u>	<u>14 day</u>	<u>21 day</u>
Burnished Custom Masonry Cleaner (1:2)	95%	90%	90%
Burnished Custom Masonry Cleaner (1:3)	90%	90%	90%
Safety Klean (1:3)	95%	95%	95%
Vana Trol [®] (1:8)	100%	90%	95%
Vana Trol [®] (1:10)	95%	90%	95%

“Copper” Cast Stone

	<u>7 day</u>	<u>14 day</u>	<u>21 day</u>
Burnished Custom Masonry Cleaner (1:2)	90%	95%	95%
Burnished Custom Masonry Cleaner (1:3)	90%	95%	95%
Safety Klean (1:3)	90%	95%	95%
Vana Trol [®] (1:8)	95%	95%	100%
Vana Trol [®] (1:10)	95%	90%	95%



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TEST RESULTS – New Construction Cleaning (continued)

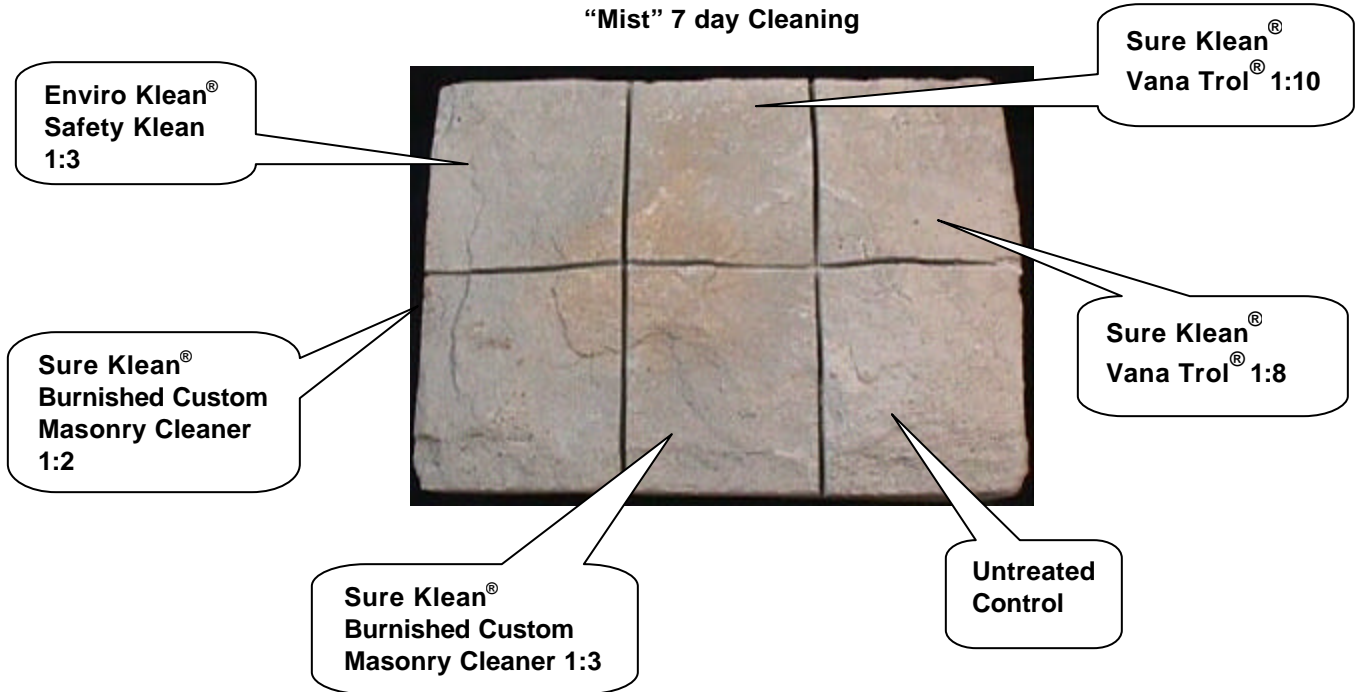
% Removal

“Natural” Cast Stone

	<u>7 day</u>	<u>14 day</u>	<u>21 day</u>
Burnished Custom Masonry Cleaner (1:2)	95%	95%	97%
Burnished Custom Masonry Cleaner (1:3)	95%	95%	97%
Safety Klean (1:3)	100%	100%	100%
Vana Trol [®] (1:8)	100%	95%	100%
Vana Trol [®] (1:10)	100%	100%	100%

