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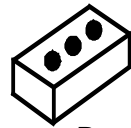
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**ATTACHMENTS**

- ASTM C 67 Immersion Testing
- Technical Services TECH Note RILEM Test Method No. II.4
- Product Data literature for all products evaluated
- Material Safety Data Sheets for all products evaluated



**FOR:** Gerardo Ramos  
Claymex Brick & Tile Co.  
2224 Del Rio Highway  
Eagle Pass, TX 78852-3317

**cc:** Jack James  
Paul Tessier

**SUBJECT:** Claymex Brick & Tile Co.  
Eagle Pass, TX

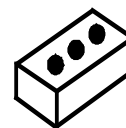
**DATE:** March 30, 2001

**PROJECT:** 0102-03 PC

**SAMPLES SUBMITTED:** 3 styles of new clay brick, 1 sleeve each

<b>Sample</b>	<b>Color/Finish</b>	<b>Size</b>
"Oxford Antique"	Orange clay w/ gray slurry finish	3" x 10" x 3"
"Old French"	Red clay w/ gray slurry finish	3" x 10" x 3"
"Lafayette"	Pink clay w/ white slurry finish	3" x 10" x 3"

Submitted by: Paul Tessier



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**PURPOSE OF TESTING:**

Three types of clay brick units with various slurry finishes were submitted for testing using PROSOCO Inc.'s cleaning and water repellent products.

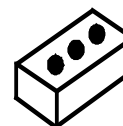
- A. New Construction Cleaning** – PROSOCO Inc.'s cleaners were evaluated for removal of laboratory applied mortar.

To simulate new construction soiling, the ability of each cleaner to remove hardened deposits of Ash Grove<sup>®</sup> Type S cementitious mortar was evaluated and is reported below. Mortar was applied by placing the fired clay units face down in a smooth-finished tray of prepared mortar for 10 minutes. The mortar-stained brick were cured at 75% ± 5% RH and 70°F ± 5°F before any cleaning tests were attempted.

Heavy deposits of mortar are removed with dry scraping after 24 hours. Sure Klean<sup>®</sup> Vana Trol<sup>®</sup>, Sure Klean<sup>®</sup> Light Duty Concrete Cleaner and Enviro Klean<sup>®</sup> Mortar & Grout Remover were tested were tested for removal of Ash Grove<sup>®</sup> Type S masonry cement mortar after 3, 7, and 14 days of curing.

- B. Surface Alteration Testing** – Sure Klean<sup>®</sup> Vana Trol<sup>®</sup>, Sure Klean<sup>®</sup> Light Duty Concrete Cleaner, and Enviro Klean<sup>®</sup> Mortar & Grout Remover were tested at various dilutions to determine if they would produce any adverse effects during the cleaning process. Adverse effects were evaluated visually and were based upon damage to the surface coating, discoloration or erosion/etching of the masonry unit.

- C. Protective Water Repellents** – Sure Klean<sup>®</sup> Weather Seal Siloxane PD and Sure Klean<sup>®</sup> Weather Seal Siloxane WB Concentrate were evaluated for their ability to provide water repellency to the submitted samples.



**CLEANING PRODUCTS**

BRICK TYPE	Sure Klean <sup>®</sup> Vana Trol <sup>®</sup>	Sure Klean <sup>®</sup> Light Duty Concrete Cleaner	Enviro Klean <sup>®</sup> Mortar & Grout Remover
All submitted brick samples	1:6	1:3	1lb/1gal
	1:8	1:6	

**ADVERSE EFFECTS PRODUCTS EVALUATED**

BRICK TYPE	Sure Klean <sup>®</sup> Vana Trol <sup>®</sup>	Sure Klean <sup>®</sup> Light Duty Concrete Cleaner	Enviro Klean <sup>®</sup> Mortar & Grout Remover
All submitted brick samples	1:6	1:3	1lb/1gal
	1:8	1:6	

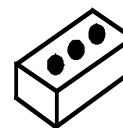
**WATER REPELLENT PRODUCTS EVALUATED**

BRICK TYPE	Treatment	Dilution
All Submitted Brick Types	Siloxane PD	Concentrate
	Siloxane WB Concentrate	1:9

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



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PROSOCO, Inc.

