

VANGUARD ADA SYSTEMS OF AMERICA TEST REPORT

SCOPE OF WORK

VARIOUS ASTM EVALUATIONS FOR WEATHERING, COLOR CHANGE, BOND STRENGTH, ABRASION RESISTANCE, SMOKE DENSITY, BURN RATE, WATER ABSORPTION, SLIP AND FRICTION PROPERTIES OF ECOPATH/SKIDGUARD AND TWSI/DETECTABLE/TACTILE CUE

REPORT NUMBER

I4016.01-106-31 R0

TEST DATES

12/17/18 - 04/19/19

ISSUE DATE

05/08/19

RECORD RETENTION END DATE

04/19/23

PAGES

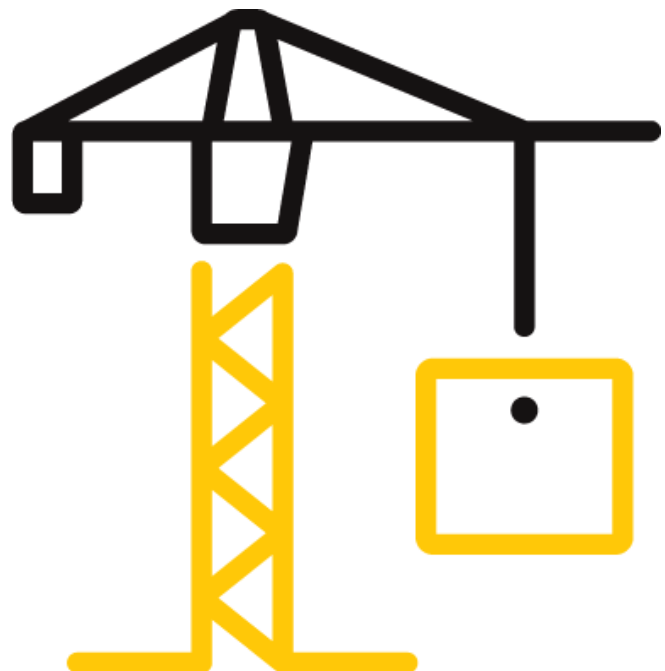
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DOCUMENT CONTROL NUMBER

ATI 00231 (09/05/17)

RT-R-AMER-Test-2827

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TEST REPORT FOR VANGUARD ADA SYSTEMS OF AMERICA

Report No.: I4016.01-106-31 R0

Date: 05/08/19

REPORT ISSUED TO

VANGUARD ADA SYSTEMS OF AMERICA

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Snohomish, Washington 98296

SECTION 1

SCOPE


Products: EcoPath/SkidGuard and TWSI/Detectable/Tactile Cue

Intertek Building & Construction (B&C) was contracted by Vanguard ADA Systems of America to evaluate EcoPath/SkidGuard and Tactile Warning Surface Indicator (TWSI) /Detectable/Tactile Cue concrete coating in accordance with ASTM D1148 Fade Resistance, ASTM G155 Xenon Arc, ASTM C609 Color Difference, ASTM C482 Bond Strength, ASTM C501 Abrasion Resistance, ASTM D2843 Smoke Density, ASTM D635 Rate of Burn, ASTM D570 Water Absorption, FM 3-C1028 Coefficient of Friction, ASTM F609 Slip Resistance, and ANSI B101 Friction. Results obtained are tested values and were secured by using the designated test methods. Testing was conducted at the Intertek B&C test facility in York, Pennsylvania.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

For INTERTEK B&C:

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SECTION 2

SUMMARY OF TEST RESULTS

PROCEDURE	PROPERTY	PRODUCT	AVERAGE RESULTS
ASTM D1148, ASTM C609	Color Difference, ΔE^*	EcoPath/SkidGuard	2.91
ASTM C482	Bond Strength	TWSI/Detectable/Tactile Cue	613 psi
ASTM C501	Abrasion Resistance	EcoPath/SkidGuard	4.162 g loss
ASTM D2843	Smoke Density Rating	EcoPath/SkidGuard	0.1
ASTM D635	Rate of Burn	EcoPath/SkidGuard	No sustained burn
ASTM D570	Water Absorbed	EcoPath/SkidGuard	1.81%
FM 3-C1028	Static CoF	TWSI/Detectable/Tactile Cue	Dry: 1.16
			Wet: 0.88
ASTM F609	Slip Resistance (CoF)	EcoPath/SkidGuard	Dry: 0.84 (CoF)
			Wet: 0.86 (CoF)
ANSI B101.1	Static CoF	EcoPath/SkidGuard	0.97 (CoF)
ANSI B101.3	Dynamic CoF	EcoPath/SkidGuard	0.64 (CoF)

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TEST METHODS

The specimens were evaluated in accordance with the following:

ASTM D1148-13 (Reapproved 2018), *Standard Test Method for Rubber Deterioration -- Discoloration from Ultraviolet (UV) or UV/Visible Radiation and Heat Exposure of Light-Colored Surfaces*

ASTM G155-13, *Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials, Cycle 1*

ASTM C609-07 (Reapproved 2014), *Standard Test Method for Measurement of Light Reflectance Value and Small Color Differences Between Pieces of Ceramic Tile*

ASTM C482-02 (Reapproved 2014), *Standard Test Method for Bond Strength of Ceramic Tile to Portland Cement Paste*

ASTM C501-84 (Reapproved 2015), *Standard Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser*

ASTM D2843-16, *Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics*

ASTM D635-18, *Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position*

ASTM D570-98 (Reapproved 2018), *Standard Test Method for Water Absorption of Plastics, Twenty-Four Hour Immersion*

FM 3-C1028 (2010), *Florida Method of Test for Determining the Static Coefficient of Friction of Surface Applied Detectable Warning Surfaces*

ASTM C1028-07^{E1} (Withdrawn 2014), *Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method*

ASTM F609-05 (Reapproved 2013), *Standard Test Method for Using a Horizontal Pull Slipmeter (HPS)*

ANSI/NFSI B101.1-2009, *Test Method for Measuring Wet SCOF of Common Hard-Surface Floor Materials*

ANSI/NFSI B101.3-2012, *Test Method for Measuring Wet DCOF of Common Hard-Surface Floor Materials*

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MATERIAL SOURCE

The concrete coating materials were provided by Vanguard ADA Systems of America. The following were received on November 28, 2018: two nominally 24-inch square by three-inch thick concrete slabs with a yellow coating with raised domes and two nominally 24-inch square by three-inch thick concrete slabs coated in seven nominally eight-inch square coatings of black, yellow, white, grey, green, blue, and red. Refer to the product description photos in Section 10. The material was tested as received except for preparing the smaller test specimens from the materials. Representative materials/test specimens will be retained by Intertek B&C for a minimum of four years from the test completion date.

SECTION 5

LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Joshua A Kennedy	Intertek B&C
Joseph M. Brickner	Intertek B&C

SECTION 6

TEST PROCEDURES

All conditioning of test specimens and test conditions were at standard laboratory conditions unless otherwise reported. Refer to the test related photos in Section 10, and datasheets in Section 11.

ASTM D1148 - Discoloration

The discoloration of the concrete coating was determined utilizing GretagMacBeth Color i5 spectrophotometer (ICN: 004725) using ASTM C609. Reference ASTM G155 and ASTM C609 descriptions in Section 6 and test results in Section 8. Six colors were evaluated: black, yellow, white, grey, green, and blue.

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ASTM G155 - Accelerated Weathering (Cycle 1)

The accelerated weathering was performed in an Atlas Ci5000 Weatherometer (ICN: 63081) operating at an irradiance level of 0.35 W/m² at 340 nm wavelength. The conditioning chamber was controlled at 42°C, and the black panel thermometer was set to 63°C. Relative humidity was maintained at 50%. Borosilicate "S" type inner and outer filters were used to simulate normal daylight sun conditions. The specimens were secured in the chamber with wire. They were exposed for 2000 hours to a repeating cycle that consisted of 102 minutes of light at the 63°C black panel temperature then 18 minutes of light and water spray in which the air temperature was not controlled. Six colors were evaluated.

ASTM C609 - Color Difference

The color difference of the concrete coating was determined utilizing a GretagMacBeth Color i5 spectrophotometer (ICN: 004725) with a diffuse spherical geometry and a xenon lamp, CIELAB color space, illuminant D65, and 10° observer. The specular component was included in the measurements. Each specimen was measured in three equally spaced regions to obtain an indication of uniformity. Each specimen color will be compared as a control value against the post-weathering value. Six colors were evaluated.

ASTM C482, Bond Strength

The bond strength of the concrete coating material was determined utilizing an Instron Model 3369 UTM (ICN: 005740) equipped with a 50.0 kN load cell (ICN: 005741) and operating at 200 psi/min. Each specimen was supported with a fixed steel frame while an individual dome was loaded in the shear direction until a failure occurred. The yellow domed specimens were evaluated.

ASTM C501 - Abrasion Resistance

The abrasion resistance of the concrete coating material was determined utilizing a Taber Abraser (ICN: Y001522) equipped with H-22 wheels and 1000 grams per arm. Four specimens were abraded for 1000 cycles consisting of one specimen for each black, grey, yellow, and green color. The initial and final weight of each specimen was measured with a Mettler Toledo Balance Model XP1203S (ICN: 65216).

ASTM D2843 - Smoke Density

Each test specimen was exposed to a flame inside a Smoke Chamber. The horizontal light absorption was measured across the light beam path of a photoelectric cell, and the condition of the smoke chamber was observed. The Light Absorption Curves are presented in Section 12. White color specimens were evaluated.

