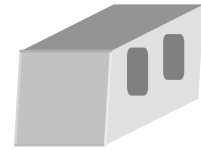




# BLOCK PROGRAM LABORATORY REPORT



**PROSOCO, Inc.**

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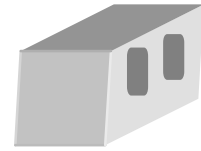
Technical Services TECH Note RILEM Test Method No. II.4

Product Data literature for all products evaluated

Material Safety Data Sheets for all products evaluated



# BLOCK PROGRAM LABORATORY REPORT



**PROSOCO, Inc.**

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**FOR:** Tray Atwood  
Cc: Jack James  
Paul Tessier

**SUBJECT:** Featherlite  
Round Rock Plant  
Round Rock, TX

**DATE:** December 5, 2000

**PROJECT:** 0010-06 BP

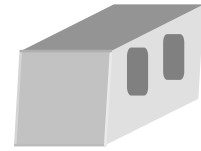
**SAMPLES SUBMITTED:**

<u>Block</u>	<u>Color</u>	<u>Size</u>
(A) Split-face CMU	Saddletan	4" x 8" x 16"
(B) Burnished smooth-face CMU w/ in-plant acrylic	Saddletan	4" x 8" x 16"
(C) Split-face CMU	Apache Brown	4" x 8" x 16"
(D) Burnished smooth-face CMU w/ in-plant acrylic	Apache Brown	4" x 8" x 16"
(E) Split-face CMU	Copperstone	4" x 8" x 16"
(F) Burnished smooth-face CMU w/ in-plant acrylic	Copperstone	4" x 8" x 16"
(G) Split-face CMU	Granite Pink	4" x 8" x 16"
(H) Burnished smooth-face CMU w/ in-plant acrylic	Granite Pink	4" x 8" x 16"
(I) Split-face CMU	Lonestar Gray	4" x 8" x 16"
(J) Burnished smooth-face CMU w/ in-plant acrylic	Lonestar Gray	4" x 8" x 16"
(K) Split-face CMU	Limestone	4" x 8" x 16"
(L) Burnished smooth-face CMU w/ in-plant acrylic	Limestone	4" x 8" x 16"

Submitted by: Jack James



# BLOCK PROGRAM LABORATORY REPORT



PROSOCO, Inc.

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## PURPOSE OF TESTING:

The submitted custom masonry units (or CMUs) included six integrally colored split-face concrete blocks and six integrally colored burnished smooth-face concrete blocks with an applied in-plant acrylic. All blocks were submitted for testing to determine the effectiveness of PROSOCO's new construction cleaning and water repellent products.

**A. Cleaning Concrete Masonry Units:** Sure Klean® New Construction Cleaners were evaluated for removal of laboratory applied mortar.

To simulate new construction soiling, all CMUs 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 CMU and filled with a wet mixture of Type S cementitious mortar. The wet, mortar-filled cylinder is allowed to remain in contact with the CMU for 10 minutes before removal.

Soiled CMUs 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 Type S mortar staining after 3 days, 7 days, and 14 days of curing.

Refer to “\*Note: When cleaning integrally colored CMU” in the following section, “Surface Alteration Testing.”

**B. Surface Alteration Testing -** Sure Klean® Custom Masonry Cleaner was tested on the split face CMUs 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. Also, Sure Klean® Burnished Custom Masonry Cleaner was tested on the burnished CMUs at various dilutions to determine if the cleaner would remove or otherwise alter, the acrylic surface coating. Surface Alteration was evaluated visually based upon perceived discoloration or erosion/etching of the masonry unit.

Aggregate Exposure is the visual examination of the CMU 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 CMU 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 CMU.

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:

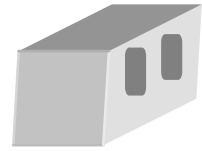
- 0 – no change
- 1 – 1-24% change – slight
- 2 – 25-49% change – moderate
- 3 – 50-74% change – heavy
- 4 – 75-100% change – excessive

**\* NOTE: When cleaning integrally colored CMU.**

Integrally colored concrete masonry units (CMUs) frequently have high amounts of pigments concentrated on the surface of the cured concrete unit. Variation of surface pigment concentrations from one CMU to the next creates a blotchy appearance in the completed wall. Allowed to remain on the surface of the CMU, the weakly bound pigment will weather and streak, further detracting from the appearance of the completed CMU wall.