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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<sup>®</sup> Type S mortar from the submitted fired clay units.

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

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

**Sure Klean<sup>®</sup> Light Duty Concrete Cleaner** – A general-purpose, nonetching acidic cleaner removes rust, mud, oil, atmospheric dirt, mortar smears and other stains without altering the surface texture. Light Duty Concrete Cleaner removes common construction and atmospheric staining from smooth architectural and engineered concrete and adds depth to colors, brightens white matrices and exposed aggregate.

**Enviro Klean<sup>®</sup> Mortar & Grout Remover** – A safe and effective way to remove excess mortar, grout and job dirt from masonry. Mixes with water at the job site to clean most brick, concrete, tile and stone surfaces. Also ideal for colored mortars and grouts, and since it's made from natural food products, it's safe for the environment.

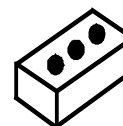
### TEST METHOD – New Construction Cleaning

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.
 

Vana Trol <sup>®</sup> .....	5 minutes
LD Concrete Cleaner .....	5 minutes
Mortar & Grout Remover .....	5 minutes
4. Pressure rinse thoroughly.\*
5. Let dry at least 18 hours and visually examine.

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



**Test Results - New Construction Cleaning**

**% Removal**

**“Oxford Antique”**

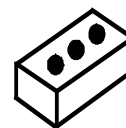
	<u>7 day</u>	<u>14 day</u>	<u>21 day</u>
SK Vana Trol <sup>®</sup> (1:6)	100%	100%	100%
SK Vana Trol <sup>®</sup> (1:8)	100%	100%	100%
SK LD Concrete Cleaner (1:3)	100%	100%	100%
SK LD Concrete Cleaner (1:6)	100%	100%	100%
EK Mortar & Grout Remover (1lb/gal)	100%	100%	100%

**“Old French”**

	<u>7 day</u>	<u>14 day</u>	<u>21 day</u>
SK Vana Trol <sup>®</sup> (1:6)	100%	100%	100%
SK Vana Trol <sup>®</sup> (1:8)	100%	100%	100%
SK LD Concrete Cleaner (1:3)	100%	100%	100%
SK LD Concrete Cleaner (1:6)	100%	100%	100%
EK Mortar & Grout Remover (1lb/gal)	100%	100%	100%

**“Lafayette”**

	<u>7 day</u>	<u>14 day</u>	<u>21 day</u>
SK Vana Trol <sup>®</sup> (1:6)	100%	100%	100%
SK Vana Trol <sup>®</sup> (1:8)	100%	100%	100%
SK LD Concrete Cleaner (1:3)	100%	100%	100%
SK LD Concrete Cleaner (1:6)	100%	100%	100%
EK Mortar & Grout Remover (1lb/gal)	100%	100%	100%



**CONCLUSIONS - Cleaning:**

Based on the test results, all cleaners and all dilutions performed extremely well in removing excess mortar smears on the submitted brick samples. The cleaners performed well in removing the mortar soils even after allowing the mortar to remain on the surface of the brick for 14 days under ideal curing conditions.

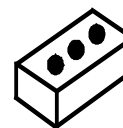
It is also recommended that the selected cleaners always be used in the lowest possible concentration, typically a 1:8 dilution for Sure Klean<sup>®</sup> Vana Trol<sup>®</sup> and 1:6 dilution for Sure Klean<sup>®</sup> Light Duty Concrete Cleaner. They should be rinsed with the lowest pressure of water as practical, garden hose strength preferred, to minimize removal of the decorative finish. To facilitate easier removal of excess mortar and construction dirt while minimizing any potential adverse affect on the decorative sand finish, clean within 7 days of construction.

