



8165 E Kaiser Blvd. Anaheim, CA 92808
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Report No: L011606605

Date: 1/28/2016



NVLAP LAB CODE 200927-0

Report No: L011606605

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

Model Number: 204321-213

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 204321-213 . 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:	204321-213	
Driver Model Number:	GE ULTRAMAX P-SERIES GE232MAXP-N+	
Total Lumens:	1946.65	
Input Voltage (VAC/60Hz):	120.00	
Input Current (Amp):	0.26	
Input Power (W):	15.58	
Input Power Factor:	1.00	
Current ATHD @ 120V(%):	5%	
Current ATHD @ 277V(%):	16% (0.13A, 15.75W, 0.89PF)	
Efficacy:	125	
Color Rendering Index (CRI):	86	
Correlated Color Temperature (K):	5102	
Chromaticity Coordinate x:	0.3425	
Chromaticity Coordinate y:	0.3522	
Ambient Temperature (°C):	25.0	
Stabilization Time (Hours):	0:35	
Total Operating Time (Hours):	1:10	
Off State Power(W):	0.00	

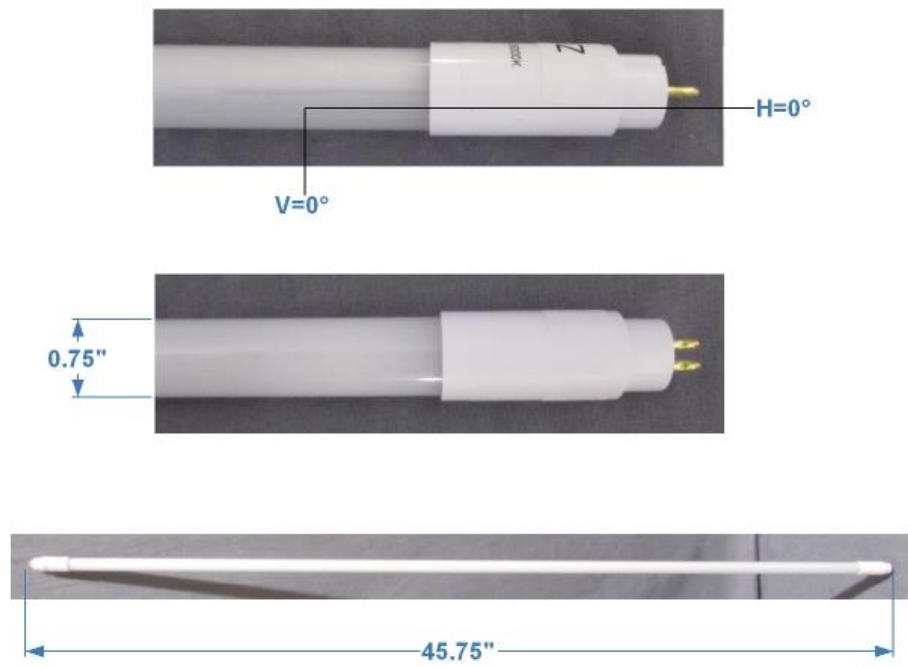
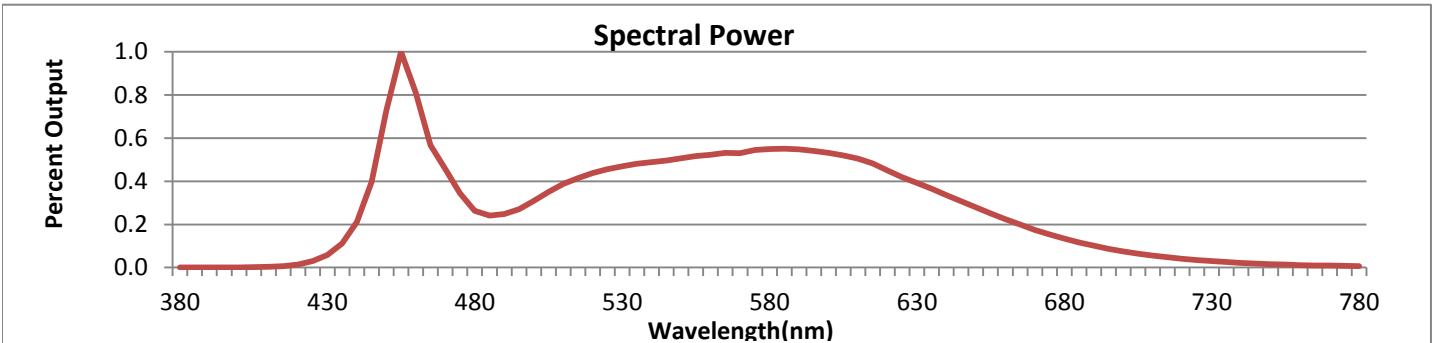


