



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

Report No: L011606602

Date: 1/28/2016



NVLAP LAB CODE 200927-0

Report No: L011606602

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

Model Number: 204321-212

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 204321-212. Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 1/21/16

Date of Tests: 1/26/16 - 1/26/16

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:	204321-212	
Driver Model Number:	GE ULTRAMAX P-SERIES GE232MAXP-N+	
Total Lumens:	2028.62	
Input Voltage (VAC/60Hz):	120.00	
Input Current (Amp):	0.26	
Input Power (W):	15.68	
Input Power Factor:	1.00	
Current ATHD @ 120V(%):	5%	
Current ATHD @ 277V(%):	14% (0.13A, 15.85W, 0.9PF)	
Efficacy:	129	
Color Rendering Index (CRI):	84	
Correlated Color Temperature (K):	4041	
Chromaticity Coordinate x:	0.3790	
Chromaticity Coordinate y:	0.3771	
Ambient Temperature (°C):	25.0	
Stabilization Time (Hours):	0:35	
Total Operating Time (Hours):	1:05	
Off State Power(W):	0.00	

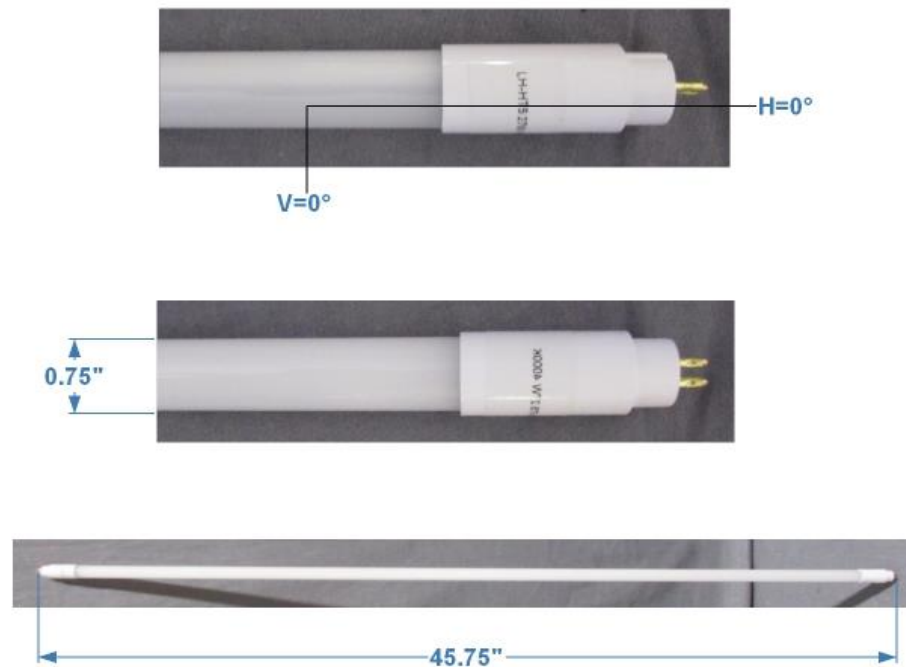
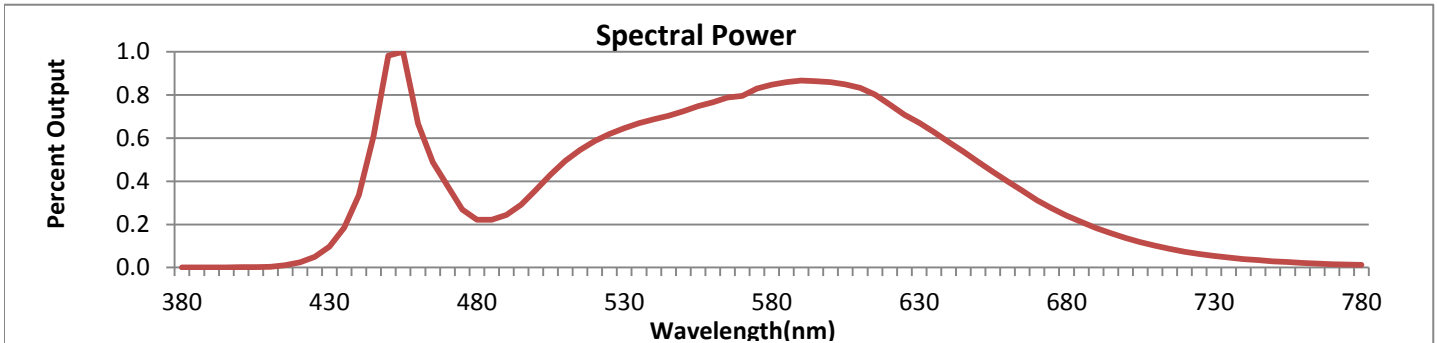