**RECOMMENDED PRODUCTS AND DILUTIONS - CLEANING:**

Sample	Sure Klean <sup>®</sup> Vana Trol <sup>®</sup>	Sure Klean <sup>®</sup> Light Duty Concrete Cleaner	Enviro Klean <sup>®</sup> Mortar & Grout Remover
"Oxford Antique"	1:8	1:6	1lb/1gal
"Old French"	1:8	1:6	1lb/1gal
"Lafayette"	1:8	1:6	1lb/1gal



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## **SECTION B – Surface Alterations:**

### **DESCRIPTION OF PRODUCTS EVALUATED – Surface Alterations:**

**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.

**Sure Klean® Light Duty Concrete Cleaner** – A general-purpose, nonetching acidic cleaner removes rust, mud, oil, atmospheric dirt, mortar smears and other stains without altering the surface texture. Light Duty Concrete Cleaner removes common construction and atmospheric staining from smooth architectural and engineered concrete and adds depth to colors, brightens white matrices and exposed aggregate.

**Enviro Klean® Mortar & Grout Remover** – A safe and effective way to remove excess mortar, grout and job dirt from masonry. Mixes with water at the job site to clean most brick, concrete, tile and stone surfaces. Also ideal for colored mortars and grouts, and since it's made from natural food products, it's safe for the environment.

### **TEST METHOD – Surface Alteration Testing:**

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.
 

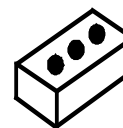
Vana Trol® .....	5 minutes
LD Concrete Cleaner .....	5 minutes
Mortar & Grout Remover .....	5 minutes
4. Pressure rinse thoroughly.\*
5. Let dry at least 18 hours and visually examine.

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





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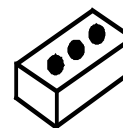
**Surface Alteration Results:**

<b>Substrate: "Oxford Antique"</b>		<b>Pigment Color: Orange clay w/ gray slurry finish</b>			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:6	2	0	1	0
Vana Trol®	1:8	2	0	1	0
LD Concrete Cleaner	1:3	2	0	1	0
LD Concrete Cleaner	1:6	1	0	0	0
Mortar & Grout Remover	1lb/1gal	2	0	1	0
<b>Substrate: "Old French"</b>		<b>Pigment Color: Red clay w/ gray slurry finish</b>			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:6	0	0	0	0
Vana Trol®	1:8	0	0	0	0
LD Concrete Cleaner	1:3	0	0	0	0
LD Concrete Cleaner	1:6	0	0	0	0
Mortar & Grout Remover	1lb/1gal	0	0	0	0
<b>Substrate: "Lafayette"</b>		<b>Pigment Color: Pink clay w/ white slurry finish</b>			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:6	1	0	0	0
Vana Trol®	1:8	1	0	0	0
LD Concrete Cleaner	1:3	1	0	0	0
LD Concrete Cleaner	1:6	1	0	0	0
Mortar & Grout Remover	1lb/1gal	1	0	0	0

Scale used for reporting results of all categories

0 – no change  
1 – slight  
2 – moderate

3 – heavy  
4 – excessive

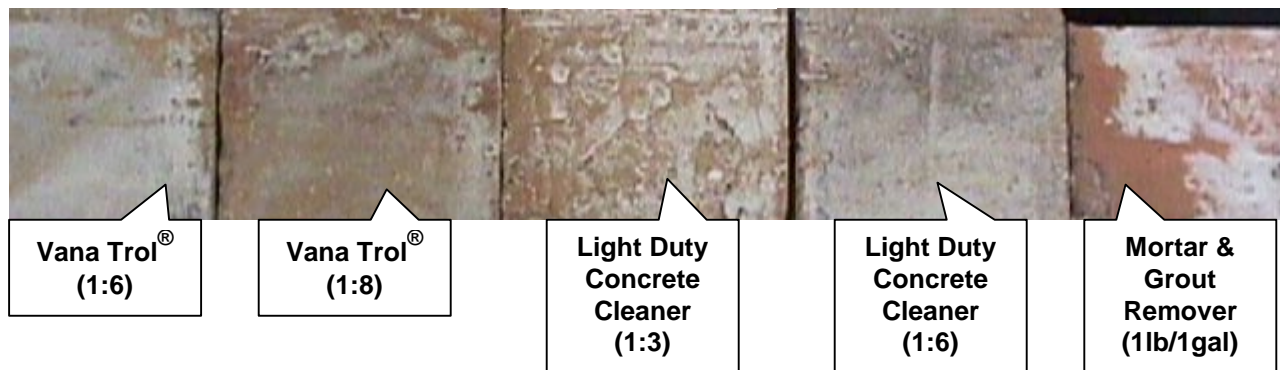


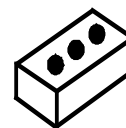
Photos of "Oxford Antique" before and after cleaning:

