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#### **ATTACHMENTS**

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

Product Data literature for all products evaluated





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FOR: John Belden cc: Steve Dean

John Bourne

**SUBJECT:** Belden Brick Co.

Canton, OH

**DATE:** June 3, 2004

**PROJECT:** 0405-05 PTP

SAMPLES SUBMITTED: (6) types of clay brick

Commercial Face Brick	Finish	Color/Coating	Size
"Mod. Amherst Bld. A"	Dart – Tex	Dark Red	
"Mod. Alaska White Velour"	Engobe Velour	White	
"Mod. Burbank Bld"	Knife Cut	Gray-Tan	7 ½" x 3½" x
"Jumbo Polar Clear"	Sand Alkatrol Borax	White	2½"
"Mod. Sea Gray Velour"	Velour	Gray	
"Mod. 470-479 Dark"	Smooth	Brown	

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#### **PURPOSE OF TESTING:**

Six different types of clay brick were submitted to PROSOCO, Inc.'s Testing Laboratory with a request to determine if application of the products evaluated will produce any surface alteration during new construction cleaning operations. Additionally, the effectiveness of water repellent treatments suitable for clay brick masonry was evaluated.

**A. New Construction Cleaning** – Sure Klean<sup>®</sup> Vana Trol<sup>®</sup> and/or Sure Klean<sup>®</sup> 600 Detergent and/or Enviro Klean<sup>®</sup> Safety Klean and/or Sure Klean<sup>®</sup> 101 Lime Solvent were evaluated for removal of laboratory applied mortar.

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

Soiled brick were allowed to dry before test cleaning.

Heavy deposits of mortar were removed with dry scraping after 24 hours. Prepared cleaning solutions were then evaluated for their effectiveness in removing residual Ash Grove<sup>®</sup> Type N mortar after 7, 14, and 21 days of curing.

**B. Limiting Surface Alterations** – Sure Klean<sup>®</sup> Vana Trol<sup>®</sup> and/or Sure Klean<sup>®</sup> 600 Detergent and /or Enviro Klean<sup>®</sup> Safety Klean and/or Sure Klean<sup>®</sup> 101 Lime Solvent were tested 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.

<u>Surface Finish Removal</u> is the visual examination of the brick comparing the surface finish of the untreated control surface to the surface finish cleaned with selected product(s) at given dilutions.

<u>Substrate Deterioration</u> is the visual examination of the brick 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 brick.

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

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

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





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#### PRODUCTS EVALUATED FOR CLEANING AND LIMITING SURFACE ALTERATIONS

SAMPLE	TREATMENT	DILUTION
"Mod. Alaska White Velour" "Mod. Burbank Bld" "Jumbo Polar Clear"	Sure Klean <sup>®</sup> Vana Trol <sup>®</sup>	1:6, 1:8
"Mod. Sea Gray Velour"	Sure Klean <sup>®</sup> Safety Klean	1:2, 1:3
"Mod. 470-479 Dark" "Mod. Amherst Bld. A"	Sure Klean <sup>®</sup> 101 Lime Solvent	1:6, 1:8
	Sure Klean <sup>®</sup> 600 Detergent	1:6, 1:8

#### WATER REPELLENT PRODUCTS EVALUATED

SAMPLE	TREATMENT	DILUTION
All submitted clay	Sure Klean <sup>®</sup> Weather Seal Siloxane PD	Concentrate
brick	Sure Klean <sup>®</sup> Weather Seal Siloxane WB Concentrate	1:9, 1:14

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<sup>®</sup> Type N mortar from the submitted fired clay brick.

Ash Grove® Type N cementitious mortar was prepared in compliance with the manufacturers instructions, applied to the brick surface and allowed to cure for 7, 14 and 21 days. Mortar removal was accomplished using chemical assistance and a high-pressure water rinse with pressure rinsing equipment. The removal of Ash Grove® Type N cementitious masonry cement mortar was visually evaluated after 7, 14 and 21 days of curing.

