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Attachments

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

Submitted Information

For: Michael Trotta
cc: John Bourne

Subject: Belden Brick Company
Canton, OH

Date: April 24, 2006

Project: 0601-11 PTP

Samples Submitted: 6 types of clay pavers

Sample	Color	Finish	Size
"4 x 8 Pawnee"	Charcoal/Tan/Red	Wire-cut	4" x 8" x 2"
"Landmark Gray Chamfer A"	Gray/Buff	Wire-cut	4" x 8" x 2 ½"
"Mod Belcrest 100 A"	Dark Pink	Sand	3 ¾" x 7 ½" x 2"
"Mod Belcrest 700 A"	Dark Red	Sand	3 ¾" x 7 ½" x 2"
"Regimental Red Chamfer A"	Red	Wire-cut	4" x 8" x 2 ½"
"Wheatfield Chamfer A"	Gray/Buff	Wire-cut	4" x 8" x 2 ½"

Submitted by: Michael Trotta

Introduction

Architectural Materials Testing (AMT) Laboratories is a Boyer Industries company that provides laboratory testing and consulting services for the construction industry. Laboratory testing includes evaluating chemical cleaning products for a variety of new and existing architectural materials.

This report includes descriptions of the PROSOCO, Inc. products and test methods that were used. Following test results and conclusions, the report provides recommendations for the most effective products and procedures.

Purpose of Testing

Six types of clay pavers were submitted to AMT Laboratories by PROSOCO, Inc. with a request to determine if application of the products evaluated will produce any surface alteration during new construction cleaning operations.

New Construction Cleaning – Sure Klean® Vana Trol® was evaluated for removal of laboratory applied Type S mortar while limiting surface alterations to the decorative finish. The surface alteration evaluation was visually determined based upon perceived discoloration or erosion/etching of the samples.

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

Heavy deposits of mortar were removed with dry scraping after 24 hours. Prepared cleaning solutions were then evaluated for their effectiveness in removing residual Type S mortar after 3, 7, and 14 days of curing.

A visual examination was also made to determine if the tested cleaners caused any surface alterations to the submitted clay pavers based on the following:

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

Substrate Deterioration is the visual examination of the sample 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 sample.

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

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

Products Evaluated

New Construction Cleaning Products Evaluated

Sample	Product	Dilution
All Submitted Clay Pavers	Sure Klean® Vana Trol®	1:6, 1:8

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

New Construction Cleaning

These cleaning trials were conducted to determine the optimal cleaning/cure time combination to most efficiently remove Type S mortar from the submitted samples while limiting surface alterations to the decorative finish.

Type S cementitious mortar was prepared in compliance with the manufacturer's instructions, applied to the clay pavers and allowed to cure for 3, 7 and 14 days. Mortar removal was accomplished using chemical assistance and a high-pressure water rinse with pressure rinsing equipment. The removal of Type S cementitious mortar was visually evaluated after 3, 7 and 14 days of curing.

Description of Products Evaluated – New Construction Cleaning

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.

Test Method – New Construction Cleaning

New construction cleaners were evaluated using the following procedure:

1. Pre-wet the surface with water.
2. Apply the cleaner.
3. Allow the appropriate dwell time, as specified:
   Sure Klean® Vana Trol® ..... 3-5 minutes
4. Pressure rinse thoroughly.*

***Pressure Rinsing Equipment –** Masonry washing equipment generating approximately 700-800 psi with a water flow rate of 8 gallons per minute delivered through a 45 degree fan spray tip was used for rinsing.

Test Results – New Construction Cleaning

Cleaning Effectiveness (% Type S Mortar Removal)

"4 x 8 Pawnee"				
Product	**Dilution**	**3 day**	**7 day**	**14 day**
Sure Klean® Vana Trol®	1:6	100%	100%	100%
Sure Klean® Vana Trol®	1:8	100%	100%	100%
"Landmark Gray Chamfer A"				
Product	**Dilution**	**3 day**	**7 day**	**14 day**
Sure Klean® Vana Trol®	1:6	100%	100%	100%
Sure Klean® Vana Trol®	1:8	100%	100%	100%
"Mod Belcrest 100 A"				
Product	**Dilution**	**3 day**	**7 day**	**14 day**
Sure Klean® Vana Trol®	1:6	100%	100%	100%
Sure Klean® Vana Trol®	1:8	100%	100%	100%
"Mod Belcrest 700A"				
Product	**Dilution**	**3 day**	**7 day**	**14 day**
Sure Klean® Vana Trol®	1:6	100%	100%	99%
Sure Klean® Vana Trol®	1:8	100%	100%	99%
"Regimental Red Chamfer A"				
Product	**Dilution**	**3 day**	**7 day**	**14 day**
Sure Klean® Vana Trol®	1:6	100%	100%	100%
Sure Klean® Vana Trol®	1:8	100%	100%	100%
"Wheatfield Chamfer A"				
Product	**Dilution**	**3 day**	**7 day**	**14 day**
Sure Klean® Vana Trol®	1:6	100%	100%	100%
Sure Klean® Vana Trol®	1:8	100%	100%	100%