"Oxford Antique"  
BEFORE



"Oxford Antique"  
AFTER





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**CONCLUSIONS – Surface Alterations:**

Test results show that the products tested caused no surface alterations on brick type “Old French” and only minor removal of the gray slurry finish on brick type “Lafayette”. However, the products tested did remove a moderate amount of the gray slurry finish on brick type “Oxford Antique” which also allowed the natural orange clay to show through producing a color change. Sure Klean<sup>®</sup> Light Duty Concrete Cleaner diluted one part cleaner to six parts fresh water had a minimal effect on the finish of “Oxford Antique”.

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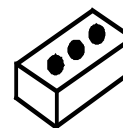
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**RECOMMENDED PRODUCTS AND DILUTIONS – SURFACE ALTERATIONS:**

All of the cleaners and dilutions tested can be recommended for brick types “Old French” and “Lafayette” submitted by Claymex Brick and Tile. Sure Klean<sup>®</sup> Light Duty Concrete Cleaner diluted one part cleaner to six parts fresh water is recommended for brick type “Oxford Antique”. Cleaners should be used in the lowest possible concentration. Rinse thoroughly with low water pressure, garden hose strength, to minimize removal of the decorative finish. Conduct all cleaning within seven days of soiling to facilitate easier removal of excess mortar and construction dirt.

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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**SECTION C - PROTECTIVE WATER REPELLENTS:**

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

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

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

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

**Sure Klean® Weather Seal Siloxane PD** - A low odor, alkaline stable, water-based blend of silanes and oligomeric alkoxysiloxanes. Weather Seal Siloxane PD is supplied pre-diluted and is designed for use on concrete and clay masonry surfaces. Weather Seal Siloxane PD penetrates more deeply than conventional water or solvent-based water repellents.

**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 alkoxysiloxanes mixes easily with water to produce a penetrating water repellent, which is ideal for application to either dense or porous masonry surfaces.

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**SAMPLE PREPARATION - Protective Water Repellents:**

The submitted brick were cut, oven dried and allowed to reabsorb atmospheric humidity for 24 hours prior to treatment. The treatment method consisted of two 10-second immersions with a 20-second absorption period between immersions to simulate a wet-on-wet application. All treatments were allowed to cure for 14 days prior to testing.

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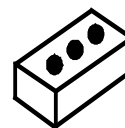
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**TEST METHODS - Protective Water Repellents:**

**Water Absorption: ASTM C 67, Immersion**

Water absorption was determined by comparing the dry weight of the sample with its weight after immersion in water at 10-minute, 30-minute, 60-minute and 24-hour intervals. See ASTM C 67 for additional information.

Reduced water absorption values – reported as effectiveness – measure the effectiveness of selected treatments in protecting samples from water penetration and water related decay mechanisms. Generally a reduction of approximately 80% is required to provide resistance to water intrusion under normal exposure conditions.



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

The water absorption tube test simulating wind driven and wind blown rain conditions was also performed. Tests were run with 5.0-milliliter head pressures. Filled to 5 milliliters, a water absorption tube produces a 98 mph dynamic wind pressure. See ASTM C 67 and 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:

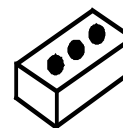
A rating of **AA** *Above Average* water repellent performance would require loss of no more than  $5 \text{ ml} \times 20\% = 1 \text{ ml}$ .

A rating of **A** *Average* water repellent performance would require loss of no more than  $5 \text{ ml} \times 50\% = 2.5 \text{ ml}$ .