PHOTOGRAPHS- New Construction Cleaning

“Mist” 7 day Cleaning

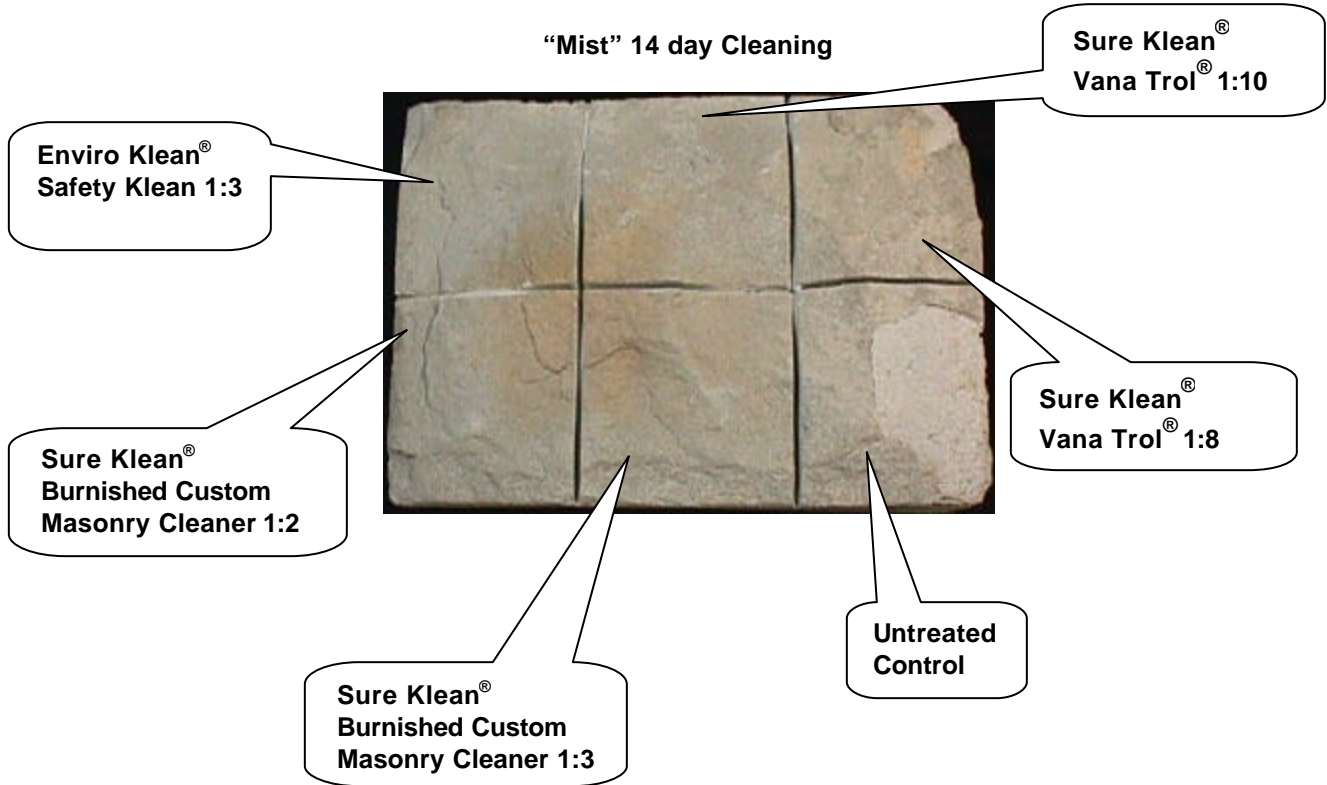




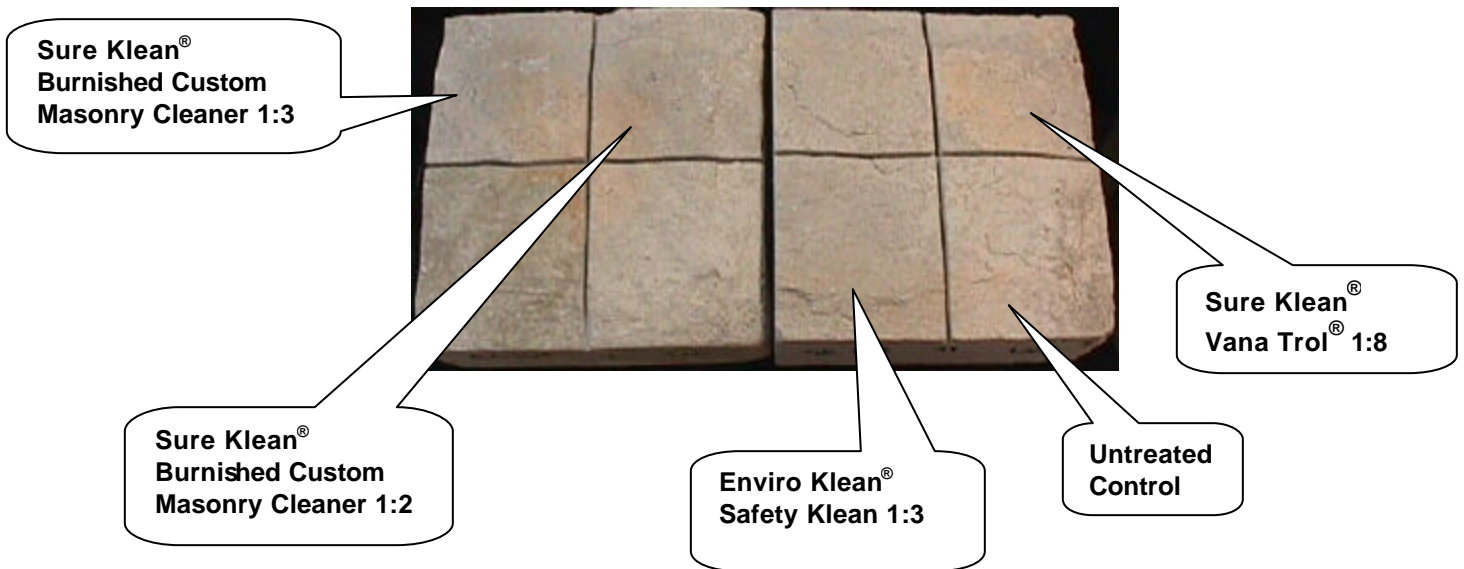
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"Mist" 14 day Cleaning



