



REPORT

3933 US ROUTE 11 CORTLAND, NEW YORK 13045

Project No. 3192154

Date: January 22, 2010

REPORT NO. 3192154CRT-001

TEST OF ONE LED STREETLIGHT

FIXTURE MODEL NO. SL2C4ELGH

RENDERED TO

DIALIGHT CORPORATION
1501 ROUTE 34 SOUTH
FARMINGDALE, NJ 07727

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

AUTHORIZATION: The testing performed was authorized by signed quote number 50017659.

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 Approved Method for Electrical and Photometric Measurements of Solid-State Lighting Products

ANSI NEMA ANSLG C78.377: 2008 Specifications of the Chromaticity of Solid State Lighting Products

DESCRIPTION OF SAMPLE: The client submitted one sample of model number SL2C4ELGH. The sample was received by Intertek on December 18, 2009, in undamaged condition, and one sample was tested as received. The sample designation was D4299L.

DATES OF TESTS: December 23, 2009 through January 5, 2010.

SUMMARY

Model No.: SL2C4ELGH
Description: LED Streetlight

Criteria	Result
Total Lumen Output	6613
Luminaire Efficacy	50.33
Power Factor	0.996
Color Rendering Index (CRI)	67.7
Correlated Color Temperature (CCT)	5592K
Chromaticity Coordinate (x)	0.3303
Chromaticity Coordinate (y)	0.3424
Chromaticity Coordinate (u')	0.2049
Chromaticity Coordinate (v')	0.3186
Backlight Rating:	B1
Uplight Rating:	U1
Glare Rating:	G1
Color Spatial Uniformity	max Δ = 0.003

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Calibration Date	Calibration Due Date
Elgar AC Power Supply	1001SX	---	---	---
Xitron Power Analyzer	2503H	E235	03/27/09	03/27/10
Labsphere Diode Array	DAS 1100	N714	Before Use	Before Use
Leeds & Northup Standard Resistor	Manganin	Y089	02/13/09	02/13/10
Data Precision Digital Voltmeter	3600	V124	02/13/09	02/13/10
Fluke Multimeter	45	M133	02/13/09	02/13/10
Fluke Temperature Meter	52	T801	06/09/09	06/09/10
Kikusui DC Power Supply	35-10L	E160	---	---
Sorenson DC Power Supply	DLM150-20E	--	---	---
UDT Optometer	S370	N301	Before Use	Before Use
ITS Two Meter Diameter Integrating Sphere	---	N308	Before Use	Before Use
ITS Ten Foot Diameter Integrating Sphere	---	N307	Before Use	Before Use
NIST Luminous Flux Standard Sources	---	150-25, 8036, 3062	12/09/08	12/09/09
NIST Spectral Flux Standard Source	RF0605	---	11/29/06	100 hours of use
LSI High Speed Mirror Goniophotometer	6440	--	Before Use	Before Use
Labsphere CDS 1100 CCD Spectroradiometer	CDS1100	--	Before Use	Before Use
Optronics Spectroradiometer	EL750D	E288	Before Use	Before Use

TEST METHODS

Seasoning in Sample Orientation – LED Products

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

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.

Photometric and Electrical Measurements – Integrating Sphere Method

A Labsphere Model DAS 1100 Diode Array Spectroradiometer and Two Meter or Ten Foot 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.

Color Spatial Uniformity

The spatial distribution of chromaticity coordinates (u' v') were measured within two vertical planes (CIE), 0° and 90° in vertical 10° increments until the light output dropped to below 10% of the maximum light output. The averaged weighted chromaticity coordinate was calculated from these points. The data was then analyzed to check for delta color differences of the u' , v' chromaticity coordinates.

TEST METHODS (cont'd)

BUG Ratings (Backlight, Uplight, Glare) – for Outdoor Fixtures Only

Zonal Lumens were calculated and grouped using the formula in IESNA TM-15-07 (revised) for each zone as defined in the BUG addendum. The maximum lumen rating in each zone was compared against the BUG zonal requirements of Energy Star.

