



REPORT

545 E. Algonquin Rd., Arlington Heights, IL 60005

Project No. G101513575

Date: February 4, 2014

REPORT NO. 101513575CHI-002

TEST OF ONE LOW VOLTAGE LED TAPE LIGHT - ONE FOOT

MODEL NO. DI-24V-AV50-90**

RENDERED TO

ELEMENTAL LED, INC. DBA DIODE LED
1195 PARK AVENUE, STE. 211
EMERYVILLE, CA 94608

TEST: Electrical and Photometric tests as required to the IESNA test standard.

STATEMENT OF LIMITATION: This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

AUTHORIZATION: The testing performed was authorized by signed quote number 500504193.

STANDARDS USED: The following American National Standards or Illuminating Engineering Society of North America Test Guides were used in part or totally to test each specimen:

IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting

ANSI NEMA ANSLG C78.377: 2012: Specifications of the Chromaticity of Solid State Lighting Products

DESCRIPTION OF SAMPLE: The client submitted one production sample of model number DI-24V-AV50-90**. The sample was received by Intertek on January 29, 2014, in undamaged condition and one sample was tested as received. The sample designation was 01292014024013D.

DATE OF TEST: February 4, 2014

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SUMMARY

Model No.:	DI-24V-AV50-90**
Description:	Low Voltage LED Tape Light - One Foot

Criteria	Result
Total Lumen Output (Lumens)	172.5
Total Power (W)	2.033
Luminaire Efficacy (LPW)	84.85
Power Factor	1.000
Current ATHD %	n/a
Correlated Color Temperature (CCT - K)	5212
Color Rendering Index (CRI - Ra)	91.8
Color Rendering Index (CRI - R9)	70.8
DUV	0.001
Chromaticity Coordinate (x)	0.339
Chromaticity Coordinate (y)	0.346
Chromaticity Coordinate (u')	0.210
Chromaticity Coordinate (v')	0.481

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date
Labsphere Spectroradiometer/ 2M Sphere	CDS1100	146137	VBU	VBU
Omega Thermometer	MDSi8	146873	08/26/13	08/26/14
Yokogawa Power Meter	WT1600	146767	05/18/13	05/18/14
Sorenson DC Power Supply	XFR150-8	146847	VBU	VBU
Sorenson DC Power Supply	XFR35-35	146850	VBU	VBU
Newport Thermohyrometer	THX-M	146382	08/26/13	08/26/14

TEST METHODS

Seasoning in Sample Orientation – LED Products

No seasoning was performed in accordance with IESNA LM-79.

Photometric and Electrical Measurements – Integrating Sphere Method

A Labsphere Model CDS 1100 CCD Array Spectroradiometer and Two Meter Sphere was used to measure correlated color temperature, chromaticity coordinates, and the color rendering index for each sample.

Ambient temperature was measured at a position inside the sphere. Each sample was operated on the client provided driver at the rated input voltage in its designated orientation. Each sample was allowed to stabilize for at least thirty minutes before measurements were made. Electrical measurements including voltage, current, and power were measured using the Xitron or Yokogawa Power Analyzer.

The calibration of the sphere photometer-spectroradiometer system is traceable to the National Institute of Standards and Technology.



RESULTS OF TEST

Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) - Integrating Sphere Method

