



8165 E Kaiser Blvd. Anaheim, CA 92808
 p. 714.282.2270
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Report No: L081600702

Date: 8/5/2016



NVLAP LAB CODE 200927-0

Report No: L081600702

Report Prepared For: REVOLUTION LIGHTING TECHNOLOGIES
 4139 Guardian St. Simi Valley, CA 93063 USA

Model Number: 515013-015

Test: Electrical and Photometric tests

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. Catalog number is 515013-015. Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 8/1/16

Date of Tests: 8/2/16 - 8/5/16

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-S1	11/18/16
Xitron Power Analyzer	2503AH	MT-EL01	11/30/16
ITECH DC Power Supply	IT6122	PSDC-03-S1	11/17/16
Fluke Digital Thermometer	52k/J	MT-TP02-GC	11/24/16
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.

Test Summary

Manufacturer:	REVOLUTION LIGHTING TECHNOLOGI
Model Number:	515013-015
Driver Model Number:	N/A
Total Lumens:	2871.19
Input Voltage (VAC/60Hz):	277.00
Input Current (Amp):	0.08
Input Power (W):	21.38
Input Power Factor:	0.95
Current ATHD @ 120V(%):	N/A
Current ATHD @ 277V(%):	18%
Efficacy:	134
Color Rendering Index (CRI):	85
Correlated Color Temperature (K):	5234
Chromaticity Coordinate x:	0.3390
Chromaticity Coordinate y:	0.3495
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:35
Total Operating Time (Hours):	1:00
Off State Power(W):	0.00

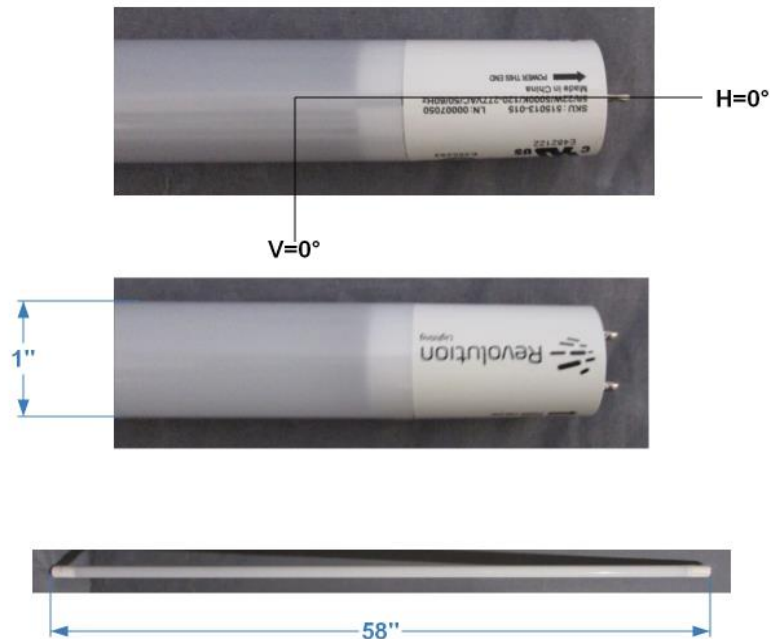
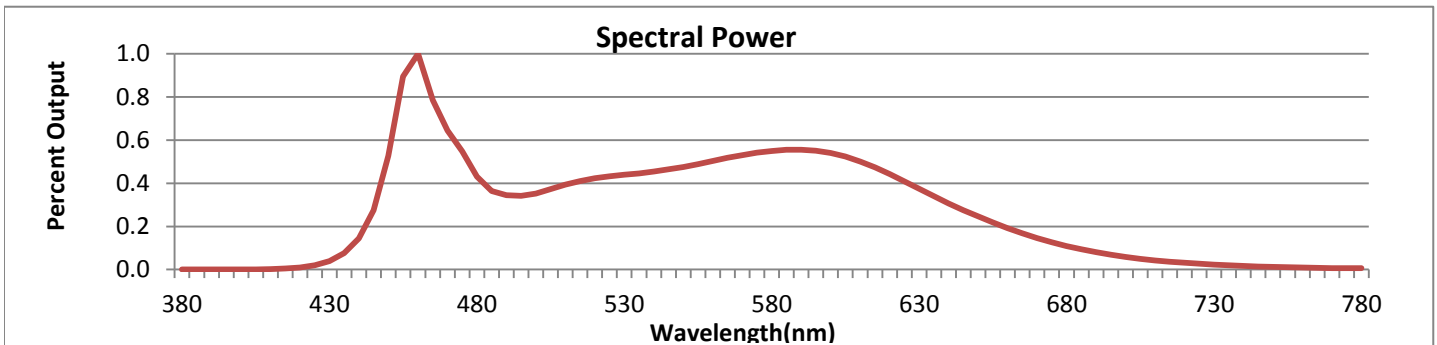


