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Report No: L071600301

Date: 7/6/2016



NVLAP LAB CODE 200927-0

Report No: L071600301

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

Model Number: 204001-433

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 204001-433. 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: 7/1/16 - 7/6/16

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:	204001-433
Driver Model Number:	N/A
Total Lumens:	1753.89
Input Voltage (VAC/60Hz):	120.00
Input Current (Amp):	0.09
Input Power (W):	10.84
Input Power Factor:	0.99
Current ATHD @ 120V(%):	7%
Current ATHD @ 277V(%):	N/A
Efficacy:	162
Color Rendering Index (CRI):	82
Correlated Color Temperature (K):	3975
Chromaticity Coordinate x:	0.3824
Chromaticity Coordinate y:	0.3805
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:35
Total Operating Time (Hours):	1:10
Off State Power(W):	0.00

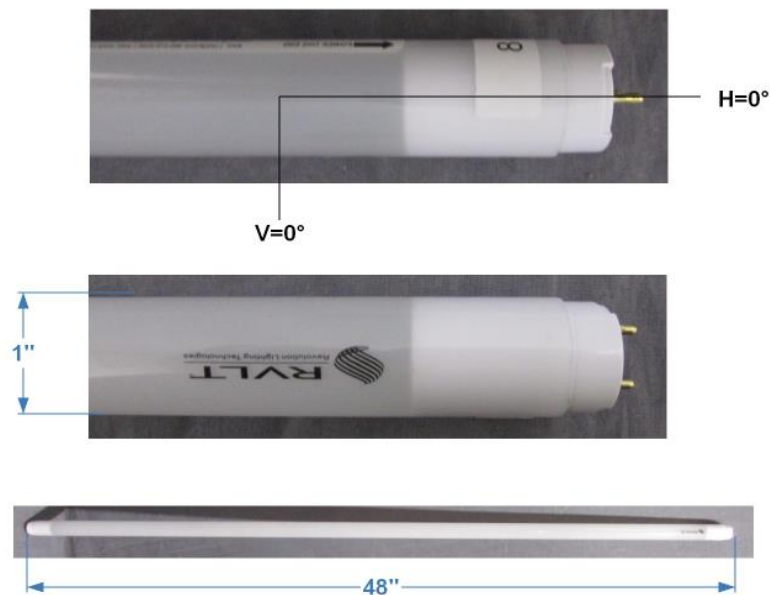
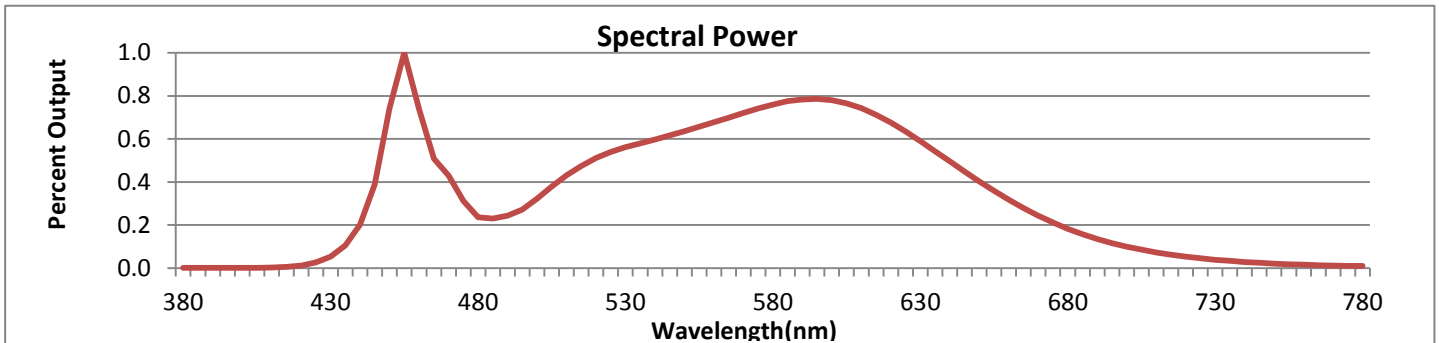


