REPORT

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

Project No. G101513575 Date: February 4, 2014

REPORT NO. 101513575CHI-001

TEST OF ONE LOW VOLTAGE LED TAPE LIGHT - ONE FOOT

MODEL NO. DI-24V-AV30-90**

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-AV30-90**. The sample was received by Intertek on January 29, 2014, in undamaged condition and one sample was tested as received. The sample designation was 01292014024013C.

DATES OF TESTS: January 30, 2014 through February 4, 2014.

SUMMARY

Model No.:	DI-24V-AV30-90**
Description:	Low Voltage LED Tape Light - One Foot

	Result	
Criteria	Sphere	Goniometer
Total Lumen Output (Lumens)	152.9	151.5
Total Power (W)	2.113	2.081
Luminaire Efficacy (LPW)	72.36	72.8

Criteria	Result
Power Factor	1.000
Current ATHD %	n/a
Correlated Color Temperature (CCT - K)	2968
Color Rendering Index (CRI - Ra)	92.3
Color Rendering Index (CRI - R9)	67.3
DUV	0.003
Chromaticity Coordinate (x)	0.435
Chromaticity Coordinate (y)	0.396
Chromaticity Coordinate (u')	0.253
Chromaticity Coordinate (v')	0.518

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 Thermohygrometer	THX-M	146382	08/26/13	08/26/14
Yokogawa Power Meter	WT210	146919	09/06/13	09/06/14
Omega Thermometer	DPI8-C24	146920	12/04/13	12/04/14
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU
Newport Hygrometer	iServer	146956	01/02/14	01/02/15
Elgar, AC Power Supply	CW1251P	146918	VBU	VBU
Cole-Parmer Triple Timer	94440-00	CHI0041	06/20/13	06/20/14

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 SSL unit.

Ambient temperature was measured at a position inside the sphere. Each SSL unit was operated on the client provided driver at the rated input voltage in its designated orientation. Each SSL unit 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.

Photometric and Electrical Measurements – Distribution Method

A LSI Type C High Speed Model 6440 Mirror Goniometer was used to measure the intensity (candelas) at each angle of distribution for each sample.

Ambient temperature was measured equal to the height of the sample mounted on the Goniometer equipment. Each sample was operated at input rated 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.

Some graphics were created with Photometrics Plus software.

RESULTS OF TEST

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

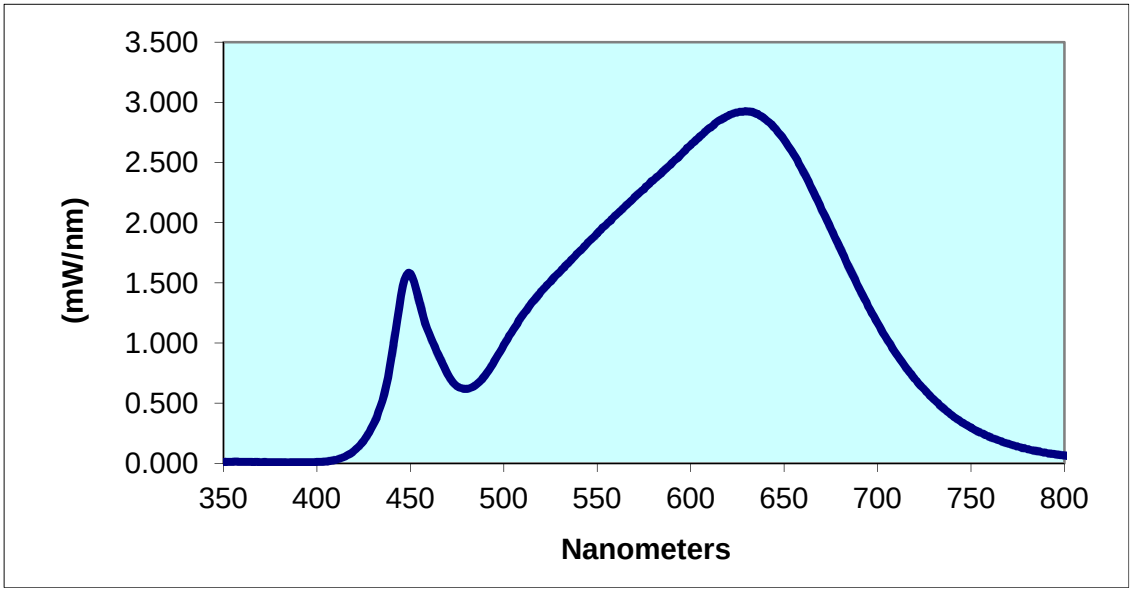
Intertek Sample No.	Base Orientation	Input Voltage {Vdc}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
01292014024013C	UP	24.0	88.03	2.113	1.000	n/a	152.9	72.36

