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www.lightlaboratory.com

Report No: L011805601



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Issue Date: 1/29/2018

Prepared For: Revolution Lighting Technologies (RVLT)
2280 Ward Ave. Docks 5&6, Simi Valley, CA 93065

Model Number: 518016-015

Test: Photometric/Colorimetric/Electrical Test

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: Total lumen is generated by using power ratio of 1.99 between 4ft and 8ft LED tube.

Sample Arrival Date: 1/24/18

Date of Tests: 1/25/18 - 1/29/18

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-S4	1/9/19
BK PRECISION	1747	PS-DC04	1/10/19
Fluke Digital Thermometer	52K/J	MT-TP05	1/10/19
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 (RVLT)
Model Number:	518016-015
Driver Model Number:	N/A
Total Lumens:	4451.31
Input Voltage (VAC/60Hz):	120.00
Input Current (Amp):	0.3
Input Power (W):	34.91
Input Power Factor:	0.98
Current ATHD @ 120V(%):	22%
Current ATHD @ 277V(%):	N/A
Efficacy:	128
Color Rendering Index (CRI):	84
Correlated Color Temperature (K):	5204
Chromaticity Coordinate x:	0.3398
Chromaticity Coordinate y:	0.3496
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:30
Total Operating Time (Hours):	2:20

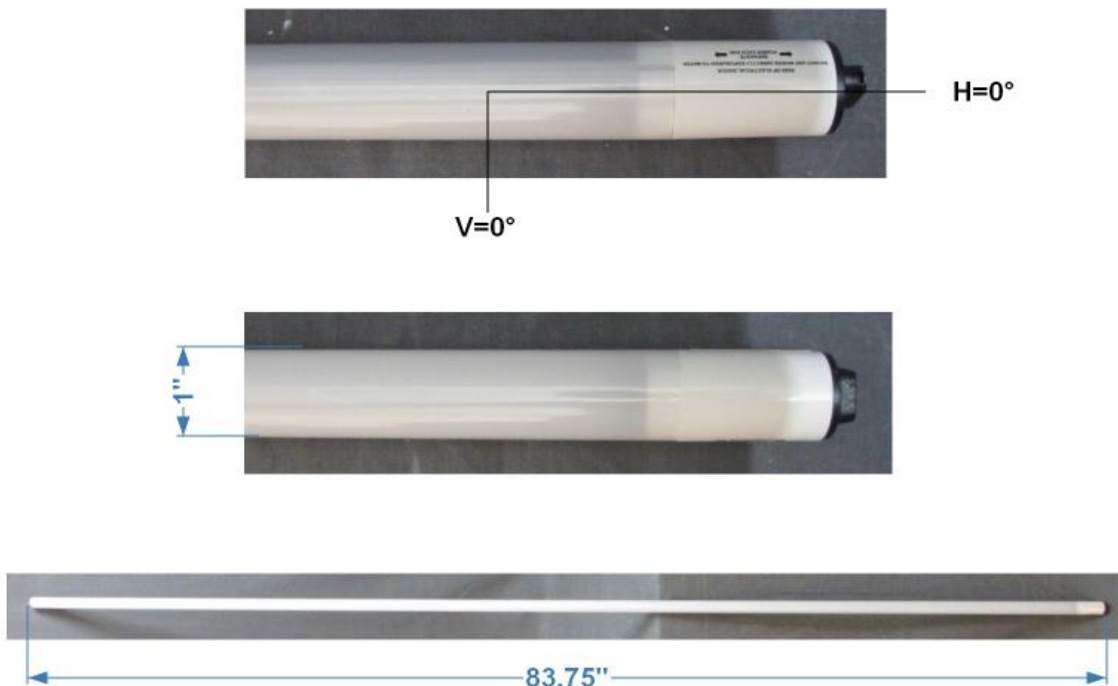
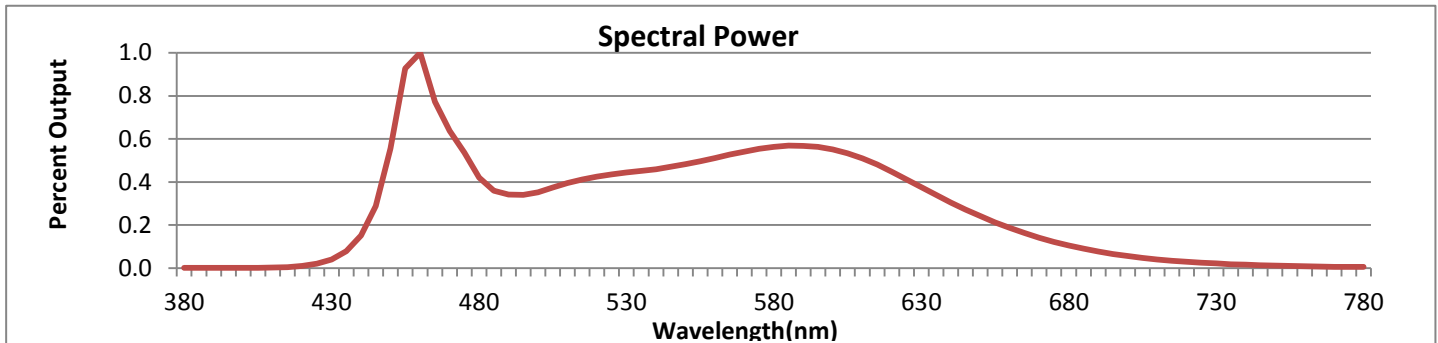


