



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

Pallet Tag Program Laboratory Report

Rivard Stone

Houlton, WI



Project No. 2104-03 PTP

Prepared For:



Prepared By:

J. Lucas Comadoll

J. Lucas Comadoll
Project Testing Technician
AMT Laboratories

June 2021



Laboratory Report

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

FOR: Bob Buttermore, Rivard Stone
cc: Kevin Gwinn, Tri-G Products, Inc.
Ken Rathbun, PROSOCO, Inc.
Jake Boyer, PROSOCO, Inc.
Al Morris, PROSOCO, Inc.

SUBJECT: Rivard Stone
Houlton, WI
Pallet Tag Evaluation

DATE: June 22, 2021
PROJECT: 2104-03 PTP

SAMPLES SUBMITTED: Four types of natural stone

Type	Name	Color	Size
Limestone	"St. Croix Valley – Cream"	Buff	(8) 8" x 8" x 1/2"
Limestone	"St. Croix Valley – Buff"	Buff	(8) 8" x 8" x 1/2"
Limestone	"St. Croix Valley – Stillwater Blend"	Buff	(8) Various Sizes
Basalt	"Iron Mountain"	Gray	(6) Various Sizes

SUBMITTED BY: Bob Buttermore
Rivard Stone
318 HWY 35/64
Houlton, WI 54082

PURPOSE OF TEST:

- To determine the most appropriate PROSOCO, Inc. new construction cleaner(s) for the submitted samples.
- To determine the suitability of Enviro Klean® Klean 'N Release Cleaner as a maintenance cleaner for the submitted samples.
- To determine if PROSOCO® T2683 Efflorescence Remover causes any adverse effects to the submitted samples.
- To evaluate the color and sheen enhancement characteristics of specific PROSOCO, Inc. products on the submitted samples.
- To determine the most appropriate PROSOCO, Inc. water repellent for the submitted samples.
- To determine the effectiveness of appropriate PROSOCO, Inc. products in preventing food and oil staining on the submitted samples (where applicable).

PRODUCTS EVALUATED:

New Construction Cleaning	Dilution:
Sure Klean® Vana Trol®	1:6; 1:8
Sure Klean® Light Duty Concrete Cleaner	1:2, 1:3
Enviro Klean® Safety Klean	1:2, 1:3

Maintenance Cleaning	Dilution:
Enviro Klean® Klean 'N Release Cleaner	1:10

Adverse Effects	Dilution:
PROSOCO® T2683 Efflorescence Remover	None

Color and Sheen Enhancement/Water Repellency (Where Applicable)	Dilution:
Sure Klean® Weather Seal Limestone & Marble Protector	N/A*
PROSOCO® SLX100® Water & Oil Repellent	N/A*
Sure Klean® Weather Seal Stone Tile & Masonry Protector (STMP)	N/A*
Sure Klean® Weather Seal Natural Stone Treatment	N/A*
Sure Klean® Weather Seal Natural Stone Treatment WB Plus	N/A*
Sure Klean® Weather Seal Paver Enhancer	N/A*

Stain Resistance (Where Applicable)	Dilution:
Sure Klean® Weather Seal Limestone & Marble Protector	N/A*
Sure Klean® Weather Seal Stone Tile & Masonry Protector (STMP)	N/A*

***NOTE: Per the product data sheet instructions, only use the product in concentrate. Do not dilute.**

TEST METHODS: New Construction Cleaning

Sure Klean® Vana Trol®, Enviro Klean® Safety Klean, and Sure Klean® Light Duty Concrete Cleaner were evaluated to determine the optimal concentration of cleaner which leaves the external surface looking most like the uncleaned surface of the natural stone.

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

Substrate Deterioration is the visual examination of the sample comparing the uncleaned surface 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 uncleaned surface to the 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.

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

- 0 – **No change** compared to uncleaned surface
- 1 – **Slight change** compared to uncleaned surface
- 2 – **Moderate change** compared to uncleaned surface
- 3 – **Significant change** compared to uncleaned surface

Cleaning Procedure:

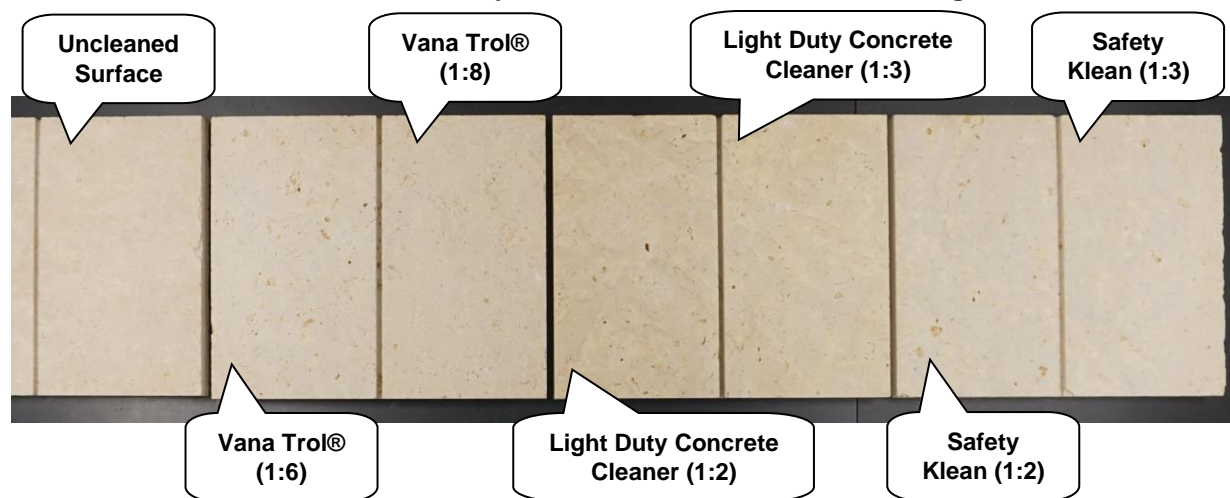
1. Pre-wet the surface and apply diluted cleaning solution according to PROSOCO, Inc. Product Data Sheet.
2. Allow for an appropriate dwell time and periodically agitate:
 - Vana Trol®.....5 minutes
 - Safety Klean.....5 minutes
 - Lighty Duty Concrete Cleaner.....5 minutes
3. Reapply cleaning solution; do not let cleaner dry into natural stone.
4. Rinse thoroughly with plenty of fresh water.*
5. Allow the sample to dry for at least 18 hours and visually examine.
6. Compare the uncleaned surfaces to the cleaned surfaces for the best match.

***Rinsing Equipment** – Masonry washing equipment generating approximately 700-800 psi with a water flow rate of 8 gallons per minute delivered through a 40 degree fan spray tip was used for rinsing.