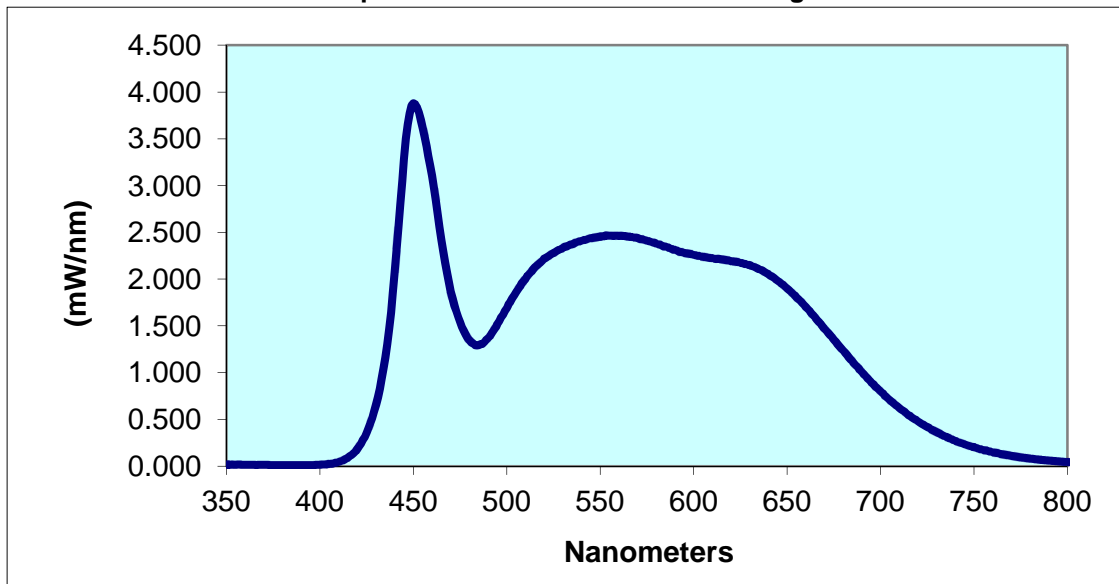
Intertek Sample No.	Base Orientation	Input Voltage {Vdc}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
01292014024013D	UP	24.0	84.67	2.033	1.000	n/a	172.5	84.85

Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
5212	91.8	70.8	0.001	0.339	0.346	0.210	0.481

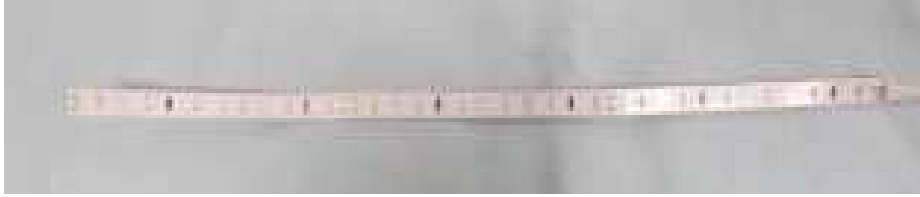
Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.015	440	2.072	530	2.333	620	2.192	710	0.623
355	0.015	445	3.282	535	2.372	625	2.174	715	0.547
360	0.015	450	3.881	540	2.409	630	2.148	720	0.478
365	0.015	455	3.611	545	2.435	635	2.106	725	0.419
370	0.014	460	3.103	550	2.453	640	2.052	730	0.363
375	0.013	465	2.421	555	2.465	645	1.982	735	0.314
380	0.011	470	1.868	560	2.461	650	1.899	740	0.27
385	0.011	475	1.536	565	2.454	655	1.805	745	0.233
390	0.011	480	1.346	570	2.439	660	1.703	750	0.201
395	0.012	485	1.296	575	2.409	665	1.591	755	0.173
400	0.016	490	1.37	580	2.379	670	1.47	760	0.15
405	0.024	495	1.519	585	2.349	675	1.352	765	0.129
410	0.045	500	1.691	590	2.312	680	1.235	770	0.111
415	0.091	505	1.861	595	2.279	685	1.119	775	0.094
420	0.184	510	2.003	600	2.258	690	1.005	780	0.081
425	0.359	515	2.126	605	2.239	695	0.898		
430	0.657	520	2.217	610	2.223	700	0.8		
435	1.16	525	2.28	615	2.21	705	0.707		

Spectral Data Over Visible Wavelengths



PICTURE (not to scale)



CONCLUSION

The results tabulated in this report are representative of the actual test samples submitted for this report only. The data is provided to the client for further evaluation. Compliance to the referenced specification requirements was not determined in this report.

In Charge Of Tests:



Tim Quigley
Engineer
Lighting Division

Report Reviewed By:



Joe Schledorn
Project Engineer
Lighting Division

Attachment: None



UL Verification Services Inc.
7036 Snowdrift Road
Allentown, PA 18106
610-774-1300

Photometric Indoor Test Report

Relevant Standards
IES LM-79-2008
ANSI C82.77-2002

Prepared For
Elemental LED Inc, DBA Diode LED
Wes Buck
Suite 211, 1195 Park Ave.
Emeryville, CA 94608
United States

Catalog Number
Avenue 24™ 24v Premium Tape Light DI-24V-AV50-90XX
Project Number
10460077
Test Number
758895

Test Date

2014-09-24

Prepared By

Handwritten signature of Dane Hernandez-Adams in black ink.

Dane Hernandez-Adams, Technician

Approved By

Handwritten signature of Eric M. Gaudreau in black ink.