# BLOCK PROGRAM LABORATORY REPORT



**PROSOCO, Inc.**

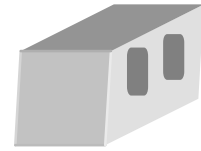
**Page 4**

In addition to removing excess mortar and construction related soiling, the goal of any cleaning operation undertaken on integrally colored CMU should include removal of unnaturally high concentrations of surface pigment. By revealing the natural through-body color on the integrally colored unit, the overall color uniformity and weathering resistance of the completed CMU wall is improved.

**C. Protective Water Repellents** - Sure Klean<sup>®</sup> Custom Masonry Sealer, Sure Klean<sup>®</sup> Weather Seal Siloxane PD, and Sure Klean<sup>®</sup> Weather Seal Siloxane WB Concentrate were evaluated on the Split face CMUs only for their ability to provide water repellency to the submitted samples.



# BLOCK PROGRAM LABORATORY REPORT



PROSOCO, Inc.

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## CLEANING PRODUCTS EVALUATED

BLOCK TYPE	Custom Masonry Cleaner
All Colors of Split-Face CMUs	1:4
	1:6

BLOCK TYPE	Burnished Custom Masonry Cleaner
All Colors of Burnished CMUs	1:2
	1:3

## SURFACE ALTERATION PRODUCTS EVALUATED

BLOCK TYPE	Custom Masonry Cleaner
All Colors of Split-Face CMUs	1:4
	1:6

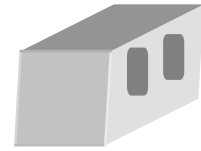
BLOCK TYPE	Burnished Custom Masonry Cleaner
All Colors of Burnished CMUs	1:2
	1:3

## WATER REPELLENT PRODUCTS EVALUATED

Block Type	Product	Dilution
All Colors of Split-Face CMUs	Custom Masonry Sealer	Concentrate
	Siloxane PD	Concentrate
	Siloxane WB	1:9



# BLOCK PROGRAM LABORATORY REPORT



## SECTION A – CLEANING INTEGRALLY COLORED CMUs

### DESCRIPTION OF PRODUCTS EVALUATED

These cleaning trials were conducted to determine the optimal cleaning/cure time combination.

**Sure Klean® Custom Masonry Cleaner** – A general purpose, concentrated acidic cleaner for most custom masonry and colored concrete. Removes concrete splashes, excess mortar, mud, heavy efflorescence and surface soiling, leaving the masonry clean and uniform with no acid burning or streaking. Liquid concentrate for dilution with 2-6 parts water. Apply by brush or low-pressure spray.

**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.

### TEST METHOD – Cleaning

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

1. Prewet the surface with water.
2. Apply each cleaner at the appropriate dilutions.
3. Allow 3-5 minute exposure time.
4. Reapply the products and moderately agitate with a brush.
5. Pressure rinse thoroughly.\*
6. Allow the surface to dry for at least 24 hours and visually examine.

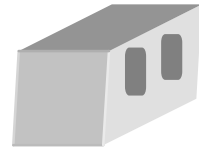
Pressure rinsing was conducted at approximately 800 psi with a warm water flow rate of 1.9 gallons per minute.

### Test Results - Cleaning

Block Type	Cleaner	Dilution	Cure	Effectiveness
All Colors of Split-Face CMUs	Custom Masonry Cleaner	1:4	3 day	100%
		1:6		100%
		1:4	7 day	100%
		1:6		99%
		1:4	14 day	100%
		1:6		100%
All Colors of Burnished CMUs	Burnished Custom Masonry Cleaner	1:2	3 day	100%
		1:3		100%
		1:2	7 day	99%
		1:3		99%
		1:2	14 day	100%
		1:3		100%



# BLOCK PROGRAM LABORATORY REPORT



PROSOCO, Inc.

