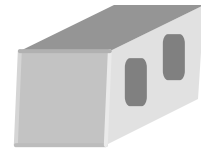




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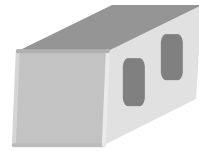
ATTACHMENTS

Product Data literature for all products evaluated

Technical Services TECH Note RILEM Test Procedures



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FOR: Bill Hickert
cc: Craig Frieze
Paul Tessier
Stephen Dean

SUBJECT: Russel Block
Russel, KS

DATE: March 11, 2003

PROJECT: 0302-08 PTP

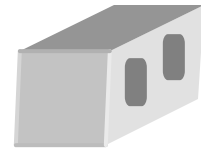
SAMPLES SUBMITTED: Two different types of block

<u>Block</u>	<u>Color</u>	<u>Size</u>
(2) Rough-face CMU's	"Quivira Buff"	16" x 8" x 8"
(2) Smooth-face CMU's	"Terra Cotta"	

Submitted by: Craig Frieze



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PURPOSE OF TESTING:

One integrally colored smooth-face concrete block and one integrally colored rough-face concrete block with small and fine aggregate were submitted for testing using PROSOCO's new construction cleaning and water repellent products.

A. Cleaning Concrete Masonry Units: Sure Klean[®] Custom Masonry Cleaner was evaluated for removal of laboratory applied mortar.

To simulate new construction soiling, all CMU's 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 Ash Grove[®] Type S mortar. The wet, mortar-filled cylinder is allowed to remain in contact with the CMU for 10 minutes before removal.

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

B. Color Uniformity Testing* - Sure Klean[®] Custom Masonry Cleaner was evaluated at various dilutions to determine the optimal concentration of cleaner that leaves the external surface looking most like the natural through-body color of the CMU. Color uniformity was evaluated by comparing aggregate exposure and surface pigment alternation/removal of each cleaned surface compared to the natural through-body color of the CMU.

Aggregate Exposure is the visual examination comparing aggregate exposure of the interior, through-body section of CMU to surfaces cleaned with selected product(s) at given dilutions.

Surface Pigment Alteration/Removal* is the visual examination comparing the pigmentation of the interior, through-body section of the CMU to surfaces cleaned with selected product(s) at given dilutions.

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

0 – Worst match to through-body	3 – Good match to through-body
1 – Poor match to through-body	4 – Best match to through-body
2 – Fair match to through-body	

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

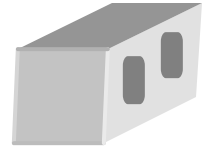
Integrally colored concrete masonry units (CMU's) frequently have high amounts of pigments concentrated on the surface of the cured concrete unit. Variation of surface pigment concentrations from one CMU to the next creates a blotchy appearance in the completed wall. Allowed to remain on the surface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

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[®] Custom Masonry Sealer was evaluated for its ability to provide water repellency to the submitted samples.



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PRODUCTS EVALUATED FOR CLEANING AND COLOR UNIFORMITY

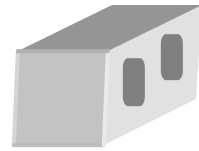
Block Type	Product	Dilution
All submitted CMU's	Sure Klean [®] Custom Masonry Cleaner	1:2, 1:4, 1:6

WATER REPELLENT PRODUCTS EVALUATED

Block Type	Product	Dilution
All submitted CMU's	Sure Klean [®] Custom Masonry Sealer	Concentrate



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SECTION A – CLEANING INTEGRALLY COLORED CMU's

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.

TEST METHOD – Cleaning

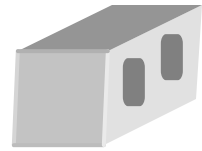
Dilution ratios refer to mixtures of parts concentrated cleaner : parts fresh water. Chemical cleaners were evaluated using the following procedure:

1. Prewet the surface with water.
2. Apply each cleaner at the appropriate dilutions.
3. Allow appropriate dwell time for each cleaner:
 Custom Masonry Cleaner 3 minutes
4. Reapply the products and moderately agitate with a brush.
5. Pressure rinse thoroughly.*
6. Allow the surface to dry for 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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TEST RESULTS - Cleaning

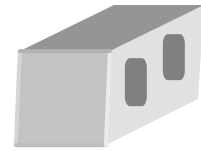
% removal

"Quivira Buff" rough-face				
Product	Dilution	3 day	7 day	14 day
Custom Masonry Cleaner	1:2	100%	100%	100%
Custom Masonry Cleaner	1:4	100%	100%	100%
Custom Masonry Cleaner	1:6	95%	100%	100%

"Terra Cotta" smooth-face				
Product	Dilution	3 day	7 day	14 day
Custom Masonry Cleaner	1:2	100%	100%	100%
Custom Masonry Cleaner	1:4	100%	100%	100%
Custom Masonry Cleaner	1:6	100%	100%	100%



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CONCLUSIONS - Cleaning

Based upon 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[®] Custom Masonry Cleaner tested affected the substrate in a similar manner, removing slight to heavy concentrations of pigmented matrix from the rough and smooth block faces, exposing small and large aggregate, and enhancing the natural appearance of the integrally colored concrete masonry unit.