**Sure Klean® Vana Trol®** - A concentrated acidic cleaner for new masonry surfaces that are subject to vanadium, manganese and other metallic stains. Use on: gray, brown, white, and most light-colored brick; natural stone; cast stone. Dissolves mortar smears and construction dirt quickly, leaving the masonry clean and uniform with no acid burning or streaking. Liquid concentrate for dilution with 4-10 parts water. Apply by brush or low-pressure spray.

**Sure Klean**<sup>®</sup> **600 Detergent** – A general purpose, concentrates acidic cleaner for brick, tile and concrete surfaces. 600 Detergent dissolves mortar smears and construction dirt quickly, leaving the masonry clean and uniform with no acid burning or streaking.

**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. Nonfuming 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.

**Sure Klean® 101 Lime Solvent** – A concentrated acidic cleaner for dark-colored brick and tile surfaces which are not subject to metallic oxidation. Safely removes excess mortar and construction dirt.

#### **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>	3-5 minutes
600 Detergent	3-5 minutes
Safety Klean	3-5 minutes
101 Lime Solvent	3-5 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

#### "Mod. Amherst Bld. A"

Product	Dilution	7 day	14 day	21 day
Sure Klean® 101 Lime Solvent	1:6	90%	90%	90%
Sure Rieam To I Lime Solvent	1:8	90%	90%	90%
Sura Klaan <sup>®</sup> 600 Determent	1:6	90%	90%	90%
Sure Klean <sup>®</sup> 600 Detergent	1:8	90%	90%	90%

#### "Mod. Alaska White Velour"

Product	Dilution	7 day	14 day	21 day
Sure Klean <sup>®</sup> Vana Trol <sup>®</sup>	1:6	100%	100%	100%
Sure Rieari Varia 1101	1:8	90%	95%	95%
Enviro Klean <sup>®</sup> Safety Klean	1:2	100%	95%	95%
Enviro Riean Salety Riean	1:3	100%	95%	95%

#### "Mod. Burbank Bld"

Product	Dilution	7 day	14 day	21 day
Sure Klean® Vana Trol®	1:6	95%	95%	95%
Sure Riearr Varia 1101	1:8	90%	90%	90%
Enviro Klaan® Safaty Klaan	1:2	95%	90%	90%
Enviro Klean <sup>®</sup> Safety Klean	1:3	95%	90%	90%

#### "Jumbo Polar Clear"

Product	Dilution	7 day	14 day	21 day
Sure Klean <sup>®</sup> Vana Trol <sup>®</sup>	1:6	100%	100%	100%
Sule Mean Valia 110	1:8	90%	100%	95%
Enviro Klean <sup>®</sup> Safety Klean	1:2	95%	90%	98%
Enviro Klean Safety Klean	1:3	95%	90%	98%





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#### **TEST RESULTS- New Construction Cleaning**

#### % Removal

#### "Mod. Sea Gray Velour"

Product	Dilution	7 day	14 day	21 day
Sure Klean <sup>®</sup> Vana Trol <sup>®</sup>	1:6	100%	100%	95%
Sule Reall Valla 1101	1:8	95%	95%	95%
Enviro Klean <sup>®</sup> Safety Klean	1:2	100%	95%	95%
Enviro Klean Salety Klean	1:3	100%	95%	95%

#### "Mod. 470-479 Dark"

Product	Dilution	7 day	14 day	21 day
Sure Klean® 101 Lime Solvent	1:6	100%	100%	100%
Sure Kleari To i Lime Solveni	1:8	100%	100%	100%
Sura Klaan <sup>®</sup> 600 Determent	1:6	100%	100%	100%
Sure Klean <sup>®</sup> 600 Detergent	1:8	100%	100%	100%





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#### **CONCLUSIONS - New Construction Cleaning**

Based on the test results, all PROSOCO, Inc. products tested performed extremely well in removing excess mortar smears from the submitted clay bricks. These products performed well in removing the mortar soils even after allowing the mortar to remain on the surface of the brick for 21 days under ideal curing conditions.

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, at least 400 psi, 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 mortar and construction dirt 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 brick submitted by Belden Brick Co., Canton, OH, are provided in the chart below. Recommendations are based on the optimum dilution for complete removal of mortar while limiting surface alterations.

