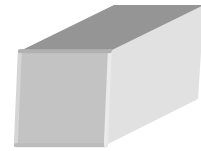




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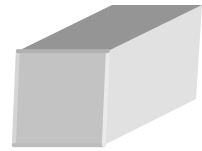
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ATTACHMENTS

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



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FOR: Shane Carrow
cc: Robert Helton
Steve Dean
Paul Tessier

SUBJECT: ProStaff Casting Inc.
Cache, OK

DATE: September 4, 2002

PROJECT: 0206-22 PTP

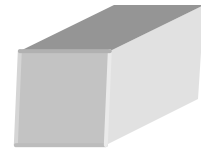
SAMPLES SUBMITTED: One color of smooth-face steel reinforced cast stone.

<u>Sample</u>	<u>Color</u>	<u>Size</u>
(5) Smooth-face steel reinforced cast stone	"Buff"	6" x 5½" x 3"

Submitted by: Shane Carrow
ProStaff Casting Inc.
RT. 1 Box 105A
Cache, OK 73527



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PURPOSE OF TESTING:

One integrally colored smooth-face steel reinforced cast stone with fine aggregate was submitted for testing using PROSOCO's new construction cleaning and water repellent products.

A. Cleaning Concrete Masonry Units: Sure Klean® Custom Masonry Cleaner and Sure Klean® Burnished Custom Masonry Cleaner were evaluated for removal of laboratory applied mortar.

To simulate new construction soiling, all units 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 unit 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 unit 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 and Sure Klean® Burnished Custom Masonry Cleaner were 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 unit. 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 unit.

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

Surface Pigment Alternation/Removal* is the visual examination comparing the pigmentation of the interior, through-body section of the unit 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 concrete masonry unit.

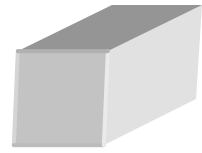
Integrally colored concrete masonry units frequently have high amounts of pigments concentrated on the surface of the cured concrete unit. Variation of surface pigment concentrations from one unit to the next creates a blotchy appearance in the completed wall. Allowed to remain on the surface of the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

In addition to removing excess mortar and construction related soiling, the goal of any cleaning operation undertaken on integrally colored unit 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 unit wall is improved.

C. Protective Water Repellents - Sure Klean® Custom Masonry Sealer, Sure Klean® Weather Seal Siloxane WB Concentrate, and Sure Klean® Weather Seal SL100 were evaluated for their ability to provide water repellency to the submitted samples.



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PRODUCTS EVALUATED FOR CLEANING AND COLOR UNIFORMITY

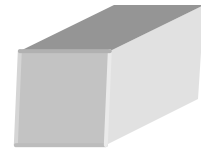
Sample	Product	Dilution
All submitted cast stone	Sure Klean [®] Custom Masonry Cleaner	1:2, 1:4, 1:6
	Sure Klean [®] Burnished Custom Masonry Cleaner	1:2, 1:3

WATER REPELLENT PRODUCTS EVALUATED

Sample	Product	Dilution
All submitted cast stone	Sure Klean [®] Custom Masonry Sealer	Concentrate
	Sure Klean [®] Weather Seal Siloxane WB Concentrate	1:9, 1:14
	Sure Klean [®] Weather Seal SL100	Concentrate



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SECTION A – CLEANING INTEGRALLY COLORED CAST STONE

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, non-etching acidic cleaner removes rust, mud, oil, atmospheric dirt, mortar smears 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:

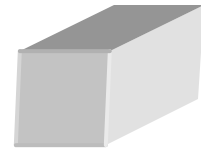
1. Prewet the surface with water.
2. Apply each cleaner at the appropriate dilutions.
3. Allow appropriate dwell time for each cleaner:

Custom Masonry Cleaner	3 minutes
Burnished Custom Masonry Cleaner	5 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

"Buff" smooth-face cast stone				
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%
Burnished Custom Masonry Cleaner	1:2	100%	100%	100%
Burnished Custom Masonry Cleaner	1:3	100%	100%	100%

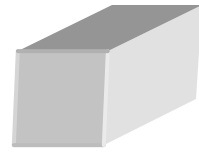
CONCLUSIONS - Cleaning

Based on the test data, all of the submitted cast stone 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 and Sure Klean[®] Burnished Custom Masonry Cleaner tested affected the substrate in a similar manner, removing slight to heavy concentrations of pigmented matrix from the smooth cast stone faces, exposing small and fine aggregate, and enhancing the natural appearance of the integrally colored cast stone.