RATING TABLE: BACKLIGHT

NOTE: MAX RATING IN ANY ZONE = RATING FOR LUMINAIRE

	B0	B1	B2	B3	B4	B5
BH	110	500	1000	2500	5000	>5000
BM	220	1000	2500	5000	8500	>8500
BL	110	500	1000	2500	5000	>5000

RATING TABLE: UPLIGHT

NOTE: MAX RATING IN ANY ZONE = RATING FOR LUMINAIRE

	U0	U1	U2	U3	U4	U5
UH	0	10	100	500	1000	>1000
UL	0	10	100	500	1000	>1000
FVH	10	75	150	>150	NA	NA
BVH	10	75	150	>150	NA	NA

GLARE RATINGS

NOTE: MAX RATING IN ANY ZONE = RATING FOR LUMINAIRE

FOR ASYMMETRICAL LUMINAIRE TYPES (I, II, III, IV)

	G0	G1	G2	G3	G4	G5
FVH	10	250	375	500	750	>750
BVH	10	250	375	500	750	>750
FH	660	1800	5000	7500	12000	>12000
BH	110	500	1000	2500	5000	>5000

FOR QUADRILATERAL SYMMETRICAL LUMINAIRE TYPES (V, VSQUARE)

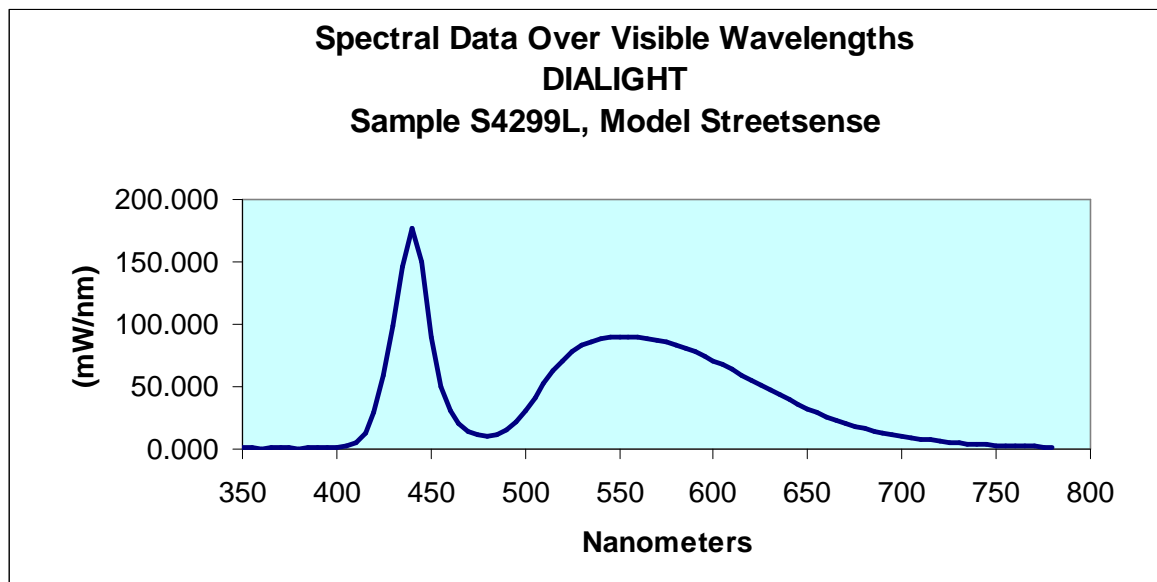
	G0	G1	G2	G3	G4	G5
FVH	10	250	375	500	750	>750
BVH	10	250	375	500	750	>750
FH	660	1800	5000	7500	12000	>12000
BH	660	1800	5000	7500	1200	>12000



RESULTS OF TESTS

Spectral Distribution over Visible Wavelengths

nm	mW/nm ²	nm	mW/nm ²	nm	mW/nm ²	nm	mW/nm ²
SL2C4ELGH							
350	0.663	465	19.877	580	83.267	690	13.007
355	0.693	470	13.961	585	80.834	695	11.581
360	0.610	475	11.477	590	77.738	700	10.221
365	0.685	480	10.749	595	74.887	705	9.072
370	0.699	485	11.729	600	71.151	710	7.963
380	0.688	490	15.263	605	67.381	715	7.099
385	0.622	495	21.795	610	63.503	720	6.259
390	0.757	500	30.496	615	59.353	725	5.475
395	0.866	505	41.192	620	55.215	730	4.869
400	1.138	510	52.147	625	51.200	735	4.225
405	1.636	515	62.270	630	47.172	740	3.764
410	2.862	520	70.775	635	43.072	745	3.317
415	5.757	525	77.632	640	39.453	750	2.959
420	12.952	530	82.767	645	35.719	755	2.646
425	29.536	540	86.453	650	32.391	760	2.417
430	59.028	545	88.750	655	29.009	765	2.140
435	99.085	550	89.590	660	25.910	770	1.926
440	145.719	555	89.640	665	23.187	775	1.763
445	176.636	560	89.926	670	20.679	780	1.552
450	150.463	565	89.207	675	18.382		
455	89.901	570	88.390	680	16.357		
460	49.421	575	86.741	685	14.621		