FIG. 1 LUMINAIRE

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



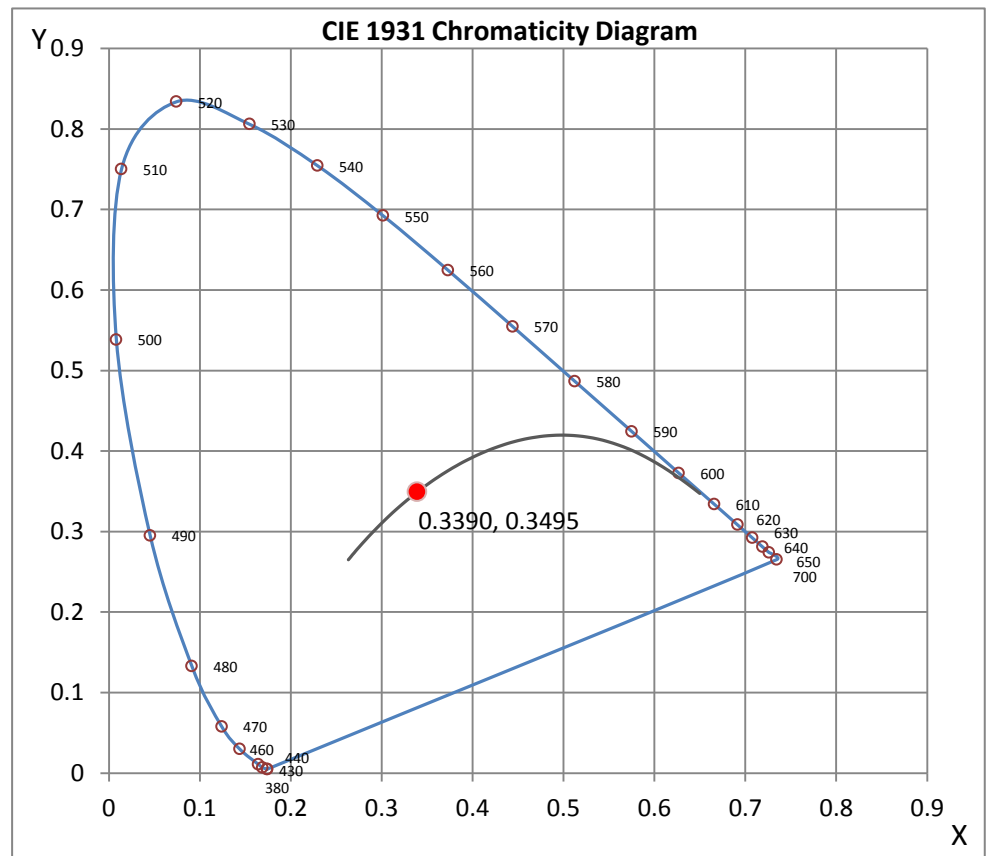
Wavelength	W/m ² nm	440	0.1451	510	0.3934	580	0.5492	650	0.2463	720	0.0312
380	0.0007	450	0.5278	520	0.4227	590	0.5550	660	0.1919	730	0.0226
390	0.0007	460	1.0000	530	0.4396	600	0.5410	670	0.1458	740	0.0165
400	0.0010	470	0.6446	540	0.4544	610	0.5012	680	0.1091	750	0.0121
410	0.0023	480	0.4305	550	0.4759	620	0.4427	690	0.0805	760	0.0089
420	0.0095	490	0.3452	560	0.5036	630	0.3738	700	0.0587	770	0.0066
430	0.0393	500	0.3526	570	0.5303	640	0.3069	710	0.0428	780	0.0057

CRI & CCT

x	0.3390
y	0.3495
u'	0.2081
v'	0.4827
CRI	84.50
CCT	5234
Duv	0.00146

R Values

R1	86.56
R2	98.42
R3	90.11
R4	77.73
R5	84.69
R6	92.21
R7	80.94
R8	65.68
R9	18.09
R10	94.60
R11	78.43
R12	64.97
R13	91.53
R14	95.28



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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:

Test Report Reviewed by:

Jeff Ahn
 Engineering Manager

Steve Kang
 Quality Assurance

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

*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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Photometric Test Report