A rating of **BA** *Below Average* water repellent performance would be reported for treatments which result in a loss of more than  $50\% \times 5 \text{ ml} = 2.5 \text{ ml}+$ .



# PALLET CARD PROGRAM LABORATORY REPORT



PROSOCO, Inc.

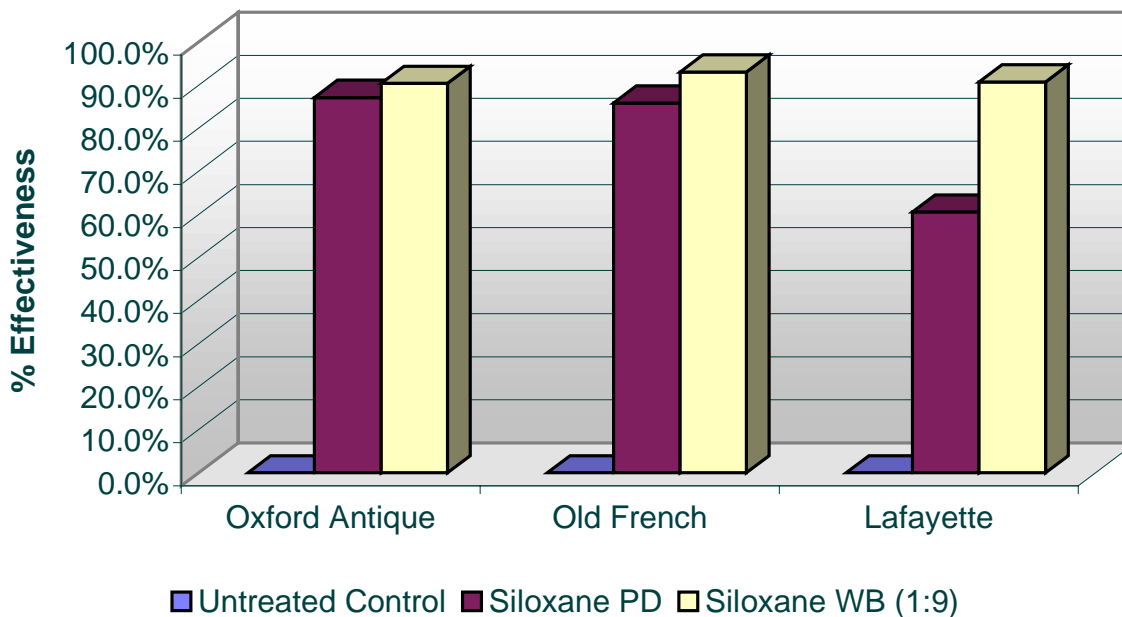
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## TEST RESULTS - Protective Water Repellents:

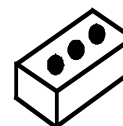
Water Absorption: ASTM C 67, Immersion

<b>"Oxford Antique"</b>	<b>% Absorption</b>	<b>% Effectiveness</b>
Untreated Control	16.43	--
Siloxane PD	2.10	87.2%
Siloxane WB (1:9)	1.57	90.5%
<b>"Old French"</b>	<b>% Absorption</b>	<b>% Effectiveness</b>
Untreated Control	15.28	--
Siloxane PD	2.15	85.9%
Siloxane WB (1:9)	1.06	93.1%
<b>"Lafayette"</b>	<b>% Absorption</b>	<b>% Effectiveness</b>
Untreated Control	15.66	--
Siloxane PD	6.18	60.6%
Siloxane WB (1:9)	1.44	90.8%

Water Absorption: ASTM C 67, Immersion



Graph 1



TEST RESULTS - Protective Water Repellents:

