LIGHT LABORATORY INC.
8165 E Kaiser Blvd. Anaheim, CA 92808
www.lightlaboratory.com

NVLAP TESTING
NVLAP LAB CODE 200927-0

Report No: **L121605909** **Issue Date: 2/8/2017**

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

Model Number: **131232-201**

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. Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 12/21/16

Date of Tests: 1/6/17 - 1/10/17

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	11/28/17
ITECH	IT6122	PS-DC03-S1	11/28/17
Fluke Digital Thermometer	52k/J	MT-TP02-GC	11/28/17
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.

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Test Summary	
Manufacturer:	Revolution Lighting
Model Number:	131232-201
Driver Model Number:	N/A
Total Lumens:	2400.58
Input Voltage (VAC/60Hz):	120.00
Input Current (Amp):	0.16
Input Power (W):	19.49
Input Power Factor:	0.99
Current ATHD @ 120V(%):	11%
Current ATHD @ 277V(%):	N/A
Efficacy:	123
Color Rendering Index (CRI):	83
Correlated Color Temperature (K):	3102
Chromaticity Coordinate x:	0.4299
Chromaticity Coordinate y:	0.4017
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	1:30
Total Operating Time (Hours):	2:00
Off State Power(W):	0.00

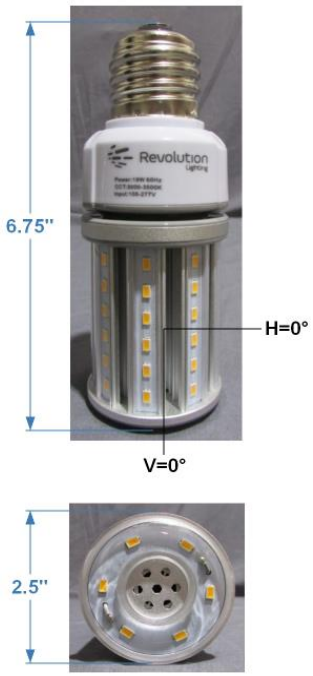

FIG. 1 LUMINAIRE

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

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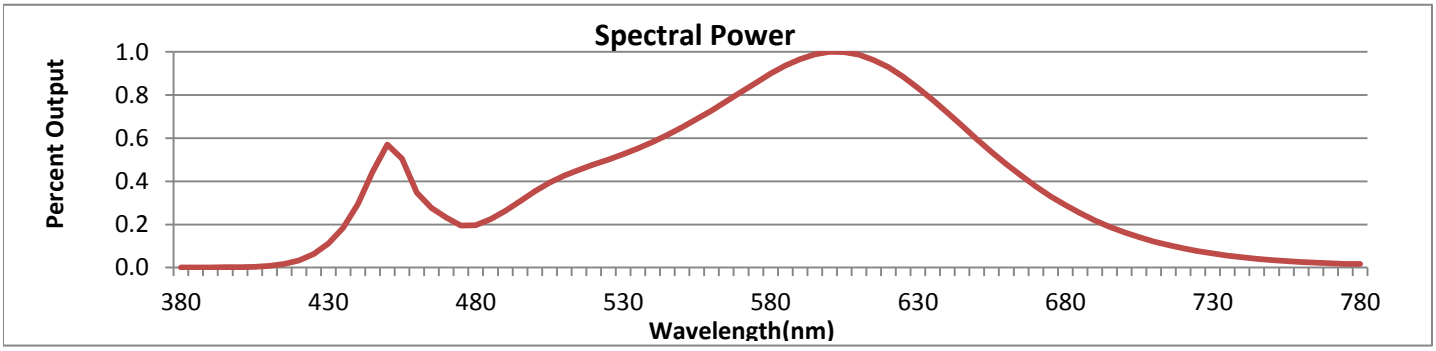