RESULTS OF TESTS (cont'd)

Photometric, Temperature, and Electrical Measurements at 25°C – Integrating Sphere Method

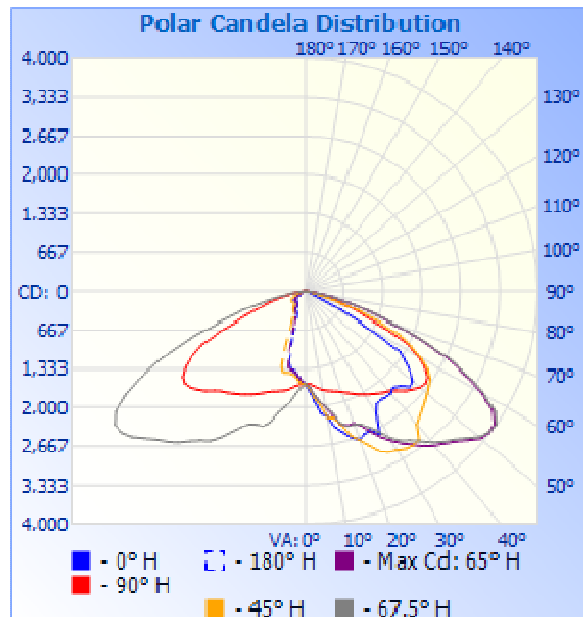
Intertek Sample No.	Correlated Color Temperature (K)	CRI	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
SL2C4ELGH						
D4299L	5592	67.7	0.3303	0.3424	0.2049	0.4779

Photometric Measurements – Distribution Method

Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (A)	Input Power (Watts)	Input Power Factor	Absolute Luminous Flux (Lumens)	Lumen Efficacy (Lumens Per Watt)
SL2C4ELGH							
D4299L	Horizontal	120.0	1.10	131.4	0.996	6613	50.33

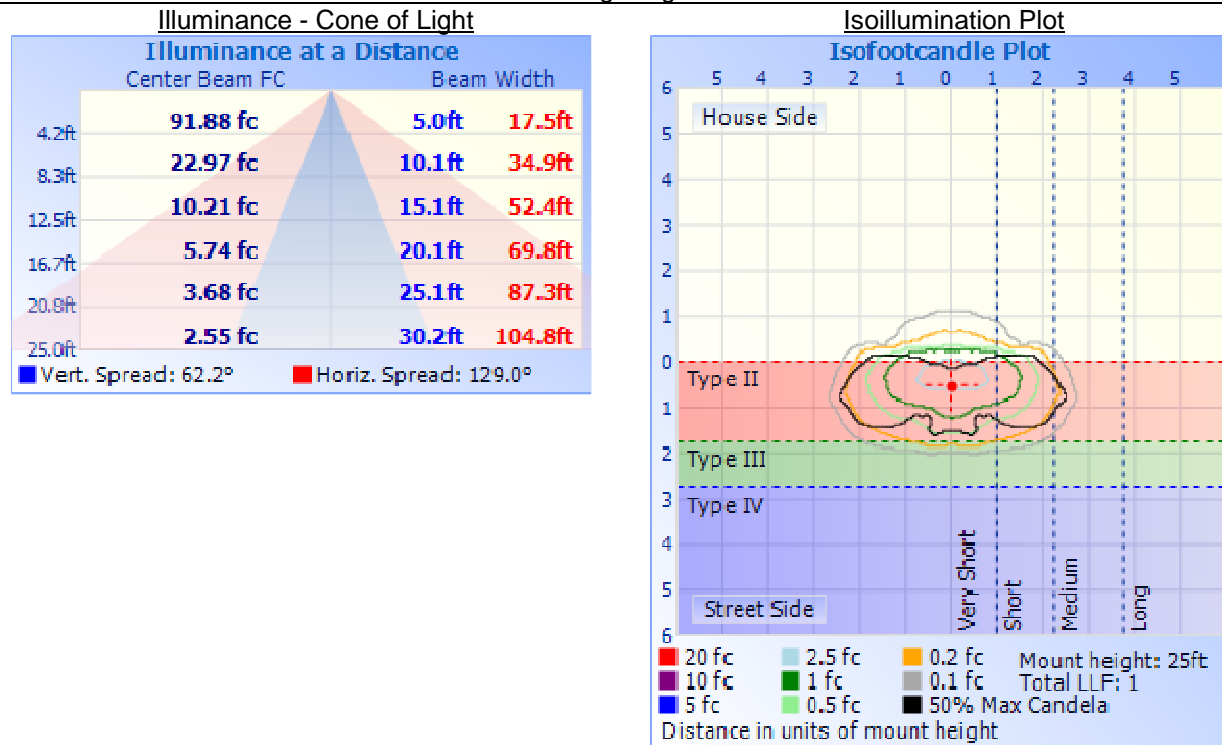
Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
SL2C4ELGH					
0	1595	1595	1595	1595	1595
5	1893	1860	1831	1773	1629
10	2183	2150	2196	2022	1720
15	2503	2473	2348	2324	1776
20	2713	2789	2723	2434	1839
25	2639	2905	3039	2573	1944
30	2441	2909	3153	2903	2045
35	2265	2474	3230	3129	2143
40	2297	2294	2977	3392	2241
45	2304	2180	2851	3605	2424
50	2407	2006	2730	3893	2573
55	2076	1917	2618	3995	2565
60	1164	1772	2285	3564	2236
65	291	675	1787	2702	1545
70	83	220	968	1597	833
75	28	78	282	814	492
80	7	22	38	221	149
85	1	2	3	6	9
90	0	0	0	0	0