"Mist" 21 day Cleaning





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CONCLUSIONS – New Construction Cleaning

Based on the test results, all cleaners and all dilutions performed well in removing excess mortar smears on the submitted cast stone. The cleaners performed well in removing the mortar soils even after allowing the mortar to remain on the surface of the cast stone for 21 days under ideal curing conditions.

It is also recommended that the selected cleaners always be used in the lowest possible concentration, typically a 1:3 dilution for Sure Klean[®] Burnished Custom Masonry Cleaner, a 1:3 dilution for Enviro Klean[®] Safety Klean, and a 1:10 dilution of Sure Klean[®] Vana Trol[®]. To facilitate easier removal of excess mortar and construction dirt while minimizing any potential adverse affect on the cast stone, clean within 7 days of construction.

RECOMMENDATIONS – New Construction Cleaning

Recommendations for cleaning for the cast stone submitted by Liberty Cast Stone, Whitney, TX are provided in the chart below. Recommendations are based on the optimum dilution for complete removal of mortar.

Sample	New Construction Cleaning (Type N mortar, 14 day cleaning)
"Mist" cast-stone	Enviro Klean [®] Safety Klean 1:3 OR Sure Klean [®] Vana Trol [®] 1:10
"Autumn" cast-stone	Sure Klean [®] Vana Trol [®] 1:8
"Marble" cast-stone	Enviro Klean [®] Safety Klean 1:3
"Smoke" cast-stone	Enviro Klean [®] Safety Klean 1:3 OR Sure Klean [®] Vana Trol [®] 1:8
"Copper" cast-stone	Sure Klean [®] Vana Trol [®] 1:8
"Natural" cast-stone	Enviro Klean [®] Safety Klean 1:3 OR Sure Klean [®] Vana Trol [®] 1:10

The most appropriate cleaner and dilution should be determined on the specific job-site, and will be dependent primarily on the nature and severity of soiling present at that location. Rinsing with high-pressure spray (400-800 psi) 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 cleaning product and procedures for a particular project. See product literature for additional application and product information.



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SECTION B – LIMITING SURFACE ALTERATIONS

DESCRIPTION OF PRODUCTS EVALUATED – Limiting Surface Alterations

Sure Klean® Burnished Custom Masonry Cleaner – A general purpose, nonetching acidic cleaner for custom masonry and colored concrete. Removes rust, mud, oil, atmospheric dirt, and other stains without altering the surface texture. Liquid concentrate for dilution with 2-3 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 metal surfaces. Liquid concentrate for dilution with up to three parts fresh water. Apply by brush, roller, 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 – Limiting 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	3-5 minutes
Safety Klean	3 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.



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TEST RESULTS – Limiting Surface Alterations

Substrate: Rock-face cast stone		Pigment Color: “Mist”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Burnished Custom Masonry Cleaner	1:2	0	2	0	0
Burnished Custom Masonry Cleaner	1:3	0	0	0	0
Safety Klean	1:3	0	2	0	0
Vana Trol [®]	1:8	0	0	0	0
Vana Trol [®]	1:10	0	0	0	0
Substrate: Rock-face cast stone		Pigment Color: “Autumn”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Burnished Custom Masonry Cleaner	1:2	0	0	0	0
Burnished Custom Masonry Cleaner	1:3	0	0	0	0
Safety Klean	1:3	0	1	0	0
Vana Trol [®]	1:8	0	0	0	0
Vana Trol [®]	1:10	0	0	0	0
Substrate: Rock-face cast stone		Pigment Color: “Marble”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Burnished Custom Masonry Cleaner	1:2	0	2	0	0
Burnished Custom Masonry Cleaner	1:3	0	1	0	0
Safety Klean	1:3	0	1	0	0
Vana Trol [®]	1:8	0	1	0	0
Vana Trol [®]	1:10	0	0	0	0
Substrate: Rock-face cast stone		Pigment Color: “Smoke”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Burnished Custom Masonry Cleaner	1:2	0	0	0	0
Burnished Custom Masonry Cleaner	1:3	0	1	0	0
Safety Klean	1:3	0	0	0	0
Vana Trol [®]	1:8	0	0	0	0
Vana Trol [®]	1:10	0	0	0	0

The following is the scale used for reporting results of all categories:	
0 – no change 1 – slight 2 – moderate	3 – heavy 4 – excessive



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TEST RESULTS – Limiting Surface Alterations

