



8165 E Kaiser Blvd. Anaheim, CA 92808
 p. 714.282.2270
 f. 714.676.5558

Report No: L111602311

Date: 11/15/2016



NVLAP LAB CODE 200927-0

Report No: L111602311

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

Model Number: 204001-432

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 204001-432. Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 11/9/16

Date of Tests: 11/11/16 - 11/15/16

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:	204001-432	
Driver Model Number:	N/A	
Total Lumens:	1640.98	
Input Voltage (VAC/60Hz):	120.00	
Input Current (Amp):	0.09	
Input Power (W):	10.53	
Input Power Factor:	0.99	
Current ATHD @ 120V(%):	8%	
Current ATHD @ 277V(%):	12% (0.04A, 10.89W, 0.9PF)	
Efficacy:	156	
Color Rendering Index (CRI):	83	
Correlated Color Temperature (K):	4010	
Chromaticity Coordinate x:	0.3813	
Chromaticity Coordinate y:	0.3812	
Ambient Temperature (°C):	25.0	
Stabilization Time (Hours):	0:35	
Total Operating Time (Hours):	1:10	
Off State Power(W):	0.00	

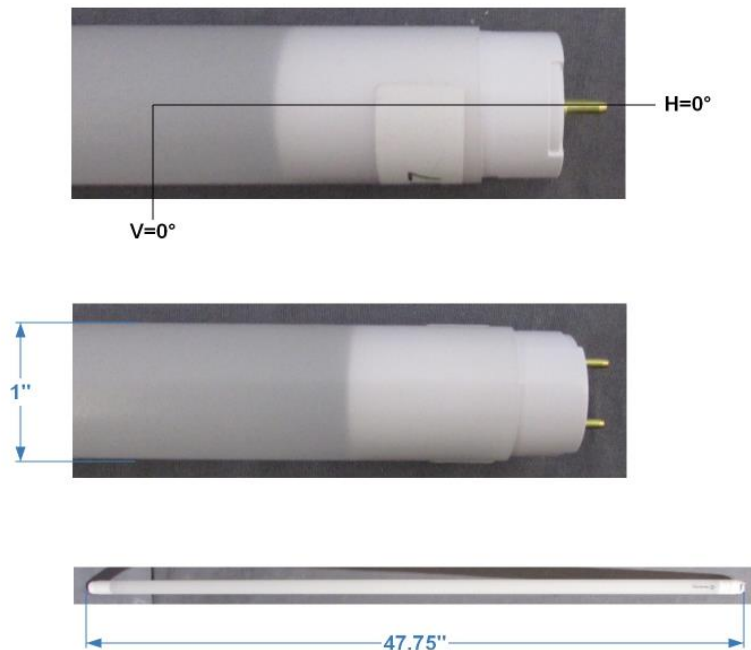
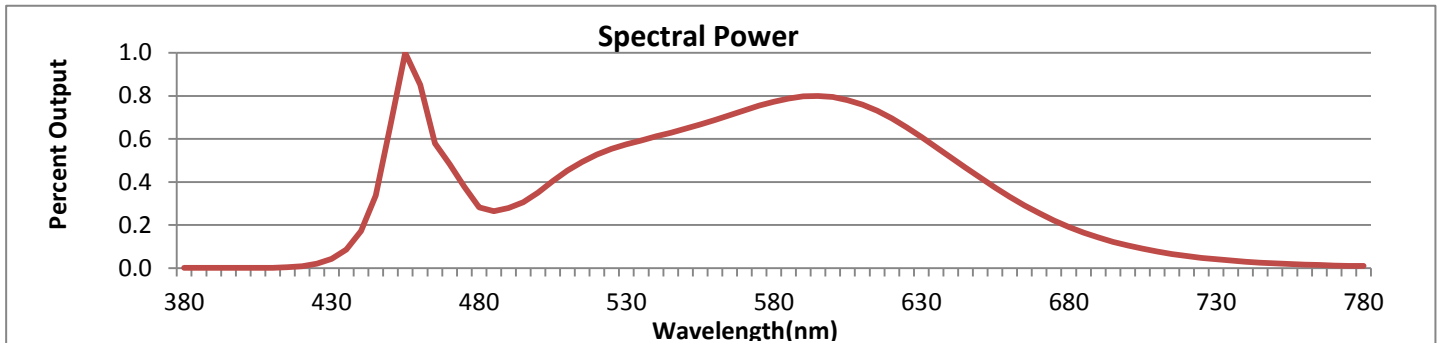