RECOMMENDED PRODUCTS AND DILUTIONS - CLEANING

Recommendations for cleaning for each type of CMU submitted by Russel Block in Russel, KS are provided in the chart below. Recommendations are based on the optimum dilution for complete removal of mortar.

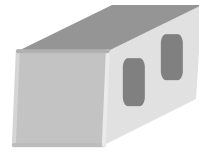
Block	Color	New Construction Cleaning (Type S mortar, 14 day)
Rough-face	"Quivira Buff"	Sure Klean [®] Custom Masonry Cleaner (1:6)
Smooth-face	"Terra Cotta"	

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. Pressure rinsing equipment providing at least 400 psi at 4-6 gpm delivered through a 15-40 degree fan spray often produces best cleaning 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 cleaning product and procedures for a particular project. See product literature for additional application and product information.



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SECTION B – COLOR UNIFORMITY:

DESCRIPTION OF PRODUCTS EVALUATED – Color Uniformity:

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.

TEST METHOD – Color Uniformity Testing:

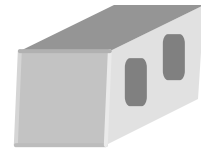
Dilution ratios refer to mixtures of concentrated cleaner : fresh water.

1. Prewet the surface with water.
2. Apply each cleaner at the appropriate dilutions.
3. Allow appropriate dwell time, as specified.
Custom Masonry Cleaner 3 minutes
4. Reapply the products and moderately agitate with a brush.
5. Pressure rinse thoroughly.*
6. Allow the sample to dry for at least 18 hours and visually examine.
7. Break the sample in half and compare the through-body surfaces to the cleaned surfaces for the best match.

* 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 – Color Uniformity

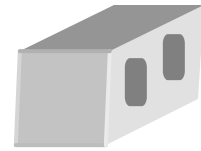
Substrate: Rough-face		Pigment Color: "Quivira Buff"	
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal
Custom Masonry Cleaner	1:2	3	3
Custom Masonry Cleaner	1:4	2	3
Custom Masonry Cleaner	1:6	2	3
Substrate: Smooth-face		Pigment Color: "Terra Cotta"	
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal
Custom Masonry Cleaner	1:2	3	2
Custom Masonry Cleaner	1:4	3	3
Custom Masonry Cleaner	1:6	2	2

Scale used for reporting results of both categories

- | | |
|--|---------------------------------------|
| 0 – Worst match to through-body | 3 – Good match to through-body |
| 1 – Poor match to through-body | 4 – Best match to through-body |
| 2 – Fair match to through-body | |



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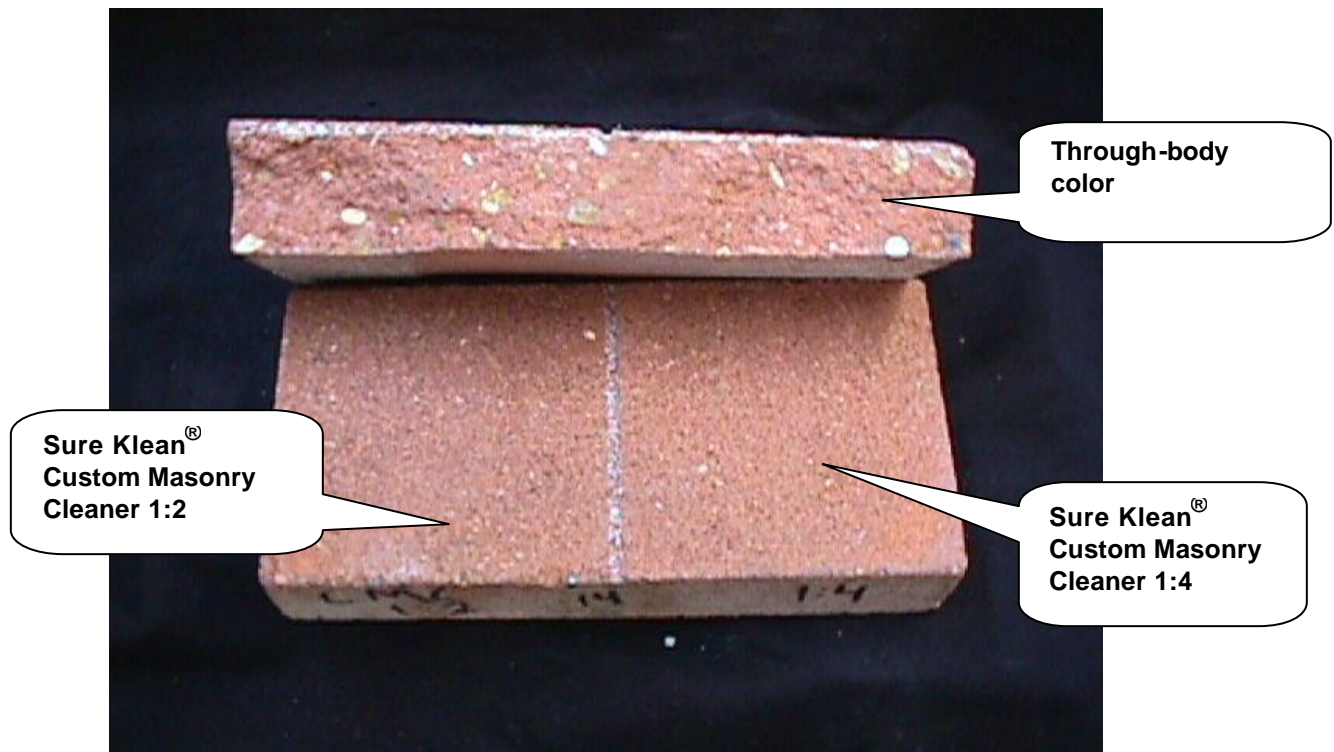