FIG.1 LUMINAIRE

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



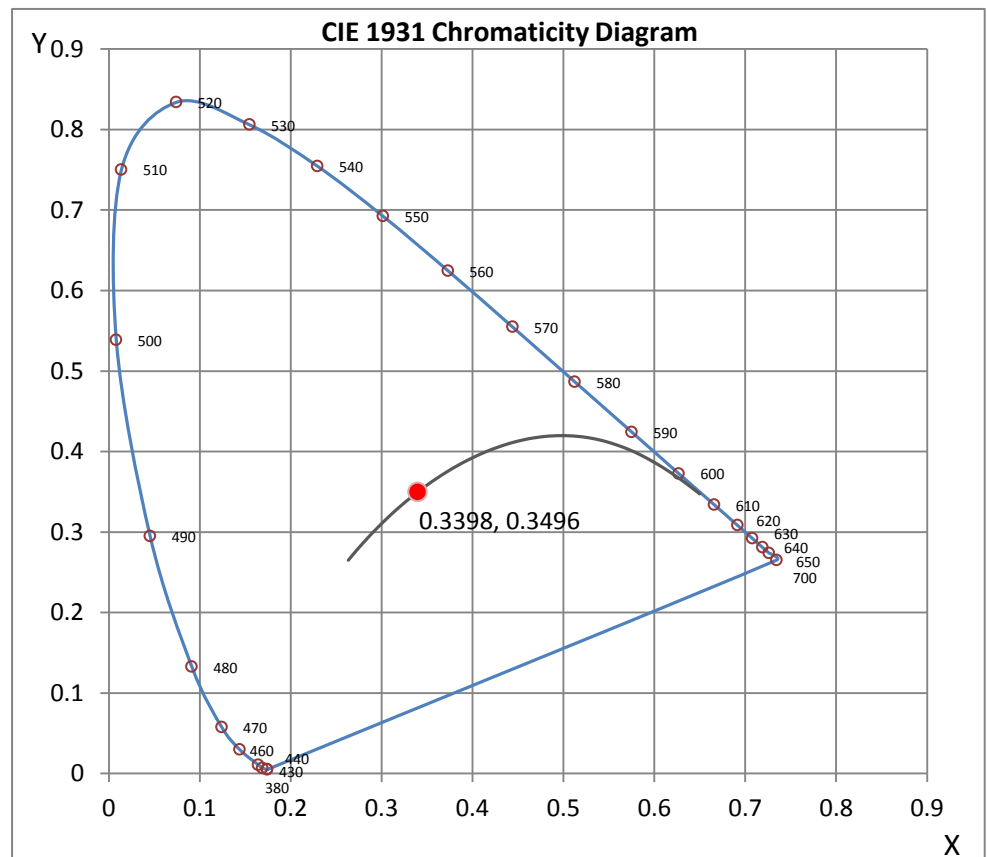
Wavelength	W/m ² nm	440	0.1508	510	0.3948	580	0.5628	650	0.2416	720	0.0294
380	0.0007	450	0.5562	520	0.4246	590	0.5682	660	0.1863	730	0.0214
390	0.0008	460	1.0000	530	0.4436	600	0.5519	670	0.1409	740	0.0156
400	0.0010	470	0.6375	540	0.4597	610	0.5093	680	0.1046	750	0.0114
410	0.0022	480	0.4200	550	0.4826	620	0.4476	690	0.0770	760	0.0083
420	0.0096	490	0.3418	560	0.5117	630	0.3755	700	0.0559	770	0.0061
430	0.0402	500	0.3525	570	0.5414	640	0.3051	710	0.0405	780	0.0053

CRI & CCT

x	0.3398
y	0.3496
u'	0.2086
v'	0.4829
CRI	84.00
CCT	5204
Duv	0.00118

R Values

R1	85.68
R2	97.81
R3	90.36
R4	77.45
R5	84.09
R6	91.72
R7	80.81
R8	64.37
R9	13.74
R10	93.04
R11	77.88
R12	64.45
R13	90.60
R14	95.43