Brick Type	New Construction Cleaning (Type N, 21 Days)
"Mod. Amherst Bld. A" and "Mod. 470-479 Dark" Submitted Clay Brick	Sure Klean <sup>®</sup> 600 Detergent (1:6), (1:8) OR Sure Klean <sup>®</sup> 101 Lime Solvent (1:6), (1:8)
All Other Submitted Clay Brick	Sure Klean <sup>®</sup> Vana Trol <sup>®</sup> 1:6

Note: Sure Klean® Vana Trol® is recommended for new construction cleaning when colored mortars are used.

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



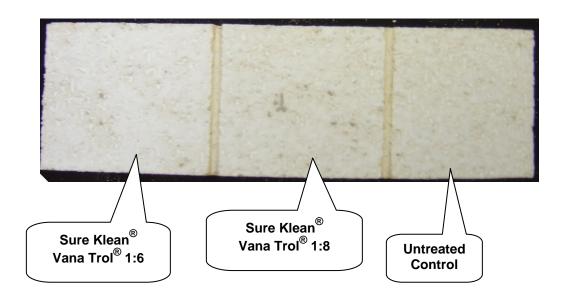


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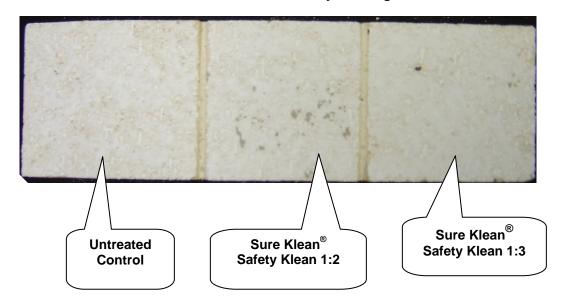
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#### **PHOTOGRAPHS - Cleaning**

"Mod. Alaska White Velour" 21 day cleaning



"Mod. Alaska White Velour" 21 day cleaning







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#### **SECTION B – LIMITING SURFACE ALTERATIONS**

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

**Sure Klean® Vana Trol® -** A concentrated acidic cleaner for new masonry surfaces that are subject to vanadium, manganese and other metallic stains. Designed for use on gray, brown, white and most light-colored brick, natural stone and cast stone. Dissolves mortar smears and construction dirt quickly, leaving the masonry clean and uniform with no acid burning or streaking. Liquid concentrate for dilution with 4-10 parts water. Apply by brush or low-pressure spray.

**Sure Klean**<sup>®</sup> **600 Detergent** – A general purpose, concentrates acidic cleaner for brick, tile and concrete surfaces. 600 Detergent dissolves mortar smears and construction dirt quickly, leaving the masonry clean and uniform with no acid burning or streaking.

**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. Nonfuming 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.

**Sure Klean® 101 Lime Solvent** – A concentrated acidic cleaner for dark-colored brick and tile surfaces which are not subject to metallic oxidation. Safely removes excess mortar and construction dirt.

#### **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.

Vana Trol <sup>®</sup>	3-5 minutes
600 Detergent	
Safety Klean	
101 Lime Solvent	

- 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: Clay brick	Pigment Color: "Mod. Amherst Bld. A"				
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean <sup>®</sup> 600 Detergent	1:6	0	0	0	0
Sure Klean® 600 Detergent	1:8	0	0	0	0
Sure Klean <sup>®</sup> 101 Lime Solvent	1:6	0	0	0	0
Sure Klean <sup>®</sup> 101 Lime Solvent	1:8	0	0	0	0
Substrate: Clay brick	Pigment Color: "Mod. Alaska White Velour"				
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean <sup>®</sup> Vana Trol <sup>®</sup>	1:6	0	0	0	0
Sure Klean <sup>®</sup> Vana Trol <sup>®</sup>	1:8	0	0	0	0
Enviro Klean <sup>®</sup> Safety Klean	1:2	0	0	0	0
Enviro Klean <sup>®</sup> Safety Klean	1:3	0	0	0	0
Substrate: Clay brick	Pigment Color: "Mod. Burbank Bld"				
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean <sup>®</sup> Vana Trol <sup>®</sup>	1:6	0	0	0	0
Sure Klean <sup>®</sup> Vana Trol <sup>®</sup>	1:8	0	0	0	0
Enviro Klean <sup>®</sup> Safety Klean	1:2	0	0	0	0
Enviro Klean <sup>®</sup> Safety Klean	1:3	0	0	0	0

