



# LABORATORY REPORT

AMT Laboratories • 3741 Greenway Circle • Lawrence, Kansas 66046 • (888) 376-3600

**FOR:** Mr. Kim Stevens  
**cc:**

**SUBJECT:** One Master® Product Evaluation  
Lawrence, KS  
**DATE:** June 10, 2009  
**PROJECT:** 0904-01 RIL SR AE SLR WVT QUV SCR CLNE  
Water Repellency, Stain Resistance, Adverse Effects, Slip Resistance, Water Vapor  
Transmission, Accelerated Weathering, Scrub Resistance, and Cleaning Evaluation

**SAMPLES SUBMITTED:**

<u>Sample</u>	<u>Size</u>
Various in-house substrates	Various
“One Master Aqua Qwik Dry”	½ gallon
“One Master Aqua Qwik Dry Extreme”	
“One Master T-77 Maintainer”	

Submitted by: Mr. Kim Stevens  
One Master®  
Snyder Manufacturing Corporation  
1541 West Cowles St.  
Long Beach, CA 90813

**PURPOSE OF TEST:**

- To compare the effectiveness of the submitted treatments in providing water repellency using the RILEM II.4 method.
- To compare the surface beading characteristics and stain resistance of the submitted treatments.
- To determine if the submitted treatments cause any change in appearance to the tested substrates.
- To compare the slip resistance characteristics of the submitted treatments.
- To determine the water vapor transmission characteristics of the submitted treatments.
- To determine if exposure to artificial weathering will have any adverse effects on the submitted treatments.
- To determine if the treatments show any change in appearance or in water repellency after 300 cycles of scrubbing in a Washability and Wear Tester.
- To determine the effectiveness of the T-77 Maintainer in removing general soiling.

**PRODUCTS EVALUATED**

**Water Repellency via RILEM II.4 Method, Adverse Effects, Accelerated Weathering, Scrub Resistance**

Sample	Product	Dilution
Unpolished orange sandstone	One Master Aqua Qwik Dry	Concentrate
	One Master Aqua Qwik Dry Extreme	
Precast concrete panels	One Master Aqua Qwik Dry	Concentrate
	One Master Aqua Qwik Dry Extreme	

**Stain Resistance, Slip Resistance, Adverse Effects**

Sample	Product	Dilution
Steel troweled concrete	One Master Aqua Qwik Dry	Concentrate
	One Master Aqua Qwik Dry Extreme	

**NOTE:** One Master Aqua Qwik Dry and One Master Aqua Qwik Dry Extreme were also applied to red clay "Saltillo" tile for stain resistance and slip resistance. However, both treatments had a very uneven appearance. No testing was conducted on these samples due to the uneven appearance of the treatments.



**PRODUCTS EVALUATED (cont.)**

**Water Vapor Transmission, Adverse Effects**

Sample	Product	Dilution
Unpolished brown sandstone	One Master Aqua Qwik Dry	Concentrate
	One Master Aqua Qwik Dry Extreme	
Mortar cubes	One Master Aqua Qwik Dry	
	One Master Aqua Qwik Dry Extreme	

**Cleaning**

Sample	Product	Dilution
White concrete brick	One Master T-77 Maintainer	Concentrate, 1:17

**PRODUCT DATA (Provided by One Master Products):**

**Aqua Qwik Dry and Aqua Qwik Dry Extreme**

Penetrating, environmentally friendly, advanced fluoropolymer formulas that provide protection from water and oil based stains. Strengthens slip resistance on wet and dry surfaces while allowing the surfaces to breathe. Can be used on: marble, granite, concrete, glass, fiberglass, natural stone, limestone, brick, terra cotta, grout, etc. Non-yellowing, UV resistant. Cure time = 72 hours. WILL NOT prevent etching from acidic or caustic materials. VOC compliant in South Coast Air Quality Management District, Northeast Ozone Transport Commission, etc.

NOTE: Aqua Qwik Dry Extreme is reported to be noticeably thicker in viscosity than Aqua Qwik Dry.