Substrate: Rock-face cast stone		Pigment Color: “Copper”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Burnished Custom Masonry Cleaner	1:2	0	0	0	0
Burnished Custom Masonry Cleaner	1:3	0	0	0	0
Safety Klean	1:3	0	0	0	0
Vana Trol®	1:8	0	0	0	0
Vana Trol®	1:10	0	0	0	0
Substrate: Rock-face cast stone		Pigment Color: “Natural”			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Burnished Custom Masonry Cleaner	1:2	0	0	0	0
Burnished Custom Masonry Cleaner	1:3	0	0	0	0
Safety Klean	1:3	0	1	0	0
Vana Trol®	1:8	0	1	0	0
Vana Trol®	1:10	0	0	0	0

The following is the scale used for reporting results of all categories:	
0 – no change	3 – heavy
1 – slight	4 – excessive
2 – moderate	

CONCLUSIONS – Limiting Surface Alterations

Although the tests showed that on several substrates there was slight substrate deterioration, there was also similar substrate deterioration on the surfaces to which no cleaners were applied. Additionally, there was no substrate deterioration on the same surfaces treated with the same cleaners on different days.

Therefore, it is our determination that it is the high-powered water spray rather than the cleaners causing the deterioration. Because of this, it is recommended that the substrates be cleaned with garden-hose water pressure. When garden-hose water pressure was used during testing in the lab little to no deterioration was noted.



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RECOMMENDATIONS – Limiting Surface Alterations

Recommendations for limiting surface alterations for the submitted cast stone by Liberty Classic Stone, Whitney, TX are provided in the chart below. Recommendations are based on the optimum dilution for removal of mortar while limiting surface alterations.

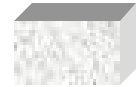
Sample	Product
“Mist” cast-stone	Enviro Klean [®] Safety Klean 1:3 OR Sure Klean [®] Vana Trol [®] 1:10
“Autumn” cast-stone	Sure Klean [®] Vana Trol [®] 1:8
“Marble” cast-stone	Enviro Klean [®] Safety Klean 1:3
“Smoke” cast-stone	Enviro Klean [®] Safety Klean 1:3 OR Sure Klean [®] Vana Trol [®] 1:8
“Copper” cast-stone	Sure Klean [®] Vana Trol [®] 1:8
“Natural” cast-stone	Enviro Klean [®] Safety Klean 1:3 OR Sure Klean [®] Vana Trol [®] 1:10

The most appropriate cleaner and dilution should be determined on the specific job-site, and will be dependent primarily on the nature and severity of soiling present at that location. Rinsing with high-pressure spray (400-800 psi) 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 cleaning product and procedures for a particular project. See product literature for additional application and product information.



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SECTION C – PROTECTIVE WATER REPELLENTS

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

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

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

DESCRIPTIONS OF PRODUCTS EVALUATED – Protective Water Repellents

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

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.

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

TEST METHODS – Protective Water Repellents

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

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



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TEST RESULTS – Protective Water Repellents

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

RESULTS	
“Mist” Cast Stone	
Untreated Control	<40 mph
Siloxane WB 1:9	56 mph
Siloxane WB 1:14	56 mph
Siloxane PD	54 mph
Custom Masonry Sealer	53 mph
“Autumn” Cast Stone	
Untreated Control	48 mph
Siloxane WB 1:9	57 mph
Siloxane WB 1:14	56 mph
Siloxane PD	54 mph
Custom Masonry Sealer	59 mph
“Marble” Cast Stone	
Untreated Control	<40 mph
Siloxane WB 1:9	54 mph
Siloxane WB 1:14	54 mph
Siloxane PD	57 mph
Custom Masonry Sealer	56 mph
“Smoke” Cast Stone	
Untreated Control	<40 mph
Siloxane WB 1:9	57 mph
Siloxane WB 1:14	55 mph
Siloxane PD	58 mph
Custom Masonry Sealer	56 mph
“Copper” Cast Stone	
Untreated Control	<40 mph
Siloxane WB 1:9	54 mph
Siloxane WB 1:14	49 mph
Siloxane PD	55 mph
Custom Masonry Sealer	55 mph



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TEST RESULTS – Protective Water Repellents (continued)

"Natural" Cast Stone	
Untreated Control	<40 mph
Siloxane WB 1:9	54 mph
Siloxane WB 1:14	53 mph
Siloxane PD	58 mph
Custom Masonry Sealer	53 mph

PHOTOGRAPHS- Water Repellency

"Mist" Cast-stone Surface Beading



Sure Klean®
Custom Masonry
Sealer

Untreated Control

"Mist" Cast-stone Surface Beading



Sure Klean®
Weather Seal
Siloxane WB 1:14

Sure Klean®
Weather Seal
Siloxane WB 1:9

Sure Klean®
Weather Seal
Siloxane PD

Untreated
Control



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CONCLUSIONS – Protective Water Repellents

Based upon laboratory evaluations, all of the applied treatments provided excellent water repellency to all of the submitted cast stone samples. None of the applied treatments changed the appearance of the cast stone in any way.