FIG. 1 LUMINAIRE

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



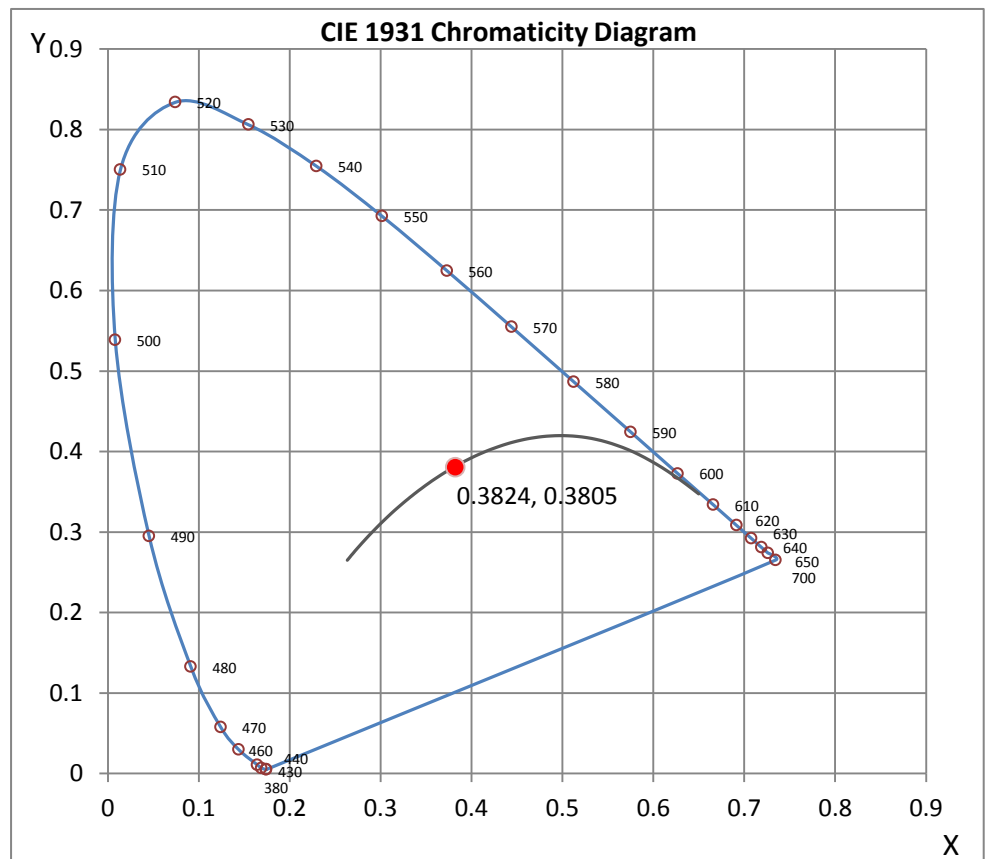
Wavelength	W/m ² nm	440	0.2024	510	0.4303	580	0.7587	650	0.4031	720	0.0531
380	0.0009	450	0.7415	520	0.5114	590	0.7839	660	0.3183	730	0.0389
390	0.0008	460	0.7363	530	0.5615	600	0.7809	670	0.2435	740	0.0285
400	0.0011	470	0.4301	540	0.5981	610	0.7426	680	0.1832	750	0.0211
410	0.0025	480	0.2366	550	0.6362	620	0.6769	690	0.1356	760	0.0156
420	0.0122	490	0.2437	560	0.6777	630	0.5899	700	0.0996	770	0.0116
430	0.0528	500	0.3217	570	0.7208	640	0.4963	710	0.0728	780	0.0100

CRI & CCT

x	0.3824
y	0.3805
u'	0.2249
v'	0.5035
CRI	82.20
CCT	3975
Duv	0.00118

R Values

R1	80.73
R2	89.84
R3	95.11
R4	79.15
R5	79.56
R6	84.61
R7	85.40
R8	63.37
R9	7.41
R10	74.54
R11	77.08
R12	54.78
R13	83.26
R14	97.29



*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.