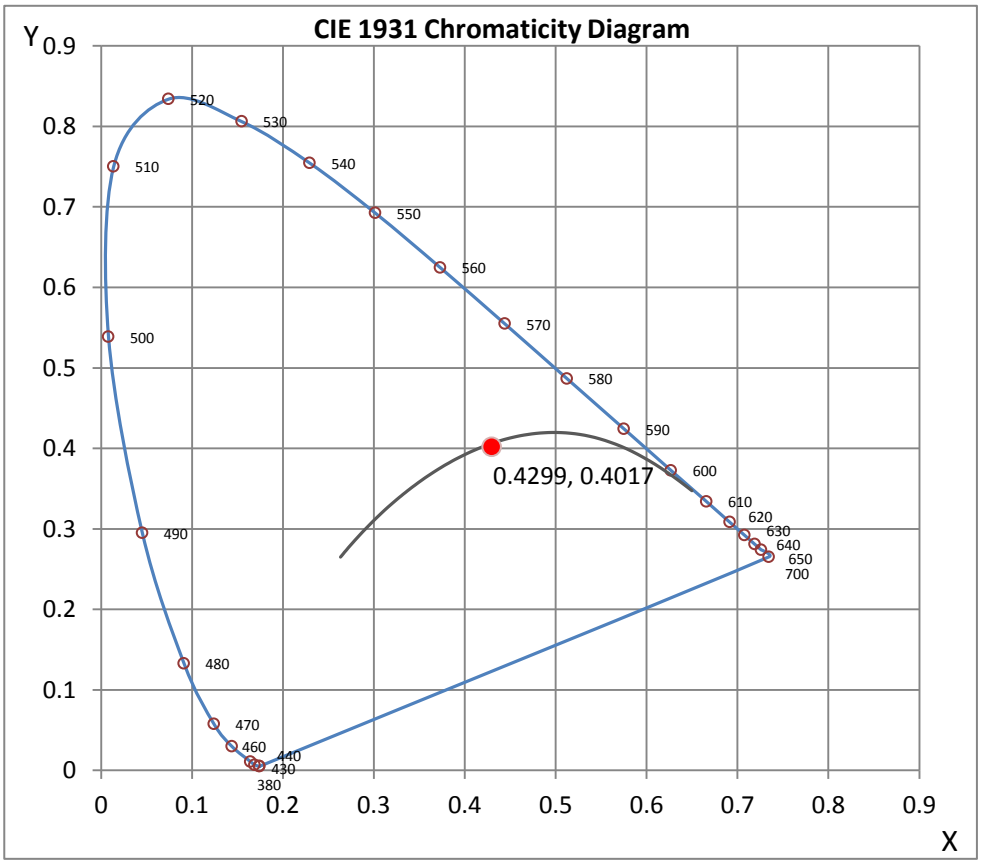
Wavelength	W/m²nm	440	0.2944	510	0.4266	580	0.8996	650	0.5957	720	0.0891
380	0.0009	450	0.5708	520	0.4777	590	0.9671	660	0.4798	730	0.0651
390	0.0009	460	0.3480	530	0.5257	600	1.0000	670	0.3763	740	0.0478
400	0.0021	470	0.2313	540	0.5824	610	0.9874	680	0.2893	750	0.0350
410	0.0079	480	0.1968	550	0.6502	620	0.9294	690	0.2186	760	0.0257
420	0.0336	490	0.2625	560	0.7281	630	0.8332	700	0.1638	770	0.0191
430	0.1113	500	0.3534	570	0.8143	640	0.7182	710	0.1213	780	0.0162

CRI & CCT

x	0.4299
y	0.4017
u'	0.2470
v'	0.5194
CRI	82.50
CCT	3102
Duv	0.00006

R Values

R1	80.48
R2	90.13
R3	96.70
R4	80.46
R5	80.57
R6	87.39
R7	83.65
R8	60.25
R9	8.52
R10	77.46
R11	79.26
R12	70.47
R13	82.60
R14	98.46