Eric Gaudreau, Engineering Project Handler

The results contained in this report pertain only to the tested sample.
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UL Verification Services Inc.
7036 Snowdrift Road
Allentown, PA 18106
610-774-1300

Luminaire Description: LED strip
Catalog Number: Avenue 24™ 24v Premium Tape Light DI-24V-AV50-90XX
Lamp: 18 white LEDs
Mounting: Surface
Ballast/Driver: One Meanwell LPV-60-24

Luminaire

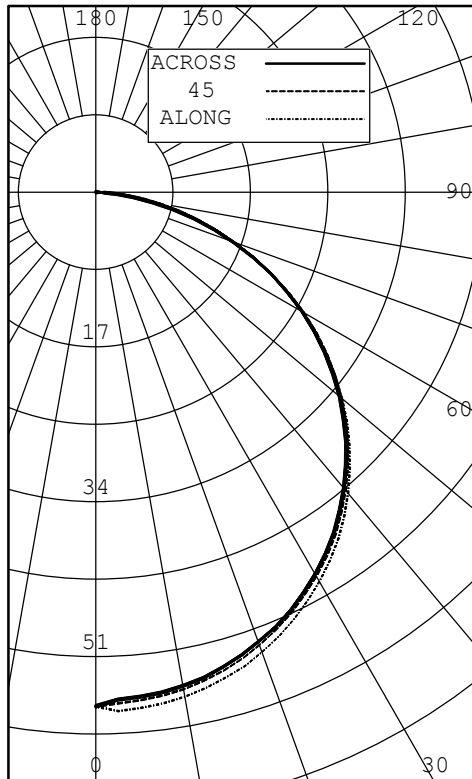


Test Conditions

Test Temperature:	24.1 °C
Voltage:	120.0 VAC
Current:	0.06340 A
Power:	3.027 W
Power Factor:	0.398
Frequency:	60 Hz
Current THD:	174 %



INTENSITY (CANDLEPOWER) SUMMARY OUTPUT



ANGLE	ALONG	22.5	45	67.5	ACROSS	OUTPUT LUMENS
0	56	56	56	56	56	
5	57	57	56	56	56	5
10	56	56	55	55	55	
15	55	55	54	54	54	15
20	54	54	53	53	53	
25	52	52	51	51	51	24
30	49	49	49	49	48	
35	46	46	46	46	46	29
40	43	43	43	43	42	
45	39	39	39	39	39	30
50	35	35	35	35	35	
55	31	31	31	31	31	28
60	26	26	26	26	26	
65	21	22	21	22	21	21
70	16	17	16	16	16	
75	12	12	12	11	11	12
80	7	8	7	7	6	
85	3	4	3	3	2	4
90	0	0	0	0	0	

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	44	26.43
0-40	73	43.55
0-60	131	77.98
0-90	168	100.00
40-90	95	56.45
60-90	37	22.02
90-180	0	0.00
0-180	168	100.00

EFFICACY (LUMENS PER WATT): 55.9

*** THIS IS AN ABSOLUTE TEST ***

LUMINOUS LENGTH: 12.000 INS
 WIDTH: 0.375 INS

LUMINANCE SUMMARY CD./SQ.M.

S/MH: 1.3
 SC: 1.3

ANGLE	ALONG	45	ACROSS
45	19192	19143	18996
55	18556	18687	18506
65	17360	17543	17385
75	15570	15522	14828
85	11461	13075	9323

TESTED IN ACCORDANCE WITH IES PROCEDURES.