TEST RESULTS AND PHOTOGRAPHS: New Construction Cleaning

Name: "St. Croix Valley – Cream" Limestone					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:6	0	0	0	0
Vana Trol®	1:8	0	0	0	0
Light Duty Concrete Cleaner	1:2	1	0	1	0
Light Duty Concrete Cleaner	1:3	1	0	1	0
Safety Klean	1:2	0	0	0	0
Safety Klean	1:3	0	0	0	0

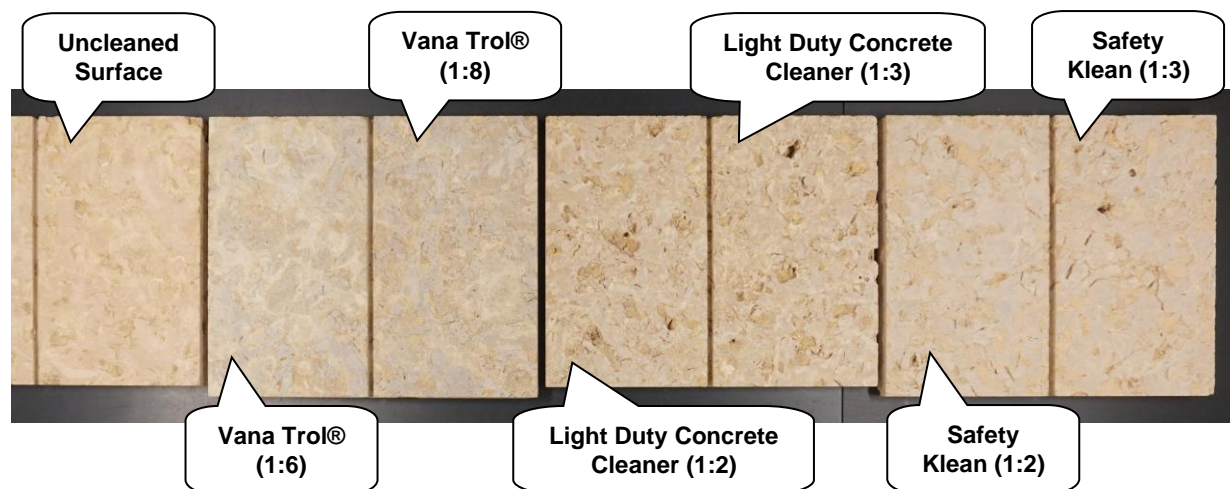
"St. Croix Valley – Cream" Limestone After Cleaning



TEST RESULTS AND PHOTOGRAPHS: New Construction Cleaning (cont.)

Name: "St. Croix Valley – Buff" Limestone					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:6	0	0	0	0
Vana Trol®	1:8	0	0	0	0
Light Duty Concrete Cleaner	1:2	1	1	0	0
Light Duty Concrete Cleaner	1:3	1	1	0	0
Safety Klean	1:2	1	1	0	0
Safety Klean	1:3	1	1	0	0

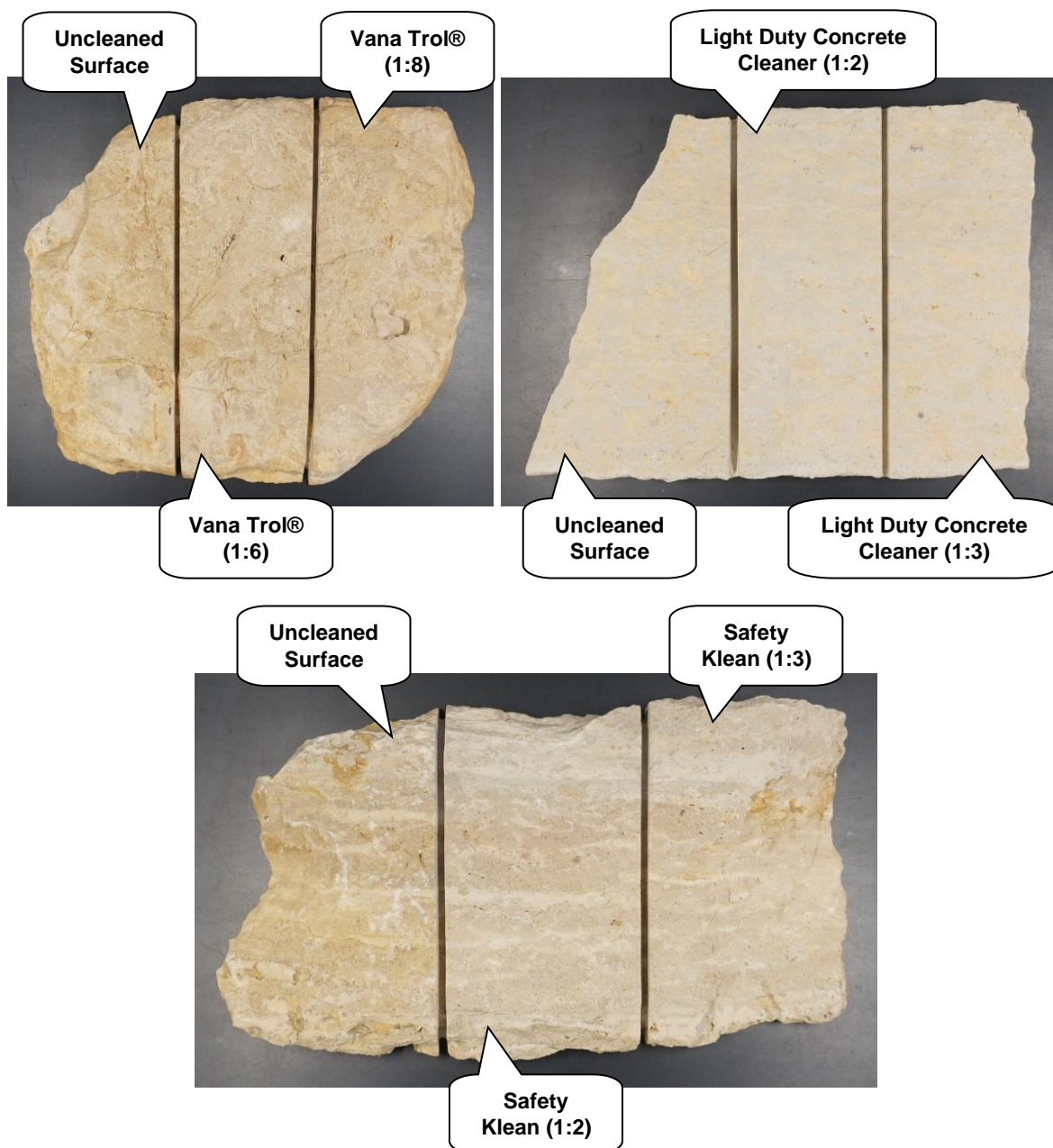
"St. Croix Valley – Buff" Limestone After Cleaning



TEST RESULTS AND PHOTOGRAPHS: New Construction Cleaning (cont.)

