



8165 E Kaiser Blvd. Anaheim, CA 92808
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Report No: L071600305

Date: 7/6/2016



NVLAP LAB CODE 200927-0

Report No: L071600305

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

Model Number: 202000-411

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 202000-411 . 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: 7/5/16 - 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:	202000-411
Driver Model Number:	N/A
Total Lumens:	1041.20
Input Voltage (VAC/60Hz):	120.00
Input Current (Amp):	0.07
Input Power (W):	7.75
Input Power Factor:	0.99
Current ATHD @ 120V(%):	10%
Current ATHD @ 277V(%):	N/A
Efficacy:	134
Color Rendering Index (CRI):	83
Correlated Color Temperature (K):	3017
Chromaticity Coordinate x:	0.4349
Chromaticity Coordinate y:	0.4019
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:40
Total Operating Time (Hours):	1:10
Off State Power(W):	0.00

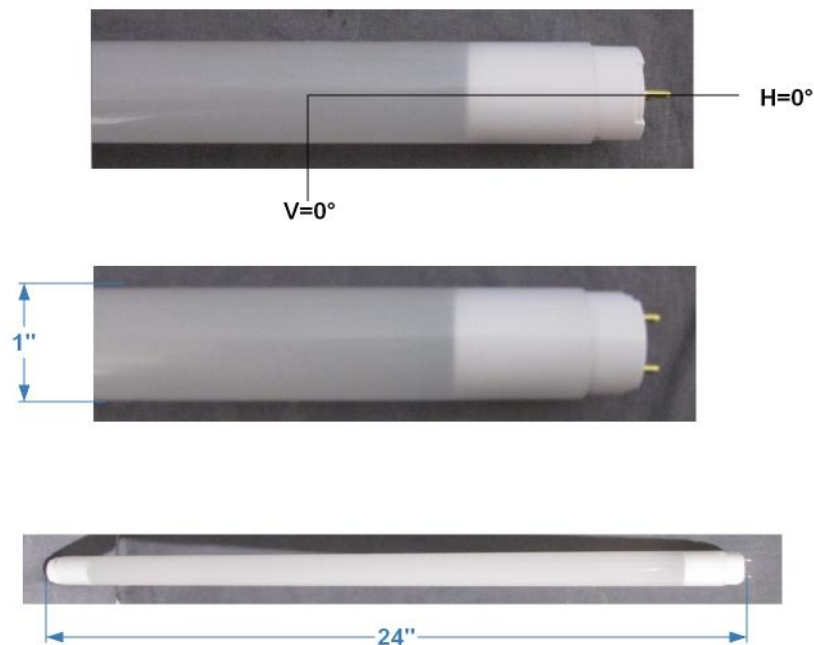
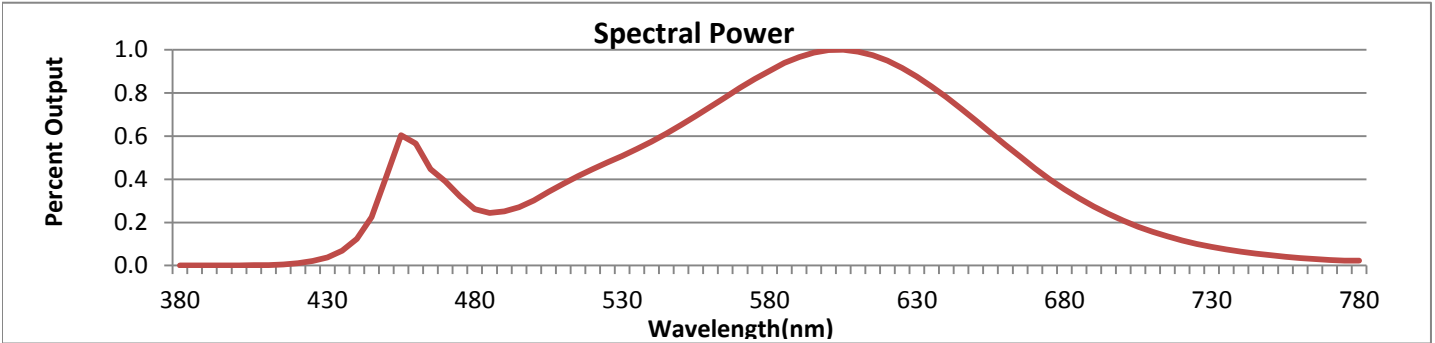