Caveat: *This standard is used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions, but does not by itself incorporate all factors required for fire hazard or fire risk assessment of the materials, products, or assemblies under actual fire conditions.*

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ASTM D635 - Rate of Burn

The linear rate of burn of the concrete coating material was determined utilizing a laboratory burner (ICN: Y002875) inside of a fire hood (ICN: 005985). Ten specimens averaging 141 mm long by 13.2 mm wide by 11.85 mm thick were supported horizontally at one end and exposed to a gas flame at the free end for 30 seconds. Yellow, grey, and white specimens were evaluated.

***Caveat:** This standard is used to measure and describe the response of materials, products or assemblies to heat and flame under controlled conditions but does not, by itself, incorporate all factors required for fire hazards or fire risk assessment of materials, products, or assemblies under actual fire conditions.*

ASTM D570 - Water Absorption

The rate of water absorption of the concrete coating material was determined utilizing a Mettler Toledo Model XP1203S Balance (ICN: 65216) to weigh each specimen before and after a 24-hour water absorption period. Each specimen was dried in a Blue M oven (ICN: 005318) at 50°C for 24 hours before and after being fully submerged in distilled water. Specimen dimensions were measured utilizing a Fowler Digital Caliper (ICN: INT01066). Black, yellow, and white specimens applied to plastic were evaluated.

FM 3-C1028 - Static Coefficient of Friction

The static coefficient of friction of the concrete coating material was determined utilizing a dial force gauge (ICN: INT00657) to pull two Neolite pads measuring 6-inch x 0.75-inch by 0.125-inch attached to a sled with a total weight of 31.34 lb_f along the surface of each specimen until a noticeable slip occurred. For the wet method, the Neolite pads and surface of the specimen were fully saturated with distilled water. The non-domed portion of the Detectable Walking Surface was evaluated.

ASTM F609 - Slip Resistance

The slip resistance of the concrete coating material was determined utilizing an Instron Model 3369 UTM (ICN: 005740) equipped with a 500 N load cell (ICN: 143682) and operating at a crosshead speed of 0.5 in/min. The test foot had three Neolite pads of 0.5 inch diameter. With the test foot and specimen leveled to 0°, the cord was pulled horizontally until a peak load was achieved. Each of three specimens were measured four times with 90° rotation between readings for the EcoPath and Detectable Walking Surface for the dry and wet conditions. For the EcoPath product, black, yellow and grey specimens were evaluated.

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ANSI/NFSI B101.1 - Static Coefficient of Friction

The static slip resistance of the concrete coating material as determined utilizing a BOT-3000E Digital Tribometer (ICN: INT00746), which was calibrated to verify that readings fell within ±5% of the reference check tile value. One pass was made on each test area with the Bot-3000E unit in one direction followed by an additional pass made in the opposite direction, another pass in a direction perpendicular to the first (90° offset from the initial travel path), and another pass opposite to the previous pass (with visual evaluation and periodic reconditioning of the neolite contact foot as required). The specimen surface was soaked in distilled water before and during testing. Black, yellow, and grey specimens were evaluated.

ANSI/NFSI B101.3 - Dynamic Coefficient of Friction

The dynamic slip resistance of the concrete coating material as determined utilizing a BOT-3000E Digital Tribometer (ICN: INT00746), which was calibrated to verify that readings fell within ±5% of the reference check tile value. A total of five passes were made on each test area with the Bot-3000E unit in one direction followed by five additional passes made in the opposite direction, another five passes in a direction perpendicular to the first set (90° offset from the initial travel path), and another five passes opposite to the previous pass series (with visual evaluation and periodic reconditioning of the SBR contact foot as required). The specimen surface was soaked in a surfactant solution of 0.1% sodium lauryl sulfate in distilled water before and during testing. Black, yellow, and grey specimens were evaluated.

SECTION 7

TEST SPECIMEN DESCRIPTIONS

TEST PROCEDURE	NUMBER OF SPECIMENS	NOMINAL SPECIMEN DIMENSIONS	VISUAL CHARACTERISTICS
ASTM D1148	6	6 x 3 x1 inch	All six colors
ASTM G155	6	6 x 3 x1 inch	All six colors
ASTM C609	6	6 x 3 x1 inch	All six colors
ASTM C482	6	4 x 4 x 3 inch	Yellow, raised domes
ASTM C501	4	4 x 4 x 0.5 inch	Black, Grey, Yellow, and Green
ASTM D2843	3	1 x 1 x 0.25 inch	White
ASTM D635	10	4.5 x 0.5 x 0.4 inch	Yellow, Grey, and White
ASTM D570	3	3 x 1 x 0.25 inch	Black, Yellow, and White
ASTM F609	3, Flat	8 x 8 x 3 inch	Black, Yellow, and Grey
ANSI B101.1	3	8 x 8 x 3 inch	Black, Yellow, and Grey
ANSI B101.3	3	8 x 8 x 3 inch	Black, Yellow, and Grey
FM 3-C1028	3	8 x 8 x 3 inch	Yellow, raised domes

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TEST RESULTS

ASTM D1148 (ASTM G155) - Accelerated Weathering

SPECIMEN	EXPOSURE (hours)	OBSERVATIONS
1 (Black)	2006	Slight lightening; no other visible deleterious effects
2 (Green)	2006	Slight lightening; no other visible deleterious effects
3 (Blue)	2006	Slight lightening; no other visible deleterious effects
4 (Grey)	2006	Slight lightening; no other visible deleterious effects
5 (Yellow)	2006	Slight lightening; no other visible deleterious effects
6 (White)	2006	Slight lightening; no other visible deleterious effects

ASTM D1148 (ASTM C609) - Discoloration and Color Readings (Initial)

SPECIMEN	L*	a*	b*	Y
1 (Black)	26.98	0.03	-0.91	5.086
2 (Green)	46.86	-24.28	29.83	15.916
3 (Blue)	48.90	-17.71	-32.19	17.512
4 (Grey)	60.99	-0.98	1.33	29.234
5 (Yellow)	71.93	21.23	52.19	43.560
6 (White)	88.96	0.81	8.09	74.071

ASTM D1148 (ASTM C609) - Discoloration and Color Readings (Post-Weathering)

SPECIMEN	L*	a*	b*	Y	DY	DE*
1 (Black)	28.53	0.24	-0.20	5.659	0.572	1.72
2 (Green)	46.02	-27.30	29.14	15.286	-0.630	3.22
3 (Blue)	51.04	-18.26	-31.52	19.299	1.787	2.31
4 (Grey)	64.12	-0.85	2.57	32.953	3.718	3.37
5 (Yellow)	72.81	20.10	48.67	44.881	1.320	3.79
6 (White)	90.08	-0.42	5.54	76.483	2.412	3.05

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ASTM C482 - Bond Strength

SPECIMEN	DIAMETER (in)	MAXIMUM LOAD (lb _f)	BOND STRENGTH (psi)	FAILURE LOCATION
1	0.921	392	588	Substrate Face
2	0.959	467	646	Substrate Face
3	0.942	446	640	Dome Base
4	0.954	414	580	Substrate Face
5	0.973	451	606	Substrate Face
6	0.958	446	618	Substrate Face
Average	0.951	436	613	

ASTM C501 - Abrasion Resistance

SPECIMEN	INITIAL MASS (g)	FINAL MASS (g)	MASS LOSS (g)	ABRASIVE WEAR INDEX
1	338.118	333.814	4.304	20
2	244.992	240.998	3.994	22
3	312.896	308.661	4.235	21
4	265.822	261.708	4.114	21
Average			4.162	21

ASTM D2843 - Smoke Density

SPECIMEN	WIDTH (in)	LENGTH (in)	THICKNESS (in)	MAXIMUM SMOKE DENSITY (%)	SMOKE DENSITY RATING		
1	1.009	0.992	0.257	1.24	0.1		
2	1.009	0.991	0.258	15.75	0.2		
3	1.009	0.990	0.259	1.09	0.1		
Average				5.25	0.1		
SPECIMEN	OBSERVATIONS, (min:sec)						
	GOOD	FAIR	POOR	OBSCURE	FLAME	CHAR	EXTINGUISH
1	0:15	--	--	--	--	--	--
2	0:15	--	--	--	--	--	--
3	0:15	--	--	--	--	--	--

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ASTM D635 - Rate of Burn

SPECIMEN	INITIAL BURN	SUSTAINED BURN	COMMENTS
1	Yes	No	Class CC1
2	Yes	No	Class CC1
3	Yes	No	Class CC1
4	Yes	No	Class CC1
5	Yes	No	Class CC1
6	Yes	No	Class CC1
7	Yes	No	Class CC1
8	Yes	No	Class CC1
9	Yes	No	Class CC1
10	Yes	No	Class CC1

ASTM D570 - Water Absorption

SPECIMEN	DRY WEIGHT (g)	WET WEIGHT (g)	REDRIED WEIGHT (g)	WEIGHT INCREASE (%)	SOLUBLE MATTER LOST (%)	WATER ABSORBED (%)
1	1.299	1.322	1.293	1.77	0.46	2.23
2	2.649	2.681	2.643	1.21	0.23	1.43
3	1.828	1.853	1.821	1.37	0.38	1.75
Average				1.45	0.36	1.81

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FM 3-C1028 - Calibration Data

Pull No.	Dry Condition (lb _f)	Wet Condition (lb _f)
1 (0°)	19.1	14.5
2 (90°)	20.0	14.7
3 (180°)	18.3	14.4
4 (270°)	17.0	14.9
Average	18.6	14.6
CoF	0.267	0.043