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')
2968	92.3	67.3	0.003	0.435	0.396	0.253	0.518

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.01	440	0.892	530	1.593	620	2.888	710	0.911
355	0.012	445	1.389	535	1.672	625	2.918	715	0.8
360	0.01	450	1.577	540	1.754	630	2.925	720	0.701
365	0.011	455	1.331	545	1.834	635	2.907	725	0.612
370	0.009	460	1.08	550	1.911	640	2.862	730	0.532
375	0.009	465	0.902	555	1.988	645	2.788	735	0.461
380	0.008	470	0.739	560	2.062	650	2.689	740	0.397
385	0.007	475	0.639	565	2.139	655	2.572	745	0.342
390	0.008	480	0.619	570	2.211	660	2.433	750	0.295
395	0.008	485	0.651	575	2.28	665	2.278	755	0.254
400	0.01	490	0.73	580	2.354	670	2.114	760	0.219
405	0.015	495	0.849	585	2.426	675	1.95	765	0.189
410	0.029	500	0.982	590	2.497	680	1.786	770	0.162
415	0.055	505	1.11	595	2.568	685	1.62	775	0.138
420	0.105	510	1.227	600	2.645	690	1.459	780	0.118
425	0.188	515	1.334	605	2.72	695	1.305		
430	0.315	520	1.43	610	2.786	700	1.165		
435	0.518	525	1.511	615	2.847	705	1.031		

Spectral Data Over Visible Wavelengths



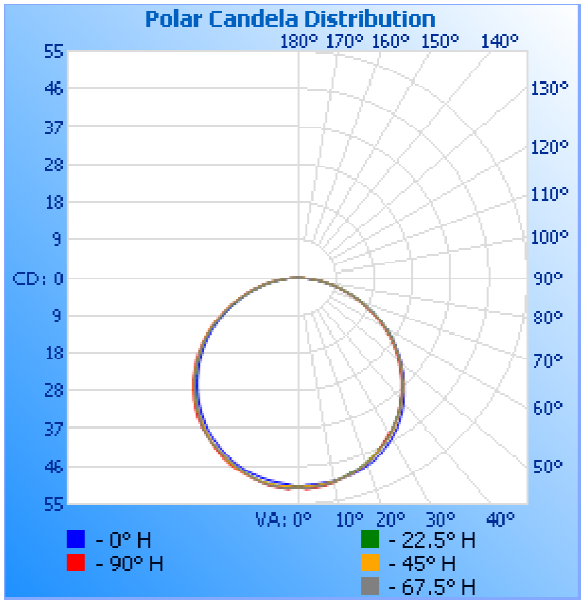
RESULTS OF TEST (cont'd)

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

Intertek Sample No.	Base Orientation	Input Voltage {Vdc}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Absolute Luminous Flux (Lumens)	Lumen Efficacy (Lumens Per Watt)
01292014024013C	UP	24.0	86.70	2.081	1.000	151.5	72.8