INTENSITY (CANDLEPOWER) DATA
 IN 2.5 DEGREE STEPS

ANGLE	PLANE						OUTPUT LUMENS
	ALONG	22.5	45	67.5	ACROSS	AVERAGE	
0.0	56	56	56	56	56	56	
2.5	57	57	56	56	56	56	
5.0	57	57	56	56	56	56	5
7.5	57	57	56	56	55	56	
10.0	56	56	55	55	55	56	
12.5	56	56	55	55	55	55	
15.0	55	55	54	54	54	55	15
17.5	55	54	54	54	53	54	
20.0	54	54	53	53	53	53	
22.5	53	53	52	52	52	52	
25.0	52	52	51	51	51	51	24
27.5	51	50	50	50	50	50	
30.0	49	49	49	49	48	49	
32.5	48	48	47	47	47	47	
35.0	46	46	46	46	46	46	29
37.5	45	45	44	44	44	44	
40.0	43	43	43	43	42	43	
42.5	41	41	41	41	41	41	
45.0	39	39	39	39	39	39	30
47.5	37	38	37	37	37	37	
50.0	35	35	35	35	35	35	
52.5	33	33	33	33	33	33	
55.0	31	31	31	31	31	31	28
57.5	29	29	29	29	28	29	
60.0	26	26	26	26	26	26	
62.5	24	24	24	24	24	24	
65.0	21	22	21	22	21	21	21
67.5	19	19	19	19	19	19	
70.0	16	17	16	16	16	16	
72.5	14	14	14	14	14	14	
75.0	12	12	12	11	11	12	12
77.5	9	10	9	9	9	9	
80.0	7	8	7	7	6	7	
82.5	5	5	5	5	4	5	
85.0	3	4	3	3	2	3	4
87.5	1	2	2	1	1	2	
90.0	0	0	0	0	0	0	



COEFFICIENTS OF UTILIZATION

ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE = .20

CC WALL	90				80				70				50				30				10				0	
	70	50	30	10	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0	
RCR	0	1.221	.221	.221	.22	1.191	.191	.191	.19	1.161	.161	.161	.16	1.111	.111	.111	.11	1.061	.061	.061	.06	1.021	.021	.021	.02	1.00
	1	1.121	.071	.020	.98	1.091	.051	.010	.97	1.071	.030	.990	.95	0.980	.950	.92	0.940	.920	.89	0.910	.890	.87	0.85			
	2	1.020	.940	.870	.81	1.000	.920	.860	.80	0.980	.900	.840	.79	0.870	.820	.77	0.840	.800	.76	0.810	.770	.74	0.72			
	3	0.940	.830	.740	.68	0.910	.810	.740	.67	0.890	.800	.730	.67	0.770	.710	.66	0.740	.690	.64	0.720	.670	.63	0.61			
	4	0.860	.740	.650	.58	0.840	.730	.640	.58	0.820	.710	.640	.57	0.690	.620	.57	0.670	.610	.56	0.640	.590	.55	0.53			
	5	0.800	.660	.570	.50	0.770	.650	.560	.50	0.750	.640	.550	.49	0.620	.540	.49	0.600	.530	.48	0.580	.520	.48	0.46			
	6	0.730	.590	.500	.43	0.710	.580	.490	.43	0.690	.570	.490	.43	0.550	.480	.42	0.530	.470	.42	0.520	.460	.41	0.40			
	7	0.670	.530	.440	.38	0.650	.520	.430	.37	0.640	.510	.430	.37	0.490	.420	.37	0.480	.410	.36	0.470	.410	.36	0.34			
	8	0.620	.480	.390	.33	0.600	.470	.390	.33	0.590	.460	.380	.32	0.450	.370	.32	0.440	.370	.32	0.420	.360	.32	0.30			
	9	0.570	.430	.340	.29	0.560	.430	.340	.29	0.550	.420	.340	.29	0.410	.330	.28	0.400	.330	.28	0.390	.320	.28	0.26			
	10	0.530	.390	.310	.25	0.520	.390	.310	.25	0.510	.380	.310	.25	0.370	.300	.25	0.360	.290	.25	0.350	.290	.25	0.23			

THE ABOVE COEFFICIENTS HAVE BEEN CALCULATED BASED ON LUMINAIRE LUMENS
 BECAUSE IN AN ABSOLUTE TEST THE BARE LAMP LUMENS ARE UNKNOWN.
 LIGHTING DESIGN CALCULATIONS MADE USING THESE COEFFICIENTS SHOULD
 THEREFORE USE THE LUMINAIRE LUMENS IN THE CALCULATION FORMULA

LABORATORY RESULTS MAY NOT BE REPRESENTATIVE OF FIELD PERFORMANCE.
 BALLAST AND FIELD FACTORS HAVE NOT BEEN APPLIED.

TEST DISTANCE EXCEEDS FIVE TIMES THE GREATEST
 LUMINOUS OPENING OF LUMINAIRE.



Cone of Light

Cone Of Light Tabulation

Mounting Height (Feet)	Footcandles at Nadir	Diameter (Feet)
4.00	2.53	5.06
6.00	1.12	7.60
8.00	0.632	10.1
10.0	0.404	12.7
12.0	0.281	15.2
14.0	0.206	17.7
16.0	0.158	20.3

Cone of Light Plot