FIG. 1 LUMINAIRE

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



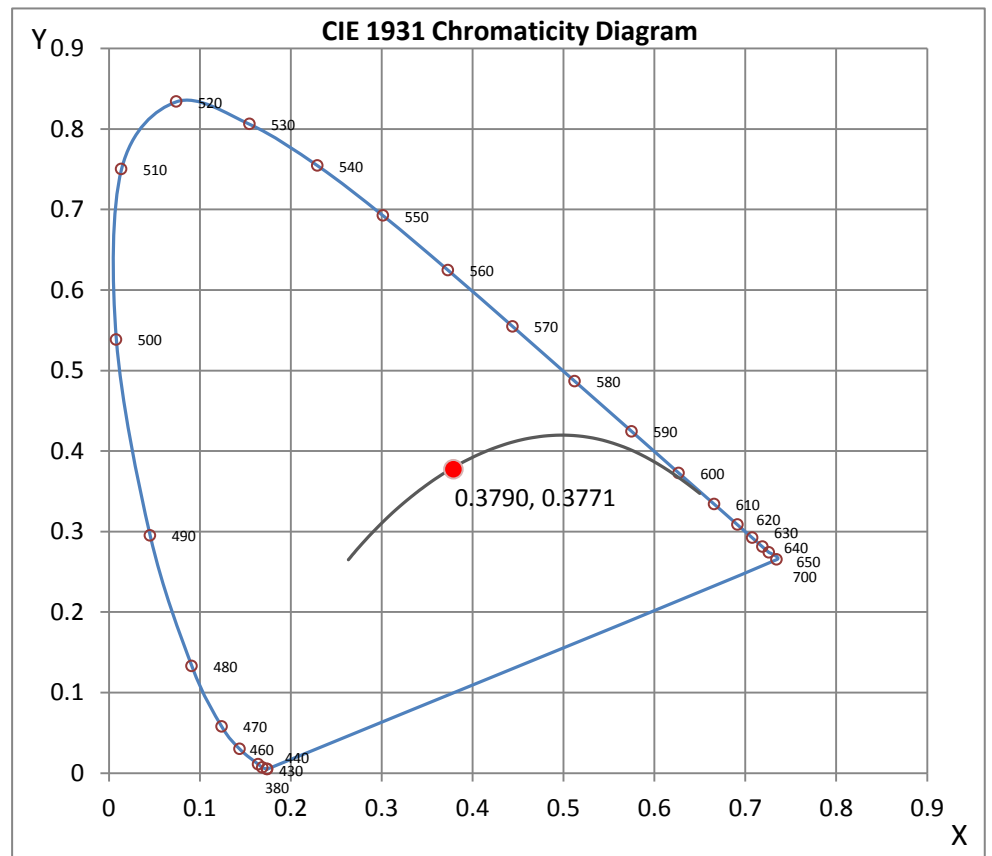
Wavelength	W/m ² nm	440	0.3365	510	0.4939	580	0.8478	650	0.4909	720	0.0735
380	0.0009	450	0.9824	520	0.5867	590	0.8666	660	0.3989	730	0.0539
390	0.0011	460	0.6662	530	0.6465	600	0.8595	670	0.3124	740	0.0397
400	0.0016	470	0.3794	540	0.6875	610	0.8333	680	0.2413	750	0.0292
410	0.0041	480	0.2210	550	0.7249	620	0.7555	690	0.1831	760	0.0212
420	0.0238	490	0.2443	560	0.7657	630	0.6709	700	0.1371	770	0.0159
430	0.0966	500	0.3600	570	0.7955	640	0.5821	710	0.1020	780	0.0118

