



8165 E Kaiser Blvd. Anaheim, CA 92808
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Report No: L071600308

Date: 7/7/2016



NVLAP LAB CODE 200927-0

Report No: L071600308

Report Prepared For: Revolution Lighting Technologies
 4139 Guardian St. Simi Valley, CA 93063 USA

Model Number: 514012-015

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 514012-015 . Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 7/1/16

Date of Tests: 7/6/16 - 7/7/16

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 Technologies
Model Number:	514012-015
Driver Model Number:	N/A
Total Lumens:	2131.90
Input Voltage (VAC/60Hz):	120.00
Input Current (Amp):	0.16
Input Power (W):	16.54
Input Power Factor:	0.88
Current ATHD @ 120V(%):	25%
Current ATHD @ 277V(%):	N/A
Efficacy:	129
Color Rendering Index (CRI):	85
Correlated Color Temperature (K):	5136
Chromaticity Coordinate x:	0.3417
Chromaticity Coordinate y:	0.3532
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:30
Total Operating Time (Hours):	1:25
Off State Power(W):	0.00

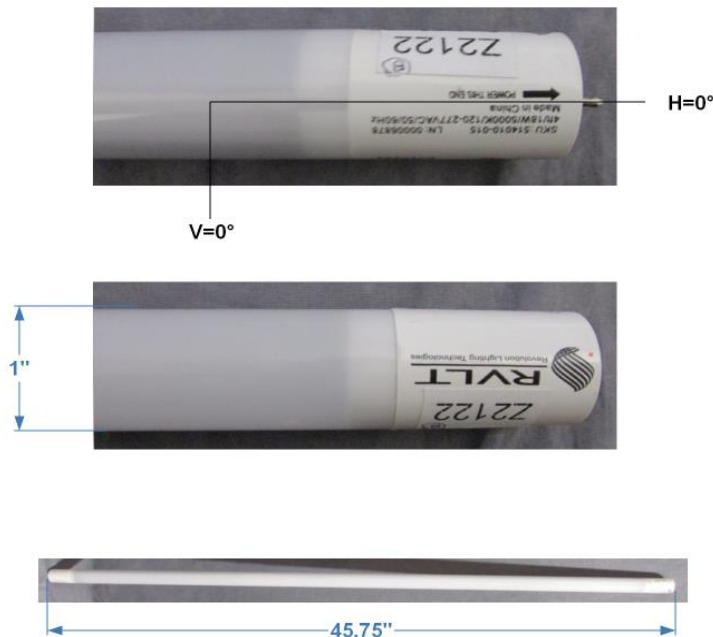
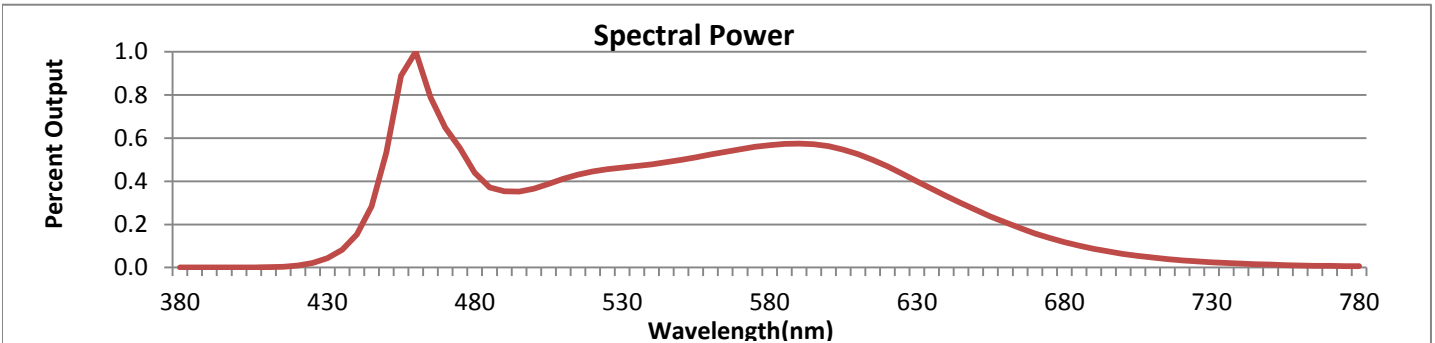