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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 : L071600301.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
 [TEST] L071600301
 [TESTLAB] LIGHT LABORATORY, INC.
 [ISSUEDATE] 7/6/2016
 [MANUFAC] REVOLUTION LIGHTING TECHNOLOGIES
 [LUMCAT] 204001-433
 [LUMINAIRE] 10.5W 4FT 4000K G4 TUBE LAMP SEP HIGH EFFICACY
 [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, 10.84W
 [TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	1754
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	162
Total Luminaire Watts	10.84
Ballast Factor	1.00
CIE Type	Semi-Direct
Spacing Criterion (0-180)	1.20
Spacing Criterion (90-270)	1.38
Spacing Criterion (Diagonal)	1.42
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	674250	13726	11260
55	429944	11626	10151
65	248757	9638	8989
75	113911	7847	7809
85	17481	6339	6644

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L071600301.IES

CANDELA TABULATION

	<u>0.0</u>	<u>22.5</u>	<u>45.0</u>	<u>67.5</u>	<u>90.0</u>
0	377.65	377.65	377.65	377.65	377.65
5	375.38	375.55	376.01	376.39	376.39
10	368.67	369.43	371.27	372.95	373.70
15	357.51	359.19	363.47	367.24	368.75
20	342.33	345.05	352.48	359.53	362.04
25	324.37	328.98	338.93	349.58	353.82
30	301.97	308.89	324.79	338.09	344.17
35	277.80	286.61	307.21	325.59	333.68
40	251.04	262.07	287.75	311.53	320.93
45	222.85	236.65	268.20	296.47	307.42
50	192.98	211.14	248.23	280.03	293.07
55	164.62	184.84	227.59	263.46	277.13
60	135.34	159.88	207.33	246.80	261.95
65	105.38	135.92	188.95	229.89	245.42
70	79.62	113.48	170.49	213.49	229.39
75	51.43	93.26	154.00	197.47	213.20
80	27.02	77.40	138.15	181.90	196.92
85	8.14	62.38	124.47	166.67	181.40
90	0.50	52.06	112.18	152.96	167.14
95	0.00	44.80	101.23	139.95	153.12
100	0.00	40.36	92.04	127.99	140.37
105	0.00	38.09	84.62	117.26	128.62
110	0.00	37.25	78.28	107.82	118.39
115	0.00	37.59	72.87	99.43	108.66
120	0.00	38.51	68.63	91.87	100.18
125	0.00	39.90	65.24	85.29	92.63
130	0.00	41.57	62.47	79.75	85.83
135	0.00	42.08	60.20	74.59	79.96
140	0.00	41.99	57.31	70.14	74.59
145	0.00	41.11	53.91	66.28	69.89
150	0.00	38.30	50.93	62.93	65.78
155	0.00	33.31	49.42	57.89	62.26
160	0.00	26.60	46.15	52.02	59.07
165	0.00	23.75	38.97	45.52	55.46
170	0.00	20.72	27.44	33.14	40.36
175	0.00	14.14	20.77	21.56	18.38
180	0.00	0.00	0.00	0.00	0.00

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L071600301.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	138.28	N.A.	7.90
0-30	294.68	N.A.	16.80
0-40	486.41	N.A.	27.70
0-60	893.32	N.A.	50.90
0-80	1227.57	N.A.	70.00
0-90	1350.76	N.A.	77.00
10-90	1315.02	N.A.	75.00
20-40	348.14	N.A.	19.80
20-50	554.11	N.A.	31.60
40-70	588.16	N.A.	33.50
60-80	334.24	N.A.	19.10
70-80	152.99	N.A.	8.70
80-90	123.20	N.A.	7.00
90-110	180.17	N.A.	10.30
90-120	245.97	N.A.	14.00
90-130	299.24	N.A.	17.10
90-150	372.10	N.A.	21.20
90-180	403.13	N.A.	23.00
110-180	222.97	N.A.	12.70
0-180	1753.89	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	35.74
10-20	102.54
20-30	156.41
30-40	191.73
40-50	205.98
50-60	200.93
60-70	181.26
70-80	152.99
80-90	123.20
90-100	99.35
100-110	80.81
110-120	65.81
120-130	53.27
130-140	42.01
140-150	30.85
150-160	19.84
160-170	9.50
170-180	1.69