CRI & CCT

x	0.3790
y	0.3771
u'	0.2240
v'	0.5015
CRI	83.50
CCT	4041
Duv	0.00059

R Values

R1	82.42
R2	88.75
R3	92.69
R4	82.66
R5	81.36
R6	83.23
R7	88.04
R8	68.84
R9	18.45
R10	72.11
R11	80.91
R12	56.01
R13	83.98
R14	95.56



*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 : JEFF AHN

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: 10*



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

Photometric Test Report

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L011606602.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
 [TEST] L011606602
 [TESTLAB] LIGHT LABORATORY, INC.
 [ISSUEDATE] 1/28/2016
 [MANUFAC] REVOLUTION LIGHTING TECHNOLOGIES
 [LUMCAT] 204321-212
 [LUMINAIRE] T5 LED TUBE LED TUBE, DIFFUSED LENS
 [BALLASTCAT] GE ULTRAMAX P-SERIES GE232MAXP-N+
 [LAMPPOSITION] 0,0
 [_TEST CONDITION] GE ULTRAMAX P-SERIES GE232MAXP-N+ WAS
 [MORE] CONNECTED TO TWO LED TUBES FROM THE OUTPUT.
 [MORE] PHOTOMETRIC MEASUREMENTS WERE MEASURED FROM
 [MORE] A SINGLE LED TUBE WHILE THE OTHER TUBE WAS POWERED
 [MORE] AND COVERED WITH BLACK VELVET TO PREVENT ANY LIGHT POLLUTION.
 [MORE] INPUT POWER OF SINGLE MEASURED MODULE IS CALCULATED
 [MORE] FROM THE TOTAL POWER DIVIDED BY TWO.
 [OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
 [MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
 [INPUT] 120VAC, 15.68W
 [TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	2029
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	129
Total Luminaire Watts	15.68
Ballast Factor	1.00
CIE Type	Semi-Direct
Spacing Criterion (0-180)	1.24
Spacing Criterion (90-270)	1.34
Spacing Criterion (Diagonal)	1.42
Basic Luminous Shape	Rectangular w/Sides
Luminous Length (0-180)	3.44 ft
Luminous Width (90-270)	0.06 ft
Luminous Height	0.03 ft

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L011606602.IES

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	23155	18978	18942
55	21853	17771	18146
65	19719	16677	17575
75	15965	15953	17433
85	7573	16230	18068