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RECOMMENDED PRODUCTS AND DILUTIONS - CLEANING

Recommendations for cleaning for the "Buff" smooth-face cast stone submitted by ProStaff Casting Inc., Cache, OK are provided in the chart below. Recommendations are based on the optimum dilution for complete removal of mortar.

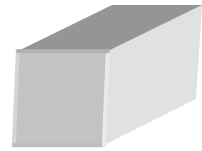
Sample	Color	New Construction Cleaning (Type S mortar, 14 day)
Smooth-face cast stone	Buff	Sure Klean [®] Custom Masonry Cleaner (1:6)
		Sure Klean [®] Burnished Custom Masonry Cleaner (1:3)

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.

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 products 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.

Sure Klean Burnished Custom Masonry Cleaner – A general purpose, non-etching acidic cleaner removes rust, mud, oil, atmospheric dirt, mortar smears 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 – Color Uniformity Testing:

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

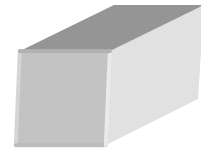
1. Prewet the surface with water.
2. Apply each cleaner at the appropriate dilutions.
3. Allow appropriate dwell time, as specified.

Custom Masonry Cleaner	3 minutes
Burnished Custom Masonry Cleaner	5 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: Smooth-face cast stone		Pigment Color: "Buff"	
Product	Dilution	Aggregate Exposure	Surface Pigment Alteration/Removal
Custom Masonry Cleaner	1:2	4	3
Custom Masonry Cleaner	1:4	4	3
Custom Masonry Cleaner	1:6	4	2
Burnished Custom Masonry Cleaner	1:2	4	4
Burnished Custom Masonry Cleaner	1:3	4	3

Scale used for reporting results of both categories

0 – **Worst** match to through-body

1 – **Poor** match to through-body

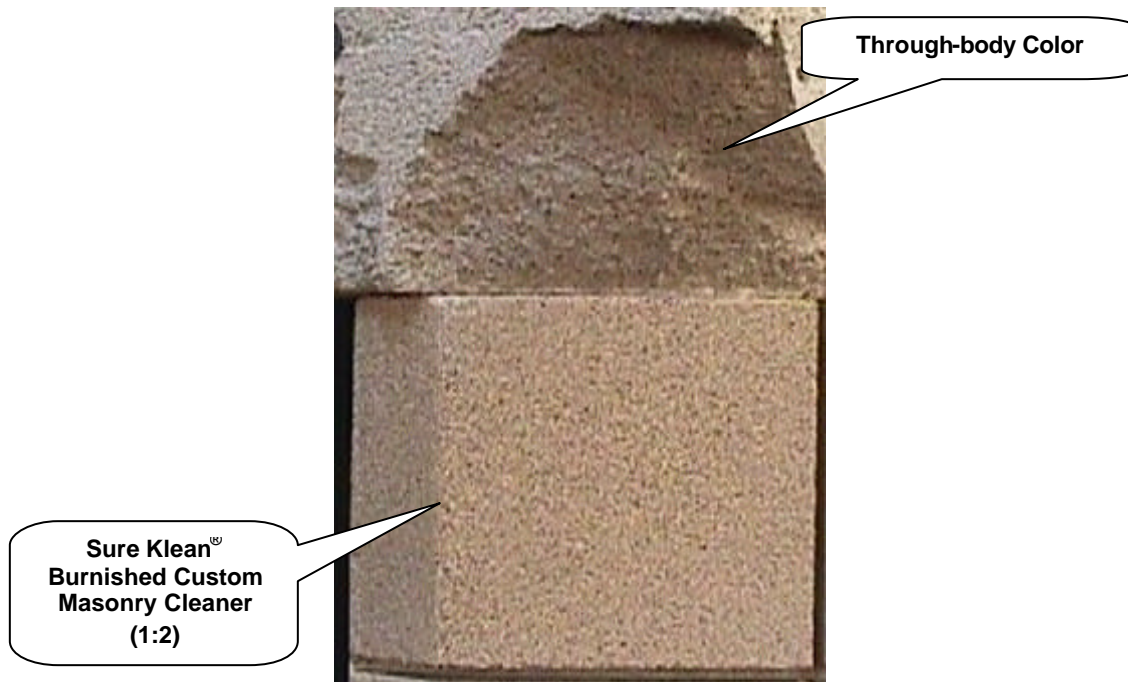
2 – **Fair** match to through-body

3 – **Good** match to through-body

4 – **Best** match to through-body

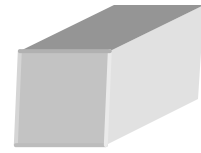
PHOTOGRAPH – Color Uniformity

"Buff" smooth-face cast stone after cleaning





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CONCLUSIONS - COLOR UNIFORMITY