<sup>0 -</sup> No change

<sup>1 –</sup> change – slight

<sup>2 –</sup> change – moderate

<sup>3 -</sup> change - heavy

<sup>4 –</sup> change - excessive





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#### **TEST RESULTS – Limiting Surface Alterations**

Substrate: Clay brick	Pigment Color: "Jumbo Polar Clear"				
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean <sup>®</sup> Vana Trol <sup>®</sup>	1:6	0	0	0	0
Sure Klean <sup>®</sup> Vana Trol <sup>®</sup>	1:8	0	0	0	0
Enviro Klean <sup>®</sup> Safety Klean	1:2	0	0	0	0
Enviro Klean <sup>®</sup> Safety Klean	1:3	0	0	0	0
Substrate: Clay brick	Pigment Color: "Mod. Sea Gray Velour"				
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean <sup>®</sup> Vana Trol <sup>®</sup>	1:6	0	0	0	0
Sure Klean <sup>®</sup> Vana Trol <sup>®</sup>	1:8	0	0	0	0
Enviro Klean <sup>®</sup> Safety Klean	1:2	0	0	0	0
Enviro Klean <sup>®</sup> Safety Klean	1:3	0	0	0	0
Substrate: Clay brick	Pigment Color: "Mod. 470-479 Dark"				
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean <sup>®</sup> 600 Detergent	1:6	0	0	0	0
Sure Klean® 600 Detergent	1:8	0	0	0	0
Sure Klean <sup>®</sup> 101 Lime Solvent	1:6	0	0	0	0
Sure Klean <sup>®</sup> 101 Lime Solvent	1:8	0	0	0	0

<sup>0 –</sup> No change

<sup>1 –</sup> change – slight

<sup>2 -</sup> change - moderate

<sup>3 -</sup> change - heavy

<sup>4 -</sup> change - excessive





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#### **CONCLUSIONS – Limiting Surface Alterations**

Test results indicate that none of the products tested caused any surface alterations on any of the submitted clay brick. 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 mortar and construction dirt while minimizing any potential surface alterations to the decorative finish, clean within 7 days of construction.

#### **RECOMMENDED PRODUCTS AND DILUTIONS – Limiting Surface Alterations**

Product recommendations for limiting surface alterations for each type of clay brick submitted by Belden Brick Co., Canton, OH, are provided in the chart below. Recommendations are based on the optimum dilution for complete removal of mortar while limiting surface alterations.

Brick Type	Recommended Products
"Mod. Amherst Bld. A" and "Mod. 470-479 Dark" Submitted Clay Brick	Sure Klean <sup>®</sup> 600 Detergent (1:6), (1:8) OR Sure Klean <sup>®</sup> 101 Lime Solvent (1:6), (1:8)
All Other Submitted Clay Brick	Sure Klean <sup>®</sup> Vana Trol <sup>®</sup> 1:6

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

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

**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 concentrated water repellent designed for dilution with fresh water at the jobsite. A solvent-free blend of silanes and oligomeric alkoxysiloxanes, it mixes easily with water to produce a penetrating water repellent ideal for application to dense or porous masonry surfaces.

#### **SAMPLE PREPARATION - Protective Water Repellents:**

The submitted brick were cut, oven dried and allowed to reabsorb atmospheric humidity for at least 24 hours prior to treatment. The treatment method adhered to the 2004 PROSOCO, Inc. Product Guide. All treatments were allowed to cure for at least 3 days prior to testing.





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#### **TEST METHODS - Protective Water Repellents:**

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

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

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.

 $\underline{\mathbf{A}}$  = "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  $\underline{AA}$  Above Average water repellent performance would require loss of no more than 5 ml X 20% = 1 ml.