FM 3-C1028 - Static Coefficient of Friction

Specimen ID		F-A-1		F-A-2		F-A-3	
Condition		Dry (lb _f)	Wet (lb _f)	Dry (lb _f)	Wet (lb _f)	Dry (lb _f)	Wet (lb _f)
Pull	1 (0°)	28.8	25.8	27.7	25.9	27.8	26.5
	2 (90°)	28.9	25.8	27.9	26.3	25.7	26.8
	3 (180°)	29.2	26.1	26.1	25.8	27.4	24.9
	4 (270°)	28.9	27.2	28.3	25.7	27.5	27.1
Total		115.8	104.9	110.0	103.7	108.4	105.3
Individual CoF		1.19	0.88	1.14	0.87	1.13	0.88
Average CoF		Dry	1.16	Wet	0.88		

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ASTM F609 - Slip Resistance, Dry

SPECIMEN	PULL DIRECTION	STATIC LOAD (lb _f)	STATIC CoF	SLIP INDEX
1	0°	5.3	0.87	8.7
	90°	5.0	0.82	8.2
	180°	5.0	0.83	8.3
	270°	9.1	1.50	15
2	0°	3.5	0.57	5.7
	90°	4.5	0.74	7.4
	180°	4.2	0.69	6.9
	270°	3.8	0.62	6.2
3	0°	4.8	0.79	7.9
	90°	5.9	0.96	9.6
	180°	3.7	0.61	6.1
	270°	6.5	1.07	10.7
Average		5.1	0.84	8.4
Std. Dev.		1.539	0.253	2.532

ASTM F609 - Slip Resistance, Wet

SPECIMEN	PULL DIRECTION	STATIC LOAD (lb _f)	STATIC CoF	SLIP INDEX
1	0°	5.1	0.84	8.4
	90°	5.1	0.83	8.3
	180°	6.1	1.01	10.1
	270°	5.0	0.82	8.2
2	0°	4.9	0.81	8.1
	90°	5.5	0.91	9.1
	180°	4.3	0.71	7.1
	270°	4.5	0.74	7.4
3	0°	4.9	0.81	8.1
	90°	6.1	1.00	10.0
	180°	5.4	0.88	8.8
	270°	5.9	0.97	9.7
Average		5.2	0.86	8.6
Std. Dev.		0.577	0.095	0.949

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ANSI B101.1 - Static Coefficient of Friction

SPECIMEN	PULL DIRECTION	STATIC LOAD (lb _f)	LOCATION AVERAGE
1	180° - 0°	0.98	0.98
	0° - 180°	0.99	
	270° - 90°	0.99	
	90° - 270°	0.96	
2	180° - 0°	0.94	0.94
	0° - 180°	0.93	
	270° - 90°	0.93	
	90° - 270°	0.95	
3	180° - 0°	0.98	0.98
	0° - 180°	0.99	
	270° - 90°	0.98	
	90° - 270°	0.98	
Test Average			0.97

ANSI B101.3 - Dynamic Coefficient of Friction

SPECIMEN	PULL DIRECTION	STATIC LOAD (lb _f)					LOCATION AVERAGE
		1	2	3	4	5	
1	180° - 0°	0.65	0.65	0.64	0.64	0.65	0.65
	0° - 180°	0.58	0.63	0.62	0.63	0.62	
	270° - 90°	0.67	0.66	0.61	0.67	0.64	
	90° - 270°	0.68	0.66	0.67	0.66	0.68	
2	180° - 0°	0.62	0.59	0.59	0.59	0.59	0.61
	0° - 180°	0.59	0.62	0.61	0.57	0.61	
	270° - 90°	0.59	0.55	0.64	0.63	0.64	
	90° - 270°	0.62	0.63	0.60	0.62	0.61	
3	180° - 0°	0.64	0.71	0.70	0.71	0.67	0.68
	0° - 180°	0.70	0.70	0.65	0.64	0.66	
	270° - 90°	0.63	0.68	0.72	0.65	0.70	
	90° - 270°	0.68	0.70	0.70	0.70	0.70	
Test Average						0.64	

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SECTION 9

CONCLUSION

The Ecopath/SkidGuard and TWSI/Detectable/Tactile Cue concrete coating materials met the specified performance requirements of ASTM D635 with a Class CC1 rating. The other methods performed did not have specified performance criteria.

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SECTION 10

PHOTOGRAPHS

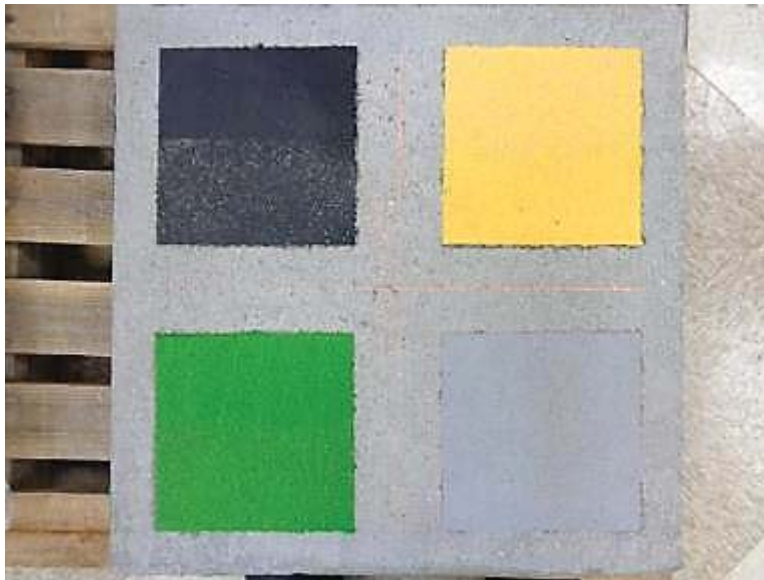


Photo No. 1
EcoPath on Concrete As-Received

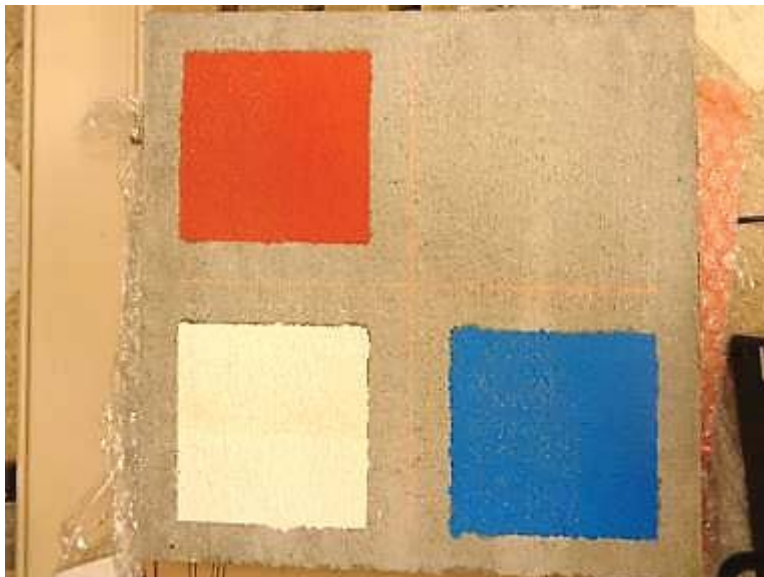


Photo No. 2
EcoPath on Concrete As-Received

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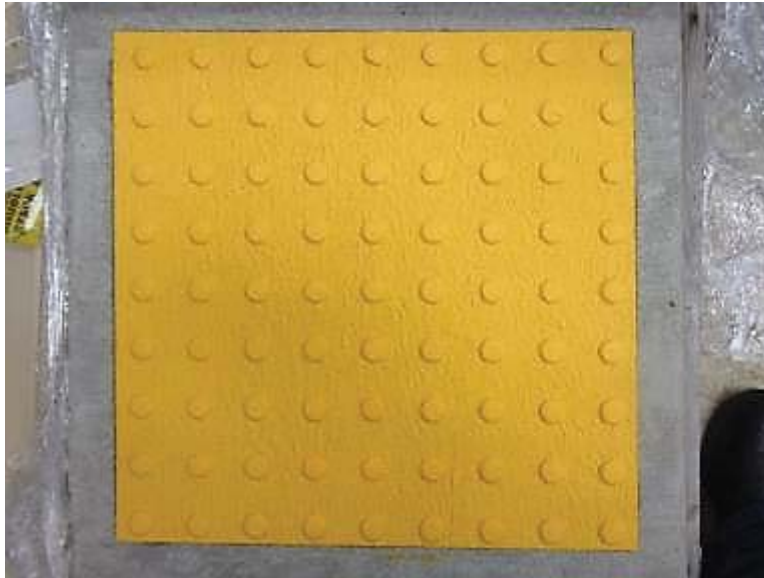


Photo No. 3
Detectable Walking Surface Material As-Received



Photo No. 4
EcoPath on Plastic As-Received

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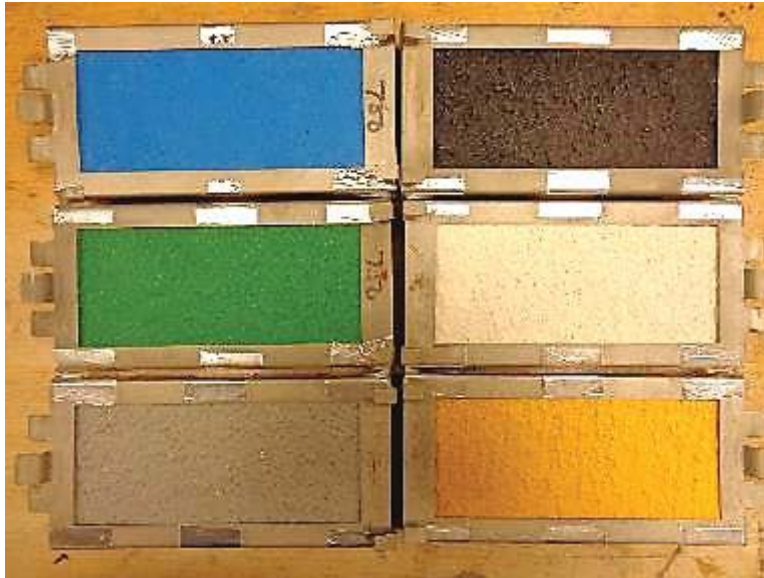