Name: "St. Croix Valley – Stillwater Blend" Limestone					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:6	1	1	1	0
Vana Trol®	1:8	1	1	1	0
Light Duty Concrete Cleaner	1:2	1	1	1	0
Light Duty Concrete Cleaner	1:3	1	1	1	0
Safety Klean	1:2	1	1	1	0
Safety Klean	1:3	1	1	1	0

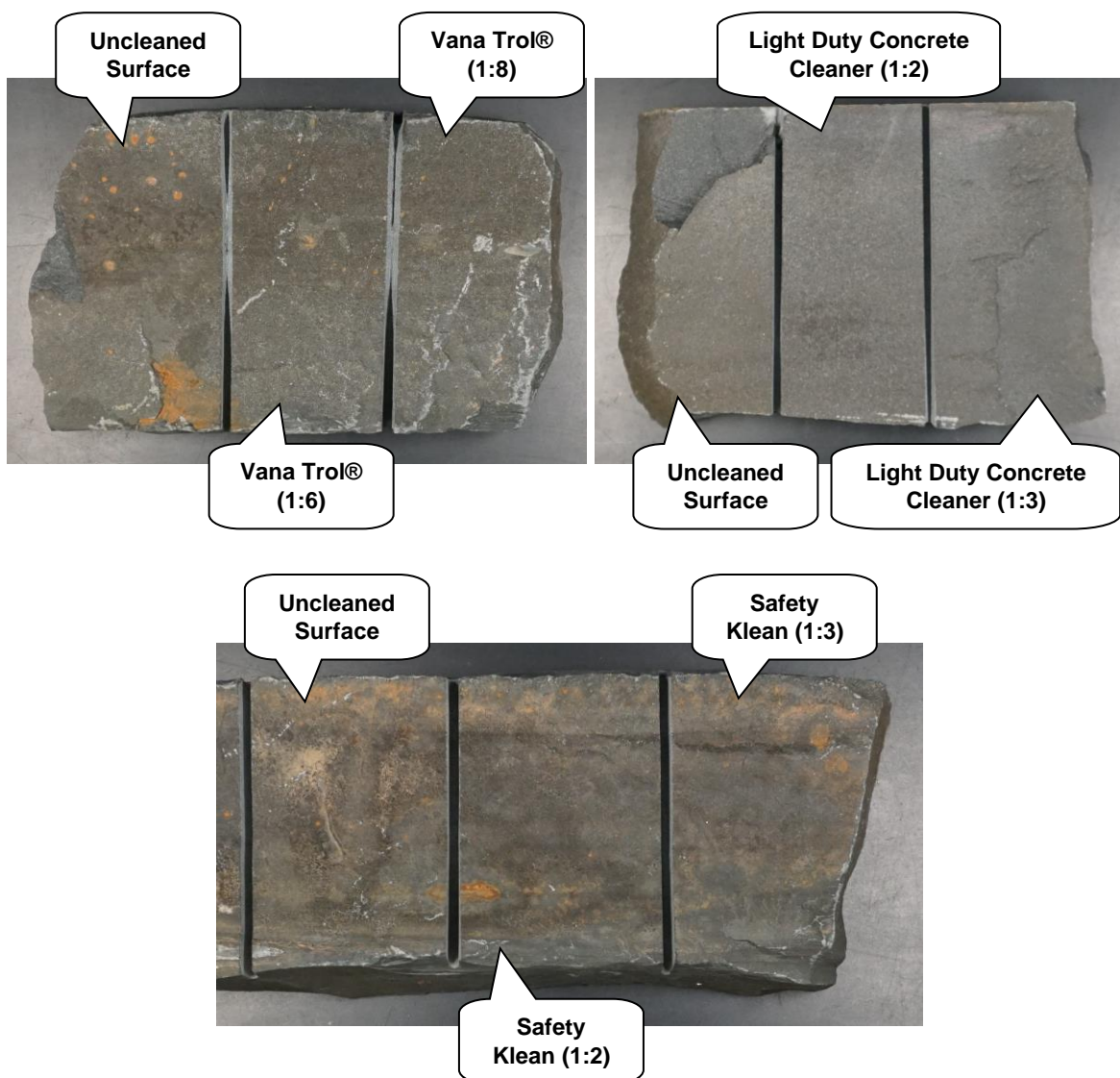
"St. Croix Valley – Stillwater Blend" Limestone After Cleaning



TEST RESULTS AND PHOTOGRAPHS: New Construction Cleaning (cont.)

Name: "Iron Mountain" Basalt					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Vana Trol®	1:6	0	0	0	0
Vana Trol®	1:8	0	0	0	0
Light Duty Concrete Cleaner	1:2	0	0	0	0
Light Duty Concrete Cleaner	1:3	0	0	0	0
Safety Klean	1:2	0	0	0	0
Safety Klean	1:3	0	0	0	0

"Iron Mountain" Basalt After Cleaning



CONCLUSIONS: New Construction Cleaning

In the cleaning tests conducted, Sure Klean® Vana Trol®, Sure Klean® Light Duty Concrete Cleaner, and Enviro Klean® Safety Klean caused slight to no change to the appearance of the submitted natural stone.

When choosing the most appropriate product for the desired result:

- For new masonry surfaces that are subject to vanadium, manganese, and other metallic stains – test Sure Klean® Vana Trol®
- For common construction and atmospheric staining – test Sure Klean® Light Duty Concrete Cleaner.
- For an effective, safe alternative to acidic cleaning compounds – test Enviro Klean® Safety Klean

It is recommended that the selected cleaners always be used in the lowest possible concentration. Apply all products in accordance with the manufacturer's recommendations 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.

RECOMMENDATIONS: New Construction Cleaning

Recommendations for cleaning for each type of natural stone submitted by Rivard Stone, Houlton, WI are provided in the chart below. Recommendations are based on the cleaner and dilution that provided the best match to the uncleaned surface.

Sample	New Construction Cleaning
"St. Croix Valley – Cream" Limestone	Sure Klean® Vana Trol® (1:6) or (1:8) OR Sure Klean® Light Duty Concrete Cleaner (1:2) or (1:3) OR Enviro Klean® Safety Klean (1:2) or (1:3)
"St. Croix Valley – Buff" Limestone	
"St. Croix Valley – Stillwater Blend" Limestone	
"Iron Mountain" Basalt	

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.

TEST METHODS: Maintenance Cleaning

Enviro Klean® Klean 'N Release Cleaner was evaluated to determine if it leaves the external surface looking like the uncleaned surface of the natural stone.

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

Substrate Deterioration is the visual examination of the sample comparing the uncleaned surface 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 uncleaned surface to the 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.

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

- 0 – **No change** compared to uncleaned surface
- 1 – **Slight change** compared to uncleaned surface
- 2 – **Moderate change** compared to uncleaned surface
- 3 – **Significant change** compared to uncleaned surface

Cleaning Procedure:

1. Pre-wet the surface and apply diluted cleaning solution according to PROSOCO, Inc. Product Data Sheet.
2. Allow for an appropriate dwell time and periodically agitate:
Klean 'N Release Cleaner..... 10 minutes
3. Reapply cleaning solution; do not let cleaner dry into natural stone.
4. Rinse thoroughly with plenty of fresh water.*
5. Allow the sample to dry for at least 18 hours and visually examine.
6. Compare the uncleaned surfaces to the cleaned surfaces for the best match.