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

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





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

AA = Above Average

A = Average

**BA** = Below Average

"Mod. Amherst Bld. A"	Results in mL loss	Ranking
Untreated Control	0.8	Ranking
Weather Seal Siloxane PD	< 5.0	<u></u> <u>BA</u>
Weather Seal Siloxane WB (1:9)	0.3	
Weather Seal Siloxane WB (1:14)	0.3	<u>A</u>
` ,		<u>A</u>
"Mod. Alaska White Velour"	Results in mL loss	Ranking
Untreated Control	0.2	
Weather Seal Siloxane PD	0.0	<u>AA</u>
Weather Seal Siloxane WB (1:9)	0.0	<u>AA</u>
Weather Seal Siloxane WB (1:14)	0.1	<u>A</u>
"Mod. Burbank Bld"	Results in mL loss	Ranking
Untreated Control	0.3	
Weather Seal Siloxane PD	0.1	<u>A</u>
Weather Seal Siloxane WB (1:9)	0.1	<u>A</u>
Weather Seal Siloxane WB (1:14)	0.1	<u>A</u>
-		
"Jumbo Polar Clear"	Results in mL loss	Ranking
"Jumbo Polar Clear" Untreated Control	Results in mL loss < 5.0	Ranking 
		Ranking  <u>BA</u>
Untreated Control	< 5.0	<u>-</u>
Untreated Control Weather Seal Siloxane PD	< 5.0 < 5.0	 <u>BA</u>
Untreated Control Weather Seal Siloxane PD Weather Seal Siloxane WB (1:9)	< 5.0 < 5.0 < 5.0	 <u>BA</u> <u>BA</u>
Untreated Control Weather Seal Siloxane PD Weather Seal Siloxane WB (1:9) Weather Seal Siloxane WB (1:14)	< 5.0 < 5.0 < 5.0 0.0	 <u>BA</u> <u>BA</u> <u>AA</u>
Untreated Control Weather Seal Siloxane PD Weather Seal Siloxane WB (1:9) Weather Seal Siloxane WB (1:14)  "Mod. Sea Gray Velour"	< 5.0 < 5.0 < 5.0 0.0 Results in mL loss	 <u>BA</u> <u>BA</u> <u>AA</u> Ranking
Untreated Control Weather Seal Siloxane PD Weather Seal Siloxane WB (1:9) Weather Seal Siloxane WB (1:14) "Mod. Sea Gray Velour" Untreated Control	< 5.0 < 5.0 < 5.0 0.0 Results in mL loss	BA BA AA Ranking
Untreated Control Weather Seal Siloxane PD Weather Seal Siloxane WB (1:9) Weather Seal Siloxane WB (1:14)  "Mod. Sea Gray Velour"  Untreated Control Weather Seal Siloxane PD	< 5.0 < 5.0 < 5.0 0.0 Results in mL loss 0.2 0.1	<u>BA</u> <u>BA</u> <u>AA</u> Ranking <u>A</u>
Untreated Control Weather Seal Siloxane PD Weather Seal Siloxane WB (1:9) Weather Seal Siloxane WB (1:14)  "Mod. Sea Gray Velour"  Untreated Control Weather Seal Siloxane PD Weather Seal Siloxane WB (1:9)	< 5.0 < 5.0 < 5.0 0.0 Results in mL loss 0.2 0.1 0.0	BA BA AA Ranking A AA
Untreated Control Weather Seal Siloxane PD Weather Seal Siloxane WB (1:9) Weather Seal Siloxane WB (1:14)  "Mod. Sea Gray Velour"  Untreated Control Weather Seal Siloxane PD Weather Seal Siloxane WB (1:9) Weather Seal Siloxane WB (1:14)	< 5.0 < 5.0 < 5.0 0.0 Results in mL loss 0.2 0.1 0.0 0.0	<u>BA</u> <u>BA</u> <u>AA</u> Ranking <u>A</u> <u>AA</u>
Untreated Control Weather Seal Siloxane PD Weather Seal Siloxane WB (1:9) Weather Seal Siloxane WB (1:14)  "Mod. Sea Gray Velour"  Untreated Control Weather Seal Siloxane PD Weather Seal Siloxane WB (1:9) Weather Seal Siloxane WB (1:14)  "Mod. 470-479 Dark"	< 5.0 < 5.0 < 5.0 0.0 Results in mL loss 0.2 0.1 0.0 0.0 Results in mL loss	BA  BA  AA  Ranking   A  AA  AA  Ranking
Untreated Control Weather Seal Siloxane PD Weather Seal Siloxane WB (1:9) Weather Seal Siloxane WB (1:14)  "Mod. Sea Gray Velour" Untreated Control Weather Seal Siloxane PD Weather Seal Siloxane WB (1:9) Weather Seal Siloxane WB (1:14)  "Mod. 470-479 Dark" Untreated Control	< 5.0 < 5.0 < 5.0 0.0 Results in mL loss 0.2 0.1 0.0 0.0 Results in mL loss 0.1	BA BA AA Ranking A AA AA Ranking A AA AA AA Ranking
Untreated Control Weather Seal Siloxane PD Weather Seal Siloxane WB (1:9) Weather Seal Siloxane WB (1:14)  "Mod. Sea Gray Velour" Untreated Control Weather Seal Siloxane PD Weather Seal Siloxane WB (1:9) Weather Seal Siloxane WB (1:14)  "Mod. 470-479 Dark" Untreated Control Weather Seal Siloxane PD	< 5.0 < 5.0 < 5.0 0.0 Results in mL loss 0.2 0.1 0.0 0.0 Results in mL loss 0.1 0.0	BA  BA  AA  Ranking   A  AA  AA  Ranking   A  AA  AA  Ranking