Photo No. 5
Weathering Specimen Detail



Photo No. 6
Post-Weathering Specimen Detail

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Photo No. 7
Color Test In-Progress Detail



Photo No. 8
Typical Bond Strength Specimen Detail

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Photo No. 9
Bond Strength Test Setup Detail



Photo No. 10
Bond Strength Test In-Progress Detail

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Photo No. 11
Bond Strength Failure Detail



Photo No. 12
Abrasion Specimen Detail

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Photo No. 13
Abrasion Test Setup Detail



Photo No. 14
H-22 Calibrade Abrasion Wheel Detail

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Photo No. 15

Typical Smoke Density Specimen Detail



Photo No. 16

Typical Smoke Density Test Setup Detail

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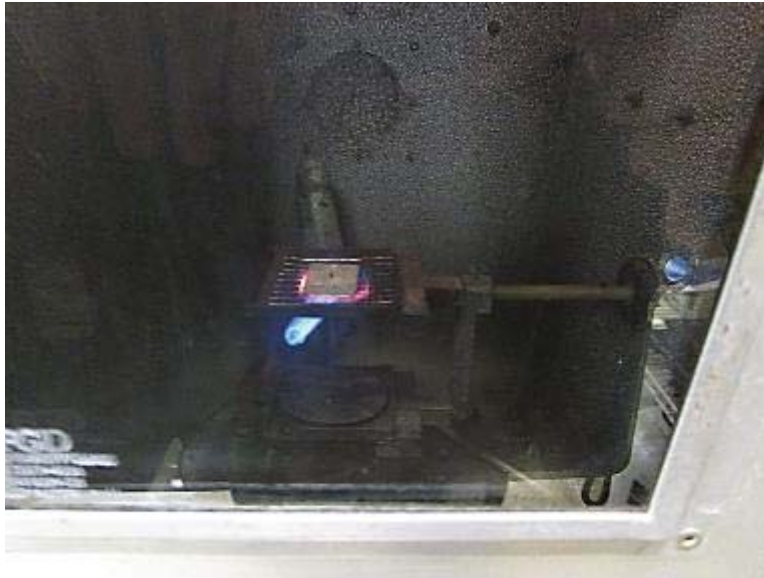


Photo No. 17
Typical Smoke Density Test Setup Detail



Photo No. 18
Typical Smoke Density Specimen Detail

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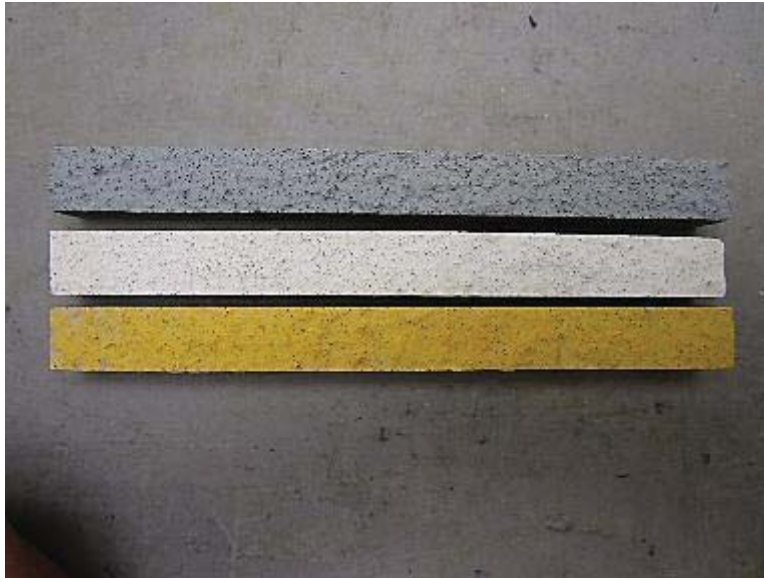


Photo No. 19
Typical Rate of Burn Specimen Detail



Photo No. 20
Typical Rate of Burn Test Setup Detail

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Photo No. 21

Typical Rate of Burn Test In-Progress Detail



Photo No. 22

Post-Test Rate of Burn Specimen Detail

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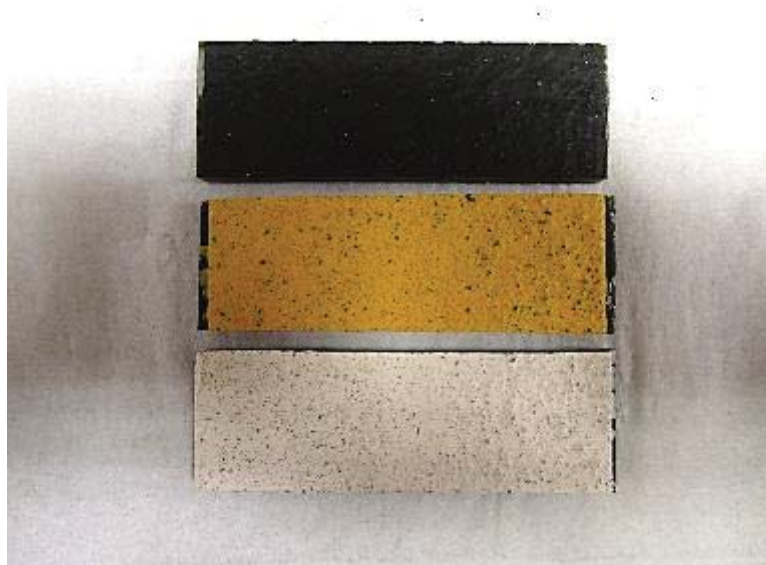


Photo No. 23

Water Absorption Specimen Detail



Photo No. 24

Water Absorption Test In-Progress Detail

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Photo No. 25
Typical FM 3-C1028 Test Detail



Photo No. 26
Typical ASTM F609 Test Setup Detail

TEST REPORT FOR VANGUARD ADA SYSTEMS OF AMERICA

Report No.: I4016.01-106-31 R0

Date: 05/08/19



Photo No. 27
Typical Friction Test In-Progress Detail



Photo No. 28
Typical Wet Friction Surface Detail

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Photo No. 29

Typical Slip Resistance Wet Specimen Detail



Photo No. 30

Typical BOT-3000 Slip Resistance Test In-Progress Detail



Total Quality. Assured.

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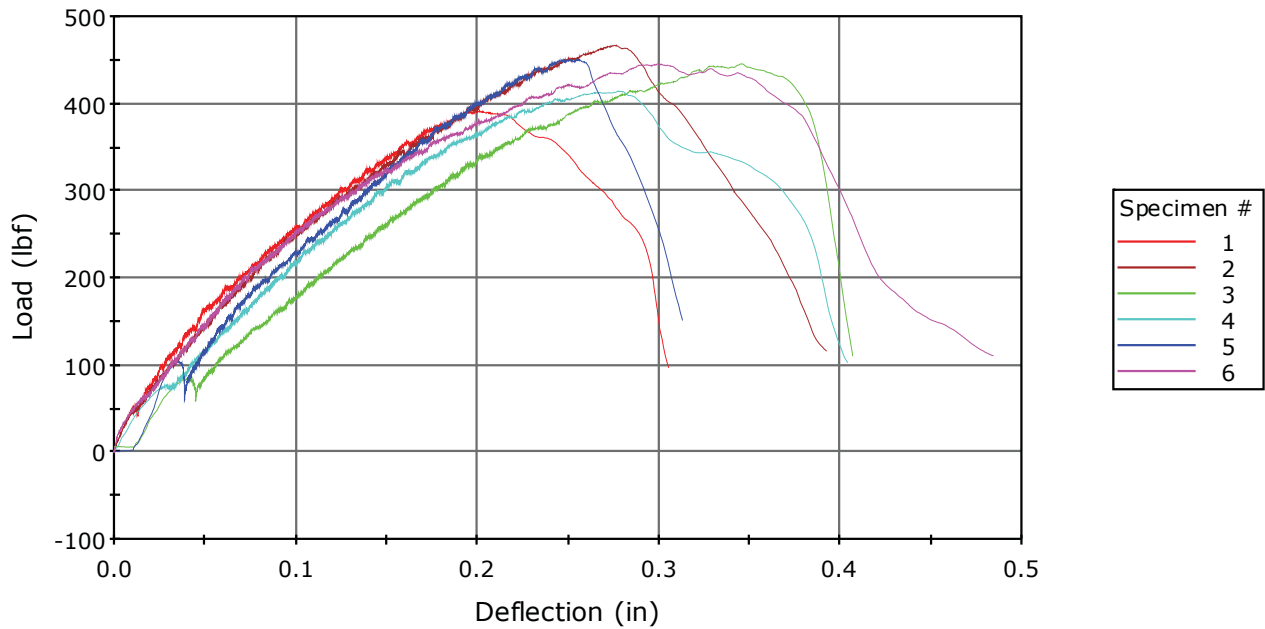
SECTION 11

DATA SHEETS

ASTM C482-02 (2014), Bond (Shear) Strength

Intertek-ATI Job #	I4016.01-106-31
Client Name	Vanguard ADA Systems of America
Sample Description	Vanguard Detectable Walking Surface
Test Speed	200 psi/min
Lab Conditions	71.5°F / 42.4%RH
Load Cell Capacity / ICN	50 kN / 005741
Test Frame / ICN	Instron / 005740
User	Josh K.