***Rinsing Equipment** – Masonry washing equipment generating approximately 700-800 psi with a water flow rate of 8 gallons per minute delivered through a 40 degree fan spray tip was used for rinsing.

TEST RESULTS AND PHOTOGRAPHS: Maintenance Cleaning

Name: "St. Croix Valley – Cream" Limestone					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Klean 'N Release Cleaner	1:10	0	0	0	0

"St. Croix Valley – Cream" Limestone After Cleaning



TEST RESULTS AND PHOTOGRAPHS: Maintenance Cleaning (cont.)

Name: "St. Croix Valley – Buff" Limestone					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Klean 'N Release Cleaner	1:10	0	0	0	0

"St. Croix Valley – Buff" Limestone After Cleaning



TEST RESULTS AND PHOTOGRAPHS: Maintenance Cleaning (cont.)

Name: "St. Croix Valley – Stillwater Blend" Limestone					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Klean 'N Release Cleaner	1:10	0	0	0	0

"St. Croix Valley – Stillwater Blend" Limestone After Cleaning



TEST RESULTS AND PHOTOGRAPHS: Maintenance Cleaning (cont.)

Name: "Iron Mountain" Basalt					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
Klean 'N Release Cleaner	1:10	0	0	0	0

"Iron Mountain" Basalt After Cleaning



CONCLUSIONS: Maintenance Cleaning

Enviro Klean® Klean 'N Release Cleaner did not cause any change in appearance to any of the submitted samples.

It is recommended that the selected cleaner always be used in the lowest possible concentration. Apply all products in accordance with the manufacturer's recommendations 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.

RECOMMENDATIONS: Maintenance Cleaning

Recommendations for maintenance cleaning for each type of natural stone submitted by Rivard Stone, Houlton, WI are provided in the chart below.

Sample	Maintenance Cleaning
"St. Croix Valley – Cream" Limestone	Enviro Klean® Klean 'N Release Cleaner (1:10)
"St. Croix Valley – Buff" Limestone	
"St. Croix Valley – Stillwater Blend" Limestone	
"Iron Mountain" Basalt	

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.

TEST METHODS: Adverse Effects

PROSOCO® T2683 Efflorescence Remover was evaluated to determine if the cleaner causes any adverse effects when used on the submitted natural stone. None of the submitted samples exhibited efflorescence, therefore only a visual adverse effects evaluation was conducted. The samples were visually examined following the procedure below based on the following:

Surface Finish Removal is the visual examination of the sample comparing the surface finish of the uncleaned surface to the surface finish cleaned with selected product(s).

Substrate Deterioration is the visual examination of the sample comparing the uncleaned surface to surfaces cleaned with selected product(s) for any potential erosion/digestion of the sample.

Color Change is the visual examination comparing the color of the uncleaned surface to the color of surfaces cleaned with selected product(s).

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 both categories:

- 0 – **No change** compared to uncleaned surface
- 1 – **Slight change** compared to uncleaned surface
- 2 – **Moderate change** compared to uncleaned surface
- 3 – **Significant change** compared to uncleaned surface

Cleaning Procedure:

1. Pre-wet the surface and apply diluted cleaning solution according to PROSOCO, Inc. Product Data Sheet.
2. Allow for an appropriate dwell time and periodically agitate:
T2683 Efflorescence Remover 5 minutes
3. Reapply cleaning solution; do not let cleaner dry into natural stone.
4. Rinse thoroughly with plenty of fresh water.*
5. Allow the sample to dry for at least 18 hours and visually examine.
6. Compare the uncleaned surfaces to the cleaned surfaces for the best match.

***Rinsing Equipment** – Masonry washing equipment generating approximately 700-800 psi with a water flow rate of 8 gallons per minute delivered through a 40 degree fan spray tip was used for rinsing.

TEST RESULTS AND PHOTOGRAPHS: Adverse Effects

Name: "St. Croix Valley – Cream" Limestone					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
T2683 Efflorescence Remover	None	1	0	1	0

"St. Croix Valley – Cream" Limestone After Cleaning



TEST RESULTS AND PHOTOGRAPHS: Adverse Effects (cont.)

Name: "St. Croix Valley – Buff" Limestone					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
T2683 Efflorescence Remover	None	1	1	0	0

"St. Croix Valley – Buff" Limestone After Cleaning



TEST RESULTS AND PHOTOGRAPHS: Adverse Effects (cont.)

Name: "St. Croix Valley – Stillwater Blend" Limestone					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
T2683 Efflorescence Remover	None	1	1	1	0

"St. Croix Valley – Stillwater Blend" Limestone After Cleaning



TEST RESULTS AND PHOTOGRAPHS: Adverse Effects (cont.)

Name: "Iron Mountain" Basalt					
Product	Dilution	Surface Finish Removal	Substrate Deterioration	Color Change	Staining
T2683 Efflorescence Remover	None	0	0	0	0

"Iron Mountain" Basalt After Cleaning



CONCLUSIONS: Adverse Effects

In the stain removal tests conducted, PROSOCO® T2683 Efflorescence Remover caused slight to no change to the appearance of the submitted natural stone.

It is recommended that the cleaner always be used in the lowest possible concentration. Apply all products in accordance with the manufacturer's recommendations 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.

RECOMMENDATIONS: Adverse Effects

Recommendations for cleaning each type of natural stone submitted by Rivard Stone, Houlton, WI are provided in the chart below.

Sample	Stain Removal (Adverse Effects)
"St. Croix Valley – Cream" Limestone	PROSOCO® T2683 Efflorescence Remover
"St. Croix Valley – Buff" Limestone	
"St. Croix Valley – Stillwater Blend" Limestone	
"Iron Mountain" Basalt	

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.

SAMPLE PREPARATION: Treatment Application

Prior to treatment application, the submitted natural stone samples were cleaned with Sure Klean® Vana Trol® diluted with eight parts water in accordance with the current PROSOCO, Inc. Product Data Sheet instructions. After the samples had dried for at least 24 hours, the treatments were applied in accordance with the current PROSOCO, Inc. Product Data Sheet instructions and allowed to cure for at least 72 hours prior to testing.

TEST METHODS: Color and Sheen Enhancement

After 72 hours, a visual evaluation was made comparing the untreated control surface to the treated surface to determine the effectiveness of the evaluated products in providing color and/or sheen enhancement to the submitted natural stone samples.