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

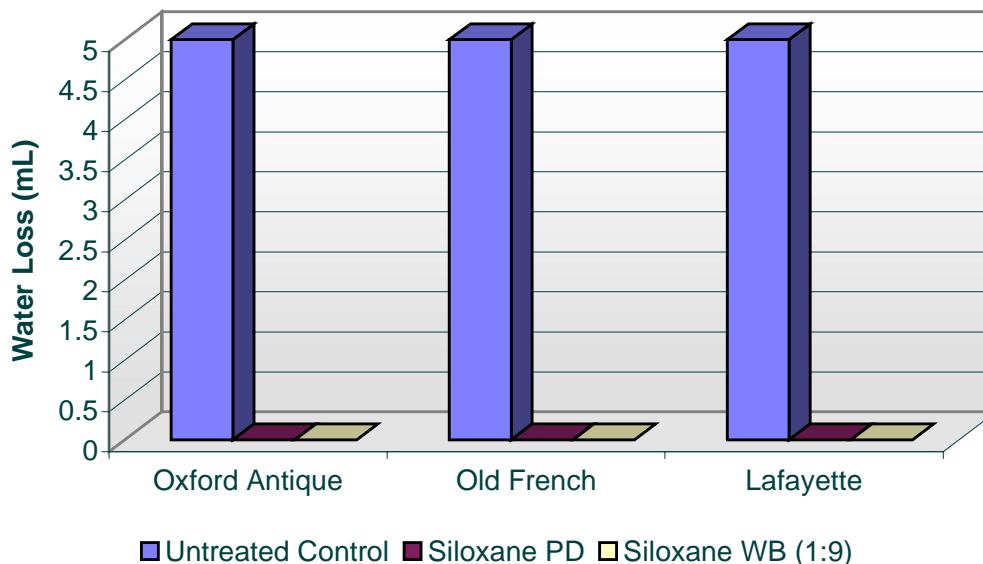
AA = Above Average

AA = Average

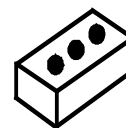
BA = Below Average

“Oxford Antique”	Results	Ranking
Untreated Control	>5.0 mL loss	---
Siloxane PD	0.0 mL loss	<u>AA</u>
Siloxane WB (1:9)	0.0 mL loss	<u>AA</u>
“Old French”	Results	Ranking
Untreated Control	>5.0 mL loss	---
Siloxane PD	0.0 mL loss	<u>AA</u>
Siloxane WB (1:9)	0.0 mL loss	<u>AA</u>
“Lafayette”	Results	Ranking
Untreated Control	>5.0 mL loss	---
Siloxane PD	0.0 mL loss	<u>AA</u>
Siloxane WB (1:9)	0.0 mL loss	<u>AA</u>

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



Graph 2



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**CONCLUSIONS - Protective Water Repellents:**

Based upon laboratory evaluations, Sure Klean<sup>®</sup> Weather Seal Siloxane WB Concentrate diluted one part concentrate to nine parts fresh water exhibited above average water repellency on all brick types. Generally a reduction of approximately 80% is required to provide resistance to water intrusion under normal exposure conditions. Sure Klean<sup>®</sup> Weather Seal Siloxane PD was unable to achieve this percentage on brick type "Lafayette".

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**RECOMMENDATIONS - Protective Water Repellents:**

Based on test results, Sure Klean<sup>®</sup> Weather Seal Siloxane WB Concentrate diluted one part concentrate to nine parts fresh water provided excellent water-repellent protection on all of the brick types submitted by Claymex Brick and Tile. This product is recommended for job site evaluation where these brick types are incorporated in the building's façade.

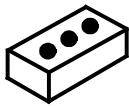
It must be pointed out that in any installation, the brick are a single component of the masonry facade. The ability of a water repellent treatment to prevent the ingress of water is affected by a variety of other factors, therefore on-site testing should be carried out for all installations with the 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.

Jason L. Anderson  
Materials Testing Technician

JLA/csm





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***Laboratory Report***

**Pallet Card Evaluation**

**Claymex Brick and Tile  
2224 Del Rio Highway  
Eagle Pass, TX**

***Project No. 0102-03 PC***

***Prepared For:***

**Gerardo Ramos  
Claymex Brick & Tile  
2224 Del Rio Highway  
Eagle Pass, TX 78852-3317**

***Prepared By:***



***PROSOCO, Inc.  
March 2001***