Specimen 1 to 6



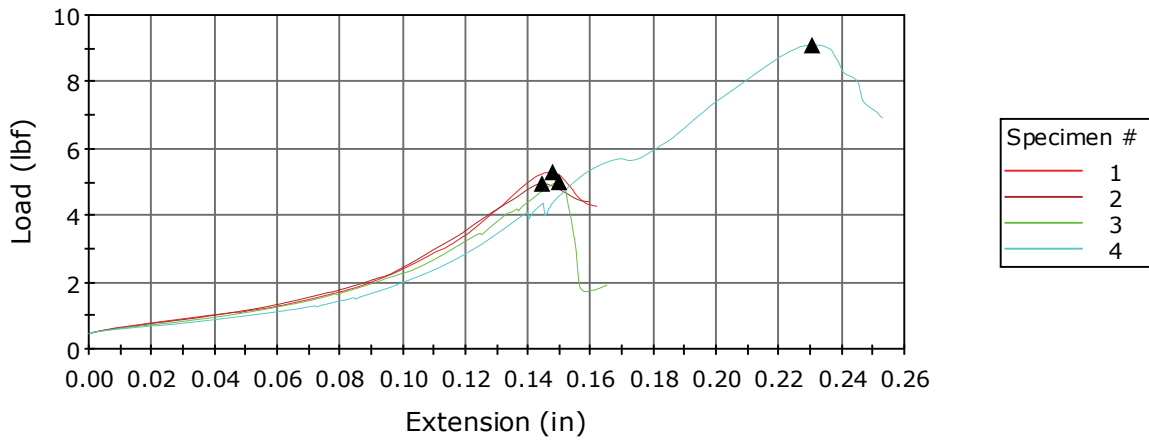
	Specimen ID	Diameter (in)	Maximum Load (lbf)	Bond Strength (psi)	Failure Location
1	B-1	0.921	392	588	Substrate Face
2	B-2	0.959	467	646	Substrate Face
3	B-3	0.942	446	640	Dome Base
4	B-4	0.954	414	580	Substrate Face
5	B-5	0.973	451	606	Substrate Face
6	B-6	0.958	446	618	Substrate Face
Mean		0.951	436	613	

Total Quality. Assured.

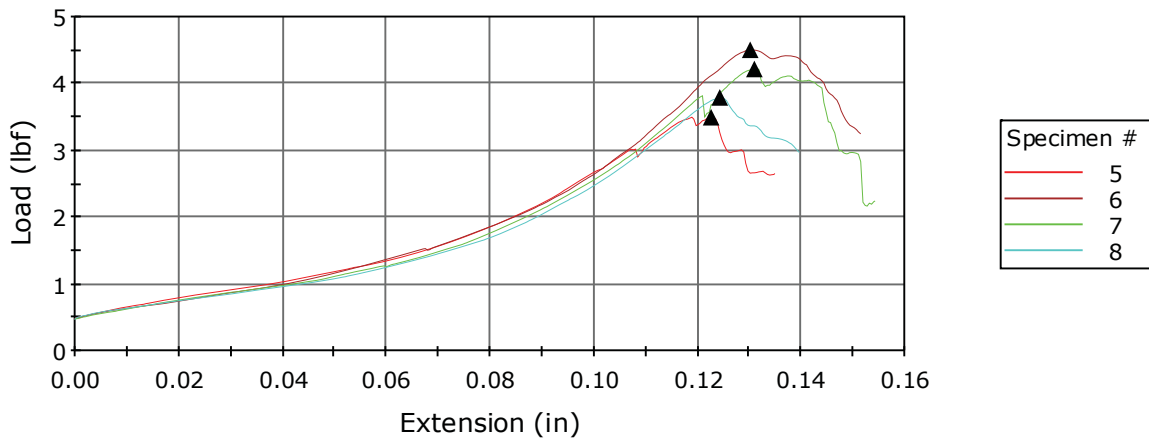
ASTM F609-05 (Reapproved 2013), Standard Test Method for Using a Horizontal Pull Slipmeter

Intertek-ATI Job #	I4016.01-106-31
Client Name	Vanguard ADA Systems of America
Lab Conditions	70.4°F / 46.1% R.H.
Test Speed	0.5 in./min.
User	Josh K.
Slope of Test (if not horizontal)	Horizontal
Type of Test Foot	Neolite
Material/Texture of Test Area	Rough Walking Surface
Load Cell Capacity / ICN	500 N / 143682
Load Cell Calibration Due Date	10/4/19
Frame / ICN	Instron / 005740
Frame Calibration Due Date	10/2/19

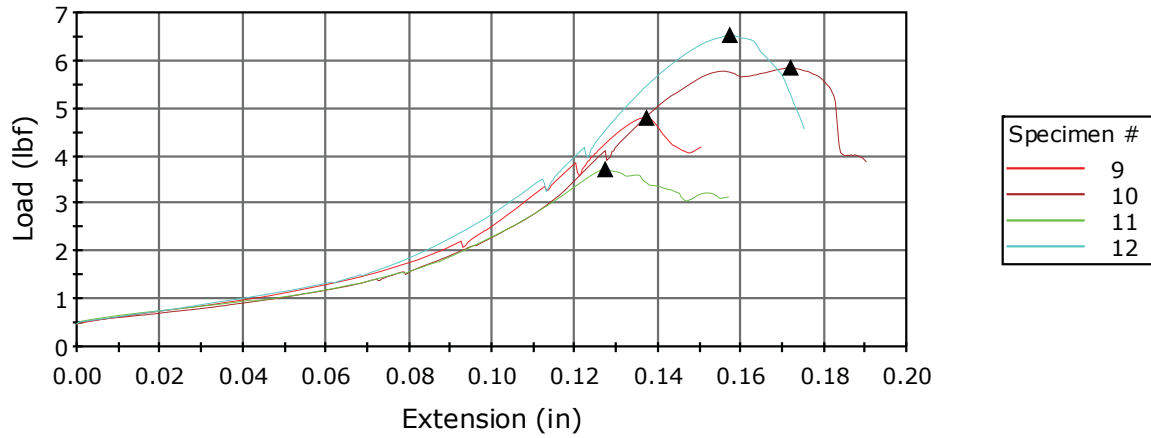
Specimen 1 to 4



Specimen 5 to 8



Specimen 9 to 12



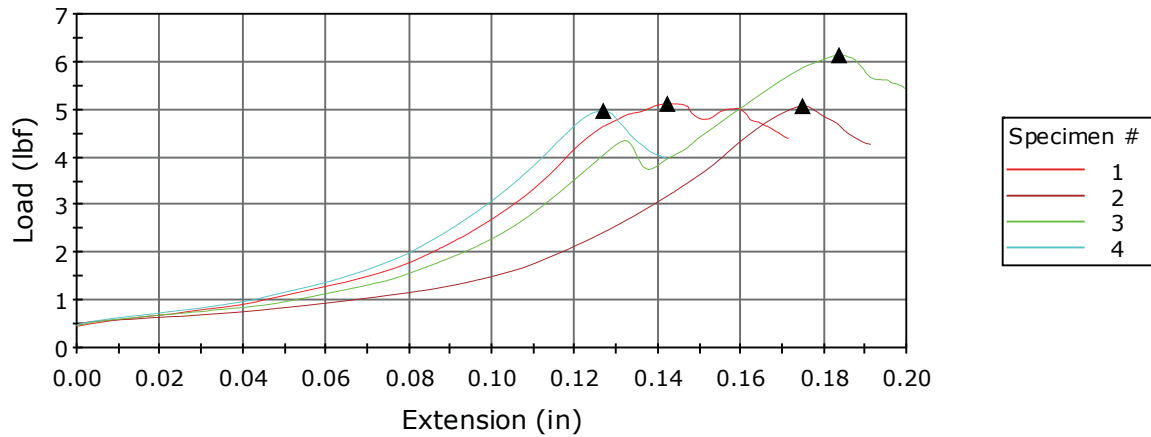
	Specimen ID	Static Load (lbf)	Static Coefficient of Friction	Slip Index
1	1-Dry-0°	5.3	0.87	8.7
2	1-Dry-90°	5.0	0.82	8.2
3	1-Dry-180°	5.0	0.83	8.3
4	1-Dry-270°	9.1	1.50	15.0
5	2-Dry-0°	3.5	0.57	5.7
6	2-Dry-90°	4.5	0.74	7.4
7	2-Dry-180°	4.2	0.69	6.9
8	2-Dry-270°	3.8	0.62	6.2
9	3-Dry-0°	4.8	0.79	7.9
10	3-Dry-90°	5.9	0.96	9.6
11	3-Dry-180°	3.7	0.61	6.1
12	3-Dry-270°	6.5	1.07	10.7
Mean		5.1	0.84	8.4
Standard Deviation		1.539	0.253	2.532

Total Quality. Assured.