FIG. 1 LUMINAIRE

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



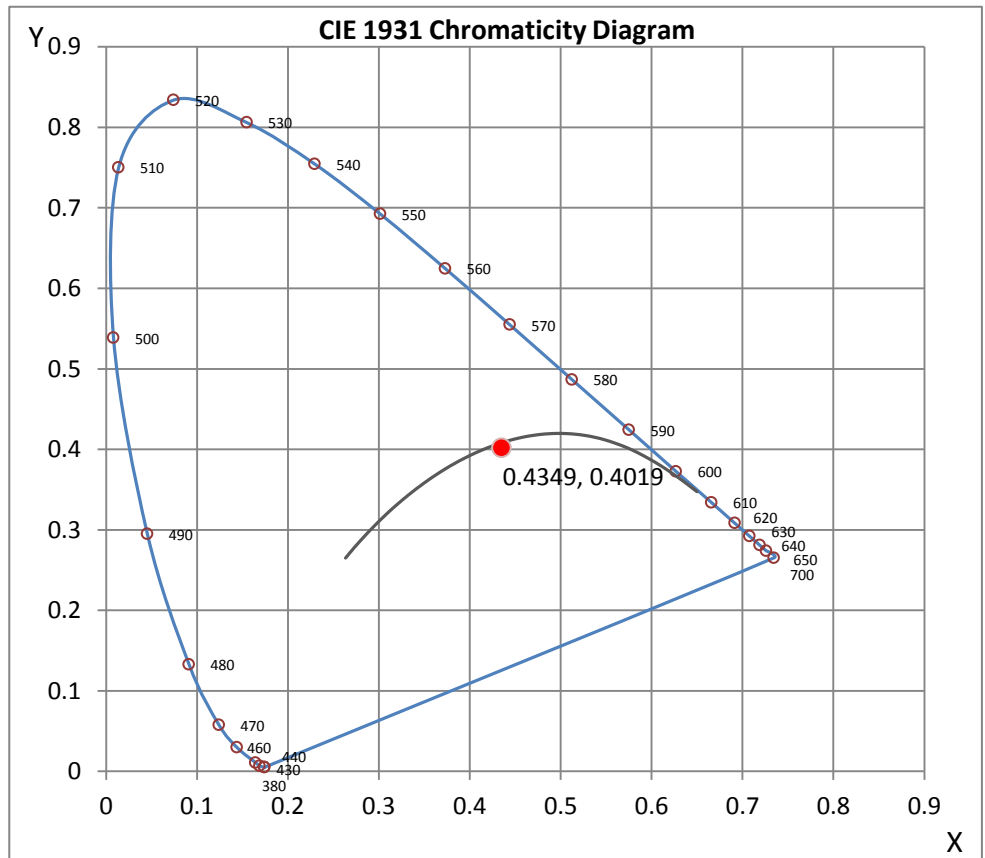
Wavelength	W/m ² nm	440	0.1229	510	0.3792	580	0.9032	650	0.6728	720	0.1168
380	0.0006	450	0.4127	520	0.4471	590	0.9660	660	0.5607	730	0.0865
390	0.0008	460	0.5661	530	0.5083	600	0.9997	670	0.4498	740	0.0640
400	0.0010	470	0.3902	540	0.5744	610	0.9918	680	0.3542	750	0.0473
410	0.0023	480	0.2610	550	0.6516	620	0.9507	690	0.2736	760	0.0352
420	0.0105	490	0.2510	560	0.7368	630	0.8764	700	0.2078	770	0.0260
430	0.0382	500	0.3023	570	0.8237	640	0.7814	710	0.1564	780	0.0223

CRI & CCT

x	0.4349
y	0.4019
u'	0.2502
v'	0.5202
CRI	83.10
CCT	3017
Duv	-0.00059

R Values

R1	81.84
R2	92.55
R3	95.69
R4	78.34
R5	81.01
R6	89.59
R7	83.31
R8	62.54
R9	17.93
R10	81.71
R11	75.56
R12	67.75
R13	84.47
R14	98.41



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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 : L071600305.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
 [TEST] L071600305
 [TESTLAB] LIGHT LABORATORY, INC.
 [ISSUEDATE] 7/6/2016
 [MANUFAC] REVOLUTION LIGHTING TECHNOLOGIES
 [LUMCAT] 202000-411
 [LUMINAIRE] 8W 2FT 3000K G4 TUBE LAMP 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] 120VAC, 7.75W
 [TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	1041
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	134
Total Luminaire Watts	7.75
Ballast Factor	1.00
CIE Type	Semi-Direct
Spacing Criterion (0-180)	1.20
Spacing Criterion (90-270)	1.36
Spacing Criterion (Diagonal)	1.42
Basic Luminous Shape	Hor. Cylinder Along Length
Luminous Length (0-180)	1.65 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	409210	18281	15222
55	258797	15374	13650
65	150133	12638	12058
75	68395	10243	10424
85	11167	8238	8859