FIG. 1 LUMINAIRE

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



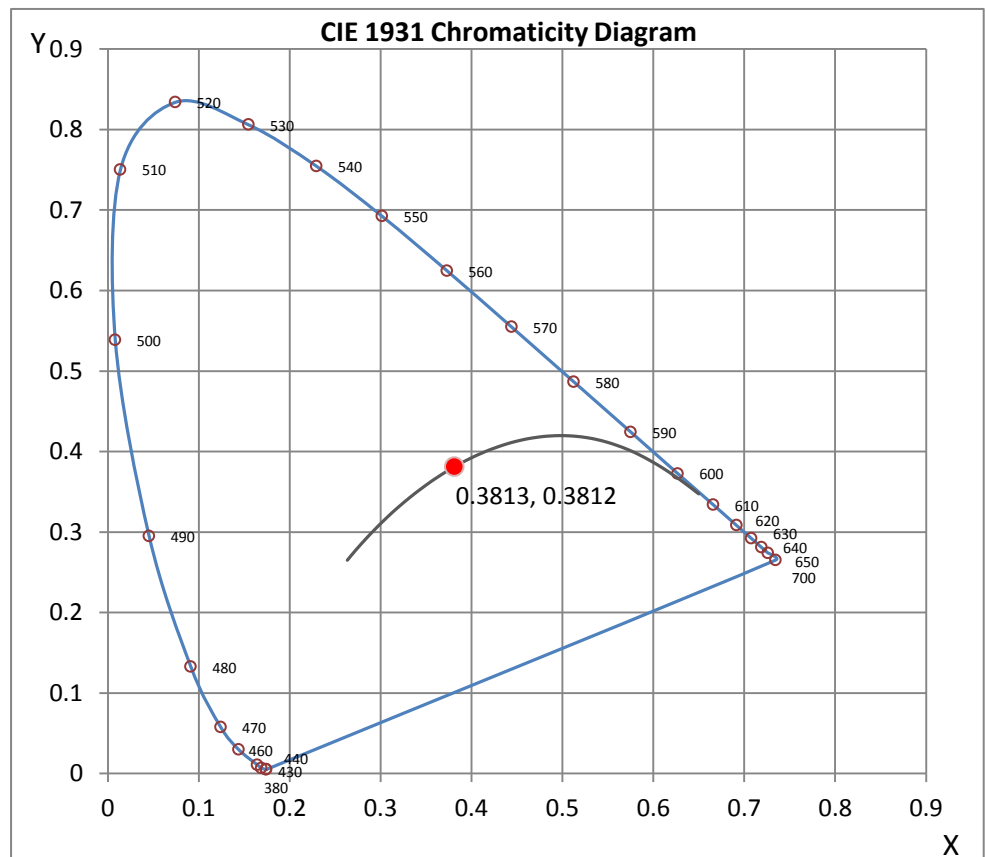
Wavelength	W/m ² nm	440	0.1717	510	0.4534	580	0.7731	650	0.4197	720	0.0560
380	0.0008	450	0.6638	520	0.5273	590	0.7985	660	0.3319	730	0.0407
390	0.0008	460	0.8518	530	0.5754	600	0.7947	670	0.2549	740	0.0299
400	0.0010	470	0.4834	540	0.6119	610	0.7598	680	0.1918	750	0.0220
410	0.0019	480	0.2828	550	0.6479	620	0.6955	690	0.1423	760	0.0164
420	0.0092	490	0.2797	560	0.6881	630	0.6085	700	0.1047	770	0.0121
430	0.0424	500	0.3505	570	0.7327	640	0.5141	710	0.0766	780	0.0105

CRI & CCT

x	0.3813
y	0.3812
u'	0.2239
v'	0.5037
CRI	83.30
CCT	4010
Duv	0.00183

R Values

R1	82.05
R2	91.48
R3	95.96
R4	79.37
R5	80.72
R6	86.83
R7	85.24
R8	64.45
R9	11.61
R10	78.35
R11	77.79
R12	56.36
R13	84.86
R14	98.06



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

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*



8165 E. Kaiser Blvd. Anaheim, CA 92808
 p. 714.282.2270
 f. 714.676.5558

Photometric Test Report

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L111602311.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
 [TEST] L111602311
 [TESTLAB] LIGHT LABORATORY, INC.
 [ISSUEDATE] 11/14/2016
 [MANUFAC] REVOLUTION LIGHTING TECHNOLOGIES
 [LUMCAT] 204001-432
 [LUMINAIRE] 10.5W HIGH EFFICACY SEP TUBE LAMP 3500K
 [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, 10.53W
 [TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	1641
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	156
Total Luminaire Watts	10.53
Ballast Factor	1.00
CIE Type	Semi-Direct
Spacing Criterion (0-180)	1.20
Spacing Criterion (90-270)	1.40
Spacing Criterion (Diagonal)	1.44
Basic Luminous Shape	Hor. Cylinder Along Length
Luminous Length (0-180)	3.67 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	597824	12354	10206
55	384369	10599	9352
65	226969	8947	8436
75	106846	7439	7474
85	23967	6145	6527