**T-77 Maintainer**

To be used to maintain all surfaces treated with Aqua Qwik Dry & Aqua Qwik Dry Extreme. A concentrated formula that is VOC compliant in California IF diluted with seventeen parts water. Allows surfaces to resist dust, water, oil, soap scum, and staining materials. Surface stays cleaner longer. Can be used on any hard surfaces sealed with Aqua Qwik Dry or Aqua Qwik Dry Extreme. A soapless maintenance product not to be substituted for a degreaser. Maintains and regrooms the sealed surface with the same component structure and benefits without leaving any detergent residue.



**QUALITY CONTROL TEST DATA OF ONE MASTER PRODUCTS: Determined by PROSOCO, Inc.  
QC and R&D Teams**

<b>SAMPLE</b>	<b>Weight Per Gallon</b>	<b>Percent Solids</b>	<b>pH</b>
One Master T-77 Maintainer (concentrate)	8.05	0.77	8.34
One Master T-77 Maintainer (1:17)	8.33	0.00	7.67
One Master Aqua Qwik Dry	8.37	1.86	8.47
One Master Aqua Qwik Dry Extreme	8.43	3.62	8.63

<b>SAMPLE</b>	<b>Rate of Evaporation (5 mil draw down on glass)</b>	<b>Draw Down</b>	<b>Flash Point</b>
One Master Aqua Qwik Dry	1 hour 15 minutes	Does not form a good film on either coated or uncoated draw down cards	>212° F
One Master Aqua Qwik Dry Extreme	1 hour		130° F

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## SAMPLE PREPARATION:

All treatments were applied by brush in accordance with the Product Data Sheet instructions. The treatments were allowed to cure for at least 72 hours prior to testing.

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## TEST METHODS: 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 5.0 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.

**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 5.0 ml of water or more, then:

A rating of **AA** *Above Average* water repellent performance would be reported for treatments which result in a loss of no more than:

$$5.0 \text{ mL} \times 20\% = \mathbf{1.0 \text{ mL}}$$

A rating of **A** *Average* water repellent performance would be reported for treatments which result in a loss of no more than:

$$5.0 \text{ mL} \times 50\% = \mathbf{2.5 \text{ mL}}$$

A rating of **BA** *Below Average* water repellent performance would be reported for treatments which result in a loss of more than:

$$5.0 \text{ mL} \times 50\% = \mathbf{2.5 \text{ mL}}$$



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**TEST RESULTS - Water Absorption Tube Test: RILEM II.4, 5.0 milliliters, 20 minutes**

**AA = Above Average**

**A = Average**

**BA = Below Average**

**Unpolished Orange Sandstone**

<b>Treatment</b>	<b>Results in mL loss</b>	<b>Ranking</b>
Untreated Control	-5.0	--
One Master Aqua Qwik Dry	-0.5	<b><u>AA</u></b>
One Master Aqua Qwik Dry Extreme	-0.5	<b><u>AA</u></b>

**Precast Concrete Panels**

<b>Treatment</b>	<b>Results in mL loss</b>	<b>Ranking</b>
Untreated Control	-0.2	--
One Master Aqua Qwik Dry	-0.1	<b><u>A</u></b>
One Master Aqua Qwik Dry Extreme	-0.1	<b><u>A</u></b>

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**CONCLUSIONS - Water Absorption Tube Test: RILEM II.4**

Both treatments evaluated on the sandstone achieved an above average ranking. The treatments achieved an average ranking on the precast panels.

Neither treatment caused any change in appearance to the sandstone or precast concrete panels.





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**TEST METHODS: Continued**

**Stain Resistance**

The soiling agents were allowed to dwell on the treated and untreated substrate for times of 24 hours, 4 hours, 1 hour, and 10 minutes. The test areas were then cleaned with Enviro Klean® 2010 All Surface Cleaner diluted with ten parts water and scrubbed under a stream of running water from a faucet. The sample was allowed to dry for 24 hours. Evaluation consisted of a visual examination of the tested areas to determine the percentage of staining removal.