RECOMMENDATIONS – Protective Water Repellents

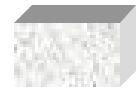
Based on test results, all of the treatments can be recommended for job-site testing on all of the cast stone submitted by Liberty Classic Stone, Whitney, TX. Recommendations are based on the treatment that proved most effective and can provide water repellency on all types submitted.

Sample	Water Repellent	Dilution
"Mist" cast-stone	Sure Klean [®] Weather Seal Siloxane WB Concentrate	1:14
"Autumn" cast-stone	Sure Klean [®] Custom Masonry Sealer	Concentrate
"Marble", "Smoke", "Copper", and "Natural" cast-stone	Sure Klean [®] Weather Seal Siloxane PD	Concentrate

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 – STAIN RESISTANCE

DESCRIPTION OF PRODUCTS EVALUATED

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

Products Evaluated for Stain Protection: *

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

Stand Off® Impregnator – Combines water and oil repellency on most substrates to prevent staining by waterborne and oily substances. This modified special system offers invisible protection and low volatility. The small molecular structure of Impregnator lets it penetrate and chemically bond deep within the substrate to provide long-lasting protection against water- and oil-related staining and deterioration.

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

Kitchen Products Evaluated:

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

Temperature:

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

SAMPLE PREPARATION – Stain Resistance

Samples were cleaned with Enviro Klean® 2010 All Surface Cleaner diluted with 10 parts water, allowed to dry and absorb atmospheric moisture for 24 hours prior to treatment. The method of application for protective treatments consisted of a wet-on-wet saturating brush application. Samples were allowed to cure for at least 1 week prior to testing.



PALLET TAG PROGRAM LABORATORY REPORT



TEST METHOD – Stain Resistance

Surface Beading Evaluation

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

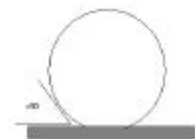
Note: Non-free flowing staining agents such as ketchup and mustard are applied in a blob and not evaluated for their beading properties.

Rating System (1-5)

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



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



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



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



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

NO ANGLE



Stain Removal Evaluation

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



PALLET TAG PROGRAM LABORATORY REPORT



TEST RESULTS – Surface Beading

“Mist” cast-stone									
	Coco-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	2	-	-	3	3	3	5	5	3
SLX 100	1	-	-	1	1	1	2	2	2
Impregnator	1	-	-	1	1	1	2	2	2
STMP	1	-	-	1	1	1	2	2	2
“Autumn” cast-stone									
	Coco-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	3	-	-	2	3	3	5	5	4
SLX 100	1	-	-	1	1	1	2	2	2
Impregnator	1	-	-	1	1	1	2	2	2
STMP	1	-	-	1	1	1	2	2	2
“Marble” cast-stone									
	Coco-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	2	-	-	3	3	3	5	5	3
SLX 100	1	-	-	1	1	1	2	2	2
Impregnator	1	-	-	1	1	1	2	2	2
STMP	1	-	-	1	1	1	2	2	2
“Smoke” cast-stone									
	Coco-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	2	-	-	2	2	2	5	5	3
SLX 100	1	-	-	1	1	1	2	2	2
Impregnator	1	-	-	1	1	1	2	2	2
STMP	1	-	-	1	1	1	2	2	2
“Copper” cast-stone									
	Coco-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	2	-	-	2	2	2	4	4	3
SLX 100	1	-	-	1	1	1	2	2	2
Impregnator	1	-	-	1	1	1	2	2	2
STMP	1	-	-	1	1	1	2	2	2



PALLET TAG PROGRAM LABORATORY REPORT



TEST RESULTS – Surface Beading (continued)

"Natural" cast-stone									
	Coco-Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
Untreated Control	2	-	-	3	2	2	5	5	3
SLX 100	1	-	-	1	1	1	2	2	2
Impregnator	1	-	-	1	1	1	2	2	2
STMP	1	-	-	1	1	1	2	2	2

TEST RESULTS – STAINING REMOVAL

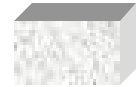
% Removal

"Mist" cast-stone

Untreated Control										
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee	
24 hr	70%	70%	50%	10%	50%	80%	80%	80%	75%	
4 hour	75%	100%	50%	10%	50%	80%	90%	90%	75%	
1 hour	75%	100%	90%	10%	80%	80%	90%	90%	75%	
10 min.	95%	100%	100%	10%	80%	80%	90%	90%	95%	
Stand Off [®] Stone, Tile, & Masonry Protector										
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee	
24 hr	100%	100%	100%	80%	80%	80%	100%	100%	75%	
4 hour	100%	100%	100%	80%	90%	90%	100%	100%	75%	
1 hour	100%	100%	100%	95%	100%	100%	100%	100%	75%	
10 min.	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Stand Off [®] SLX 100 Water & Oil Repellent										
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee	
24 hr	100%	80%	95%	30%	85%	90%	70%	70%	30%	
4 hour	100%	100%	95%	30%	90%	95%	70%	70%	30%	
1 hour	100%	100%	95%	30%	100%	100%	70%	70%	30%	
10 min.	100%	100%	100%	100%	100%	100%	100%	100%	90%	
Stand Off [®] Impregnator										
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee	
24 hr	90%	90%	90%	60%	90%	90%	70%	70%	60%	
4 hour	100%	100%	100%	60%	90%	90%	70%	70%	75%	
1 hour	100%	100%	100%	90%	90%	90%	70%	70%	75%	
10 min.	100%	100%	100%	90%	100%	100%	70%	70%	75%	