**IES INDOOR REPORT
PHOTOMETRIC FILENAME : L071600305.IES**

CANDELA TABULATION

	<u>0.0</u>	<u>22.5</u>	<u>45.0</u>	<u>67.5</u>	<u>90.0</u>
0	232.77	232.77	232.77	232.77	232.77
5	231.49	231.66	231.82	231.87	231.99
10	227.04	227.63	228.93	229.52	230.15
15	219.74	221.17	224.06	225.74	227.04
20	210.43	212.02	216.72	220.46	222.34
25	198.60	201.16	208.16	214.21	217.14
30	184.17	188.40	198.14	206.86	210.60
35	168.56	174.64	187.36	198.56	203.47
40	152.12	159.54	175.02	189.37	195.33
45	135.25	143.64	162.94	179.51	186.85
50	117.13	127.37	150.27	169.19	176.95
55	99.09	111.89	137.60	159.08	167.55
60	81.05	96.61	125.23	148.93	157.99
65	63.60	81.76	113.48	138.57	148.01
70	46.82	67.96	102.40	128.08	137.85
75	30.88	55.84	92.17	118.35	127.95
80	16.53	45.64	82.60	108.78	118.22
85	5.20	37.21	74.21	99.72	108.74
90	0.34	30.96	66.87	91.16	100.01
95	0.00	26.47	60.12	83.15	91.45
100	0.00	23.83	54.58	76.06	83.57
105	0.00	22.23	49.96	69.60	76.52
110	0.00	21.40	46.02	63.89	70.31
115	0.00	20.26	42.54	58.56	64.44
120	0.00	19.68	39.73	53.91	58.98
125	0.00	19.13	37.30	49.71	54.12
130	0.00	18.75	33.94	45.94	49.84
135	0.00	18.04	31.21	41.49	45.64
140	0.00	16.45	28.95	37.04	40.27
145	0.00	13.38	26.68	33.56	35.99
150	0.00	10.36	23.87	30.04	32.05
155	0.00	8.43	19.38	26.68	28.44
160	0.00	7.17	13.97	21.94	24.16
165	0.00	5.79	10.07	14.22	18.04
170	0.00	4.53	7.43	8.89	10.24
175	0.00	3.78	5.03	5.03	4.03
180	0.00	0.00	0.00	0.00	0.00

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L071600305.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	85.11	N.A.	8.20
0-30	180.93	N.A.	17.40
0-40	297.77	N.A.	28.60
0-60	544.09	N.A.	52.30
0-80	744.80	N.A.	71.50
0-90	818.41	N.A.	78.60
10-90	796.39	N.A.	76.50
20-40	212.65	N.A.	20.40
20-50	337.60	N.A.	32.40
40-70	355.41	N.A.	34.10
60-80	200.70	N.A.	19.30
70-80	91.62	N.A.	8.80
80-90	73.61	N.A.	7.10
90-110	106.90	N.A.	10.30
90-120	145.18	N.A.	13.90
90-130	175.08	N.A.	16.80
90-150	211.49	N.A.	20.30
90-180	222.79	N.A.	21.40
110-180	115.88	N.A.	11.10
0-180	1041.2	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	22.02
10-20	63.09
20-30	95.82
30-40	116.84
40-50	124.94
50-60	121.38
60-70	109.08
70-80	91.62
80-90	73.61
90-100	59.09
100-110	47.82
110-120	38.27
120-130	29.91
130-140	21.98
140-150	14.43
150-160	7.96
160-170	2.91
170-180	0.42

