LIGHT LABORATORY INC.
8165 E Kaiser Blvd. Anaheim, CA 92808
www.lightlaboratory.com

NVLAP TESTING
NVLAP LAB CODE 200927-0

Report No: L011805201 **Issue Date: 1/25/2018**

Report Prepared For: Environmental Lights
11235 West Bernardo Ct Ste 102, San Diego CA 92127

Model Number: 3000K-CC2835-60-20m

Test: Photometric/Colorimetric/Electrical Test

Standards Used: Appropriate part or all test guidelines were used for test performed:
IESNA LM79: 2008 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products
ANSI NEMA ANSLG C78.377: 2008 Specification of the Chromaticity of Solid State Lighting Products
ANSI C82.77:2002: Harmonic Emission Limits-Related Quality Requirements for Lighting Equipment

Description of Sample: Client submitted the sample. Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 1/24/18

Date of Tests: 1/24/18 - 1/25/18

Seasoning of Sample: No seasoning was performed in accordance with IESNA LM-79.

Equipment List

Equipment Used	Model No	Stock No	Calibration Due Date
Chroma Programmable AC Source	61604	PS-AC02	--
Yokogawa Digital Power Meter	WT210	MT-EL06-S4	1/9/19
BK PRECISION	1747	PS-DC04	1/10/19
Fluke Digital Thermometer	52K/J	MT-TP05	1/10/19
LLI Type C Goniophotometer System	RMG-C-MKII	CD-LL04-GC	--
LLI 2M Sphere	2MR97	CD-SN03-S2	--
LLI Spectroradiometer	SPR-3000	MT-SC01-S2	Before Use

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

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Test Summary	
Manufacturer:	Environmental Lights
Model Number:	3000K-CC2835-60-20m
Driver Model Number:	N/A
Total Lumens:	396.22
Input Voltage (VDC):	24.00
Input Current (Amp):	0.17
Input Power (W):	4.19
Input Power Factor:	1.00
Current ATHD @ 120V(%):	N/A
Current ATHD @ 277V(%):	N/A
Efficacy:	95
Color Rendering Index (CRI):	83
Correlated Color Temperature (K):	2898
Chromaticity Coordinate x:	0.4421
Chromaticity Coordinate y:	0.4021
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:40
Total Operating Time (Hours):	1:00

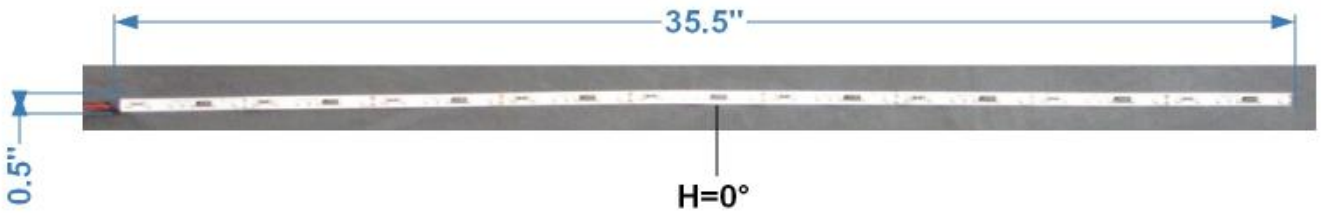

FIG. 1 LUMINAIRE

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

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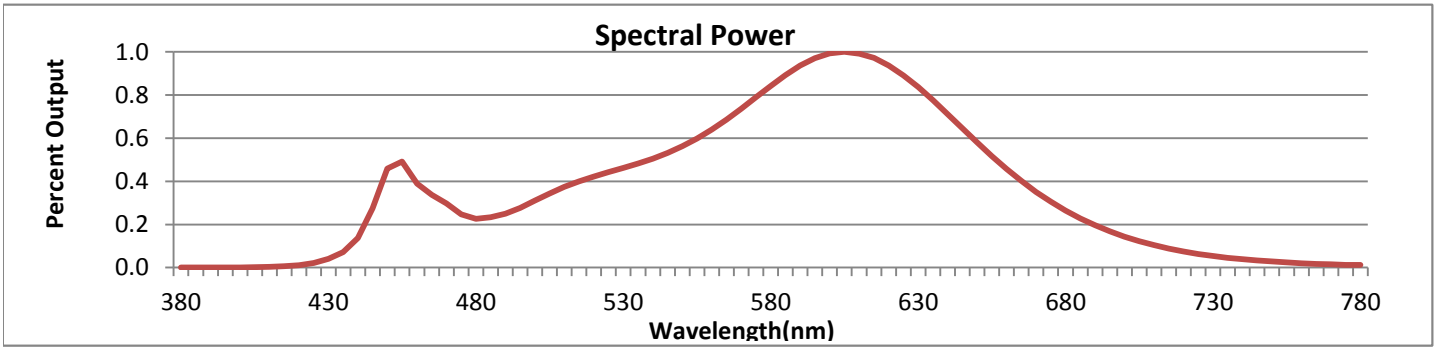