RESULTS OF TESTS (cont'd)

Model No.: SL2C4ELGH
Mounting Height: 25ft.



Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
SL2C4ELGH		
0-10	163.2	2.5
10-20	511.8	7.7
20-30	839.6	12.7
30-40	1098	16.6
40-50	1330	20.1
50-60	1445	21.9
60-70	943.3	14.3
70-80	267.4	4.0
80-90	14.3	0.2



RESULTS OF TESTS (cont'd)

BUG Rating (Backlight, Uplight, Glare)

Zone	Total Lumens	Frontlight Category	Frontlight Lumens	Backlight Category	Backlight Lumens	Uplight Category	Uplight Lumens
SL2C4ELGH							
0-30	1515.0	FL	1058.0	BL	457.0	--	--
30-60	3873.0	FM	3198.0	BM	675.0	--	--
60-80	1211.0	FH	1015.0	BH	196.0	--	--
80-90	15.0	FVH	12.0	BVH	3.0	--	--
90-100	0					UL	0.0
100-180	0					UH	0.0

Backlight Rating: B1
Uplight Rating: U1
Glare Rating: G1

RESULTS OF TESTS (cont'd)

Color Spatial Uniformity

Sample No: D4299L
 Model No.: SL2C4ELGH

Vertical Angle (°)	Horizontal Angle = 0°			Horizontal Angle = 90°		
	Candlepower (cd)	CIE' 1976 Chromaticity u'	CIE' 1976 Chromaticity v'	Candlepower (cd)	CIE' 1976 Chromaticity u'	CIE' 1976 Chromaticity v'
0	1595	0.2044	0.4813	1595	0.2044	0.4813
10	2183	0.2045	0.4801	1719	0.2045	0.4811
20	2713	0.2047	0.4803	1839	0.2046	0.4813
30	2440	0.2046	0.4802	2044	0.2048	0.4813
40	2296	0.2044	0.4826	2240	0.2049	0.4813
50	2406	0.2047	0.4846	2572	0.2049	0.4833
60	1164	0.2049	0.4879	2235	0.205	0.4847
70	1595	0.2044	0.4813	1595	0.2044	0.4813

Weighted Average

u'	v'
0.2048	0.4830

Vertical Angle (°)	Horz. 0 Δu'	Horiz. 0 Δv'	Horz. 90 Δu'	Horiz. 90 Δv'
0	-0.0004	-0.0017	-0.0004	-0.0017
10	-0.0003	-0.0029	-0.0003	-0.0019
20	-0.0001	-0.0027	-0.0002	-0.0017
30	-0.0002	-0.0028	0.0000	-0.0017
40	-0.0004	-0.0004	0.0001	-0.0017
50	-0.0001	0.0016	0.0001	0.0003
60	0.0001	0.0049	0.0002	0.0017
70	-0.0004	-0.0017	-0.0004	-0.0017

Pictures (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:

Jacki Swiernik
Project Engineer
Lighting Division

Report Reviewed By:

Dave Ellis
Senior Project Engineer
Lighting Division

Attachment: None