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L011606602.IES

CANDELA TABULATION

	<u>0.0</u>	<u>22.5</u>	<u>45.0</u>	<u>67.5</u>	<u>90.0</u>
0	493.18	493.18	493.18	493.18	493.18
5	490.75	490.88	491.09	491.42	491.67
10	483.28	483.83	485.04	486.43	487.06
15	470.86	472.04	475.06	478.21	479.76
20	454.00	455.97	461.47	467.00	469.27
25	433.19	436.34	444.60	453.37	456.68
30	407.69	413.01	424.72	436.80	441.75
35	380.42	386.50	402.36	418.26	425.31
40	343.92	357.01	377.23	397.87	406.09
45	316.99	327.22	350.21	376.18	385.62
50	280.24	294.16	324.87	350.76	364.06
55	243.57	259.43	296.14	328.31	342.41
60	204.30	224.53	267.53	305.37	319.17
65	162.94	189.62	239.63	279.82	295.42
70	120.90	155.89	211.81	254.98	271.68
75	81.89	124.18	185.64	231.28	248.19
80	44.47	95.36	161.01	207.83	225.20
85	13.93	73.79	138.78	185.34	202.96
90	0.67	53.15	119.06	164.87	181.65
95	0.59	39.43	101.06	145.45	161.01
100	0.67	29.95	86.46	127.20	142.97
105	0.84	24.04	72.32	110.84	125.44
110	1.01	20.10	61.17	95.82	109.24
115	1.18	17.45	52.27	82.27	94.22
120	1.34	15.61	44.43	70.52	79.96
125	1.51	14.47	38.05	59.99	69.30
130	1.68	13.38	32.64	50.76	57.22
135	1.76	11.96	27.73	43.04	47.91
140	1.93	10.32	23.28	36.12	40.53
145	2.01	8.60	19.68	30.00	33.39
150	2.18	7.38	16.53	24.67	27.60
155	2.27	6.59	13.47	19.55	22.57
160	2.43	5.87	9.90	14.52	18.38
165	2.43	4.66	7.76	9.69	12.50
170	2.43	2.94	5.96	7.05	8.06
175	2.52	2.52	2.77	3.48	3.02
180	0.00	0.00	0.00	0.00	0.00

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L011606602.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	180.85	N.A.	8.90
0-30	385.96	N.A.	19.00
0-40	637.80	N.A.	31.40
0-60	1172.25	N.A.	57.80
0-80	1591.84	N.A.	78.50
0-90	1730.91	N.A.	85.30
10-90	1684.22	N.A.	83.00
20-40	456.95	N.A.	22.50
20-50	727.98	N.A.	35.90
40-70	767.07	N.A.	37.80
60-80	419.60	N.A.	20.70
70-80	186.97	N.A.	9.20
80-90	139.07	N.A.	6.90
90-110	172.78	N.A.	8.50
90-120	222.66	N.A.	11.00
90-130	256.01	N.A.	12.60
90-150	289.10	N.A.	14.30
90-180	297.72	N.A.	14.70
110-180	124.93	N.A.	6.20
0-180	2028.62	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	46.69
10-20	134.16
20-30	205.11
30-40	251.84
40-50	271.03
50-60	263.41
60-70	232.63
70-80	186.97
80-90	139.07
90-100	100.76
100-110	72.02
110-120	49.88
120-130	33.34
130-140	21.00
140-150	12.10
150-160	6.09
160-170	2.20
170-180	0.33