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**TEST RESULTS: Surface Beading Evaluation**

<b>Steel Troweled Concrete</b>			
	<b>Untreated Control</b>	<b>Aqua Qwik Dry</b>	<b>Aqua Qwik Dry Extreme</b>
<b>Coca Cola</b>	4	3	3
<b>Ketchup</b>	N/A	N/A	N/A
<b>Mustard</b>	N/A	N/A	N/A
<b>Red Wine</b>	4	3	3
<b>Balsamic Vinegar</b>	4	3	3
<b>Soy Sauce</b>	4	3	3
<b>Olive Oil</b>	5	4	3
<b>Wesson Oil</b>	5	4	3
<b>Hot Coffee</b>	4	3	3

N/A – non-free flowing staining agent





**TEST RESULTS: Stain Resistance Evaluation**

**Cleaned with:** Enviro Klean® 2010 All Surface Cleaner (1:10)

**Steel Troweled Concrete**

% Removal

<b>Untreated Control</b>									
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	Cola	Ketch.	Must.	Red Wine	Bals. Vin.	Soy S.	Olive O.	Wess. Oil	Coffee
<b>24 hr</b>	90%	90%*	20%*	80%	90%*	60%	<1%	<1%	60%
<b>4 hour</b>	90%	90%*	90%*	50%	60%*	90%	<1%	<1%	80%
<b>1 hour</b>	95%	95%*	90%*	60%	60%*	90%	<1%	<1%	80%
<b>10 min.</b>	100%	100%	100%	100%	75%*	90%	<1%	<1%	80%

<b>One Master Aqua Qwik Dry</b>									
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	Cola	Ketch.	Must.	Red Wine	Bals. Vin.	Soy S.	Olive O.	Wess. Oil	Coffee
<b>24 hr</b>	80%	80%*	60%*	40%	80%*	40%	30%	30%	80%
<b>4 hour</b>	90%	100%*	90%*	50%	80%*	90%	30%	30%	80%
<b>1 hour</b>	100%	100%*	100%*	60%	80%*	100%	30%	30%	95%
<b>10 min.</b>	100%	100%	100%*	90%	90%*	100%	40%	40%	100%

<b>One Master Aqua Qwik Dry Extreme</b>									
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	Cola	Ketch.	Must.	Red Wine	Bals. Vin.	Soy S.	Olive O.	Wess. Oil	Coffee
<b>24 hr</b>	100%	100%	100%*	100%	90%*	80%	90%	90%	80%
<b>4 hour</b>	100%	100%	100%	100%	90%*	90%	90%	90%	80%
<b>1 hour</b>	100%	100%	100%	100%	90%*	100%	100%	100%	100%
<b>10 min.</b>	100%	100%	100%	100%	90%*	100%	100%	100%	100%

% Removal of stain following maintenance cleaning.

\* Indicates etching of surface treatment due to the acidic nature of the staining agent.

## **CONCLUSIONS – Stain Resistance**

In stain resistance tests conducted, both of the treatments evaluated improved the surface beading of the steel troweled concrete.

Aqua Qwik Dry Extreme was very effective at repelling the applied stains from the concrete, especially the oils.

Aqua Qwik Dry improved the stain resistance of the concrete against SOME stains, but did not improve the stain resistance against other stains. For instance, Aqua Qwik Dry improved the stain resistance against mustard but had worse stain resistance than the untreated control against red wine and soy sauce.

Neither treatment caused any change in appearance to the concrete.

See photographs on following page.

**PHOTOGRAPHS: Stain Resistance Evaluation**

**Steel Troweled Concrete With Stains Applied**



**Untreated Control**

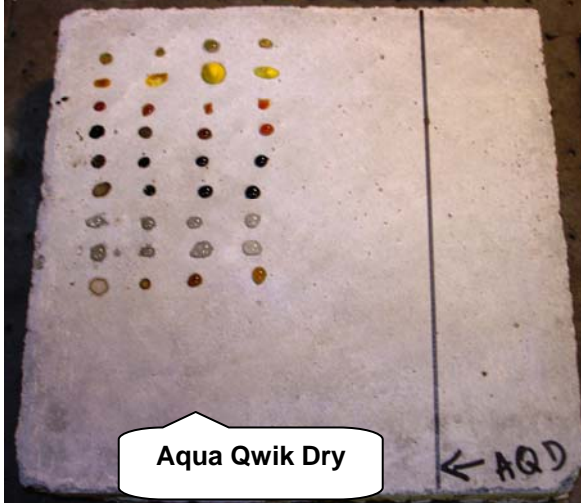
**Steel Troweled Concrete After Stain Testing**