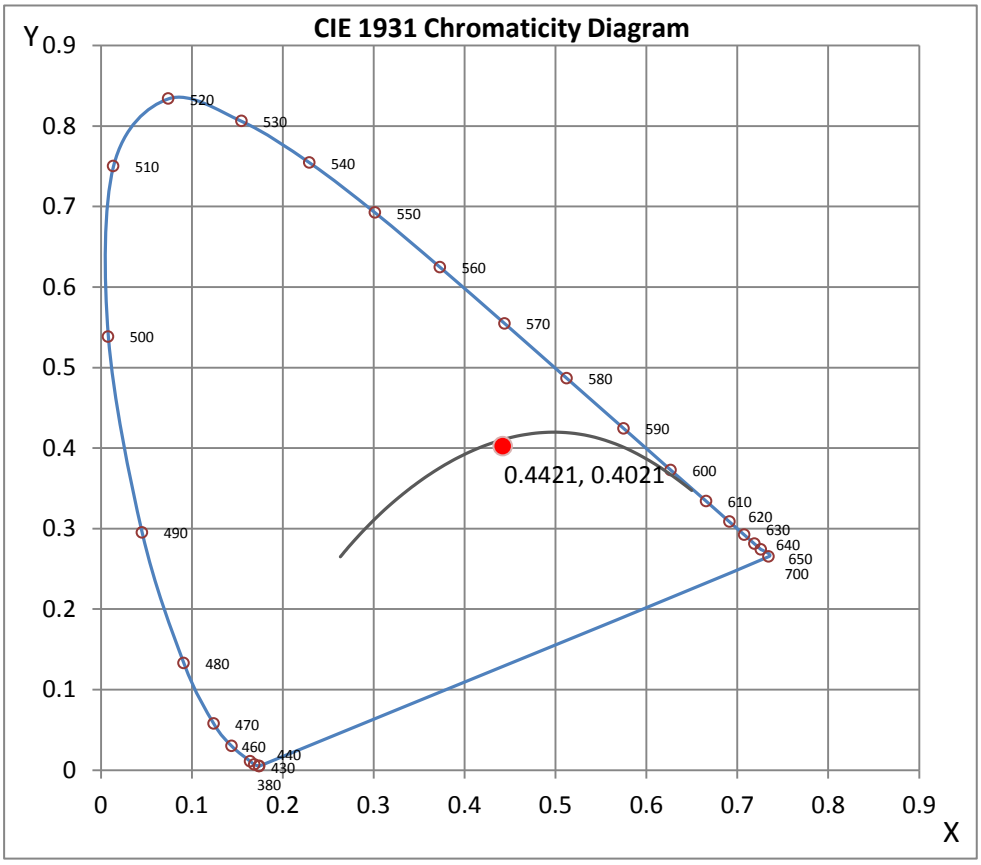
Wavelength	W/m²nm	440	0.1372	510	0.3738	580	0.8421	650	0.5812	720	0.0748
380	0.0007	450	0.4592	520	0.4218	590	0.9362	660	0.4579	730	0.0538
390	0.0008	460	0.3898	530	0.4626	600	0.9928	670	0.3512	740	0.0387
400	0.0011	470	0.2980	540	0.5054	610	0.9920	680	0.2648	750	0.0280
410	0.0032	480	0.2254	550	0.5628	620	0.9364	690	0.1962	760	0.0202
420	0.0116	490	0.2493	560	0.6397	630	0.8379	700	0.1435	770	0.0147
430	0.0400	500	0.3100	570	0.7363	640	0.7118	710	0.1039	780	0.0127

CRI & CCT

x	0.4421
y	0.4021
u'	0.2548
v'	0.5214
CRI	83.00
CCT	2898
Duv	-0.00145

R Values

R1	82.57
R2	93.87
R3	93.25
R4	80.21
R5	83.02
R6	92.93
R7	80.63
R8	57.89
R9	9.30
R10	86.06
R11	79.98
R12	75.78
R13	85.59
R14	97.04



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Test Methods

Photometric Measurements - Goniophotometer

A Custom Light Laboratory Type C Rotating Mirror Goniophotometer was used to measure candelas(intensity) at each angle of distribution as defined by IESNA for the appropriate fixture type.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Spectral Measurements - Integrating Sphere

A Sensing Spectroradiometer SPR-3000, in conjunction with Light Laboratory 2 meter integrating sphere was used to measure chromaticity coordinates, correlated color temperature(CCT) and the color rendering index(CRI) for each sample.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Disclaimers:

This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST or any agency of Federal Government.