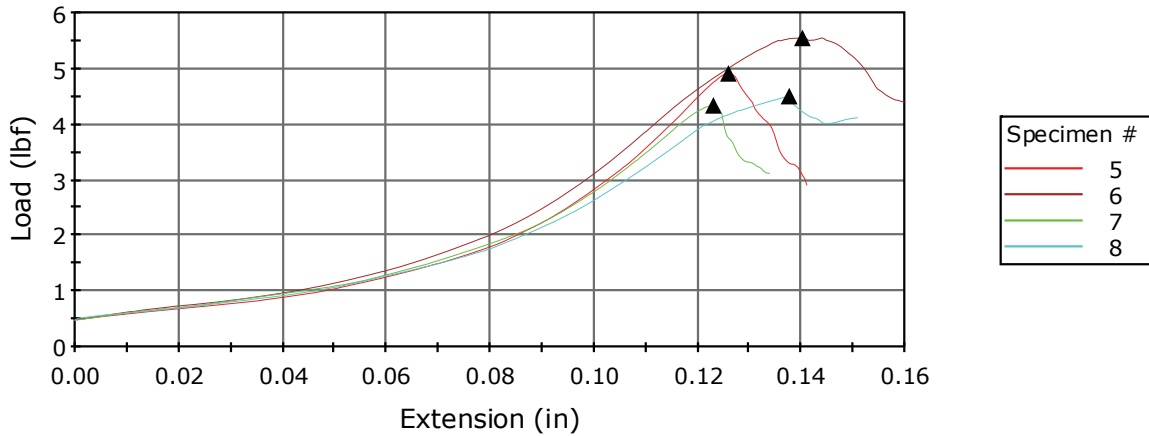
ASTM F609-05 (Reapproved 2013), Standard Test Method for Using a Horizontal Pull Slipmeter

Intertek-ATI Job #	I4016.01-106-31
Client Name	Vanguard ADA Systems of America
Lab Conditions	70.4°F / 40.9% R.H.
Test Speed	0.5 in./min.
User	Josh K.
Floor Condition	Wet
Slope of Test (if not horizontal)	Horizontal
Type of Test Foot	Neolite
Material/Texture of Test Area	Rough Walking Surface
Load Cell Capacity / ICN	500 N / 143682
Load Cell Calibration Due Date	10/4/19
Frame / ICN	Instron / 005740
Frame Calibration Due Date	10/2/19

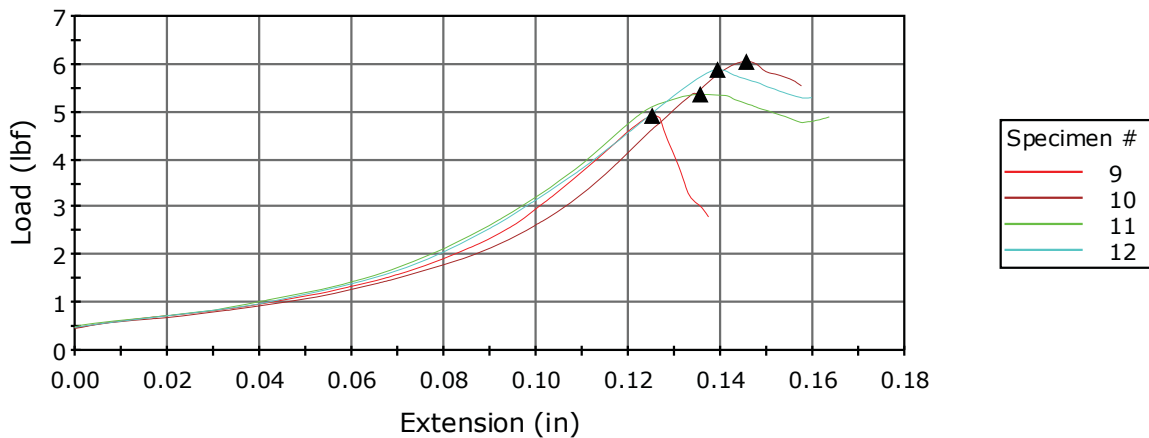
Specimen 1 to 4



Specimen 5 to 8



Specimen 9 to 12



	Specimen ID	Static Load (lbf)	Static Coefficient of Friction	Slip Index
1	1-Wet-0°	5.1	0.84	8.4
2	1-Wet-90°	5.1	0.83	8.3
3	1-Wet-180°	6.1	1.01	10.1
4	1-Wet-270°	5.0	0.82	8.2
5	2-Wet-0°	4.9	0.81	8.1
6	2-Wet-90°	5.5	0.91	9.1
7	2-Wet-180°	4.3	0.71	7.1
8	2-Wet-270°	4.5	0.74	7.4
9	3-Wet-0°	4.9	0.81	8.1
10	3-Wet-90°	6.1	1.00	10.0
11	3-Wet-180°	5.4	0.88	8.8
12	3-Wet-270°	5.9	0.97	9.7
Mean		5.2	0.86	8.6
Standard Deviation		0.577	0.095	0.949



Total Quality. Assured.

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TEST REPORT FOR VANGUARD ADA SYSTEMS OF AMERICA

Report No.: I4016.01-106-31 R0

Date: 05/08/19

SECTION 12

LIGHT ABSORPTION CURVES

Smoke Density Testing per ASTM D 2843

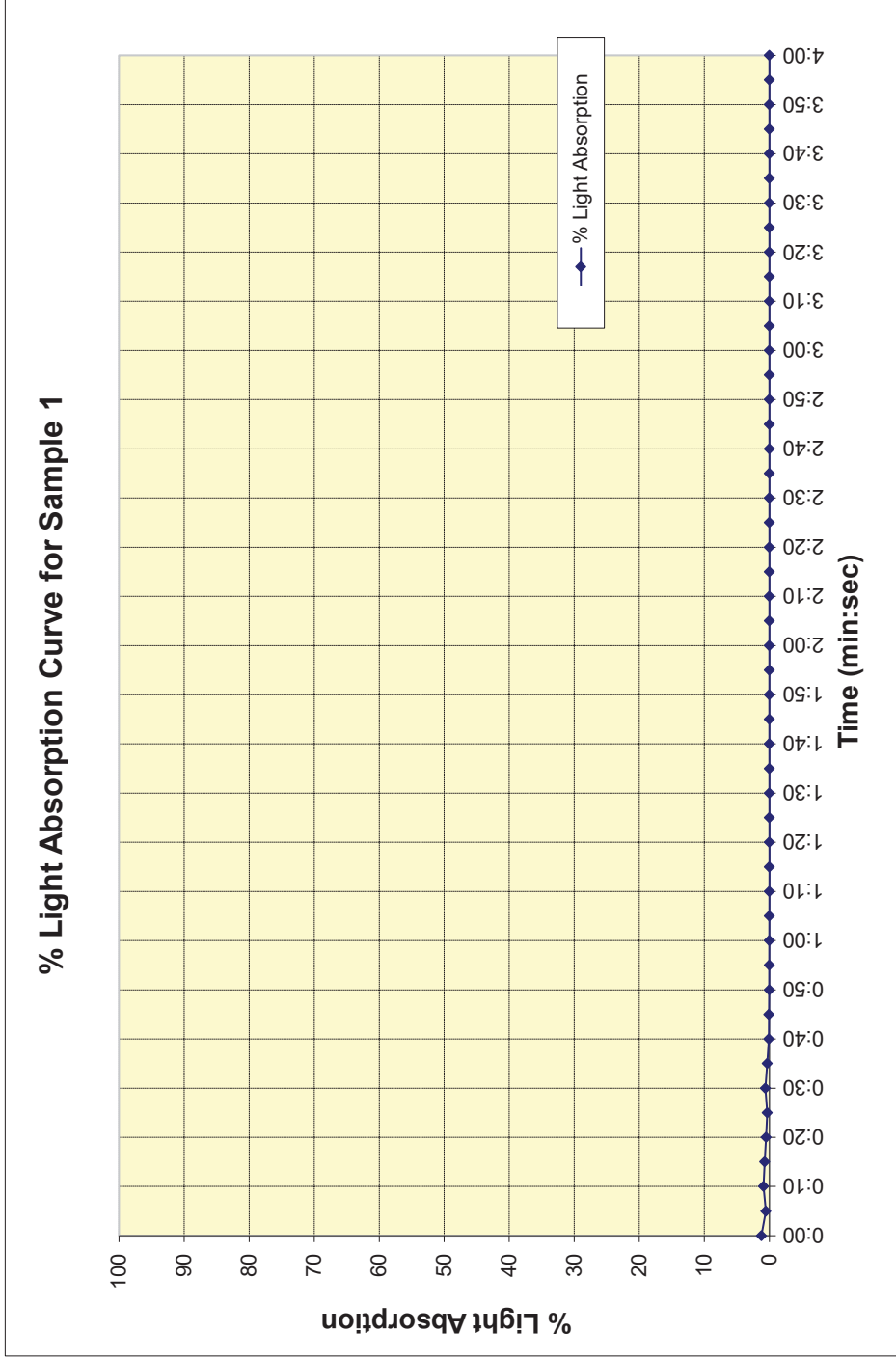
Exit Sign Chamber

Job No.: I4016.01-106-31
 Test Date: 3/6/2019
 Technician: Joshua Kennedy

Time (min:sec)	% Light Absorption	% Light Absorption
0:00	98.76	1.24
0:05	99.44	0.56
0:10	99.10	0.90
0:15	99.27	0.73
0:20	99.47	0.53
0:25	99.66	0.34
0:30	99.40	0.60
0:35	99.65	0.35
0:40	99.90	0.10
0:45	99.93	0.07
0:50	100.00	0.00
0:55	100.00	0.00
1:00	99.98	0.02
1:05	100.00	0.00
1:10	100.00	0.00
1:15	100.00	0.00
1:20	100.00	0.00
1:25	100.00	0.00
1:30	100.00	0.00
1:35	100.00	0.00
1:40	100.00	0.00
1:45	100.00	0.00
1:50	100.00	0.00
1:55	100.00	0.00
2:00	100.00	0.00
2:05	100.00	0.00
2:10	100.00	0.00
2:15	100.00	0.00
2:20	100.00	0.00
2:25	100.00	0.00
2:30	100.00	0.00
2:35	100.00	0.00
2:40	100.00	0.00
2:45	100.00	0.00
2:50	100.00	0.00
2:55	100.00	0.00
3:00	100.00	0.00
3:05	100.00	0.00
3:10	100.00	0.00
3:15	100.00	0.00
3:20	100.00	0.00
3:25	100.00	0.00
3:30	100.00	0.00
3:35	100.00	0.00
3:40	100.00	0.00
3:45	100.00	0.00
3:50	100.00	0.00
3:55	100.00	0.00
4:00	100.00	0.00