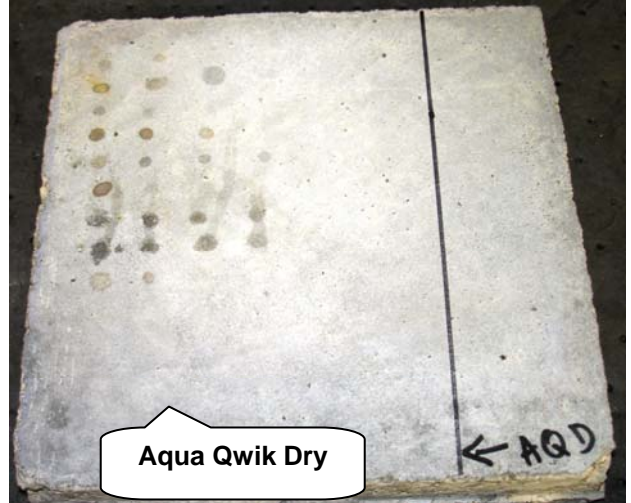
**Untreated Control**

**PHOTOGRAPHS: Stain Resistance Evaluation**

**Steel Troweled Concrete With Stains Applied**



**Steel Troweled Concrete After Stain Testing**



**Steel Troweled Concrete With Stains Applied**



**Steel Troweled Concrete After Stain Testing**



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## TEST METHODS: ASTM C 1028 Slip Resistance Evaluation

The samples were tested for wet and dry static coefficient of friction using procedures and materials in accordance with ASTM C 1028.

### Calibration

A 50-lb weight with a neolite heel attached on the bottom of the assembly was placed on the standard tile. Using a dynamometer the force required to set the heel assembly into motion was recorded.

A total of four pulls were made with each pull being perpendicular to the previous pull. The following equation was used to determine the calibration factors. The calibration procedure was repeated for both a dry and wet surface.

$$X_D = 0.71 - \frac{R}{NW}$$

$$X_W = 0.47 - \frac{R}{NW}$$

- $X_D$  = Dry Calibration Factor  
 $X_W$  = Wet Calibration Factor  
 $R$  = Sum of the recorded pulls  
 $N$  = Number of pulls  
 $W$  = Weight of the neolite heel assembly

### Testing – Dry and Wet

A 50-lb weight assembly with a neolite heel attached on the bottom of the assembly was placed on top of the tile to be tested. Using a dynamometer the force required to set the test assembly in motion was measured.

Four pulls, each perpendicular to the previous pull, on three different surfaces was measured to give a total of four measurements. The following equations were used to determine the static coefficient of friction. The tests were run on both a wet and dry surface.

$$F_D = \frac{R}{NW} + X_D$$

$$F_W = \frac{R}{NW} + X_W$$

- $F_D$  = Static Coefficient of Friction for Dry Surface  
 $F_W$  = Static Coefficient of Friction for Wet Surface  
 $R$  = Sum of the 4 force readings  
 $N$  = Number of Pulls (4)  
 $W$  = Total Weight of the Neolite Heel Assembly

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**TEST RESULTS: Slip Resistance**

Sample	DRY SCOF	WET SCOF
Untreated Concrete	0.7780	0.6120
One Master Aqua Qwik Dry	0.7585	0.6642
One Master Aqua Qwik Dry Extreme	0.7197	0.6787

ADA regulations have suggested that horizontal surfaces have a static coefficient of friction (SCOF) of 0.6 or greater and a ramped surface have a static coefficient of friction of 0.8 or greater. It should be noted that the larger the SCOF the more resistant the surface is to slipping.

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**CONCLUSIONS: Slip Resistance**

Based on the laboratory test results, both of the treatments evaluated achieved a static coefficient of friction of at least 0.6. Aqua Qwik Dry Extreme had the lowest SCOF on a dry surface, and Aqua Qwik Dry had the lowest SCOF on a wet surface. However, both treatments had fairly similar SCOF results.

Neither treatment caused any change in appearance to the concrete.