**IES INDOOR REPORT
PHOTOMETRIC FILENAME : L111602311.IES**

CANDELA TABULATION

	<u>0.0</u>	<u>22.5</u>	<u>45.0</u>	<u>67.5</u>	<u>90.0</u>
0	332.28	332.28	332.28	332.28	332.28
5	329.49	330.58	330.79	331.46	332.59
10	324.12	324.96	326.68	329.11	330.75
15	314.55	316.19	320.01	324.37	326.30
20	301.21	304.40	311.45	317.62	321.43
25	284.60	289.93	300.37	310.15	315.14
30	266.14	272.81	287.20	301.42	307.67
35	245.17	253.68	272.85	291.35	298.95
40	221.50	232.83	257.54	279.65	289.30
45	197.59	211.52	241.39	267.65	278.64
50	173.34	189.58	224.11	254.86	267.15
55	147.17	167.30	207.49	241.73	255.32
60	121.49	145.57	191.64	228.55	242.98
65	96.15	124.85	175.40	215.13	230.31
70	71.49	105.26	159.92	201.66	217.23
75	48.24	87.76	145.99	188.40	204.05
80	26.93	72.41	132.86	175.32	190.96
85	11.16	60.20	120.65	163.11	178.21
90	2.27	51.14	110.04	151.36	165.88
95	1.09	44.72	100.85	139.78	153.46
100	0.00	40.74	92.46	128.96	141.88
105	0.00	38.60	85.29	119.39	131.48
110	0.00	37.88	79.12	110.54	121.49
115	0.00	38.05	74.21	102.11	111.84
120	0.00	39.06	69.89	94.52	103.29
125	0.00	40.23	66.41	87.85	95.73
130	0.00	41.32	63.60	81.76	88.52
135	0.00	41.57	61.25	76.52	81.89
140	0.00	41.28	58.10	71.86	76.44
145	0.00	40.95	53.91	67.75	71.40
150	0.00	37.55	50.68	63.72	66.70
155	0.00	31.34	48.92	58.36	62.34
160	0.00	28.65	46.31	51.98	58.98
165	0.00	24.79	37.59	45.69	56.05
170	0.00	20.22	29.28	31.25	42.96
175	0.00	15.73	19.72	20.51	18.21
180	0.00	0.00	0.00	0.00	0.00

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L111602311.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	121.91	N.A.	7.40
0-30	260.32	N.A.	15.90
0-40	430.96	N.A.	26.30
0-60	799.37	N.A.	48.70
0-80	1112.91	N.A.	67.80
0-90	1233.14	N.A.	75.10
10-90	1201.67	N.A.	73.20
20-40	309.05	N.A.	18.80
20-50	494.22	N.A.	30.10
40-70	536.77	N.A.	32.70
60-80	313.54	N.A.	19.10
70-80	145.19	N.A.	8.80
80-90	120.23	N.A.	7.30
90-110	181.22	N.A.	11.00
90-120	248.51	N.A.	15.10
90-130	302.98	N.A.	18.50
90-150	376.80	N.A.	23.00
90-180	407.84	N.A.	24.90
110-180	226.62	N.A.	13.80
0-180	1640.98	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	31.47
10-20	90.44
20-30	138.42
30-40	170.63
40-50	185.17
50-60	183.25
60-70	168.35
70-80	145.19
80-90	120.23
90-100	99.23
100-110	81.98
110-120	67.29
120-130	54.47
130-140	42.69
140-150	31.13
150-160	19.79
160-170	9.56
170-180	1.69