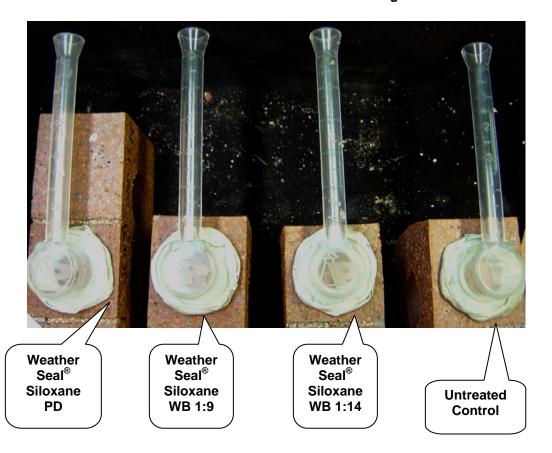


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#### **PHOTOGRAPH – Water Repellents**

#### "Mod. 470-479 Dark A"- RILEM Testing







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#### **CONCLUSIONS – Protective Water Repellents:**

RILEM test results indicate that one or more of the three water repellents tested exhibited above average or sufficient water repellency on all submitted clay brick.

#### **RECOMMENDATIONS – Protective Water Repellents:**

Recommendations for water repellent treatments for each type of clay brick submitted by Belden Brick Co., Canton, OH, are provided in the chart below. Recommendations are based on the treatments that proved most effective by RILEM results and can provide water repellency on all types indicated.

Brick Type	Water Repellent
"Mod. Amherst Bld. A" Clay Brick	Sure Klean <sup>®</sup> Weather Seal Siloxane WB Concentrate (1:9) OR (1:14)
"Jumbo Polar Clear" Clay Brick	Sure Klean <sup>®</sup> Weather Seal Siloxane WB Concentrate (1:14)
All Other Submitted Clay Brick	Sure Klean <sup>®</sup> Weather Seal Siloxane WB Concentrate (1:9) OR (1:14) OR Sure Klean <sup>®</sup> Weather Seal Siloxane PD

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.

Nathan R. Colaner Technical Analyst

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### Laboratory Report

### **Pallet Tag Program Evaluation**

# Belden Brick Co. Canton, OH

Project No. 0405-05 PTP

Prepared For:

Belden Brick Co. Canton, OH

Prepared By:



PROSOCO, Inc. June 2004