**TEST METHODS: Water Vapor Transmission (ASTM E 96 – Water Method - Modified)**

The treated and untreated samples were placed on laboratory test cells partially filled with distilled water. The sides of the samples were sealed to the top rim of the test cell so that no water vapor could escape. Cells were then weighed and placed in a room maintained at approximately 73°F (23°C) and 30% relative humidity.

The total weight loss of the individual cells was calculated after the second day and daily thereafter for a total of ten days. Weight loss was calculated as a factor of g/m<sup>2</sup> per 24 hours.

**CALCULATION:**

$$WVT = g/m^2/24 \text{ hours}$$

**TEST RESULTS: Water Vapor Transmission (ASTM E 96 - Modified)**

**Unpolished Brown Sandstone**

Sample	Water Vapor Transmission Rate	% Retention
Untreated	374.03 g/m <sup>2</sup> /24 hours	---
One Master Aqua Qwik Dry	320.22 g/m <sup>2</sup> /24 hours	86%
One Master Aqua Qwik Dry Extreme	301.79 g/m <sup>2</sup> /24 hours	81%

**Mortar Cubes**

Sample	Water Vapor Transmission Rate	% Retention
Untreated	81.67 g/m <sup>2</sup> /24 hours	---
One Master Aqua Qwik Dry	79.35 g/m <sup>2</sup> /24 hours	97%
One Master Aqua Qwik Dry Extreme	60.79 g/m <sup>2</sup> /24 hours	74%

**CONCLUSIONS:**

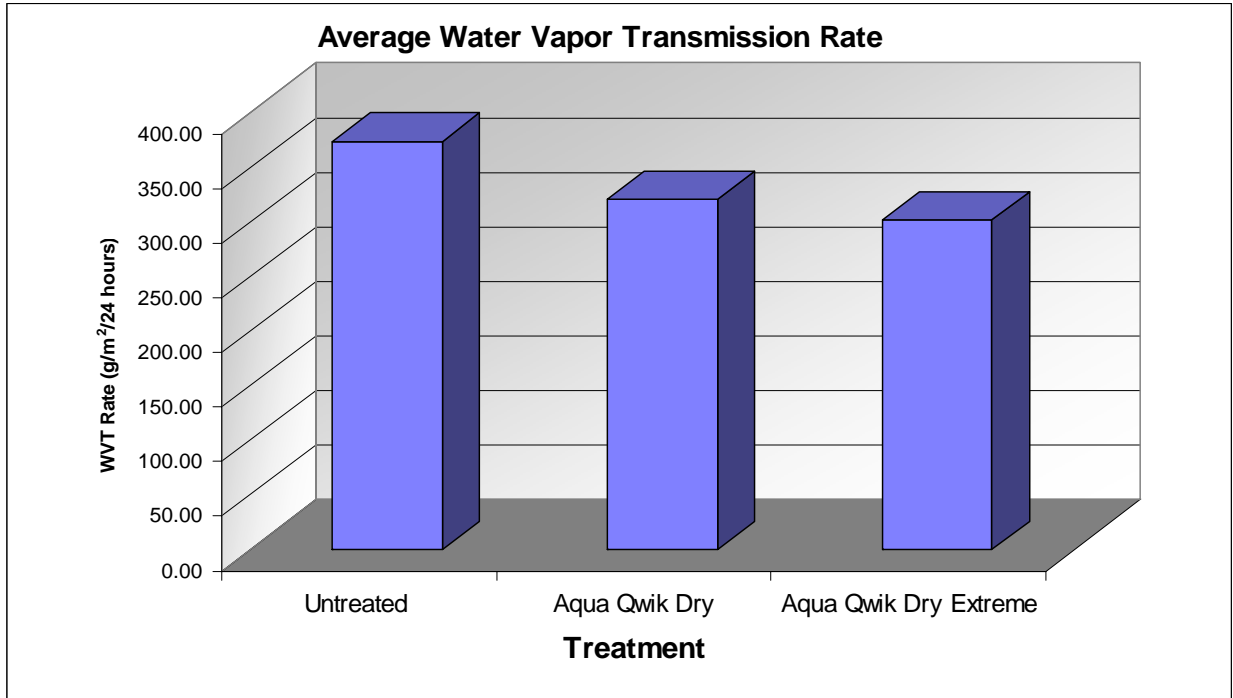
The test results on the sandstone show that Aqua Qwik Dry Extreme and Aqua Qwik Dry had similar water vapor transmission rates, with a percent retention between 81% and 86%.