FIG. 1 LUMINAIRE

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



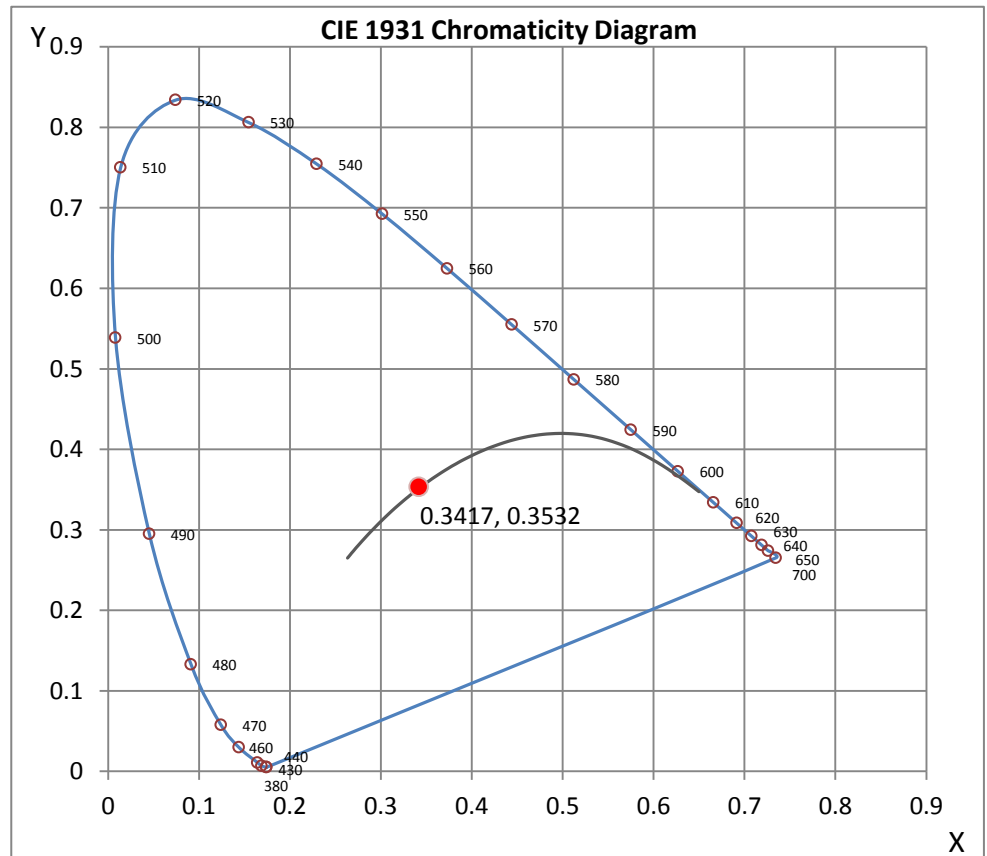
Wavelength	W/m ² nm	440	0.1532	510	0.4123	580	0.5670	650	0.2672	720	0.0335
380	0.0008	450	0.5325	520	0.4461	590	0.5746	660	0.2091	730	0.0244
390	0.0008	460	1.0000	530	0.4636	600	0.5629	670	0.1581	740	0.0179
400	0.0010	470	0.6493	540	0.4787	610	0.5252	680	0.1180	750	0.0132
410	0.0019	480	0.4390	550	0.4990	620	0.4692	690	0.0867	760	0.0098
420	0.0099	490	0.3537	560	0.5242	630	0.4000	700	0.0633	770	0.0073
430	0.0431	500	0.3653	570	0.5485	640	0.3314	710	0.0462	780	0.0063

CRI & CCT

x	0.3417
y	0.3532
u'	0.2085
v'	0.4849
CRI	85.10
CCT	5136
Duv	0.00219

R Values

R1	86.77
R2	98.18
R3	90.99
R4	78.61
R5	84.99
R6	92.56
R7	81.80
R8	66.64
R9	20.18
R10	93.78
R11	79.29
R12	65.50
R13	91.43
R14	95.75



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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 : L071600308.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
 [TEST] L071600308
 [TESTLAB] LIGHT LABORATORY, INC.
 [ISSUEDATE] 7/7/2016
 [MANUFAC] REVOLUTION LIGHTING TECHNOLOGIES
 [LUMCAT] 514012-015
 [LUMINAIRE] 18W 4FT 5000K SIGNAGE TUBE LAMP SEP 360 DEG
 [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] 120VAC, 16.54W
 [TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	2132
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	129
Total Luminaire Watts	16.54
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)	3.44 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	579035	11275	8874
55	384134	9456	8011
65	234995	7794	7149
75	111231	6367	6668
85	19371	5721	6315