*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
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Test Report Reviewed by:



Steve Kang
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Photometric Test Report

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L011805601.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L011805601
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 1/29/2018
[MANUFAC] Revolution Lighting Technologies (RVLT)
[LUMCAT] 518016-015
[LUMINAIRE] Signage Tube, 8-ft, 36W, DSEP, 5000K
[BALLASTCAT] N/A
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[TEST CONDITION] CANDELA VALUES ARE GENERATED BY USING POWER RATIO OF 1.99
[MORE] BETWEEN 4FT AND 8FT LED TUBE.
[INPUT] 120VAC, 34.91W
[TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	4451
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	128
Total Luminaire Watts	34.91
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)	7.48 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	1244875	11355	8867
55	823872	9443	7878
65	502779	7629	6975
75	235729	6180	6307
85	41534	5329	5883

**IES INDOOR REPORT
PHOTOMETRIC FILENAME : L011805601.IES**

CANDELA TABULATION

	<u>0.0</u>	<u>22.5</u>	<u>45.0</u>	<u>67.5</u>	<u>90.0</u>
0	648.86	648.86	648.86	648.86	648.86
5	645.93	646.93	645.44	646.67	647.59
10	634.21	637.10	638.49	641.06	640.48
15	617.84	622.63	624.96	629.58	630.07
20	596.86	601.74	606.85	612.64	615.03
25	567.29	574.55	583.07	592.06	596.36
30	535.55	542.91	553.82	567.45	572.56
35	497.72	506.89	521.68	540.19	548.44
40	456.23	467.81	486.73	509.36	520.52
45	411.45	424.59	449.46	479.37	493.42
50	366.02	379.73	411.21	448.96	465.82
55	315.45	333.46	374.12	418.24	438.40
60	263.24	286.12	336.93	388.33	412.29
65	212.99	239.44	302.48	362.96	388.15
70	160.95	194.74	271.42	340.49	367.83
75	106.43	153.51	245.15	320.57	350.98
80	58.17	120.63	225.07	305.37	337.27
85	19.34	97.41	211.44	295.46	327.36
90	1.49	88.42	205.41	289.92	321.90
95	18.67	94.11	208.21	291.08	321.40
100	55.68	113.77	217.71	296.37	325.37
105	101.47	143.68	233.83	306.94	333.96
110	153.19	181.69	256.95	323.14	347.83
115	201.77	223.58	285.37	342.38	365.84
120	249.35	267.93	316.93	365.18	386.34
125	298.92	313.23	350.82	392.29	408.98
130	346.68	358.34	386.26	421.46	434.10
135	389.64	400.81	423.51	450.12	461.20
140	430.62	441.12	459.95	479.71	489.28
145	470.77	478.63	493.42	509.36	515.89
150	506.79	512.66	523.91	536.05	540.01
155	536.70	544.64	551.25	559.11	561.00
160	564.46	569.18	575.13	580.50	581.16
165	584.46	588.52	593.22	596.02	595.71
170	600.16	601.58	606.27	607.43	607.93
175	611.07	612.22	611.65	613.30	611.57
180	614.63	614.63	614.63	614.63	614.63

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L011805601.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	237.96	N.A.	5.30
0-30	506.68	N.A.	11.40
0-40	834.03	N.A.	18.70
0-60	1519.36	N.A.	34.10
0-80	2070.84	N.A.	46.50
0-90	2285.59	N.A.	51.30
10-90	2224.14	N.A.	50.00
20-40	596.07	N.A.	13.40
20-50	944.91	N.A.	21.20
40-70	984.69	N.A.	22.10
60-80	551.48	N.A.	12.40
70-80	252.12	N.A.	5.70
80-90	214.75	N.A.	4.80
90-110	450.93	N.A.	10.10
90-120	732.91	N.A.	16.50
90-130	1048.94	N.A.	23.60
90-150	1686.34	N.A.	37.90
90-180	2165.73	N.A.	48.70
110-180	1714.79	N.A.	38.50
0-180	4451.31	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