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

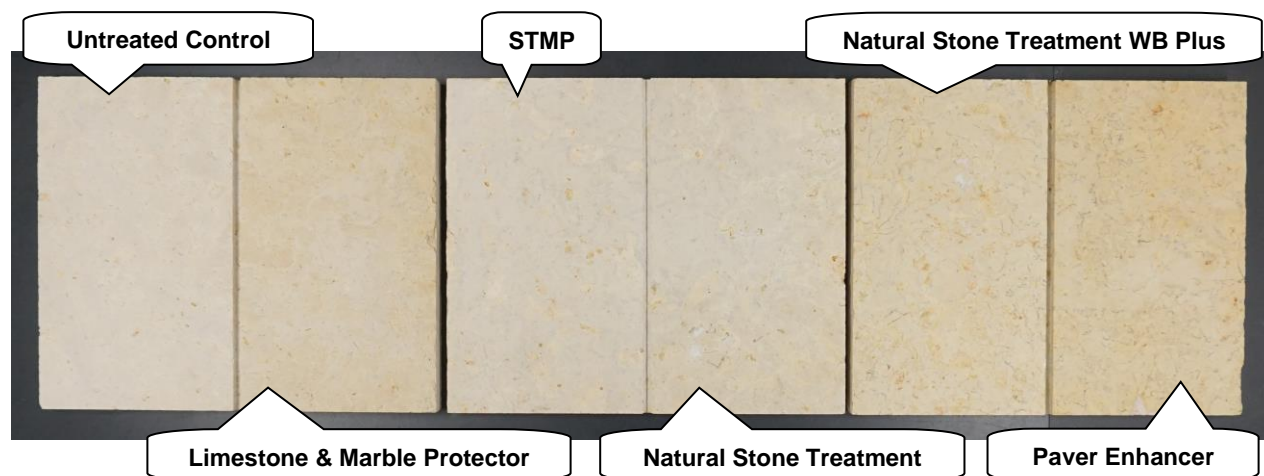
- 0 – **No enhancement** compared to untreated surface
- 1 – **Slight enhancement** compared to untreated surface
- 2 – **Moderate enhancement** compared to untreated surface
- 3 – **Significant enhancement** compared to untreated surface

NOTE: Due to the surface irregularities and varying nature of the natural stone, the substrate's color and sheen enhancement may vary from one area of the sample to another, as well as from sample to sample.

TEST RESULTS AND PHOTOGRAPHS: Color and Sheen Enhancement

"St. Croix Valley – Cream" Limestone	Color Enhancement	Sheen Enhancement
Sure Klean® Weather Seal Limestone & Marble Protector	2	0
Sure Klean® Weather Seal Stone Tile & Masonry Protector (STMP)	0	0
Sure Klean® Weather Seal Natural Stone Treatment	1	0
Sure Klean® Weather Seal Natural Stone Treatment WB Plus	2	0
Sure Klean® Weather Seal Paver Enhancer	3	0

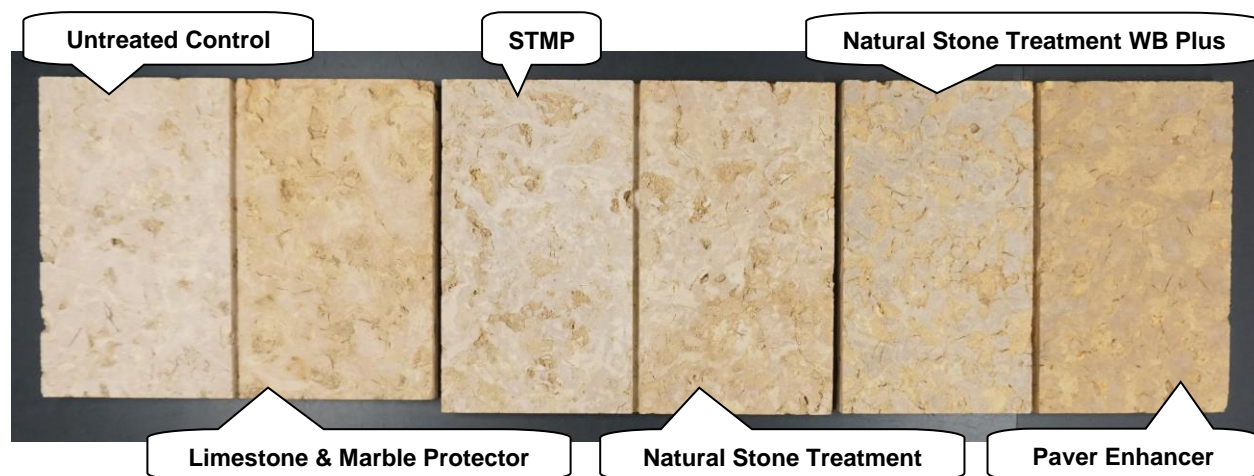
"St. Croix Valley – Cream" Limestone After Application



TEST RESULTS AND PHOTOGRAPHS: Color and Sheen Enhancement (cont.)

“St. Croix Valley – Buff” Limestone	Color Enhancement	Sheen Enhancement
Sure Klean® Weather Seal Limestone & Marble Protector	2	0
Sure Klean® Weather Seal Stone Tile & Masonry Protector (STMP)	0	0
Sure Klean® Weather Seal Natural Stone Treatment	1	0
Sure Klean® Weather Seal Natural Stone Treatment WB Plus	2	0
Sure Klean® Weather Seal Paver Enhancer	3	0

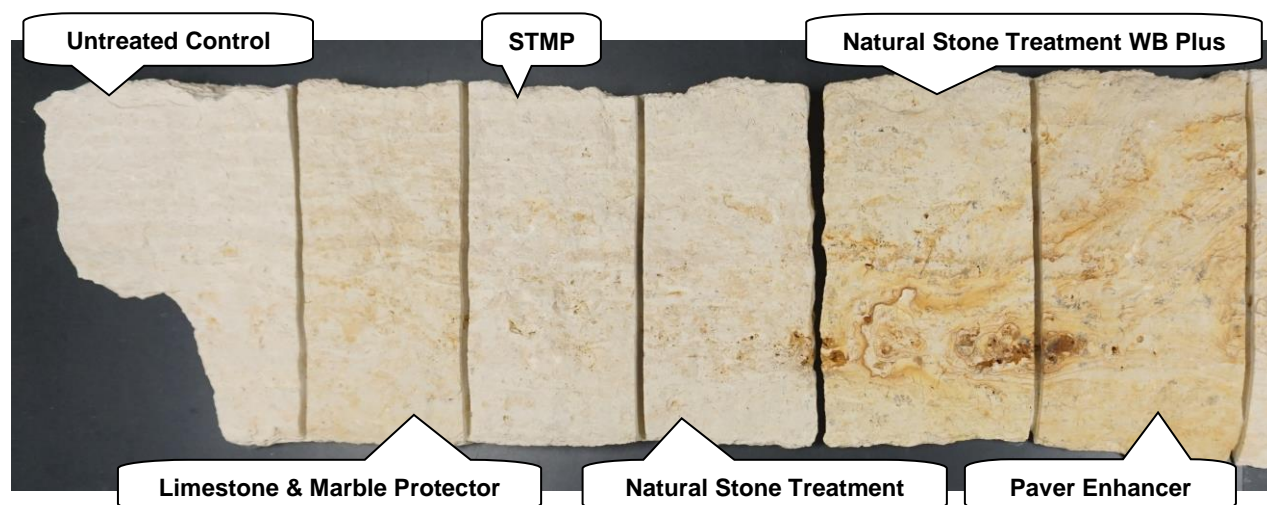
“St. Croix Valley – Buff” Limestone After Application



TEST RESULTS AND PHOTOGRAPHS: Color and Sheen Enhancement (cont.)