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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:

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 : L121605909.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L121605909
[TESTLAB] LIGHT LABORATORY, INC.
[ISSUEDATE] 1/10/2017
[MANUFAC] REVOLUTION LIGHTING
[LUMCAT] 131232-201
[LUMINAIRE] 19W 3000K E39 Omnidirectional Utility Lamp
[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, 19.49W
[TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	2401
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	123
Total Luminaire Watts	19.49
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	Circular w/ Sides
Luminous Length (0-180)	0.21 ft (Diameter)
Luminous Width (90-270)	0.21 ft (Diameter)
Luminous Height	0.25 ft

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	37230	37230	37230
55	39838	39838	39838
65	41343	41343	41343
75	41627	41627	41627
85	44976	44976	44976

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Results derived from content of manufacturers photometric file.

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CANDELA TABULATION

	0
0	99.56
5	100.57
10	105.85
15	118.40
20	134.36
25	150.14
30	165.17
35	181.17
40	199.00
45	213.31
50	224.70
55	232.91
60	238.51
65	239.20
70	234.64
75	231.00
80	230.75
85	231.36
90	231.11
95	229.65
100	226.51
105	221.39
110	214.48
115	205.67
120	194.78
125	181.70
130	166.06
135	147.72
140	126.57
145	101.83
150	80.53
155	61.30
160	41.55
165	22.44
170	8.48
175	1.16
180	0.00

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ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	43.91	N.A.	1.80
0-30	113.65	N.A.	4.70
0-40	228.08	N.A.	9.50
0-60	601.40	N.A.	25.10
0-80	1082.77	N.A.	45.10
0-90	1334.97	N.A.	55.60
10-90	1325.19	N.A.	55.20
20-40	184.17	N.A.	7.70
20-50	349.02	N.A.	14.50
40-70	609.43	N.A.	25.40
60-80	481.37	N.A.	20.10
70-80	245.26	N.A.	10.20
80-90	252.19	N.A.	10.50
90-110	483.88	N.A.	20.20
90-120	687.62	N.A.	28.60
90-130	850.26	N.A.	35.40
90-150	1029.41	N.A.	42.90
90-180	1065.61	N.A.	44.40
110-180	581.73	N.A.	24.20
0-180	2400.58	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	9.78
10-20	34.13
20-30	69.74
30-40	114.43
40-50	164.85
50-60	208.47
60-70	236.11
70-80	245.26
80-90	252.19
90-100	250.11
100-110	233.78
110-120	203.73
120-130	162.64
130-140	114.19
140-150	64.96
150-160	28.74
160-170	7.11
170-180	0.36

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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	108	108	108	108	101	101	101	101	86	86	86	73	73	73	61	61	61	56
1	94	87	81	76	86	80	75	70	68	64	60	56	53	50	46	43	41	36
2	83	73	65	58	76	67	60	53	56	51	45	46	42	38	37	34	31	26
3	75	62	53	45	68	57	49	42	48	41	36	39	34	30	31	27	24	19
4	67	54	44	37	62	50	41	34	42	35	29	34	28	24	27	23	19	15
5	61	47	38	31	56	44	35	28	36	29	24	30	24	20	24	19	16	12
6	56	42	33	26	51	39	30	24	32	25	20	26	21	17	21	17	13	10
7	52	38	28	22	47	35	26	20	29	22	17	24	18	14	19	14	11	8
8	48	34	25	19	44	31	23	18	26	20	15	22	16	12	17	13	10	7
9	44	31	22	17	41	28	21	15	24	17	13	20	14	11	16	11	8	6
10	41	28	20	15	38	26	18	14	22	16	11	18	13	9	14	10	7	5