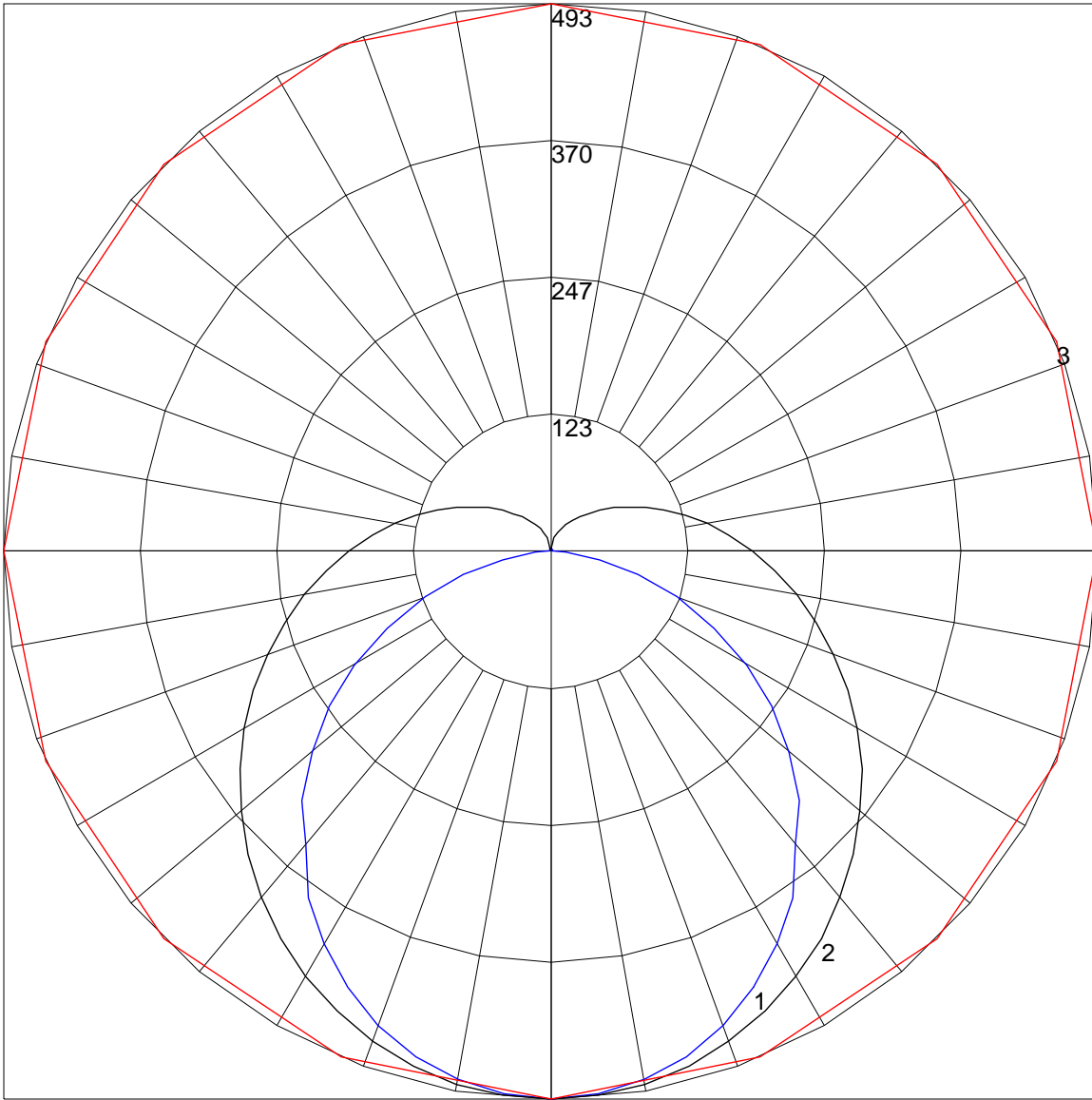
IES INDOOR REPORT
PHOTOMETRIC FILENAME : L011606602.IES

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	116	116	116	116	116	111	111	111	111	103	103	103	95	95	95	89	89	89	85
1	103	97	92	87	87	98	93	88	84	86	82	79	80	77	74	74	71	69	66
2	92	83	75	69	69	88	80	73	67	74	68	63	68	64	59	63	59	56	53
3	84	72	63	56	56	80	69	61	55	64	57	52	60	54	49	55	50	46	44
4	76	64	54	47	47	73	61	53	46	57	49	44	53	46	41	49	44	39	37
5	70	56	47	40	40	67	54	46	39	51	43	37	47	41	36	44	38	34	31
6	64	51	41	35	35	62	49	40	34	46	38	32	42	36	31	40	34	30	27
7	60	46	37	30	30	57	44	36	30	41	34	28	39	32	27	36	30	26	24
8	55	42	33	27	27	53	40	32	26	38	30	25	35	29	24	33	27	23	21
9	52	38	30	24	24	49	37	29	24	35	28	23	32	26	22	30	25	21	19
10	48	35	27	22	22	46	34	26	21	32	25	20	30	24	20	28	23	19	17

POLAR GRAPH



Maximum Candela = 493.18 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.)