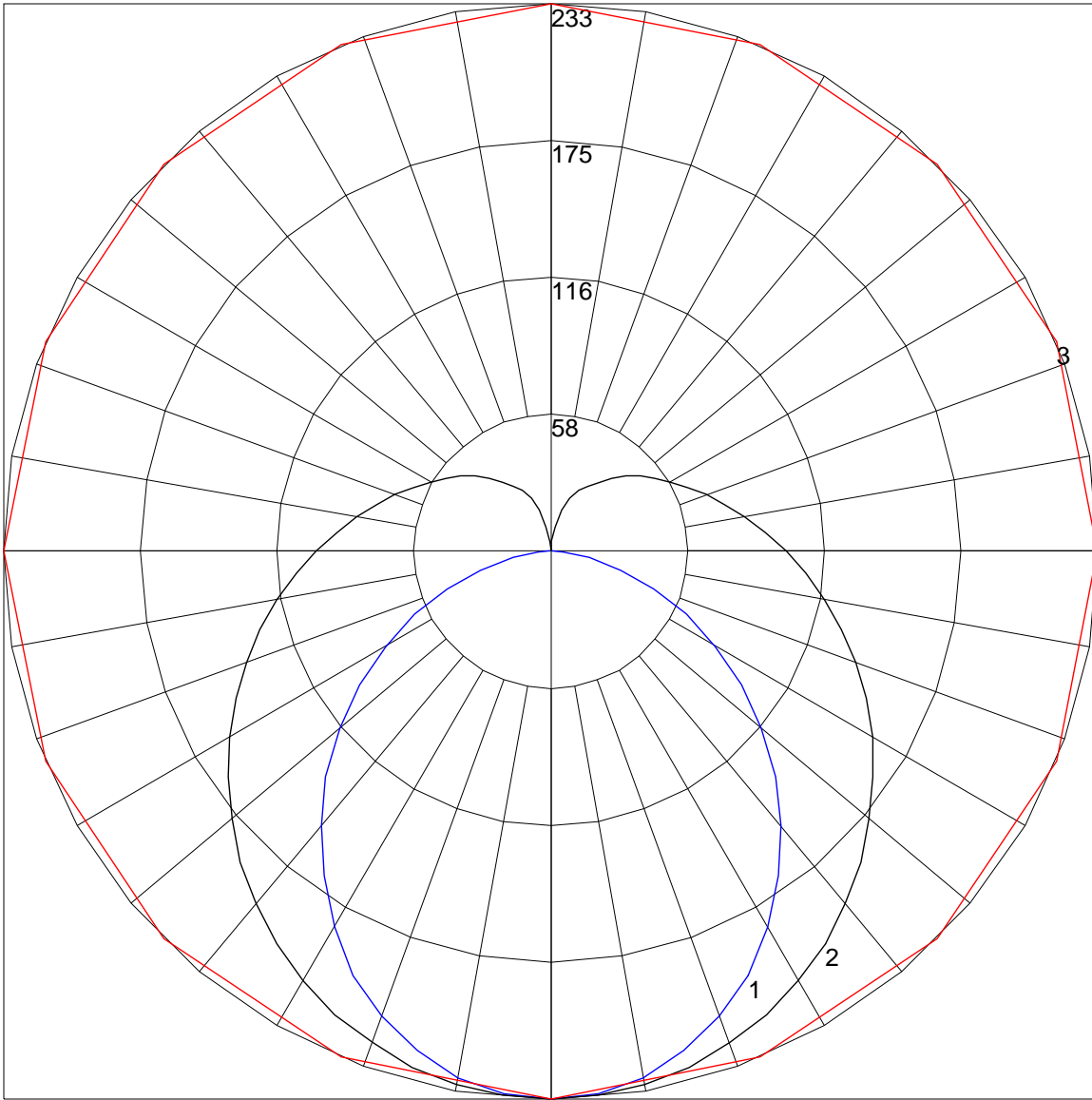
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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	109	109	109	109	99	99	99	90	90	90	82	82	82	79
1	101	95	90	85	96	91	86	82	83	79	75	75	72	69	68	66	64	60
2	91	82	74	68	86	78	71	65	71	65	60	64	60	56	58	55	51	48
3	82	71	62	55	78	68	60	53	62	55	50	56	51	46	51	46	43	39
4	75	63	53	46	71	60	51	45	54	47	42	50	44	39	45	40	36	33
5	69	56	46	39	65	53	45	38	49	41	36	44	38	33	40	35	31	28
6	63	50	41	34	60	48	39	33	44	36	31	40	34	29	36	31	27	25
7	59	45	36	30	56	43	35	29	40	32	27	36	30	26	33	28	24	22
8	55	41	32	26	52	39	31	26	36	29	24	33	27	23	31	25	21	19
9	51	37	29	24	48	36	28	23	33	26	22	31	25	20	28	23	19	17
10	48	34	26	21	45	33	26	21	31	24	20	28	23	18	26	21	17	16

POLAR GRAPH



Maximum Candela = 232.77 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.)