Report Prepared by : Keyur Patel

Test Report Released by:

Jeff Ahn
Engineering Manager

Test Report Reviewed by:

Steve Kang
Quality Assurance

**Attached are photometric data reports. Total number of pages: 9*

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Photometric Test Report

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L011805201.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L011805201
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 1/25/2018
[MANUFAC] Environmental Lights
[LUMCAT] 3000K-CC2835-60-20m
[LUMINAIRE] 3000K CCT CurrentControl LED Strip Light
[BALLASTCAT] N/A
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[POWER SUPPLY] 24VDC CONSTANT VOLTAGE SOURCE
[INPUT] 24VDC, 4.19W
[TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	396
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	95
Total Luminaire Watts	4.19
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	1.28
Spacing Criterion (90-270)	1.28
Spacing Criterion (Diagonal)	1.40
Basic Luminous Shape	Rectangular
Luminous Length (0-180)	0.01 ft
Luminous Width (90-270)	2.92 ft
Luminous Height	0.00 ft

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	48479	48479	48395
55	47077	47026	46865
65	43998	43920	43702
75	36982	36982	36512
85	22818	24043	22818

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L011805201.IES

CANDELA TABULATION

	0.0	22.5	45.0	67.5	90.0
0	135.25	135.25	135.25	135.25	135.25
5	134.69	134.77	134.81	134.77	134.69
10	133.11	133.15	133.19	133.19	133.11
15	130.53	130.45	130.53	130.58	130.45
20	126.80	126.84	126.80	126.84	126.71
25	122.15	122.02	122.06	122.11	121.82
30	116.25	116.29	116.29	116.29	116.17
35	109.69	109.61	109.48	109.61	109.44
40	101.89	101.76	101.72	101.97	101.55
45	93.08	93.17	93.08	93.04	92.92
50	83.62	83.78	83.74	83.54	83.70
55	73.32	73.36	73.24	73.45	72.99
60	62.19	62.11	61.99	62.07	61.61
65	50.49	50.53	50.40	50.32	50.15
70	38.36	38.57	38.40	38.11	38.36
75	25.99	26.07	25.99	25.66	25.66
80	15.03	14.91	14.86	14.99	14.70
85	5.40	5.48	5.69	5.56	5.40
90	0.00	0.00	0.00	0.00	0.00

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L011805201.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	49.66	N.A.	12.50
0-30	105.92	N.A.	26.70
0-40	174.44	N.A.	44.00
0-60	311.65	N.A.	78.70
0-80	389.15	N.A.	98.20
0-90	396.22	N.A.	100.00
10-90	383.41	N.A.	96.80
20-40	124.78	N.A.	31.50
20-50	196.57	N.A.	49.60
40-70	187.01	N.A.	47.20
60-80	77.51	N.A.	19.60
70-80	27.71	N.A.	7.00
80-90	7.07	N.A.	1.80
90-110	0.00	N.A.	0.00
90-120	0.00	N.A.	0.00
90-130	0.00	N.A.	0.00
90-150	0.00	N.A.	0.00
90-180	0.00	N.A.	0.00
110-180	0.00	N.A.	0.00
0-180	396.22	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	12.81
10-20	36.85
20-30	56.26
30-40	68.52
40-50	71.80
50-60	65.41
60-70	49.80
70-80	27.71
80-90	7.07
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

IES INDOOR REPORT
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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	109	104	100	96	106	102	98	94	97	94	91	93	91	88	90	88	86	84
2	99	90	84	78	96	89	82	77	85	80	75	82	77	73	79	75	72	69
3	90	79	71	64	87	78	70	64	75	68	63	72	66	62	69	65	61	58
4	82	70	61	54	80	69	60	54	66	59	53	64	58	53	62	56	52	50
5	76	63	53	47	73	61	53	46	59	52	46	57	51	45	55	50	45	43
6	70	56	47	41	68	55	47	41	53	46	40	52	45	40	50	44	39	37
7	65	51	42	36	63	50	42	36	49	41	35	47	40	35	46	40	35	33
8	60	46	38	32	59	46	38	32	44	37	32	43	36	31	42	36	31	29
9	56	43	34	29	55	42	34	29	41	34	28	40	33	28	39	33	28	26
10	53	39	31	26	51	39	31	26	38	31	26	37	30	26	36	30	26	24