Test results on the mortar cubes show that Aqua Qwik Dry had significantly better water vapor transmission than Aqua Qwik Dry Extreme. Aqua Qwik Dry had a percent retention of 97% whereas Aqua Qwik Dry Extreme had a percent retention of 74%.

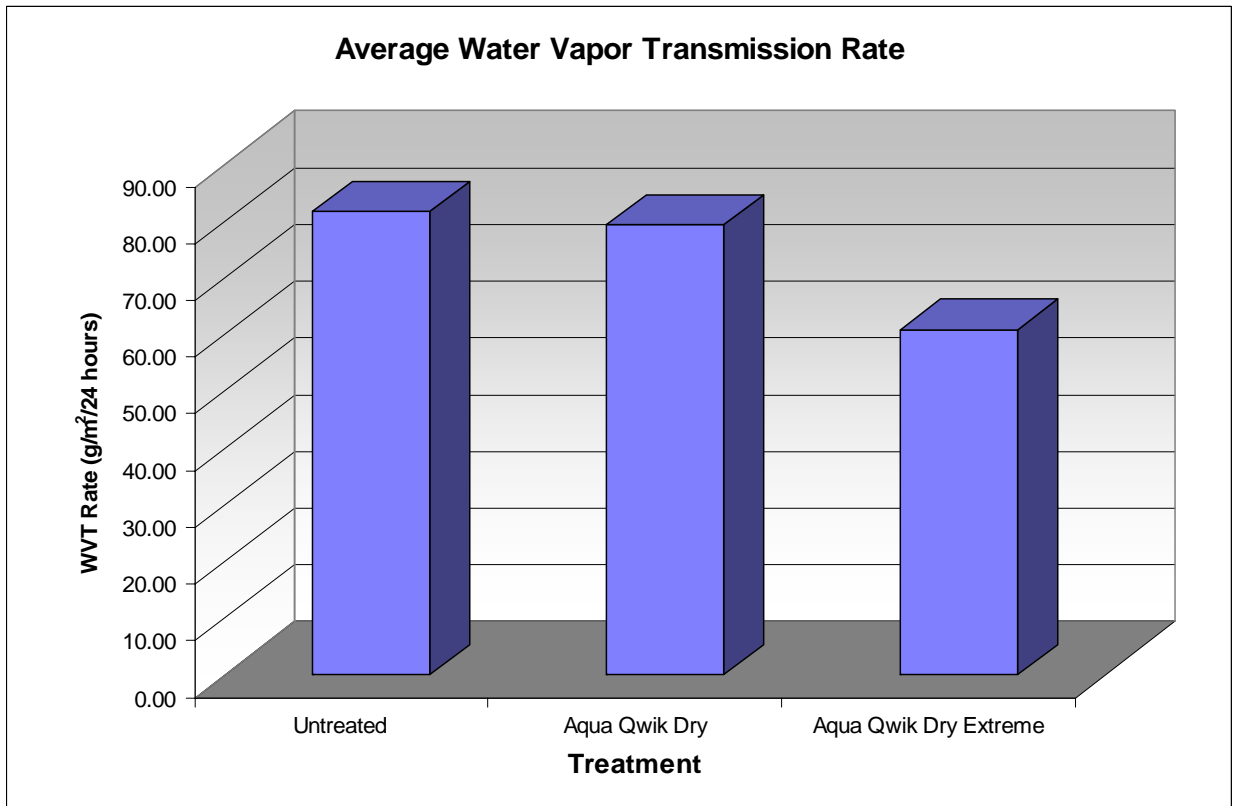
Neither treatment caused any change in appearance to the sandstone or mortar cubes.

**GRAPHS:**

**Sandstone**



**Mortar Cubes**





**TEST METHODS: Artificial Weathering ASTM G 154**

Unpolished sandstone panels and precast concrete panels were treated and allowed to cure. RILEM tube testing was performed on the panels. The panels were then exposed to alternate cycles of ultraviolet light using fluorescent lamps UVA-340 and 60°C temperatures and cooler, moist, dark conditions at 20-30°C. Temperature, humidity, and UV cycling are intended to replicate external weathering conditions, but are accelerated.