“St. Croix Valley – Stillwater Blend” Limestone	Color Enhancement	Sheen Enhancement
Sure Klean® Weather Seal Limestone & Marble Protector	1	0
Sure Klean® Weather Seal Stone Tile & Masonry Protector (STMP)	0	0
Sure Klean® Weather Seal Natural Stone Treatment	0	0
Sure Klean® Weather Seal Natural Stone Treatment WB Plus	1	0
Sure Klean® Weather Seal Paver Enhancer	2	0

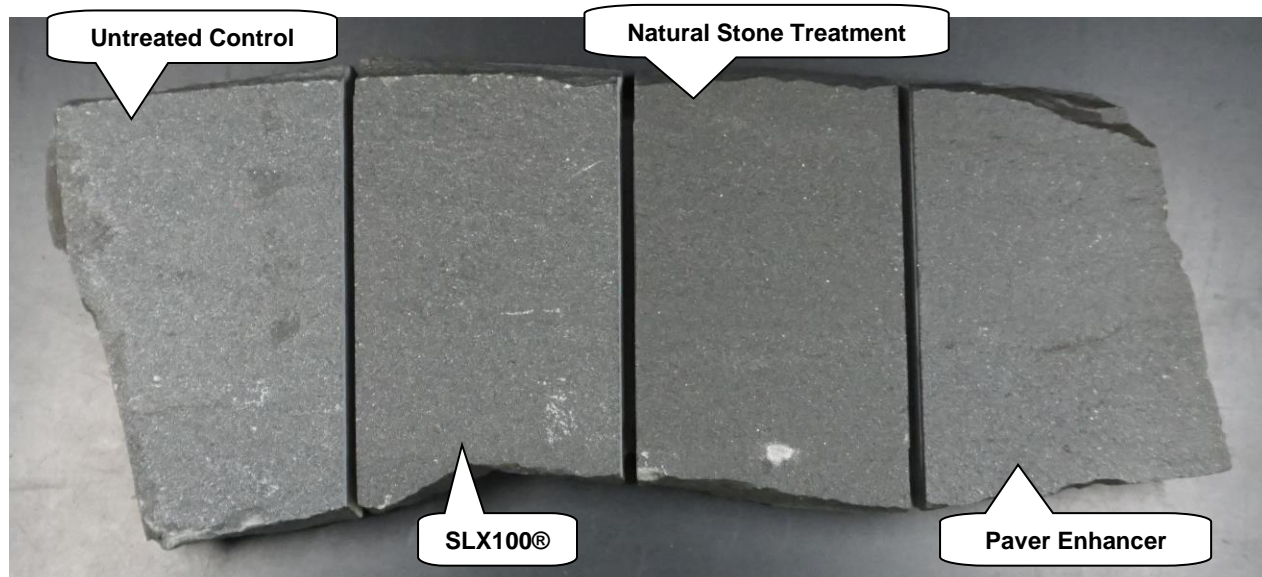
“St. Croix Valley – Stillwater Blend” Limestone After Application



TEST RESULTS AND PHOTOGRAPHS: Color and Sheen Enhancement (cont.)

"Iron Mountain" Basalt	Color Enhancement	Sheen Enhancement
PROSOCO® SLX100® Water & Oil Repellent	1	0
Sure Klean® Weather Seal Natural Stone Treatment	2	0
Sure Klean® Weather Seal Paver Enhancer	2	0

"St. Croix Valley – Cream" Limestone After Application



CONCLUSIONS: Color and Sheen Enhancement

The treatments evaluated provided a range of color enhancement results, from no change in appearance to a significant change depending on the treatment. None of the treatments evaluated provided any sheen enhancement.

Enhancement levels may vary by substrate, color, lighting, orientation, application method, and other variables. Always test in the field to confirm intended results.

Apply all products in accordance with the manufacturer's recommendations provided on container labels and product data sheets. On-site testing should be conducted to determine the most appropriate treatment and procedures for a particular project. See product literature for additional application and product information.

RECOMMENDATIONS: Color and Sheen Enhancement

Recommendations for color and sheen enhancement for each type of natural stone submitted by Rivard Stone, Houlton, WI are provided in the chart below. Recommendations are based on the treatment(s) that proved most effective.

Sample	Color and Sheen Enhancement
"St. Croix Valley – Cream" Limestone	Please refer to pages 22-27 of the report for individual recommendations based on the desired result.
"St. Croix Valley – Buff" Limestone	
"St. Croix Valley – Stillwater Blend" Limestone	
"Iron Mountain" Basalt	

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 treatment and procedures for a particular project. See product literature for additional application and product information.

TEST METHODS: Protective Water Repellents

Water Absorption Tube Test: Horizontal RILEM II.4, 5.0 milliliters, 20 minutes

The water absorption tube test simulating wind driven rain conditions was performed on the submitted samples. Tests were run with 5.0-milliliter head pressures. Filled to 5.0 milliliters, a water absorption tube produces a 103 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:

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



TEST RESULTS AND PHOTOGRAPHS: Protective Water Repellents

Water Absorption Tube Test: Horizontal RILEM II.4, 5.0 milliliters, 20 minutes

AA = Above Average A = Average BA = Below Average

"St. Croix Valley – Cream" Limestone	Results in mL loss	Ranking
Untreated Control	-0.4	--
Sure Klean® Weather Seal Limestone & Marble Protector	-0.0	<u>AA</u>
Sure Klean® Weather Seal Stone Tile & Masonry Protector (STMP)	-0.0	<u>AA</u>
Sure Klean® Weather Seal Natural Stone Treatment	-0.0	<u>AA</u>
Sure Klean® Weather Seal Natural Stone Treatment WB Plus	-0.0	<u>AA</u>
Sure Klean® Weather Seal Paver Enhancer	-0.0	<u>AA</u>

"St. Croix Valley – Buff" Limestone	Results in mL loss	Ranking
Untreated Control	-1.9	--
Sure Klean® Weather Seal Limestone & Marble Protector	-0.0	<u>AA</u>
Sure Klean® Weather Seal Stone Tile & Masonry Protector (STMP)	-0.3	<u>AA</u>
Sure Klean® Weather Seal Natural Stone Treatment	-0.0	<u>AA</u>
Sure Klean® Weather Seal Natural Stone Treatment WB Plus	-0.0	<u>AA</u>
Sure Klean® Weather Seal Paver Enhancer	-0.0	<u>AA</u>

TEST METHODS: Protective Water Repellents

Water Absorption Tube Test: Vertical RILEM II.4, 5.0 milliliters, 20 minutes

The water absorption tube test simulating wind driven rain conditions was performed on the submitted samples. 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:

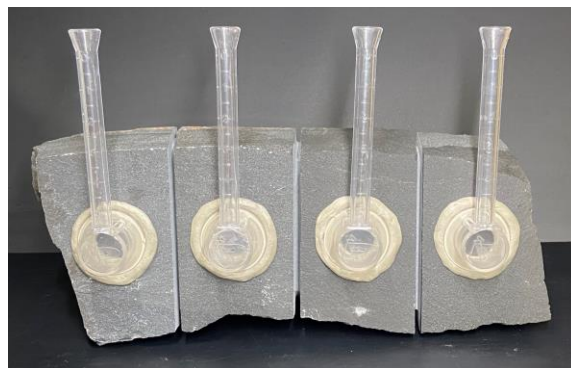
$$5.0 \text{ mL} \times 20\% = \mathbf{1.0 \text{ mL}}$$