Sample #	Manufacturer	Product Name	Material Type	Width (in)	Length (in)	Thickness (in)
1	Iard ADA Systems of A	EcoPath	Concrete Coating	1.009	0.992	0.257

% Light Absorption Curve for Sample 1



Calibration	Resistance (kW)
100% Light	2.688

Plot Area 240 Maximum Smoke Density 1.24 %
 Area Under Curve 0.3 Smoke Density Rating* 0.1

* Note: Miami-Dade County requires the Smoke Density Rating to be less than 75.

Smoke Density Testing per ASTM D 2843

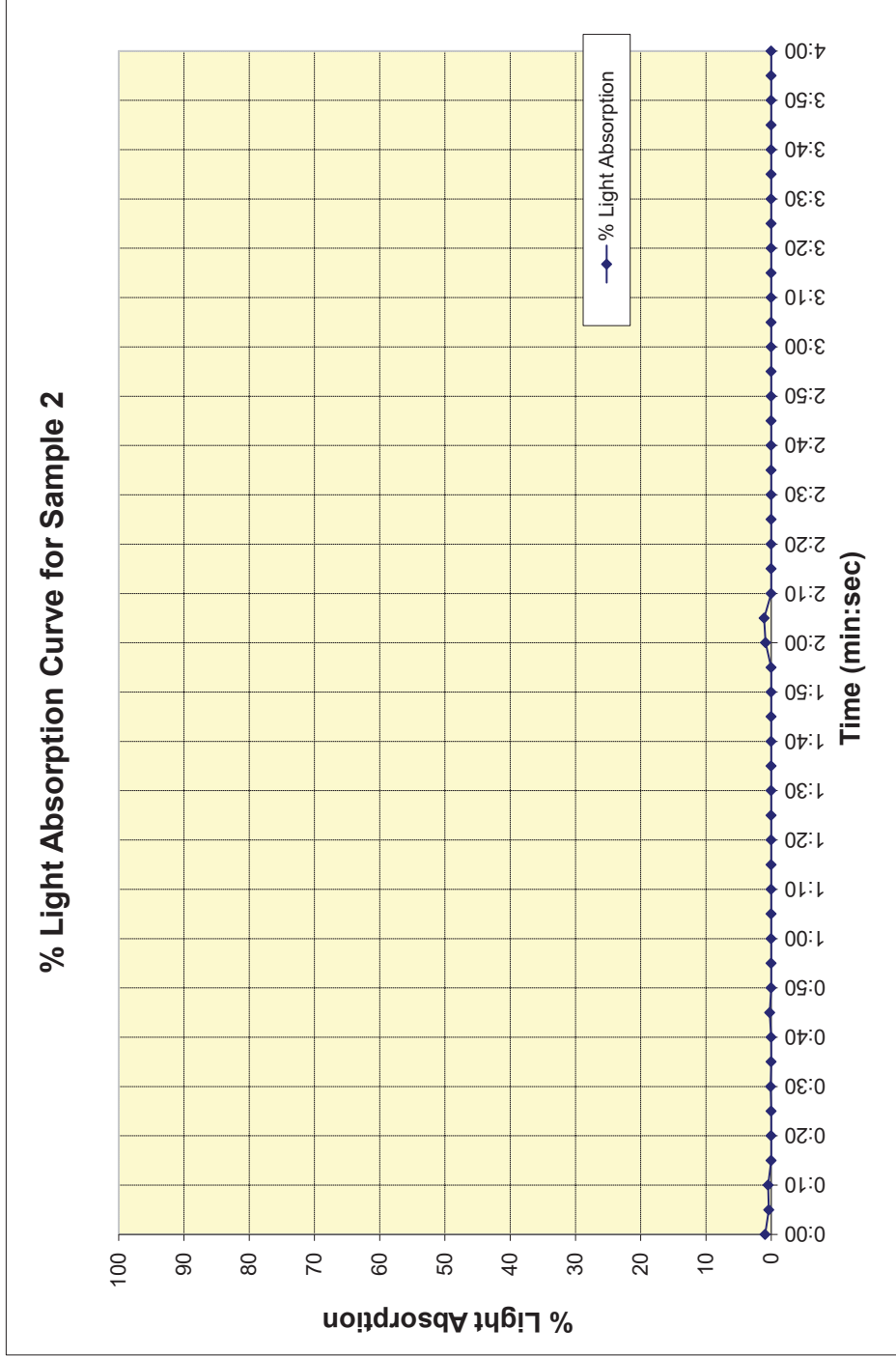
Exit Sign Chamber

Job No.: I4016.01-106-31
 Test Date: 3/6/2019
 Technician: Joshua Kennedy

Time (min:sec)	% Light Absorption	% Light Absorption
0:00	99.05	0.95
0:05	99.62	0.38
0:10	99.51	0.49
0:15	100.00	0.00
0:20	100.00	0.00
0:25	100.00	0.00
0:30	99.90	0.10
0:35	100.00	0.00
0:40	99.98	0.02
0:45	99.77	0.23
0:50	100.00	0.00
0:55	100.00	0.00
1:00	100.00	0.00
1:05	100.00	0.00
1:10	100.00	0.00
1:15	100.00	0.00
1:20	100.00	0.00
1:25	100.00	0.00
1:30	100.00	0.00
1:35	100.00	0.00
1:40	100.00	0.00
1:45	100.00	0.00
1:50	100.00	0.00
1:55	100.00	0.00
2:00	99.13	0.87
2:05	98.90	1.10
2:10	100.00	0.00
2:15	100.00	0.00
2:20	100.00	0.00
2:25	100.00	0.00
2:30	100.00	0.00
2:35	100.00	0.00
2:40	100.00	0.00
2:45	100.00	0.00
2:50	100.00	0.00
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3:30	100.00	0.00
3:35	100.00	0.00
3:40	100.00	0.00
3:45	100.00	0.00
3:50	100.00	0.00
3:55	100.00	0.00
4:00	100.00	0.00

Sample #	Manufacturer	Product Name	Material Type	Width (in)	Length (in)	Thickness (in)
2	Iard ADA Systems of A	EcoPath	Concrete Coating	1.009	0.991	0.258

% Light Absorption Curve for Sample 2



Calibration	Resistance (kW)
100% Light	2.745

Plot Area 240 Maximum Smoke Density 15.75 %
 Area Under Curve 0.4 Smoke Density Rating* 0.2

* Note: Miami-Dade County requires the Smoke Density Rating to be less than 75.