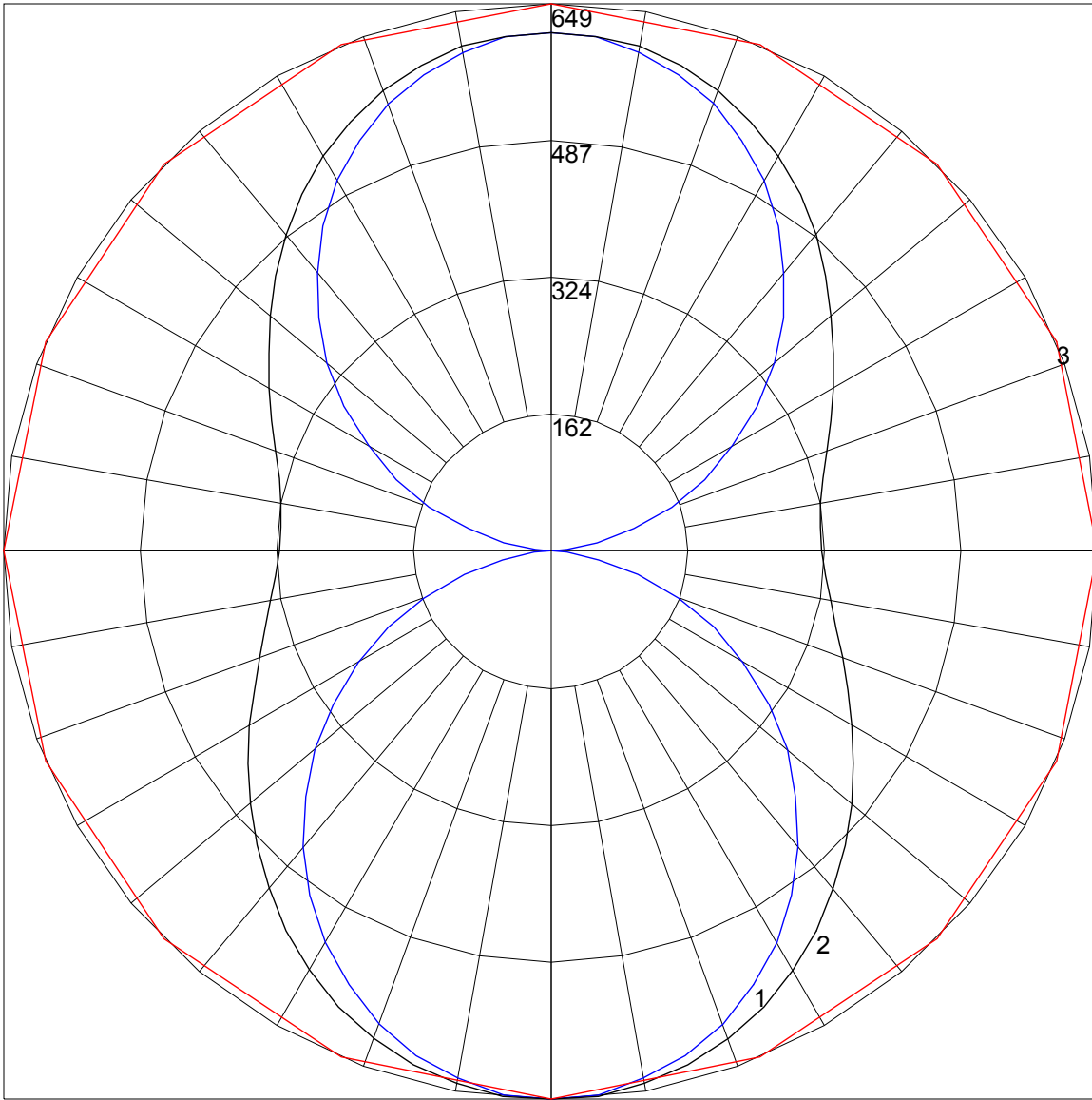
Zone	Lumens
0-10	61.45
10-20	176.51
20-30	268.72
30-40	327.35
40-50	348.83
50-60	336.50
60-70	299.36
70-80	252.12
80-90	214.75
90-100	210.74
100-110	240.19
110-120	281.98
120-130	316.03
130-140	328.39
140-150	309.01
150-160	254.07
160-170	167.12
170-180	58.20

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	107	107	107	107	99	99	99	99	84	84	84	70	70	70	57	57	57	51
1	96	91	86	82	88	84	80	76	71	68	65	59	56	54	47	46	44	39
2	87	78	71	66	80	72	66	61	61	56	52	50	47	44	41	38	36	31
3	79	68	60	54	72	63	56	50	53	48	43	44	40	36	36	33	30	26
4	72	60	52	45	66	56	48	42	47	41	36	39	34	31	32	28	25	22
5	66	53	45	38	60	49	42	36	42	36	31	35	30	26	28	25	22	19
6	60	48	39	33	55	44	37	31	38	31	27	31	27	23	26	22	19	16
7	56	43	35	29	51	40	32	27	34	28	24	28	24	20	23	20	17	14
8	52	39	31	25	48	36	29	24	31	25	21	26	21	18	21	18	15	13
9	48	35	28	22	44	33	26	21	28	23	19	24	19	16	20	16	13	11
10	45	33	25	20	41	30	24	19	26	20	17	22	18	14	18	15	12	10

POLAR GRAPH



Maximum Candela = 648.86 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.)