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:

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



TEST RESULTS AND PHOTOGRAPHS: Protective Water Repellents

Water Absorption Tube Test: Vertical RILEM II.4, 5.0 milliliters, 20 minutes

AA = Above Average A = Average BA = Below Average

"St. Croix Valley – Stillwater Blend" Limestone	Results in mL loss	<u>Ranking</u>
Untreated Control	-0.3	--
Sure Klean® Weather Seal Limestone & Marble Protector	-0.0	<u>AA</u>
Sure Klean® Weather Seal Stone Tile & Masonry Protector (STMP)	-0.0	<u>AA</u>
Sure Klean® Weather Seal Natural Stone Treatment	-0.0	<u>AA</u>
Sure Klean® Weather Seal Natural Stone Treatment WB Plus	-0.0	<u>AA</u>
Sure Klean® Weather Seal Paver Enhancer	-0.0	<u>AA</u>

"Iron Mountain" Basalt	Results in mL loss	<u>Ranking</u>
Untreated Control	-0.0	--
PROSOCO® SLX100® Water & Oil Repellent	-0.0	<u>AA</u>
Sure Klean® Weather Seal Natural Stone Treatment	-0.0	<u>AA</u>
Sure Klean® Weather Seal Paver Enhancer	-0.0	<u>AA</u>

CONCLUSIONS: Protective Water Repellents

Based on the laboratory evaluations, all of the treatments provided good water repellent protection to the submitted samples. Although some of the untreated areas in the 20 minute RILEM test did not absorb any water, the treatments will likely provide long-term water repellent protection and help to prevent water-related staining.

RECOMMENDATIONS: Water Repellency

Recommendations for water repellency for each type of natural stone submitted by Rivard Stone, Houlton, WI are provided in the chart below. Recommendations are based on the treatment(s) that proved most effective.

Sample	Water Repellency
"St. Croix Valley – Cream" Limestone	Sure Klean® Weather Seal Limestone & Marble Protector OR
"St. Croix Valley – Buff" Limestone	Sure Klean® Weather Seal Stone Tile & Masonry Protector (STMP) OR Sure Klean® Weather Seal Natural Stone Treatment OR Sure Klean® Weather Seal Natural Stone Treatment WB Plus OR
"St. Croix Valley – Stillwater Blend" Limestone	Sure Klean® Weather Seal Paver Enhancer
"Iron Mountain" Basalt	PROSOCO® SLX100® Water & Oil Repellent OR Sure Klean® Weather Seal Natural Stone Treatment OR Sure Klean® Weather Seal Paver Enhancer

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 treatment and procedures for a particular project. See product literature for additional application and product information.

SAMPLE PREPARATION: Treatments

Each stain repellent was applied in accordance with the current PROSOCO, Inc. Product Date Sheet instructions. The treatments were allowed to cure for at least 72 hours prior to the stain testing described below.

TEST METHODS: Surface Beading Evaluation**Food and Oil Products Evaluated for Stain Testing:****Temperature:**

Coca Cola	ambient (~70°F)
Ketchup	ambient (~70°F)
Mustard	ambient (~70°F)
Red wine	ambient (~70°F)
Balsamic vinegar	ambient (~70°F)
Soy sauce	ambient (~70°F)
Olive oil	ambient (~70°F)
Wesson oil	250°F
Coffee	120°F

The food and oil products were applied to the test areas by using a dropper creating a bead 0.5 – 1.0 cm in diameter. The beading properties of the oils and liquids were visually evaluated within two minutes after application. The results are reported as a rating based on the angle of contact between the base of the droplet and the substrate. A rating of “1 or 2” indicated the smallest angle of contact (<90°) which correlates to “above average” repellency. A rating of “3 or 4” indicates “average” repellency. A rating of “5 or greater” indicated that the oils or liquids quickly absorbed into the substrate and correlates to “below average” repellency.

Note: Non-free flowing staining agents such as ketchup and mustard are applied in a blob and not evaluated for their beading properties.

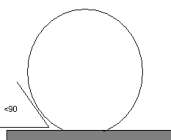
TEST METHODS: Surface Beading Evaluation (cont.)

Rating System (1-5)

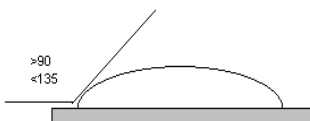
1. No wetting of contact area (no darkening); angle less than 90°



2. Wetting contained to the contact area (slight darkening); angle is less than 90°



3. Wetting contained to the contact area (slight darkening); angle is greater than 90° , but less than 135° .



4. Wetting beyond the contact area (darkening); angle is greater than 135°



5. Wetting beyond the contact area (darkening); angle is flat.



TEST RESULTS: Surface Beading Evaluation

“St. Croix Valley – Cream” Limestone			
	Untreated Control	Limestone & Marble Protector	STMP
Coca Cola	4	3	3
Ketchup	N/A	N/A	N/A
Mustard	N/A	N/A	N/A
Red Wine	4	3	3
Bals. Vin.	4	2	2
Soy Sauce	4	3	3
Olive Oil	5	3	3
Wesson Oil	5	3	3
Hot Coffee	4	3	3

“St. Croix Valley – Buff” Limestone			
	Untreated Control	Limestone & Marble Protector	STMP
Coca Cola	4	3	3
Ketchup	N/A	N/A	N/A
Mustard	N/A	N/A	N/A
Red Wine	4	3	3
Bals. Vin.	4	2	2
Soy Sauce	4	3	3
Olive Oil	5	3	3
Wesson Oil	5	3	3
Hot Coffee	4	3	3

N/A – non-free flowing staining agent

TEST METHODS: Stain Resistance Evaluation

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® Klean 'N Release Cleaner diluted with ten parts water and scrubbed under a stream of running water. The samples were allowed to dry for 24 hours. Evaluation consisted of a visual examination of the tested areas to determine the percentage of staining removal.