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## CONCLUSIONS - Cleaning:

Based on the test data, all of the submitted block samples were efficiently cleaned with each dilution of the selected PROSOCO Inc.'s cleaning products. Use higher concentrations and surface agitation to maximize aggregate exposure. Use low concentration and surface agitation to minimize aggregate exposure.

All dilutions of Sure Klean<sup>®</sup> Custom Masonry Cleaner tested affected the substrate in a similar manner, removing heavy concentrations of pigmented matrix from the split-face blocks, exposing small and large aggregate, and enhancing the natural appearance of the integrally colored concrete masonry unit.

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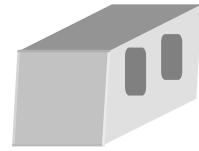
## RECOMMENDED PRODUCTS AND DILUTIONS - CLEANING:

Based on these evaluations, all of the dilutions of Custom Masonry Cleaner and Burnished Custom Masonry Cleaner tested can be recommended for job site testing. They all are effective in removing excess mortar, and they all assist in improving the color and uniformity of these concrete blocks. 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.

Note: To remove excess mortar while minimizing aggregate exposure and color enhancement on split face CMUs, clean within 7 days of completion using Custom Masonry Cleaner diluted with 6 parts fresh water.



# BLOCK PROGRAM LABORATORY REPORT



PROSOCO, Inc.

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

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

**Sure Klean® Custom Masonry Cleaner** – A general purpose, concentrated acidic cleaner for most custom masonry and colored concrete. Removes concrete splashes, excess mortar, mud, heavy efflorescence and surface soiling, leaving the masonry clean and uniform with no acid burning or streaking. Liquid concentrate for dilution with 2-6 parts water. Apply by brush or low-pressure spray.

**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.

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

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

Sure Klean® Custom Masonry Cleaner evaluated at dilutions 1:4 and 1:6. Sure Klean® Burnished Custom Masonry Cleaner evaluated at dilution 1:2 and 1:3. The following procedure was used:

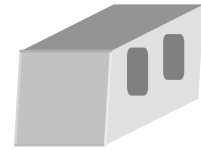
1. Prewet the surface with water.
2. Apply each cleaner at the appropriate dilutions.
3. Allow 3-5 minute exposure time.
4. Reapply the products and moderately agitate with a brush.
5. Pressure rinse thoroughly.\*
6. Allow the surface to dry for at least 24 hours and visually examine.

\* Pressure rinsing was conducted at approximately 800 psi with a warm water flow rate of 1.9 gallons per minute.





# BLOCK PROGRAM LABORATORY REPORT



PROSOCO, Inc.

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**Surface Alteration Results:**

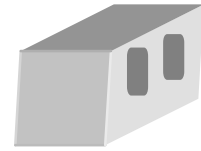
<b>Substrate:</b> Split-Face		<b>Pigment Color:</b> Saddletan			
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal	Matrix Erosion	Staining
Custom Masonry Cleaner	1:4	3	1	3	0
Custom Masonry Cleaner	1:6	2	1	2	0
<b>Substrate:</b> Split-Face		<b>Pigment Color:</b> Apache Brown			
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal	Matrix Erosion	Staining
Custom Masonry Cleaner	1:4	3	1	3	0
Custom Masonry Cleaner	1:6	2	1	2	0
<b>Substrate:</b> Split-Face		<b>Pigment Color:</b> Copperstone			
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal	Matrix Erosion	Staining
Custom Masonry Cleaner	1:4	3	1	3	0
Custom Masonry Cleaner	1:6	2	1	2	0
<b>Substrate:</b> Split-Face		<b>Pigment Color:</b> Granite Pink			
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal	Matrix Erosion	Staining
Custom Masonry Cleaner	1:4	3	1	3	0
Custom Masonry Cleaner	1:6	2	1	2	0
<b>Substrate:</b> Split-Face		<b>Pigment Color:</b> Lonestar Gray			
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal	Matrix Erosion	Staining
Custom Masonry Cleaner	1:4	3	1	3	0
Custom Masonry Cleaner	1:6	2	1	2	0
<b>Substrate:</b> Split-Face		<b>Pigment Color:</b> Limestone			
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal	Matrix Erosion	Staining
Custom Masonry Cleaner	1:4	2	1	2	0
Custom Masonry Cleaner	1:6	1	1	1	0