After 500 hours, the samples were then taken out of the QUV Tester and visually evaluated. RILEM tube testing was performed on the weathered panels to determine if any change in water repellency had occurred.

**TEST RESULTS: Artificial Weathering ASTM G 154 - Color Change**

There was no visible color change on any of the sandstone or precast panels after 500 hours of artificial weathering.

**TEST RESULTS - Artificial Weathering ASTM G 154 - Water Absorption Tube Test: RILEM II.4, 5.0 milliliters, 20 minutes**

AA = Above Average

A = Average

BA = Below Average

**Unpolished Orange Sandstone**

Treatment	Results in mL loss BEFORE QUV	Ranking	Results in mL loss AFTER QUV	Ranking
Untreated Control	-5.0	--	-5.0	--
One Master Aqua Qwik Dry	-0.5	<u>AA</u>	-0.1	<u>AA</u>
One Master Aqua Qwik Dry Extreme	-0.5	<u>AA</u>	-0.1	<u>AA</u>

**Precast Concrete Panels**

Treatment	Results in mL loss BEFORE QUV	Ranking	Results in mL loss AFTER QUV	Ranking
Untreated Control	-0.2	--	-0.6	--
One Master Aqua Qwik Dry	-0.1	<u>A</u>	-0.1	<u>AA</u>
One Master Aqua Qwik Dry Extreme	-0.1	<u>A</u>	-0.1	<u>AA</u>

**CONCLUSIONS: Artificial Weathering ASTM G 154**

There was no visible change in appearance to any of the tested samples after artificial weathering. Aqua Qwik Dry and Aqua Qwik Dry Extreme had slightly better RILEM results on the sandstone after weathering.

**TEST METHOD: Scrub Resistance (ASTM D 2486 – Modified)**

The sandstone and precast panels that were used for artificial weathering were then used for the scrub resistance test. The treated panels were placed into a GARDCO® Washability and Wear Tester, Model D10V using a bristle brush. The treated panels were scrubbed for 300 cycles. The panels were then visually evaluated and were tested with a RILEM tube to determine if there had been any change in water repellency after scrubbing.

**TEST RESULTS and CONCLUSIONS: Scrub Resistance (ASTM D 2486 – Modified)**

There was no visible change to any of the samples after 300 cycles in the testing machine. There was also no change in water repellency on any of the samples after 300 cycles in the machine.

**RILEM II.4, 5.0 milliliters, 20 minutes**

**AA = Above Average**

**A = Average**

**BA = Below Average**

**Unpolished Orange Sandstone**

Treatment	Results in mL loss BEFORE Scrubbing	Results in mL loss AFTER Scrubbing
One Master Aqua Qwik Dry	-0.1	-0.1
One Master Aqua Qwik Dry Extreme	-0.1	-0.1

**Precast Concrete Panels**

Treatment	Results in mL loss BEFORE Scrubbing	Results in mL loss AFTER Scrubbing
One Master Aqua Qwik Dry	-0.1	-0.1
One Master Aqua Qwik Dry Extreme	-0.1	-0.1



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**TEST METHODS: Cleaning**

Soil was mixed with water into a muddy paste and troweled across a white concrete brick. The soiling was allowed to dry overnight. The cleaner was then evaluated on the soiled concrete brick using a soft bristled masonry brush and garden hose strength water pressure.

**Procedure:**

1. To a pre-wetted surface, apply product.
2. Allow appropriate dwell time:  
T-77 Maintainer ..... 3 minutes
3. Throughout the dwell time, agitate with a masonry brush.
4. Rinse thoroughly with fresh water.\*
5. After 24 hours, visually examine the sample for percent effectiveness.

\*Rinsing – Garden hose strength water pressure was used for rinsing.