**IES INDOOR REPORT
PHOTOMETRIC FILENAME : L071600308.IES**

CANDELA TABULATION

	<u>0.0</u>	<u>22.5</u>	<u>45.0</u>	<u>67.5</u>	<u>90.0</u>
0	298.71	298.71	298.71	298.71	298.71
5	296.81	295.25	294.20	293.81	294.15
10	293.03	290.20	288.96	288.99	289.59
15	285.44	282.13	282.75	283.95	285.04
20	274.91	271.69	274.45	278.44	280.48
25	262.20	259.37	265.13	271.81	272.53
30	246.81	245.33	255.26	258.98	261.17
35	230.32	230.01	239.51	246.02	249.81
40	211.73	213.43	223.05	233.37	238.45
45	191.38	195.57	206.67	220.59	227.09
50	170.07	175.60	189.86	207.75	216.05
55	147.08	154.22	173.67	195.44	205.02
60	123.42	132.79	158.10	183.56	193.99
65	99.55	111.60	143.38	171.84	182.95
70	75.35	91.28	129.05	161.09	175.17
75	50.22	74.19	117.24	155.53	170.65
80	27.56	58.31	110.80	150.30	166.12
85	9.02	49.66	105.40	145.37	161.60
90	0.59	44.02	100.94	140.71	157.07
95	9.02	49.66	105.40	145.37	161.60
100	27.56	58.31	110.80	150.30	166.12
105	50.22	74.19	117.24	155.53	170.65
110	75.35	91.28	129.05	161.09	175.17
115	99.55	111.60	143.38	171.84	182.95
120	123.42	132.79	158.10	183.56	193.99
125	147.08	154.22	173.67	195.44	205.02
130	170.07	175.60	189.86	207.75	216.05
135	191.38	195.57	206.67	220.59	227.09
140	211.73	213.43	223.05	233.37	238.45
145	230.32	230.01	239.51	246.02	249.81
150	246.81	245.33	255.26	258.98	261.17
155	262.20	259.37	265.13	271.81	272.53
160	274.91	271.69	274.45	278.44	280.48
165	285.44	282.13	282.75	283.95	285.04
170	293.03	290.20	288.96	288.99	289.59
175	296.81	295.25	294.20	293.81	294.15
180	298.00	298.00	298.00	298.00	298.00

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L071600308.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	108.09	N.A.	5.10
0-30	230.61	N.A.	10.80
0-40	380.29	N.A.	17.80
0-60	697.64	N.A.	32.70
0-80	960.12	N.A.	45.00
0-90	1065.96	N.A.	50.00
10-90	1037.95	N.A.	48.70
20-40	272.19	N.A.	12.80
20-50	432.88	N.A.	20.30
40-70	458.40	N.A.	21.50
60-80	262.48	N.A.	12.30
70-80	121.44	N.A.	5.70
80-90	105.84	N.A.	5.00
90-110	227.27	N.A.	10.70
90-120	368.31	N.A.	17.30
90-130	524.99	N.A.	24.60
90-150	835.35	N.A.	39.20
90-180	1065.95	N.A.	50.00
110-180	838.67	N.A.	39.30
0-180	2131.9	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	28.01
10-20	80.09
20-30	122.51
30-40	149.68
40-50	160.68
50-60	156.67
60-70	141.04
70-80	121.44
80-90	105.84
90-100	105.84
100-110	121.44
110-120	141.04
120-130	156.67
130-140	160.68
140-150	149.68
150-160	122.51
160-170	80.09
170-180	28.00