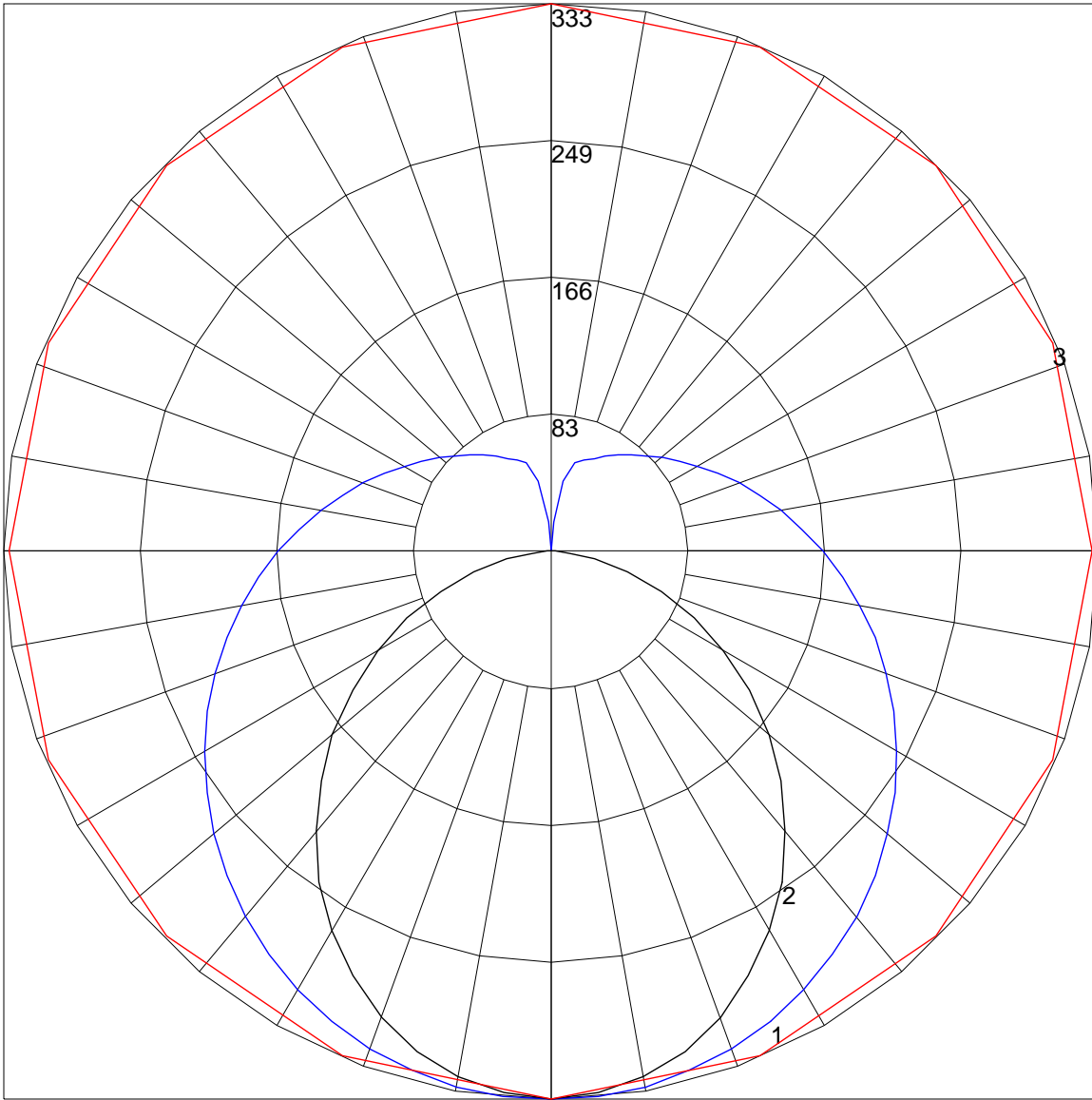
IES INDOOR REPORT
PHOTOMETRIC FILENAME : L111602311.IES

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	113	113	113	113	113	108	108	108	108	97	97	97	88	88	88	79	79	79	75
1	100	94	89	84	84	95	90	85	81	81	77	73	72	70	67	65	63	61	57
2	90	81	73	66	66	85	77	70	64	69	63	59	62	57	53	55	52	49	45
3	82	70	61	54	54	77	67	59	52	60	53	48	54	49	44	48	44	40	37
4	74	62	52	45	45	70	59	50	43	53	46	40	48	42	37	43	38	34	31
5	68	55	45	38	38	64	52	43	37	47	40	34	42	36	32	38	33	29	26
6	63	49	40	33	33	59	47	38	32	42	35	30	38	32	28	34	29	25	23
7	58	44	35	29	29	55	42	34	28	38	31	26	35	29	24	31	26	22	20
8	54	40	31	26	26	51	38	30	25	35	28	23	32	26	22	29	24	20	18
9	50	37	28	23	23	47	35	27	22	32	25	21	29	23	19	27	22	18	16
10	47	34	26	20	20	44	32	25	20	30	23	19	27	21	17	25	20	16	14

POLAR GRAPH



Maximum Candela = 332.59 Located At Horizontal Angle = 90, Vertical Angle = 5
1 - Vertical Plane Through Horizontal Angles (90 - 270) (Through Max. Cd.)
2 - Vertical Plane Through Horizontal Angles (0 - 180)
3 - Horizontal Cone Through Vertical Angle (5) (Through Max. Cd.)