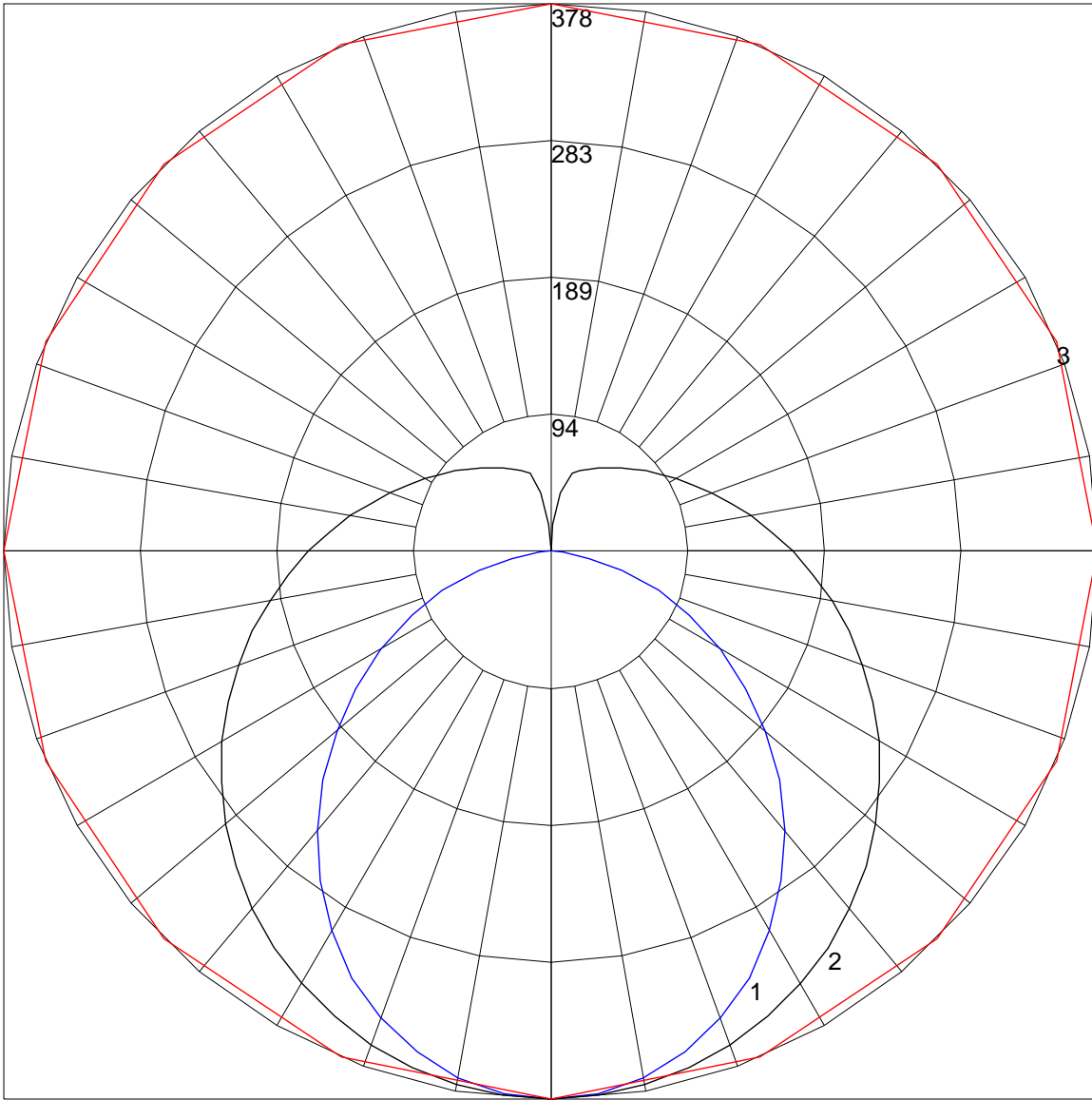
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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	114	114	114	114	114	108	108	108	108	98	98	98	89	89	89	81	81	81	77
1	101	95	90	85	85	96	90	86	81	82	78	75	74	71	68	67	64	62	59
2	91	81	74	67	67	86	77	71	65	70	65	60	63	59	55	57	54	50	47
3	82	71	62	55	55	78	67	59	53	61	54	49	55	50	45	50	45	42	38
4	75	62	53	46	46	71	59	51	44	54	47	41	49	43	38	44	39	35	32
5	69	55	46	39	39	65	53	44	38	48	41	35	44	38	33	39	34	30	28
6	63	49	40	34	34	60	47	39	33	43	36	31	39	33	29	36	31	27	24
7	58	45	36	30	30	55	43	34	29	39	32	27	36	30	25	33	27	23	21
8	54	41	32	26	26	51	39	31	25	36	29	24	33	27	22	30	25	21	19
9	51	37	29	23	23	48	36	28	23	33	26	21	30	24	20	28	22	19	17
10	47	34	26	21	21	45	33	25	20	30	24	19	28	22	18	26	21	17	15

POLAR GRAPH



Maximum Candela = 377.65 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.)