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

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TEST RESULTS – STAINING REMOVAL (Continued)

% Removal

“Autumn” cast-stone

Untreated Control									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	85%	90%	80%	60%	60%	60%	50%	50%	50%
4 hour	90%	100%	80%	70%	70%	70%	60%	60%	50%
1 hour	95%	100%	100%	80%	100%	100%	100%	100%	100%
10 min.	100%	100%	100%	90%	100%	100%	100%	100%	100%
Stand Off® Stone, Tile, & Masonry Protector									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	90%	100%	90%	90%	90%	100%	100%	95%
4 hour	100%	100%	100%	95%	90%	90%	100%	100%	95%
1 hour	100%	100%	100%	100%	100%	100%	100%	100%	100%
10 min.	100%	100%	100%	100%	100%	100%	100%	100%	100%
Stand Off® SLX 100 Water & Oil Repellent									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	90%	100%	60%	90%	90%	80%	80%	90%
4 hour	100%	100%	100%	70%	90%	100%	100%	100%	95%
1 hour	100%	100%	100%	80%	90%	90%	100%	100%	95%
10 min.	100%	100%	100%	90%	100%	100%	100%	100%	100%
Stand Off® Impregnator									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	90%	90%	60%	90%	90%	70%	70%	90%
4 hour	100%	100%	100%	70%	100%	100%	80%	80%	90%
1 hour	100%	100%	100%	80%	100%	100%	100%	100%	90%
10 min.	100%	100%	100%	90%	100%	100%	100%	100%	100%



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

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TEST RESULTS – STAINING REMOVAL (Continued)

% Removal

“Smoke” cast-stone

Untreated Control									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	70%	70%	70%	80%	80%	<1%	<1%	65%
4 hour	100%	100%	100%	70%	80%	80%	<1%	<1%	65%
1 hour	100%	100%	100%	70%	80%	80%	<1%	<1%	65%
10 min.	100%	100%	100%	90%	90%	90%	<1%	<1%	80%
Stand Off® Stone, Tile, & Masonry Protector									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%	100%	100%	80%	80%	80%	80%	100%
4 hour	100%	100%	100%	100%	100%	80%	100%	100%	100%
1 hour	100%	100%	100%	100%	100%	80%	100%	100%	100%
10 min.	100%	100%	100%	100%	100%	80%	100%	100%	100%
Stand Off® SLX 100 Water & Oil Repellent									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%	90%	80%	80%	80%	100%	100%	70%
4 hour	100%	100%	100%	100%	100%	100%	100%	100%	70%
1 hour	100%	100%	100%	100%	100%	100%	100%	100%	70%
10 min.	100%	100%	100%	100%	100%	100%	100%	100%	90%
Stand Off® Impregnator									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	90%	90%	100%	100%	100%	80%	80%	70%
4 hour	100%	100%	100%	100%	100%	100%	100%	100%	70%
1 hour	100%	100%	100%	100%	100%	100%	100%	100%	70%
10 min.	100%	100%	100%	100%	100%	100%	100%	100%	90%



PALLET TAG PROGRAM LABORATORY REPORT



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TEST RESULTS – STAINING REMOVAL (Continued)

% Removal

“Marble” cast-stone

Untreated Control									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	90%	90%	90%	40%	70%	70%	50%	50%	60%
4 hour	90%	100%	100%	40%	70%	70%	60%	60%	60%
1 hour	100%	100%	100%	40%	90%	90%	70%	70%	80%
10 min.	100%	100%	100%	80%	100%	100%	80%	80%	90%
Stand Off® Stone, Tile, & Masonry Protector									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	90%	95%	75%	80%	80%	80%	80%	80%
4 hour	100%	100%	100%	75%	90%	90%	80%	80%	80%
1 hour	100%	100%	100%	80%	100%	100%	100%	100%	90%
10 min.	100%	100%	100%	100%	100%	100%	100%	100%	90%
Stand Off® SLX 100 Water & Oil Repellent									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	90%	100%	60%	100%	100%	100%	100%	65%
4 hour	100%	100%	100%	70%	100%	100%	100%	100%	65%
1 hour	100%	100%	100%	100%	100%	100%	100%	100%	65%
10 min.	100%	100%	100%	100%	100%	100%	100%	100%	95%
Stand Off® Impregnator									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	90%	95%	100%	100%	100%	50%	50%	50%
4 hour	100%	90%	100%	100%	100%	100%	70%	70%	50%
1 hour	100%	100%	100%	100%	100%	100%	100%	100%	90%
10 min.	100%	100%	100%	100%	100%	100%	100%	100%	90%



PALLET TAG PROGRAM LABORATORY REPORT



PROSOCO, Inc.