TEST RESULTS AND PHOTOGRAPHS: Stain Resistance Evaluation

“St. Croix Valley – Cream” Limestone

% Removal

Untreated Control									
	Cola	Ketch.	Must.	Red Wine	Bals. Vin.	Soy Sauce	Olive Oil	Wesson Oil	Coffee
24 hour	100%	90%	70%	90%	50%	N/A*	10%	10%	50%
4 hour	100%	100%	70%	90%	50%	N/A*	30%	10%	N/A*
1 hour	100%	100%	90%	100%	100%	100%	30%	10%	N/A*
10 min.	100%	100%	100%	100%	100%	100%	70%	10%	70%
Sure Klean® Weather Seal Limestone & Marble Protector									
	Cola	Ketch.	Must.	Red Wine	Bals. Vin.	Soy Sauce	Olive Oil	Wesson Oil	Coffee
24 hour	100%*	100%*	100%	100%*	100%*	100%	70%	70%	100%
4 hour	100%	100%	100%	100%*	100%*	100%	70%	70%	100%
1 hour	100%	100%	100%	100%	100%	100%	90%	70%	100%
10 min.	100%	100%	100%	100%	100%	100%	70%	70%	100%
Sure Klean® Weather Seal Stone Tile & Masonry Protector (STMP)									
	Cola	Ketch.	Must.	Red Wine	Bals. Vin.	Soy Sauce	Olive Oil	Wesson Oil	Coffee
24 hour	100%	100%	100%	70%	100%	100%	100%	100%	100%
4 hour	100%	100%	100%	90%	100%	100%	100%	100%	100%
1 hour	100%	100%	100%	100%	100%	100%	100%	100%	100%
10 min.	100%	100%	100%	100%	100%	100%	100%	100%	100%

% Removal of stain following maintenance cleaning.

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

N/A* Indicates the removal of the stain, following maintenance cleaning, was unable to be determined due to olive oil or Wesson oil spreading masking the area in question.

TEST RESULTS AND PHOTOGRAPHS: Stain Resistance Evaluation (cont.)

“St. Croix Valley – Cream” Limestone With Stains



**Untreated
Control**



**Limestone &
Marble Protector**



STMP

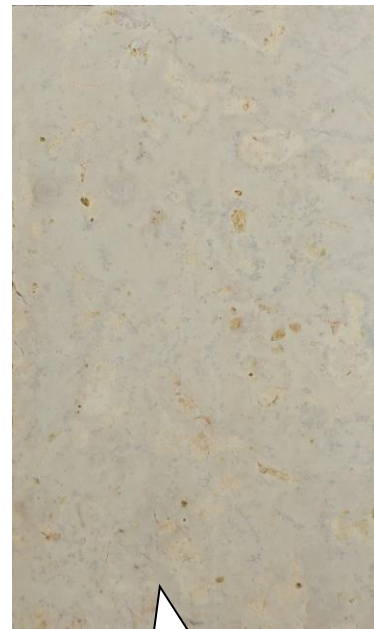
“St. Croix Valley – Cream” Limestone After Stain Testing



**Untreated
Control**



**Limestone &
Marble Protector**



STMP

TEST RESULTS AND PHOTOGRAPHS: Stain Resistance Evaluation (cont.)

“St. Croix Valley – Buff” Limestone

% Removal

Untreated Control									
	Cola	Ketch.	Must.	Red Wine	Bals. Vin.	Soy Sauce	Olive Oil	Wesson Oil	Coffee
24 hour	100%	90%	30%	70%	50%	N/A*	10%	10%	100%
4 hour	100%	100%	30%	50%	50%	N/A*	10%	10%	100%
1 hour	100%	100%	50%	100%	50%	N/A*	10%	10%	100%
10 min.	100%	100%	50%	100%	100%	N/A*	10%	10%	100%
Sure Klean® Weather Seal Limestone & Marble Protector									
	Cola	Ketch.	Must.	Red Wine	Bals. Vin.	Soy Sauce	Olive Oil	Wesson Oil	Coffee
24 hour	100%	100%	100%	100%*	100%*	100%	80%	80%	100%
4 hour	100%	100%	100%	100%*	100%*	100%	80%	80%	100%
1 hour	100%	100%	100%	100%	100%	100%	80%	80%	100%
10 min.	100%	100%	100%	100%	100%	100%	80%	80%	100%
Sure Klean® Weather Seal Stone Tile & Masonry Protector (STMP)									
	Cola	Ketch.	Must.	Red Wine	Bals. Vin.	Soy Sauce	Olive Oil	Wesson Oil	Coffee
24 hour	100%	100%	70%	70%	100%	90%	100%	90%	30%
4 hour	100%	100%	70%	70%	90%	90%	100%	100%	30%
1 hour	100%	100%	100%	100%	100%	100%	100%	100%	100%
10 min.	100%	100%	100%	100%	100%	100%	100%	100%	100%

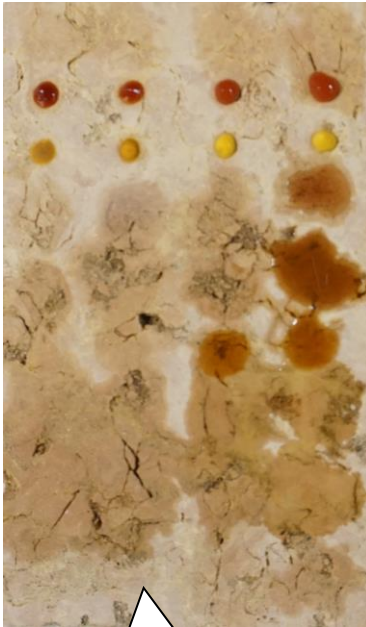
% Removal of stain following maintenance cleaning.

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

N/A* Indicates the removal of the stain, following maintenance cleaning, was unable to be determined due to olive oil or Wesson oil spreading masking the area in question.

TEST RESULTS AND PHOTOGRAPHS: Stain Resistance Evaluation (cont.)

“St. Croix Valley – Buff” Limestone With Stains



**Untreated
Control**



**Limestone &
Marble Protector**



STMP

“St. Croix Valley – Buff” Limestone After Stain Testing



**Untreated
Control**



**Limestone &
Marble Protector**



STMP

CONCLUSIONS: Surface Beading and Stain Resistance

In the surface beading evaluation, Sure Klean® Weather Seal Limestone & Marble Protector and Sure Klean® Weather Seal Stone Tile & Masonry Protector (STMP) had the smallest angles of contact with each stain applied on the submitted samples. This small angle correlates to “above average” repellency.

In the stain resistance tests conducted, Sure Klean® Weather Seal Limestone & Marble Protector and Sure Klean® Weather Seal Stone Tile & Masonry Protector (STMP) proved effective at repelling the applied stains on the submitted samples.

NOTE: Due to the surface irregularities of the natural stone, the substrate’s stain resistance may vary from one area of the stone to another.

RECOMMENDATIONS: Stain Resistance

Recommendations for stain resistance for each type of natural stone submitted by Rivard Stone, Houlton, WI are provided in the chart below. Recommendations are based on the treatments that proved most effective for providing stain repellency on the submitted natural stone.

Sample	Stain Resistance
“St. Croix Valley – Cream” Limestone	Sure Klean® Weather Seal Limestone & Marble Protector OR Sure Klean® Weather Seal Stone Tile & Masonry Protector (STMP)
“St. Croix Valley – Buff” Limestone	

The ability of a stain repellent treatment to prevent staining is affected by a variety of factors. Therefore, on-site testing should be carried out for all installations with the recommended systems to ensure job site workmanship yields equivalent 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 stain repellent product and procedures for a particular project. See product literature for additional application and product information.



J. Lucas Comadoll
QC/Project Testing Technician

ALL SAMPLES SUPPLIED FOR THE ABOVE EVALUATION WILL BE DISPOSED OF THIRTY (30) 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 THIRTY (30) 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.