Smoke Density Testing per ASTM D 2843

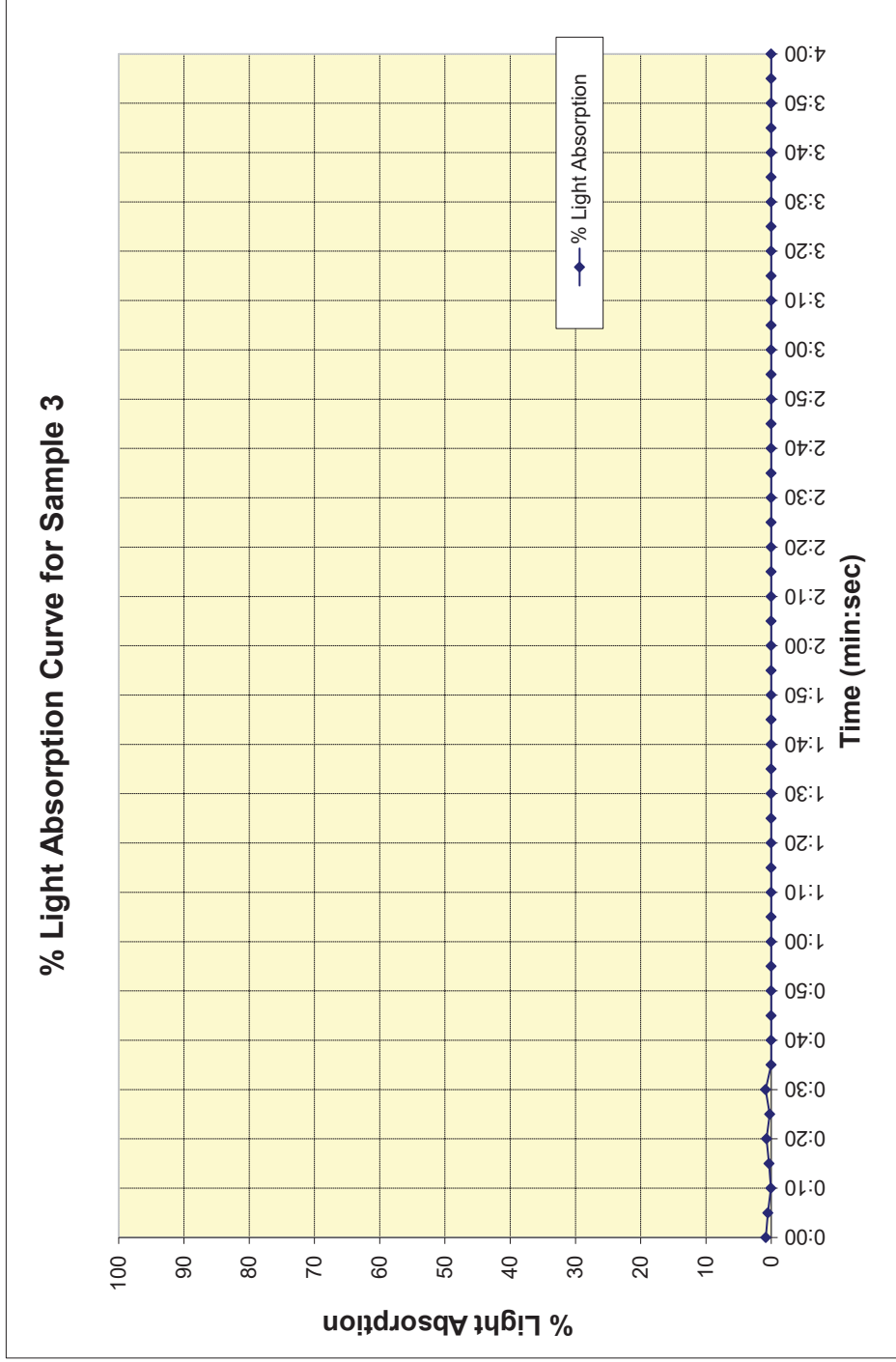
Exit Sign Chamber

Job No.: I4016.01-106-31
 Test Date: 3/6/2019
 Technician: Joshua Kennedy

Time (min:sec)	% Light Absorption	% Light Absorption
0:00	99.17	0.83
0:05	99.49	0.51
0:10	99.93	0.07
0:15	99.66	0.34
0:20	99.28	0.72
0:25	99.76	0.24
0:30	99.14	0.86
0:35	100.00	0.00
0:40	100.00	0.00
0:45	100.00	0.00
0:50	100.00	0.00
0:55	100.00	0.00
1:00	100.00	0.00
1:05	100.00	0.00
1:10	100.00	0.00
1:15	100.00	0.00
1:20	100.00	0.00
1:25	100.00	0.00
1:30	100.00	0.00
1:35	100.00	0.00
1:40	100.00	0.00
1:45	100.00	0.00
1:50	100.00	0.00
1:55	100.00	0.00
2:00	100.00	0.00
2:05	100.00	0.00
2:10	100.00	0.00
2:15	100.00	0.00
2:20	100.00	0.00
2:25	100.00	0.00
2:30	100.00	0.00
2:35	100.00	0.00
2:40	100.00	0.00
2:45	100.00	0.00
2:50	100.00	0.00
2:55	100.00	0.00
3:00	100.00	0.00
3:05	100.00	0.00
3:10	100.00	0.00
3:15	100.00	0.00
3:20	100.00	0.00
3:25	100.00	0.00
3:30	100.00	0.00
3:35	100.00	0.00
3:40	100.00	0.00
3:45	100.00	0.00
3:50	100.00	0.00
3:55	100.00	0.00
4:00	100.00	0.00

Sample #	Manufacturer	Product Name	Material Type	Width (in)	Length (in)	Thickness (in)
3	Iard ADA Systems of A	EcoPath	Concrete Coating	1.009	0.990	0.259

% Light Absorption Curve for Sample 3



Calibration	Resistance (kW)
100% Light	2.719

Plot Area: 240
 Area Under Curve: 0.1
 Maximum Smoke Density: 1.09 %
 Smoke Density Rating*: 0.1

* Note: Miami-Dade County requires the Smoke Density Rating to be less than 75.

Smoke Density Testing per ASTM D 2843

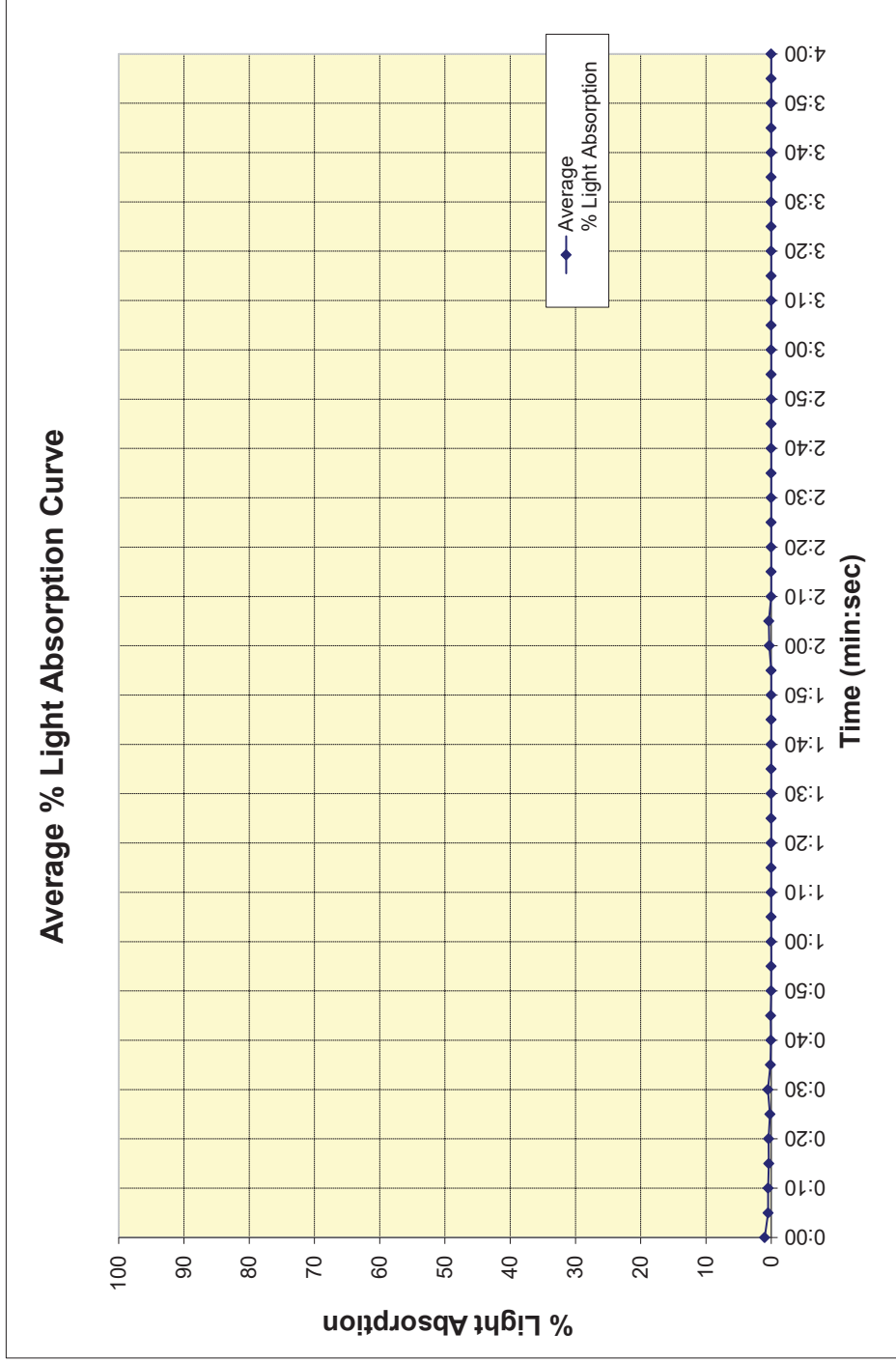
Exit Sign Chamber

Job No.: I4016.01-106-31
 Test Date: 3/6/2019
 Technician: Joshua Kennedy

Time (min:sec)	Average % Light Absorption
0:00	1.00
0:05	0.48
0:10	0.49
0:15	0.36
0:20	0.42
0:25	0.19
0:30	0.52
0:35	0.12
0:40	0.04
0:45	0.10
0:50	0.00
0:55	0.00
1:00	0.01
1:05	0.00
1:10	0.00
1:15	0.00
1:20	0.00
1:25	0.00
1:30	0.00
1:35	0.00
1:40	0.00
1:45	0.00
1:50	0.00
1:55	0.00
2:00	0.29
2:05	0.37
2:10	0.00
2:15	0.00
2:20	0.00
2:25	0.00
2:30	0.00
2:35	0.00
2:40	0.00
2:45	0.00
2:50	0.00
2:55	0.00
3:00	0.00
3:05	0.00
3:10	0.00
3:15	0.00
3:20	0.00
3:25	0.00
3:30	0.00
3:35	0.00
3:40	0.00
3:45	0.00
3:50	0.00
3:55	0.00
4:00	0.00

Sample #	Manufacturer	Product Name	Material Type	Width (in)	Length (in)	Thickness (in)
AVERAGE	Iard ADA Systems of A	EcoPath	Concrete Coating	1.009	0.991	0.258

Average % Light Absorption Curve



Calibration	Resistance (kW)
100% Light	2.688

Plot Area: 240
 Area Under Curve: 0.3
 Maximum Smoke Density: 5.25 %
 Smoke Density Rating*: 0.1

* Note: Miami-Dade County requires the Smoke Density Rating to be less than 75.



Total Quality. Assured.

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SECTION 13

REVISION LOG

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