Scale used for reporting results of all categories

- |                              |                                |
|------------------------------|--------------------------------|
| 0 – no change                | 3 – 50-74% change – heavy      |
| 1 – 1-24% change – slight    | 4 – 75-100% change – excessive |
| 2 – 25-49% change – moderate |                                |



# BLOCK PROGRAM LABORATORY REPORT



**PROSOCO, Inc.**

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**Surface Alteration Results (cont.):**

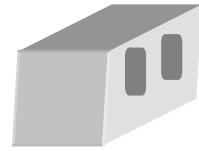
<b>Substrate:</b> Burnished		<b>Pigment Color:</b> Saddletan			
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal	Matrix Erosion	Staining
Burnished Custom Masonry Clnr	1:2	0	0 -- Acrylic Intact	0	0
Burnished Custom Masonry Clnr	1:3	0	0 -- Acrylic Intact	0	0
<b>Substrate:</b> Burnished		<b>Pigment Color:</b> Apache Brown			
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal	Matrix Erosion	Staining
Burnished Custom Masonry Clnr	1:2	0	1- Some Acrylic Removed	0	0
Burnished Custom Masonry Clnr	1:3	0	0 -- Acrylic Intact	0	0
<b>Substrate:</b> Burnished		<b>Pigment Color:</b> Copperstone			
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal	Matrix Erosion	Staining
Burnished Custom Masonry Clnr	1:2	0	0 -- Acrylic Intact	0	0
Burnished Custom Masonry Clnr	1:3	0	0 -- Acrylic Intact	0	0
<b>Substrate:</b> Burnished		<b>Pigment Color:</b> Granite Pink			
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal	Matrix Erosion	Staining
Burnished Custom Masonry Clnr	1:2	0	0 -- Acrylic Intact	0	0
Burnished Custom Masonry Clnr	1:3	0	0 -- Acrylic Intact	0	0
<b>Substrate:</b> Burnished		<b>Pigment Color:</b> Lonestar Gray			
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal	Matrix Erosion	Staining
Burnished Custom Masonry Clnr	1:2	0	0 -- Acrylic Intact	0	0
Burnished Custom Masonry Clnr	1:3	0	0 -- Acrylic Intact	0	0
<b>Substrate:</b> Burnished		<b>Pigment Color:</b> Limestone			
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal	Matrix Erosion	Staining
Burnished Custom Masonry Clnr	1:2	0	0 -- Acrylic Intact	0	0
Burnished Custom Masonry Clnr	1:3	0	0 -- Acrylic Intact	0	0

Scale used for reporting results of all categories

- |                              |                                |
|------------------------------|--------------------------------|
| 0 – no change                | 3 – 50-74% change – heavy      |
| 1 – 1-24% change – slight    | 4 – 75-100% change – excessive |
| 2 – 25-49% change – moderate |                                |