All dilutions of Sure Klean[®] Custom Masonry Cleaner and Sure Klean[®] Burnished 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 aggregate. Lower concentrations of cleaner removed slight to moderate concentrations of pigmented matrix exposing small aggregate. All dilutions enhanced the natural appearance of the integrally colored cast stone.

RECOMMENDATIONS - COLOR UNIFORMITY

Recommendations for color uniformity for the "Buff" smooth-face cast stone submitted by ProStaff Casting Inc., Cache, OK are provided in the chart below. Recommendations are based on the optimum dilution that provides the best color uniformity.

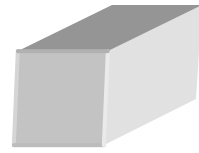
Samples	Color	Color Uniformity
Smooth-face cast stone	Buff	Sure Klean [®] Burnished Custom Masonry Cleaner (1:2)

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.

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, 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 WB Concentrate - A self-emulsifying water repellent concentrate designed for dilution with fresh water at the jobsite. This solvent-free blend of silanes and oligomeric alkoxy siloxanes mixes easily with water to produce a penetrating water repellent ideal for application to dense or porous masonry surfaces.

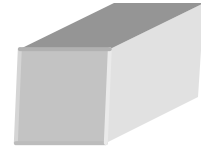
Sure Klean[®] Weather Seal SL100 Water Repellent - A modified, "neat" silane system that offers invisible protection and low volatility. Weather Seal SL100 protects concrete and masonry surfaces against water and waterborne contaminants. The product insures maximum penetration and colorless protection of dense, color-sensitive surfaces.

SAMPLE PREPARATION - Protective Water Repellents:

The submitted cast stone samples 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.



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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. See Technical Services TECH Note RILEM Tube Test Procedures.

TEST RESULTS - Protective Water Repellents:

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

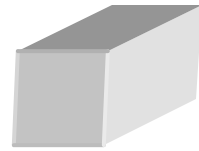
	RESULTS
"Buff" smooth-face cast stone	
Untreated Control	<40 mph
Custom Masonry Sealer	60 mph
Siloxane WB Concentrate (1:9)	60 mph
Siloxane WB Concentrate (1:14)	60 mph
SL100 Water Repellent	60 mph

CONCLUSIONS - Protective Water Repellents

Based upon laboratory evaluations, Sure Klean[®] Custom Masonry Sealer, Sure Klean[®] Weather Seal Siloxane WB Concentrate diluted with nine or fourteen parts fresh water, and Sure Klean[®] Weather Seal SL100 Water Repellent provided above average water repellency to the "Buff" smooth-face cast stone.



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RECOMMENDATIONS - PROTECTIVE WATER REPELLENTS

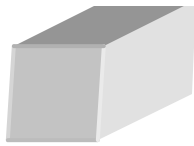
Recommendations for water repellency treatment for the "Buff" smooth-face cast stone submitted by ProStaff Casting Inc., Cache, OK are provided in the chart below. Recommendations are based on the treatment that proved most effective and can provide water repellency on all types submitted.

Sample	Water Repellents
"Buff" smooth-face cast stone	Sure Klean® Weather Seal Siloxane WB Concentrate (1:9), (1:14)
	Sure Klean® Custom Masonry Sealer
	Sure Klean® Weather Seal SL100 Water Repellent

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.

Carmen M. Niven
Project Testing Coordinator

CMN/



Laboratory Report

Pallet Tag Program Evaluation

**ProStaff Casting Inc.
Cache, OK**

Project No. 0206-22 PTP

Prepared For:

Shane Carrow

**ProStaff Casting Inc.
RT. 1 Box 105A
Cache, OK 73527**

Prepared By:



***PROSOCO, Inc.
September 2002***