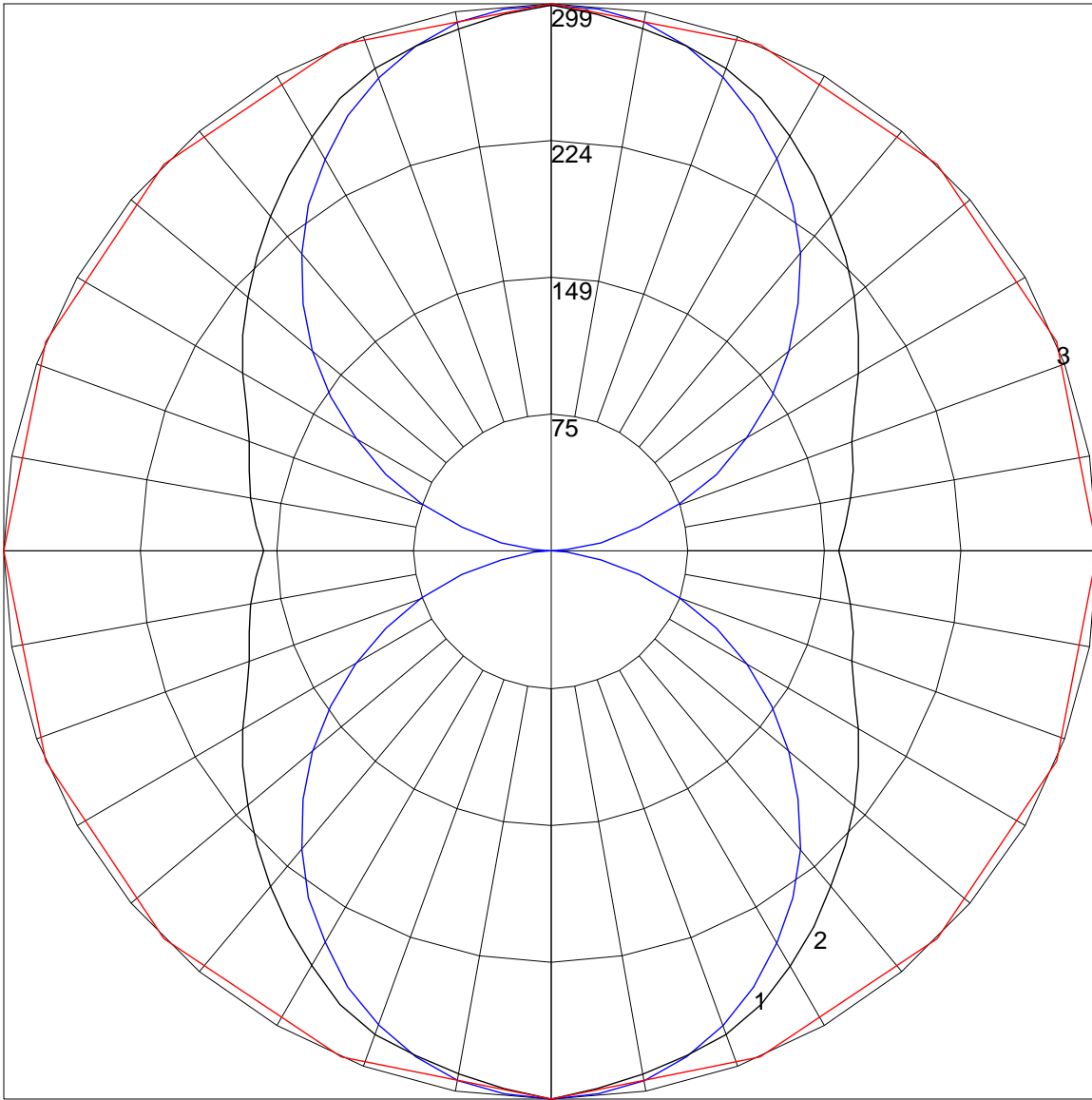
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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	107	107	107	107	99	99	99	99	83	83	83	69	69	69	56	56	56	50
1	96	90	86	81	88	83	79	75	70	67	64	58	55	53	46	45	43	38
2	86	78	71	65	79	72	66	60	60	56	52	49	46	43	40	37	35	30
3	78	68	60	53	72	63	55	50	52	47	43	43	39	36	35	32	29	25
4	71	60	51	45	65	55	48	42	46	40	36	38	34	30	31	27	25	21
5	65	53	44	38	60	49	41	35	41	35	31	34	29	26	27	24	21	18
6	60	47	39	33	55	44	36	31	37	31	26	31	26	22	25	21	18	15
7	56	43	34	28	51	39	32	27	33	27	23	28	23	20	23	19	16	13
8	51	39	31	25	47	36	29	23	30	25	20	25	21	17	21	17	14	12
9	48	35	27	22	44	33	26	21	28	22	18	23	19	16	19	16	13	11
10	45	32	25	20	41	30	23	19	26	20	16	22	17	14	18	14	12	10

POLAR GRAPH



Maximum Candela = 298.71 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.)