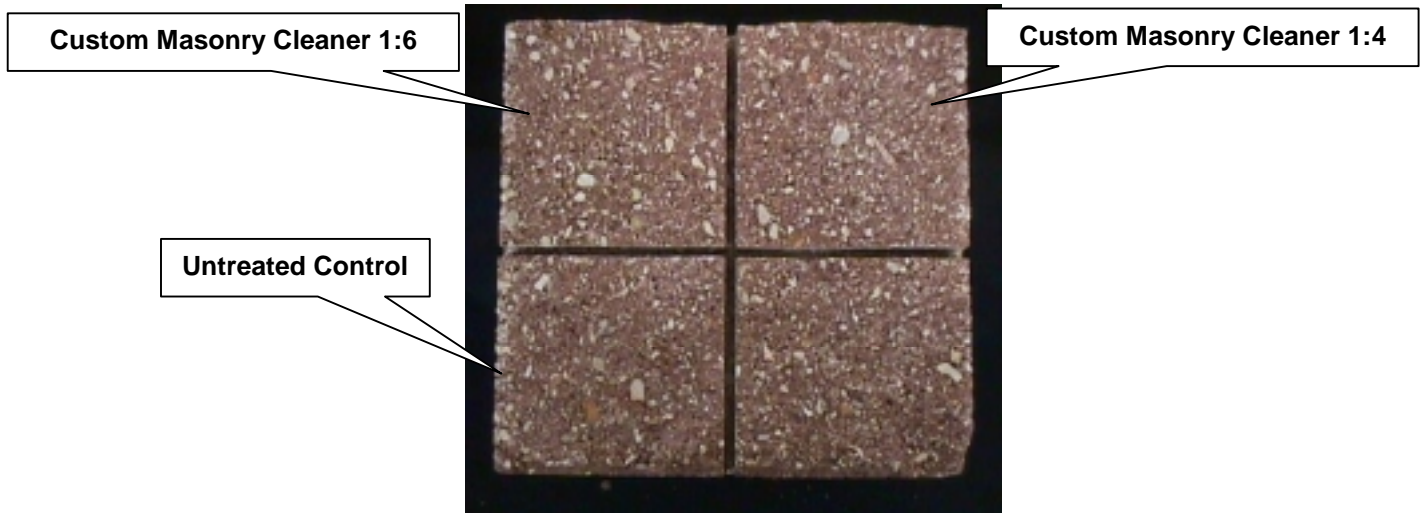
# BLOCK PROGRAM LABORATORY REPORT



PROSOCO, Inc.

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Photos of block after 14 day cleaning:



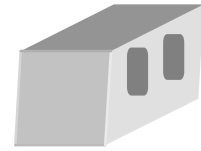
(E)  
Copperstone Split-Face  
CMU



(F)  
Copperstone Burnished Smooth-Face  
CMU w/ in-plant acrylic



# BLOCK PROGRAM LABORATORY REPORT



PROSOCO, Inc.

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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® Custom Masonry Sealer** - A clear, solvent-based silicone elastomer formulated to weatherproof custom masonry units, cast stone, and concrete block without altering the natural appearance. Custom Masonry Sealer penetrates and fills pores to prevent water penetration through exterior walls exposed to normal weathering as well as long-lasting protection against many types of graffiti.

**Sure Klean® Weather Seal Siloxane PD** - A low odor, alkaline stable, water-based blend of silanes and oligomeric alkoxy siloxanes. 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 alkoxy siloxanes 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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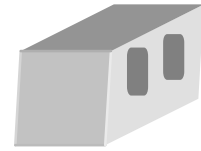
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## **SAMPLE PREPARATION - Protective Water Repellents:**

The submitted blocks were scored, allowed to dry, and to reabsorb atmospheric humidity for 24 hours prior to treatment. The treatment method consisted of a wet-on-wet brush application. All treatments were allowed to cure at least 14 days prior to testing.



# BLOCK PROGRAM LABORATORY REPORT



PROSOCO, Inc.

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**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.

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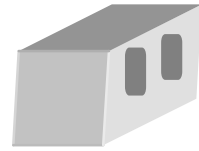
**TEST RESULTS - Protective Water Repellents:**

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

RESULTS	
Saddletan	
Untreated Control	<40mph
Custom Masonry Sealer	56mph
Siloxane WB (1:9)	60mph
Siloxane PD	58mph
Apache Brown	
Untreated Control	<40mph
Custom Masonry Sealer	60mph
Siloxane WB (1:9)	59mph
Siloxane PD	59mph
Copperstone	
Untreated Control	<40mph
Custom Masonry Sealer	60mph
Siloxane WB (1:9)	57mph
Siloxane PD	54mph
Granite Pink	
Untreated Control	<40mph
Custom Masonry Sealer	59mph
Siloxane WB (1:9)	57mph
Siloxane PD	54mph