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TEST RESULTS – STAINING REMOVAL (Continued)

% Removal

“Copper” cast-stone

Untreated Control									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	95%	90%	80%	70%	80%	90%	30%	30%	80%
4 hour	100%	90%	80%	70%	90%	100%	30%	30%	80%
1 hour	100%	100%	100%	80%	100%	100%	30%	30%	80%
10 min.	100%	100%	100%	90%	100%	100%	70%	70%	90%
Stand Off® Stone, Tile, & Masonry Protector									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%	100%	100%	100%	100%	100%	100%	100%
4 hour	100%	100%	100%	100%	100%	100%	100%	100%	100%
1 hour	100%	100%	100%	100%	100%	100%	100%	100%	100%
10 min.	100%	100%	100%	100%	100%	100%	100%	100%	100%
Stand Off® SLX 100 Water & Oil Repellent									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%	100%	80%	80%	80%	100%	100%	90%
4 hour	100%	100%	100%	90%	100%	100%	100%	100%	90%
1 hour	100%	100%	100%	100%	100%	100%	100%	100%	100%
10 min.	100%	100%	100%	100%	100%	100%	100%	100%	100%
Stand Off® Impregnator									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	90%	100%	100%	80%	80%	80%	90%	70%
4 hour	100%	90%	100%	100%	90%	90%	90%	100%	70%
1 hour	100%	100%	100%	100%	100%	100%	100%	100%	80%
10 min.	100%	100%	100%	100%	100%	100%	100%	100%	90%



PALLET TAG PROGRAM LABORATORY REPORT



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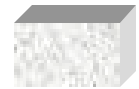
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TEST RESULTS – STAINING REMOVAL (Continued)

% Removal

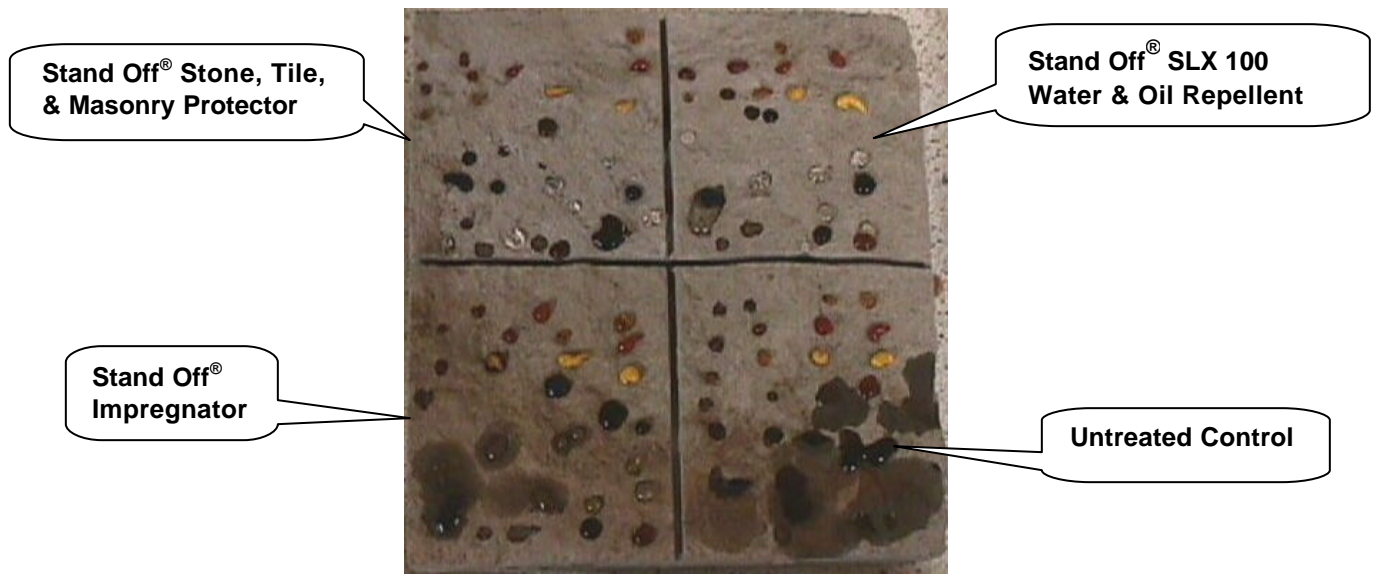
“Natural” cast-stone

Untreated Control									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	80%	70%	85%	30%	60%	60%	50%	50%	30%
4 hour	80%	70%	90%	30%	60%	60%	50%	50%	30%
1 hour	90%	100%	90%	30%	60%	60%	50%	50%	30%
10 min.	100%	100%	90%	70%	90%	90%	50%	50%	30%
Stand Off® Stone, Tile, & Masonry Protector									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	90%	85%	90%	70%	30%	50%	100%	100%	65%
4 hour	100%	90%	100%	70%	30%	50%	100%	100%	65%
1 hour	100%	100%	100%	70%	80%	80%	100%	100%	65%
10 min.	100%	100%	100%	90%	80%	80%	100%	100%	95%
Stand Off® SLX 100 Water & Oil Repellent									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	100%	100%	80%	100%	100%	100%	100%	65%
4 hour	100%	100%	100%	80%	100%	100%	100%	100%	65%
1 hour	100%	100%	100%	80%	100%	100%	100%	100%	65%
10 min.	100%	100%	100%	100%	100%	100%	100%	100%	95%
Stand Off® Impregnator									
	Coca Cola	Ketchup	Mustard	Red Wine	Balsamic Vinegar	Soy Sauce	Olive Oil	Wesson Oil	Hot Coffee
24 hr	100%	90%	80%	70%	80%	80%	70%	70%	30%
4 hour	100%	100%	80%	90%	80%	80%	70%	70%	30%
1 hour	100%	100%	100%	100%	100%	100%	70%	70%	30%
10 min.	100%	100%	100%	100%	100%	100%	70%	70%	30%