Test Results – Limiting Surface Alterations

Substrate: Clay Paver		**Pigment Color:** "4 x 8 Pawnee"			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean® Vana Trol®	1:6	0	0	0	0
Sure Klean® Vana Trol®	1:8	0	0	0	0
Substrate: Clay Paver		**Pigment Color:** "Landmark Gray Chamfer A"			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean® Vana Trol®	1:6	0	0	0	0
Sure Klean® Vana Trol®	1:8	0	0	0	0
Substrate: Clay Paver		**Pigment Color:** "Mod Belcrest 100 A"			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean® Vana Trol®	1:6	0	0	0	0
Sure Klean® Vana Trol®	1:8	0	0	0	0
Substrate: Clay Paver		**Pigment Color:** "Mod Belcrest 700 A"			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean® Vana Trol®	1:6	0	0	0	0
Sure Klean® Vana Trol®	1:8	0	0	0	0
Substrate: Clay Paver		**Pigment Color:** "Regimental Red Chamfer A"			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean® Vana Trol®	1:6	0	0	0	0
Sure Klean® Vana Trol®	1:8	0	0	0	0
Substrate: Clay Paver		**Pigment Color:** "Wheatfield Chamfer A"			
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Sure Klean® Vana Trol®	1:6	0	0	0	0
Sure Klean® Vana Trol®	1:8	0	0	0	0

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

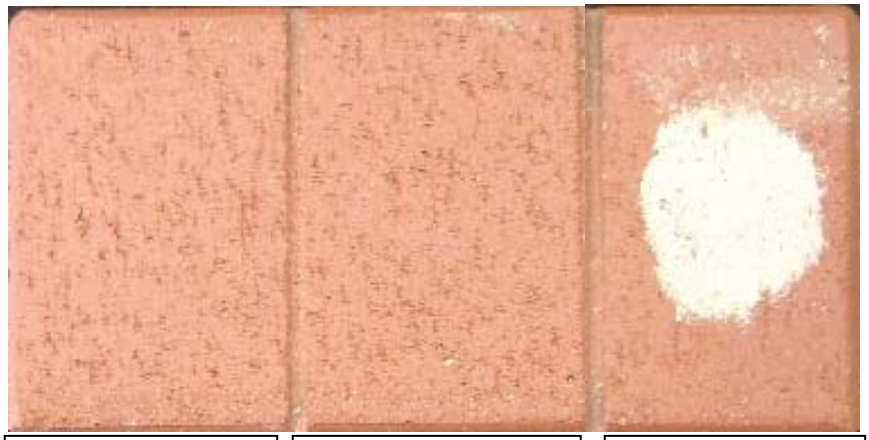
0 – No Change
1 – Slight
2 – Moderate
3 – Heavy
4 – Excessive

Photographs – New Construction Cleaning

"Regimental Red Chamfer A"; 3 Day Cleaning

Sure Klean® Vana Trol® (1:6)	Sure Klean® Vana Trol® (1:8)	Untreated Control

"Regimental Red Chamfer A"; 7 Day Cleaning



Sure Klean® Vana Trol® (1:6)	Sure Klean® Vana Trol® (1:8)	Untreated Control

"Regimental Red Chamfer A"; 14 Day Cleaning

Sure Klean® Vana Trol® (1:6)	Sure Klean® Vana Trol® (1:8)	Untreated Control

Photographs – Limiting Surface Alterations

"Regimental Red Chamfer A"; Limiting Surface Alterations

Sure Klean® Vana Trol® (1:6)	Sure Klean® Vana Trol® (1:8)	Untreated Control

Conclusions – New Construction Cleaning

Based on the test results, both dilutions of Sure Klean® Vana Trol® tested performed well in removing excess mortar from the submitted samples. The products tested performed well in removing the Type S mortar soils even after allowing the mortar to remain on the surface of the samples for 14 days under ideal curing conditions. In addition, test results indicate that the evaluated cleaners caused no noticeable surface alterations to any of the submitted clay pavers.

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 3 days of construction for Type S mortar.

Recommendations – New Construction Cleaning

Recommendations for cleaning for the clay pavers submitted by Belden Brick Company, Canton, OH are provided in the chart below. Recommendations are based on the optimum dilution for complete removal of mortar while limiting surface alterations.

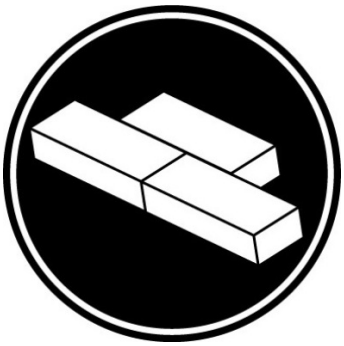
Sample	New Construction Cleaning (Type S mortar, 14 day cleaning)
All Submitted Clay Pavers	Sure Klean® Vana Trol® (1:6) OR (1:8)

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.

Christopher A. Moore
Project Testing Laboratory Technician
CAM

PALLET TAG PROGRAM
Laboratory Report

Belden Brick Company
700 W. Tuscarawas St.
Canton, OH 44701



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PROSOCO
SINCE 1939

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