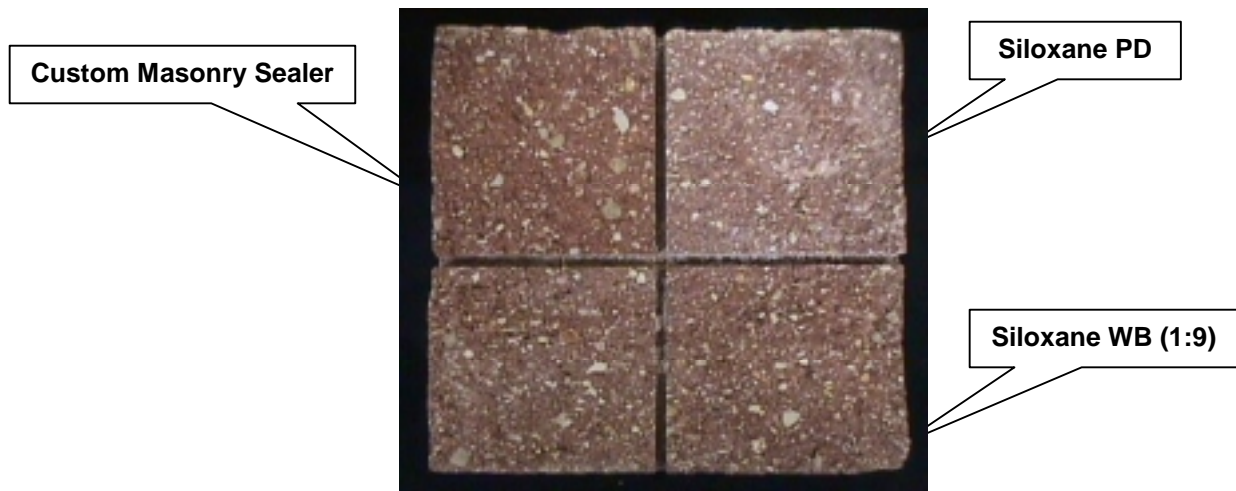
# BLOCK PROGRAM LABORATORY REPORT



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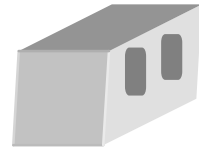
Lonestar Gray	
Untreated Control	<40mph
Custom Masonry Sealer	60mph
Siloxane WB (1:9)	58mph
Siloxane PD	58mph
Limestone	
Untreated Control	<40mph
Custom Masonry Sealer	60mph
Siloxane WB (1:9)	60mph
Siloxane PD	60mph



(E)  
Copperstone Split-Face  
CMU



# BLOCK PROGRAM LABORATORY REPORT



PROSOCO, Inc.

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## CONCLUSIONS - Protective Water Repellents:

Based upon laboratory evaluations, all of the submitted CMU exhibited above average water repellency when treated with at least one of the water repellent treatments. Sure Klean<sup>®</sup> Custom Masonry Sealer enhanced the substrate's natural appearance. The Sure Klean<sup>®</sup> Weather Seal Siloxane WB Concentrate slightly enhanced the substrate's natural appearance. The Sure Klean<sup>®</sup> Weather Seal Siloxane PD had no visual effects on the substrate.

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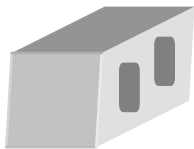
## RECOMMENDATIONS - Protective Water Repellents:

Based on evaluations, Sure Klean<sup>®</sup> Custom Masonry Sealer, Sure Klean<sup>®</sup> Weather Seal Siloxane WB Concentrate (1:9), and Sure Klean<sup>®</sup> Weather Seal Siloxane PD can be recommended for job-site testing to provide water repellency.

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  
Technical Services Analyst

JLA/csm



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**Laboratory Report**

**Block Program Evaluation**

**Featherlite  
Round Rock, TX**

**Project No. 0010-06 BP**

***Prepared For:***

**Tray Atwood  
Featherlite  
Round Rock Plant  
Round Rock, TX**

***Prepared By:***



***PROSOCO, Inc.  
November 2000***