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	51	51	51	51	51
5	50	51	51	51	51
10	50	50	50	50	50
15	50	49	50	49	49
20	49	48	48	48	48
25	47	46	46	46	46
30	45	44	44	44	44
35	43	42	42	42	42
40	40	39	39	39	38
45	36	36	36	35	35
50	32	32	32	32	32
55	28	28	28	28	28
60	24	24	24	24	24
65	20	20	20	20	19
70	15	16	15	15	15
75	11	11	11	11	11
80	6	6	6	7	7
85	2	3	3	3	3
90	0	0	1	1	0

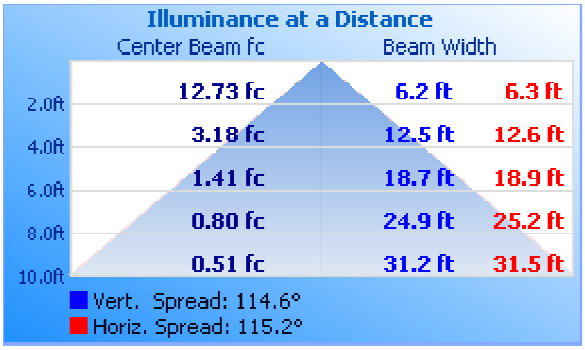


RESULTS OF TEST (cont'd)

Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



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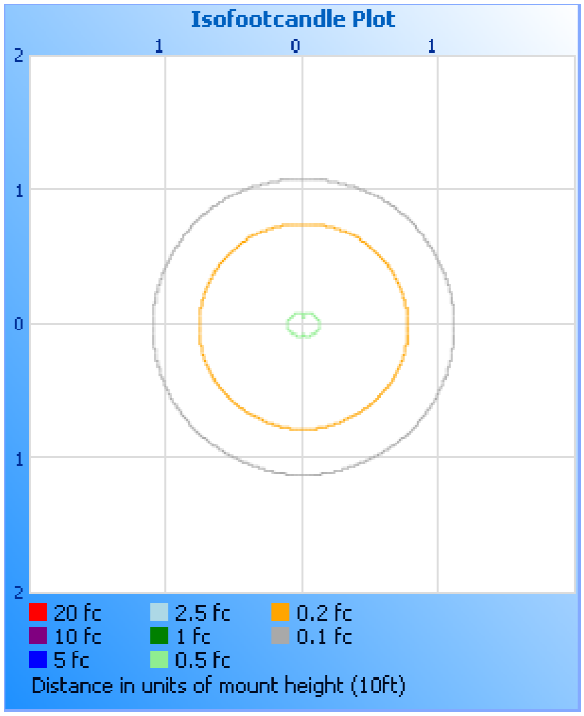


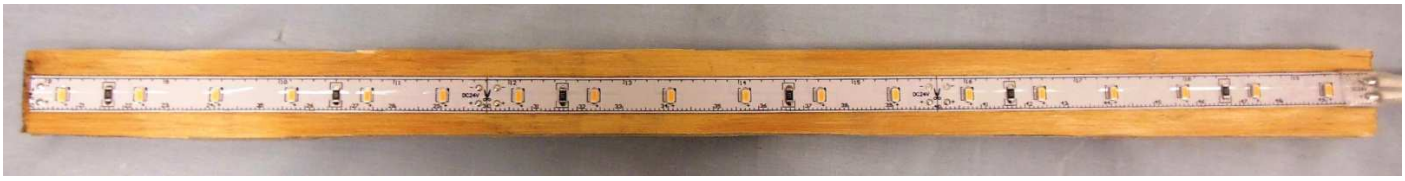
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	39.9	26.4
0-40	65.8	43.4
0-60	117.7	77.7
60-90	33.6	22.2
0-90	151.3	99.9
90-180	0.2	0.1
0-180	151.5	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	4.8	3.2
10-20	13.9	9.2
20-30	21.2	14.0
30-40	25.9	17.1
40-50	27.1	17.9
50-60	24.8	16.4
60-70	19.2	12.6
70-80	11.1	7.3
80-90	3.4	2.2
90-100	0.2	0.1

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