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L081600702.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
 [TEST] L081600702
 [TESTLAB] LIGHT LABORATORY, INC.
 [ISSUEDATE] 8/5/2016
 [MANUFAC] REVOLUTION LIGHTING TECHNOLOGIES
 [LUMCAT] 515013-015
 [LUMINAIRE] 5 ft signage tube 5000K SEP
 [BALLASTCAT] N/A
 [LAMPPOSITION] 0,0
 [LAMPCAT] N/A
 [OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
 [MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
 [INPUT] 277VAC, 21.38W
 [TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	2871
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	134
Total Luminaire Watts	21.38
Ballast Factor	1.00
CIE Type	General Diffuse
Spacing Criterion (0-180)	N.A.
Spacing Criterion (90-270)	N.A.
Spacing Criterion (Diagonal)	N.A.
Basic Luminous Shape	Hor. Cylinder Along Length
Luminous Length (0-180)	4.44 ft
Luminous Width (90-270)	0.08 ft (Diameter)
Luminous Height	0.08 ft (Diameter)

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	732614	11668	9348
55	483850	9999	8611
65	294128	8436	7938
75	145141	7136	7389
85	26308	6343	7034

**IES INDOOR REPORT
PHOTOMETRIC FILENAME : L081600702.IES**

CANDELA TABULATION

	<u>0.0</u>	<u>22.5</u>	<u>45.0</u>	<u>67.5</u>	<u>90.0</u>
0	379.93	379.93	379.93	379.93	379.93
5	378.66	378.74	378.66	378.74	376.56
10	372.45	373.03	373.87	374.84	373.54
15	363.05	364.10	366.41	369.05	368.42
20	349.79	350.59	356.76	361.08	361.37
25	333.85	336.83	344.00	351.01	352.81
30	314.13	317.95	328.73	339.43	342.91
35	293.07	298.11	311.99	326.72	332.17
40	267.90	275.83	293.91	312.92	320.93
45	242.14	251.21	275.24	298.65	308.76
50	214.54	226.37	255.70	284.22	296.51
55	185.26	200.03	236.23	270.42	284.43
60	155.39	173.76	216.93	256.87	273.02
65	124.60	148.30	199.56	244.20	262.20
70	93.64	124.30	183.41	232.54	252.38
75	65.53	102.70	168.94	222.47	244.07
80	34.90	83.11	157.70	214.67	237.45
85	12.25	69.98	150.23	209.21	232.33
90	1.85	63.14	144.90	204.60	227.80
95	12.25	69.98	150.23	209.21	232.33
100	34.90	83.11	157.70	214.67	237.45
105	65.53	102.70	168.94	222.47	244.07
110	93.64	124.30	183.41	232.54	252.38
115	124.60	148.30	199.56	244.20	262.20
120	155.39	173.76	216.93	256.87	273.02
125	185.26	200.03	236.23	270.42	284.43
130	214.54	226.37	255.70	284.22	296.51
135	242.14	251.21	275.24	298.65	308.76
140	267.90	275.83	293.91	312.92	320.93
145	293.07	298.11	311.99	326.72	332.17
150	314.13	317.95	328.73	339.43	342.91
155	333.85	336.83	344.00	351.01	352.81
160	349.79	350.59	356.76	361.08	361.37
165	363.05	364.10	366.41	369.05	368.42
170	372.45	373.03	373.87	374.84	373.54
175	378.66	378.74	378.66	378.74	376.56
180	379.93	379.93	379.93	379.93	379.93

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L081600702.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	139.40	N.A.	4.90
0-30	297.89	N.A.	10.40
0-40	493.50	N.A.	17.20
0-60	917.07	N.A.	31.90
0-80	1284.05	N.A.	44.70
0-90	1435.59	N.A.	50.00
10-90	1399.62	N.A.	48.70
20-40	354.10	N.A.	12.30
20-50	566.74	N.A.	19.70
40-70	618.56	N.A.	21.50
60-80	366.98	N.A.	12.80
70-80	172.00	N.A.	6.00
80-90	151.54	N.A.	5.30
90-110	323.54	N.A.	11.30
90-120	518.52	N.A.	18.10
90-130	729.45	N.A.	25.40
90-150	1137.7	N.A.	39.60
90-180	1435.59	N.A.	50.00
110-180	1112.06	N.A.	38.70
0-180	2871.19	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	35.97
10-20	103.43
20-30	158.49
30-40	195.61
40-50	212.64
50-60	210.93
60-70	194.98
70-80	172.00
80-90	151.54
90-100	151.54
100-110	172.00
110-120	194.98
120-130	210.93
130-140	212.64
140-150	195.61
150-160	158.49
160-170	103.43
170-180	35.97