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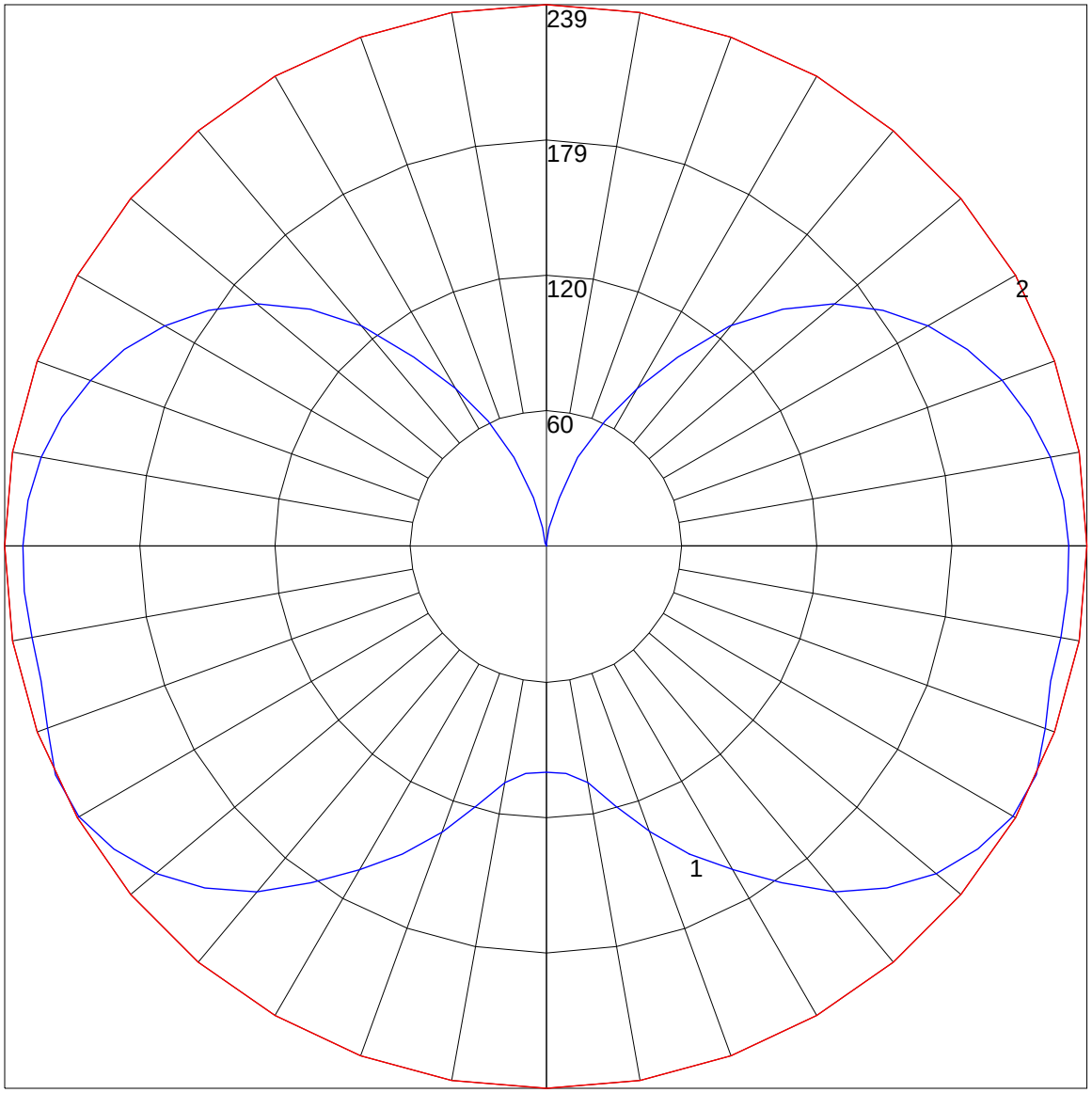
POLAR GRAPH



Maximum Candela = 239.2 Located At Horizontal Angle = 0, Vertical Angle = 65
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (65) (Through Max. Cd.)

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