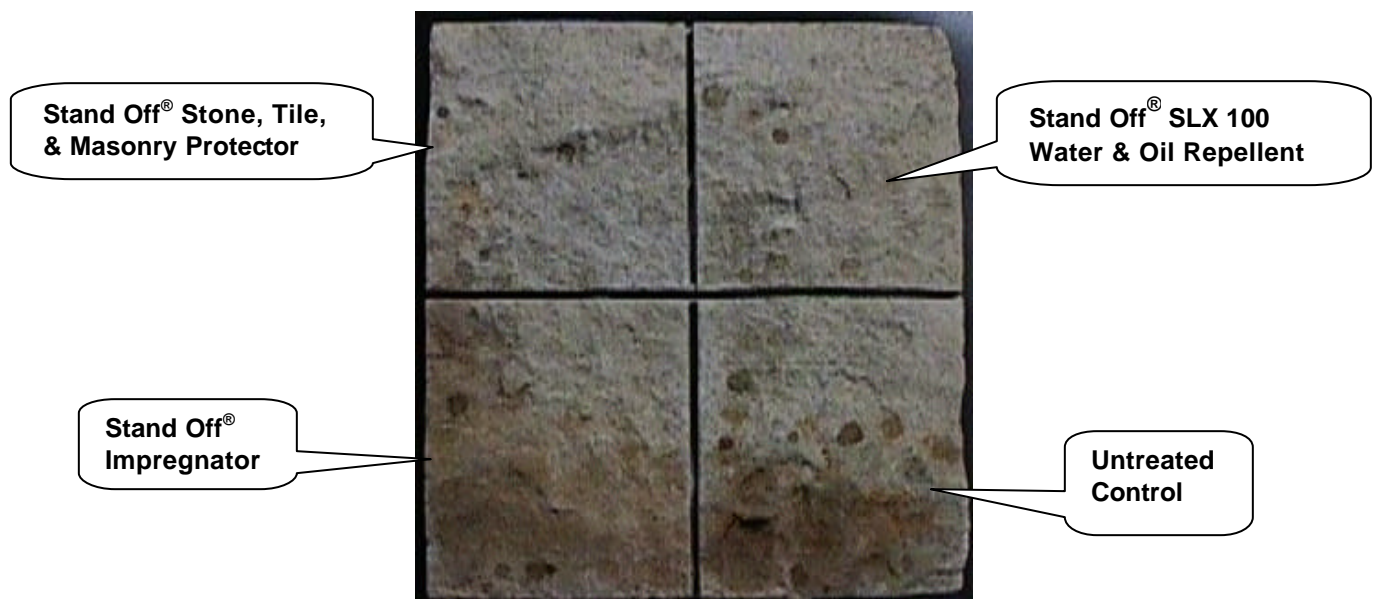


PHOTOGRAPHS- STAIN RESULTS

“Marble” cast-stone- Stains applied

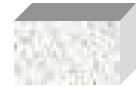


“Marble” cast-stone- Stains removed





PALLET TAG PROGRAM LABORATORY REPORT



CONCLUSIONS – Stain Resistance

Based upon laboratory evaluations, Stand Off® Stone, Tile, and Masonry Protector was an effective treatment in repelling the staining agents on most of the blocks. However, Stand Off® SLX100 Water & Oil Repellent performed better on two of the cast-stones. Both treatments improved the ability of the cast-stones to repel water.

RECOMMENDATIONS – Stain Resistance

Recommendations for stain resistance treatment for each type of cast-stone submitted by Liberty Classic Stone, Whitney, TX are provided in the charts below. Recommendations are based on the treatments that proved most effective for providing stain repellency on all types submitted.

Sample	Stain Repellent	Maintenance Cleaner
“Marble”, “Natural”	Stand Off® SLX 100 Water & Oil Repellent	Enviro Klean® 2010 All Surface Cleaner (1:10)
All Other Submitted Cast-stone	Stand Off® Stone, Tile and Masonry Protector	

Nathan R. Colaner
Technical Analyst

NRC/csm



Laboratory Report

Pallet Tag Program Evaluation

**Liberty Classic Stone
Whitney, TX**

Project No. 0304-01 PTP

Prepared For:

Paul Tessier

**Liberty Classic Stone
Whitney, TX**

Prepared By:



***PROSOCO, Inc.
May 2003***