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PHOTOGRAPHS – Color Uniformity

Terra Cotta- 14 Day Cleaning

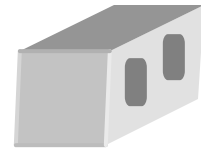


CONCLUSIONS - COLOR UNIFORMITY:

All dilutions of Sure Klean® Custom Masonry Cleaner tested affected the substrate in a similar manner. Higher concentrations of cleaner removed moderate to heavy concentrations of pigmented matrix, exposing small and large aggregate. Lower concentrations of cleaner removed slight to moderate concentrations of pigmented matrix, exposing small and large aggregate. All dilutions enhanced the natural appearance of the integrally colored CMU.



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RECOMMENDATIONS - COLOR UNIFORMITY

Recommendations for color uniformity for each type of CMU submitted by Russel Block, Russel, KS are provided in the chart below. Recommendations are based on the optimum dilution that provides the best color uniformity and the complete removal of mortar.

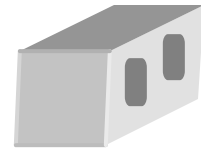
Block	Color	Color Uniformity
Rough-face	"Quivira Buff"	Sure Klean [®] Custom Masonry Cleaner (1:2)
Smooth-face	"Terra Cotta"	Sure Klean [®] Custom Masonry Cleaner (1:4)

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. Pressure rinsing equipment providing at least 400 psi at 4-6 gpm delivered through a 15-40 degree fan spray often produces best cleaning 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 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.

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 24 hours prior to testing.

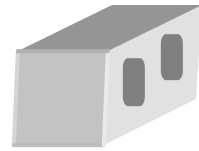
TEST METHODS - Protective Water Repellents:

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 TECH Note RILEM Tube Test Procedures.



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TEST RESULTS - Protective Water Repellents

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

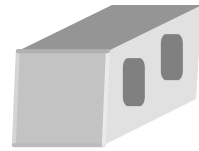
RESULTS	
"Quivira Buff" rough-face	
Untreated Control	< 40 mph
Custom Masonry Sealer	55 mph
"Terra Cotta" smooth-face	
Untreated Control	< 40 mph
Custom Masonry Sealer	60 mph

CONCLUSIONS - Protective Water Repellents

Based upon laboratory evaluations, Sure Klean[®] Custom Masonry Sealer provided effective water repellency to the submitted samples. Sure Klean[®] Custom Masonry Sealer also moderately enhanced the natural color of the CMU's.



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RECOMMENDATIONS - PROTECTIVE WATER REPELLENTS

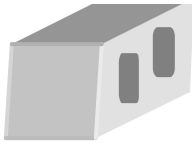
Recommendations for water repellency treatment for each type of CMU submitted by Russel Block, Russel, KS are provided in the chart below. Recommendations are based on the treatment that proved most effective and can provide water repellency on all types submitted.

Block	Water Repellents
"Quivira Buff"	Sure Klean [®] Custom Masonry Sealer
"Terra Cotta"	

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
Assistant Laboratory Technician

NRC/



Laboratory Report

Pallet Tag Program Evaluation

**Russel Block
Russel, KS**

Project No. 0302-08 PTP

Prepared For:

Bill Hickert

**Russel Block
Russel, KS**

Prepared By:



***PROSOCO, Inc.
March 2003***