IES INDOOR REPORT
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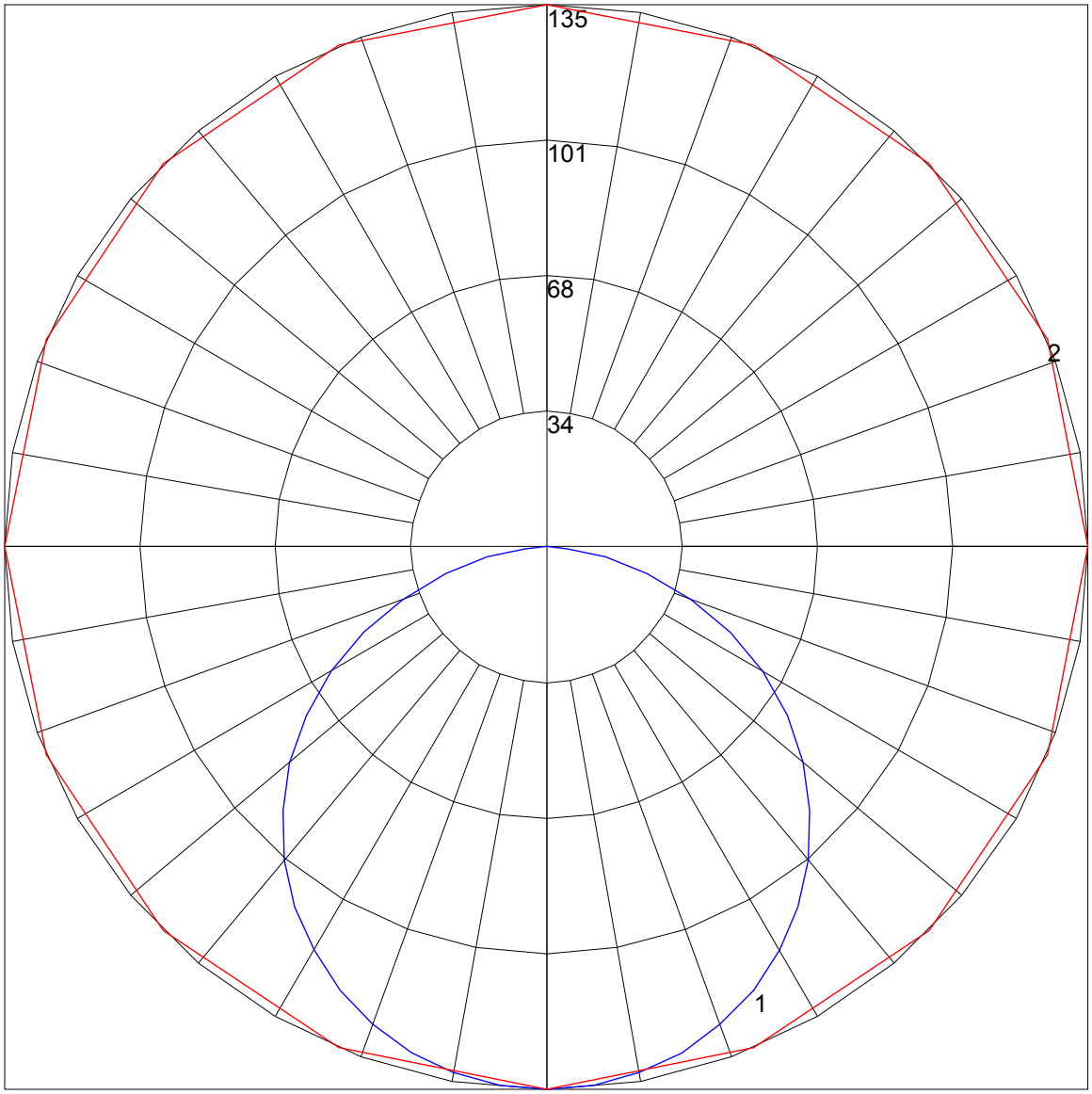
POLAR GRAPH



Maximum Candela = 135.25 Located At Horizontal Angle = 0, Vertical Angle = 0
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (0) (Through Max. Cd.)