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**TEST RESULTS: Cleaning**

White Concrete Brick		
Treatment	Dilution	% Effectiveness
One Master T-77 Maintainer	Concentrate	100%
One Master T-77 Maintainer	1:17	100%

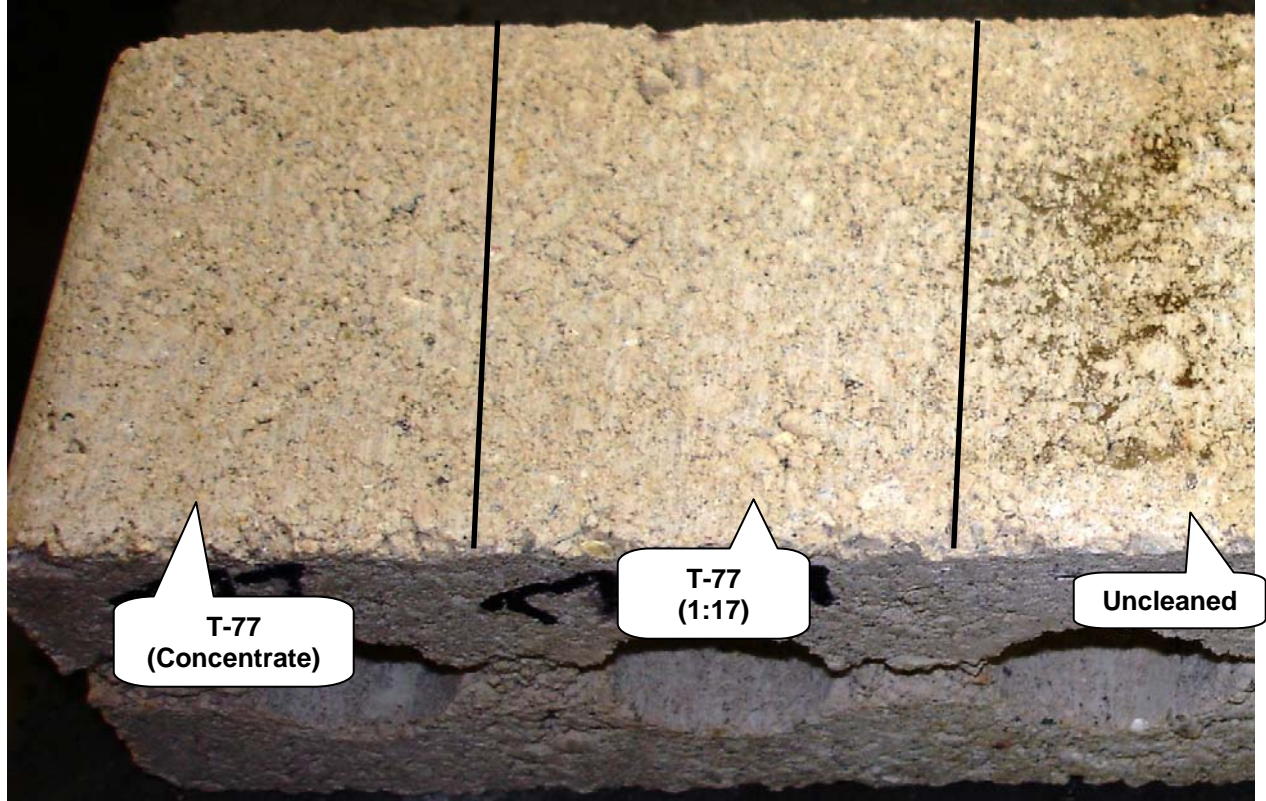
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**CONCLUSIONS: Cleaning**

Based on the test results, T-77 Maintainer in concentrate and diluted with seventeen parts water removed 100% of the soiling from the concrete brick. See photograph on following page.

PHOTOGRAPH: Cleaning

White Concrete Brick After Cleaning



Courtney A. Murdock, CDT  
Project Testing Director

CAM/

**ALL SAMPLES SUPPLIED FOR THE ABOVE EVALUATION WILL BE DISPOSED OF NINETY (90) DAYS AFTER THE ISSUE DATE OF THIS REPORT. IF SAMPLES ARE TO BE RETAINED FOR ADDITIONAL TESTING OR RETURNED TO THE SENDER, PROVIDE WRITTEN INSTRUCTIONS TO THE LABORATORY WITHIN NINETY (90) DAYS OF THE ISSUE DATE OF THIS REPORT.**

Recommendations made within this report are based on laboratory test applications and observations. Final determination of the suitability of a product and/or procedure should be made only after thorough job testing on actual surfaces.