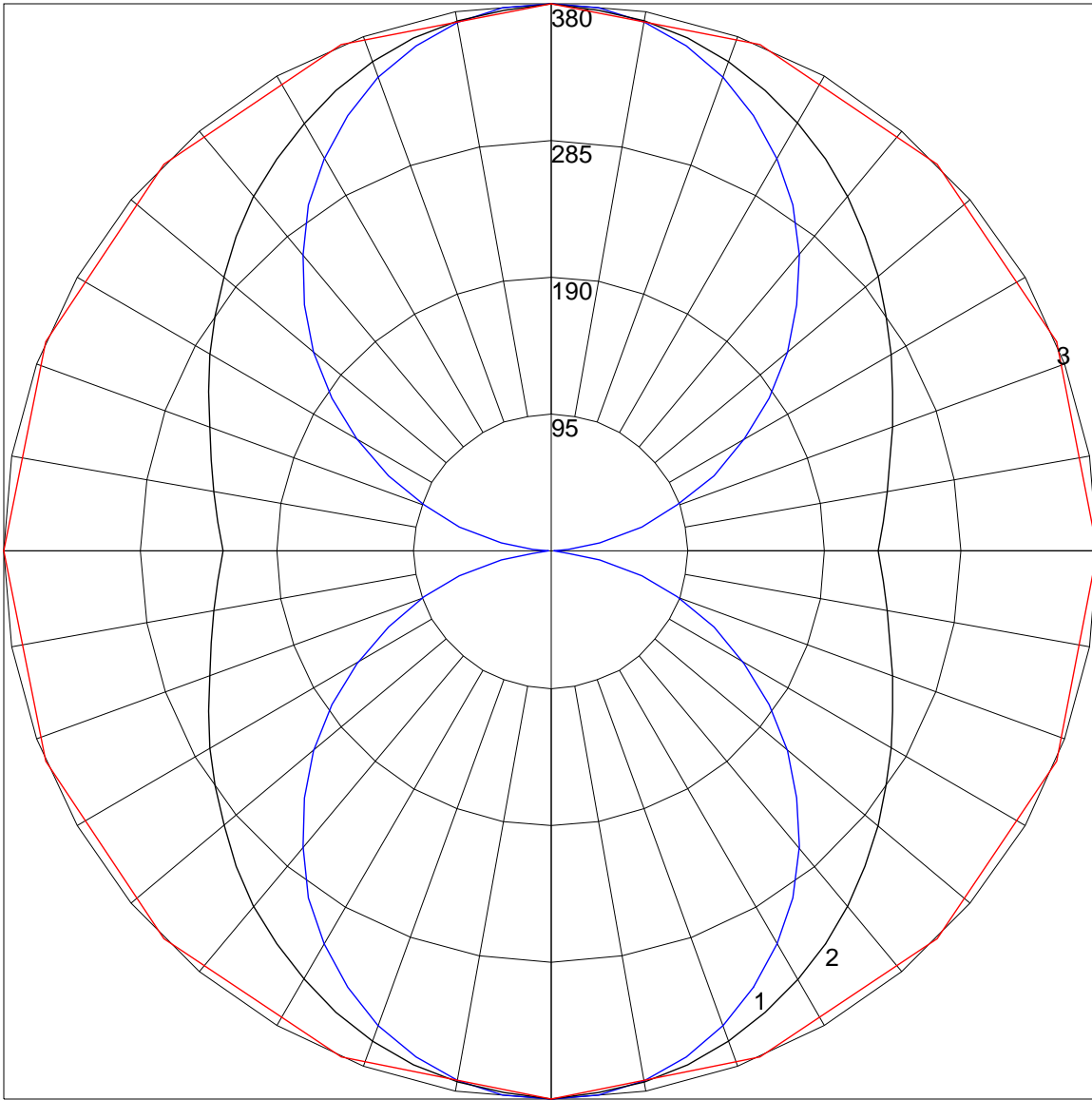
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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	107	107	107	107	99	99	99	99	83	83	83	69	69	69	56	56	56	50
1	95	90	85	81	88	83	79	75	70	66	64	57	55	53	46	44	43	37
2	86	78	70	65	79	71	65	60	60	55	51	49	46	43	39	37	34	30
3	78	67	59	53	71	62	55	49	52	47	42	43	39	35	34	31	28	24
4	71	59	51	44	65	55	47	41	46	40	35	38	33	30	30	27	24	20
5	65	53	44	37	59	49	41	35	41	35	30	34	29	25	27	23	21	17
6	60	47	38	32	55	43	36	30	37	31	26	30	26	22	24	21	18	15
7	55	42	34	28	51	39	32	26	33	27	23	27	23	19	22	19	16	13
8	51	38	30	25	47	35	28	23	30	24	20	25	20	17	20	17	14	12
9	48	35	27	22	44	32	25	20	28	22	18	23	18	15	19	15	13	10
10	44	32	24	19	41	30	23	18	25	20	16	21	17	14	17	14	11	9

POLAR GRAPH



Maximum Candela = 379.93 Located At Horizontal Angle = 0, Vertical Angle = 0

1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)

2 - Vertical Plane Through Horizontal Angles (90 - 270)

3 - Horizontal Cone Through Vertical Angle (0) (Through Max. Cd.)