FIG. 1 LUMINAIRE

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



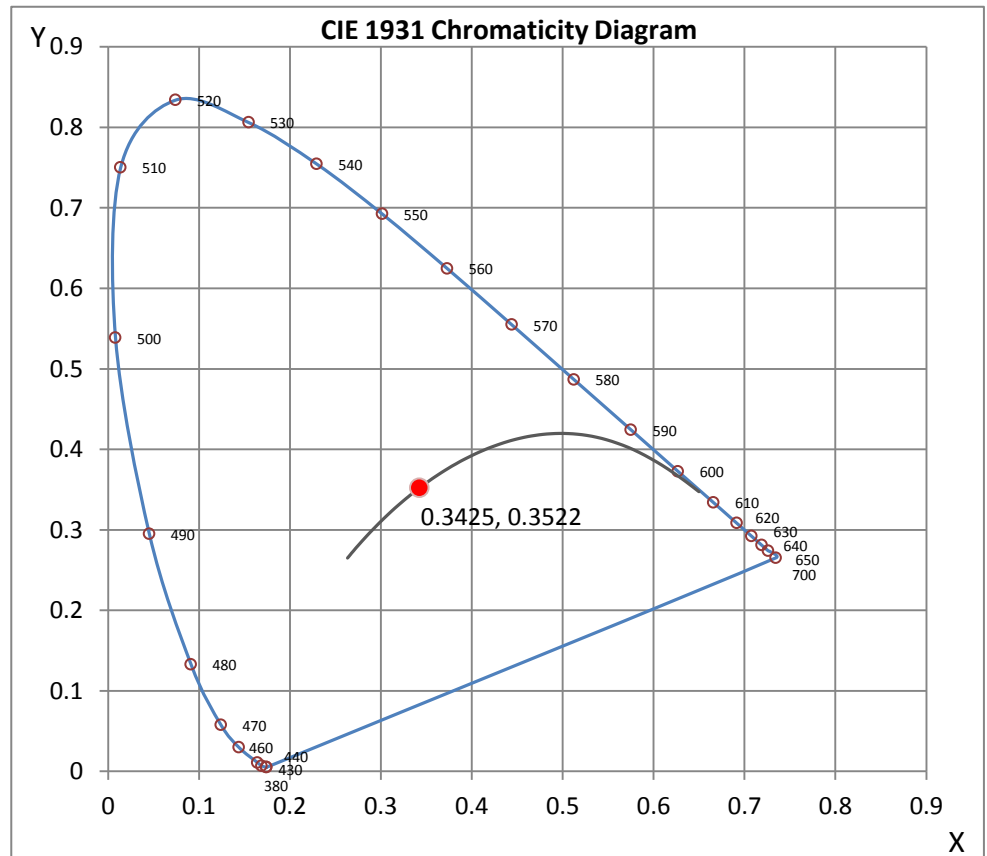
Wavelength	W/m ² nm	440	0.2110	510	0.3871	580	0.5501	650	0.2797	720	0.0403
380	0.0008	450	0.7283	520	0.4381	590	0.5481	660	0.2247	730	0.0296
390	0.0007	460	0.8103	530	0.4689	600	0.5314	670	0.1742	740	0.0217
400	0.0011	470	0.4573	540	0.4893	610	0.5055	680	0.1338	750	0.0160
410	0.0027	480	0.2628	550	0.5060	620	0.4508	690	0.1009	760	0.0116
420	0.0142	490	0.2485	560	0.5233	630	0.3929	700	0.0753	770	0.0087
430	0.0578	500	0.3088	570	0.5298	640	0.3360	710	0.0556	780	0.0065

CRI & CCT

x	0.3425
y	0.3522
u'	0.2094
v'	0.4846
CRI	85.80
CCT	5102
Duv	0.00137

R Values

R1	85.34
R2	92.71
R3	94.85
R4	83.26
R5	84.28
R6	87.28
R7	87.56
R8	71.26
R9	23.82
R10	80.65
R11	82.49
R12	60.08
R13	88.01
R14	97.40



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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 : JEFF AHN

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: 10*

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Photometric Test Report

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L011606605.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
 [TEST] L011606605
 [TESTLAB] LIGHT LABORATORY, INC.
 [ISSUEDATE] 1/28/2016
 [MANUFAC] REVOLUTION LIGHTING TECHNOLOGIES
 [LUMCAT] 204321-213
 [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, 15.58W
 [TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	1947
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	125
Total Luminaire Watts	15.58
Ballast Factor	1.00
CIE Type	Semi-Direct
Spacing Criterion (0-180)	1.24
Spacing Criterion (90-270)	1.34
Spacing Criterion (Diagonal)	1.40
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 : L011606605.IES

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	23351	18473	18749
55	22146	16774	17697
65	20968	15115	16862
75	19777	13725	16407
85	25267	13012	16627

**IES INDOOR REPORT
PHOTOMETRIC FILENAME : L011606605.IES**

CANDELA TABULATION

	<u>0.0</u>	<u>22.5</u>	<u>45.0</u>	<u>67.5</u>	<u>90.0</u>
0	498.28	498.28	498.28	498.28	498.28
5	495.53	495.78	495.87	496.41	496.71
10	487.98	488.65	489.41	490.88	491.84
15	475.40	476.28	478.16	481.77	483.53
20	457.78	459.71	462.98	469.02	472.71
25	436.04	439.69	444.10	453.75	459.03
30	411.55	415.03	421.66	435.79	442.34
35	383.10	388.09	396.95	414.78	423.63
40	351.05	357.60	369.59	391.74	403.07
45	319.67	328.40	340.90	367.58	381.68
50	284.52	294.08	310.82	339.30	354.24
55	246.84	259.51	279.52	316.11	333.93
60	209.59	224.90	248.69	289.34	308.85
65	173.26	189.33	217.18	262.49	283.43
70	135.92	154.34	187.15	236.27	258.34
75	101.44	122.33	159.71	211.02	233.59
80	70.23	91.87	134.16	186.52	210.01
85	46.48	66.62	111.26	164.45	186.77
90	29.45	49.59	92.88	144.06	166.13
95	18.96	39.90	75.68	124.81	146.33
100	13.76	32.72	62.59	107.98	128.29
105	11.16	27.52	52.27	92.84	111.34
110	9.73	23.28	43.88	79.88	96.66
115	9.31	20.10	37.30	68.30	82.56
120	9.23	17.49	32.05	58.31	71.49
125	8.81	15.27	27.94	49.76	60.58
130	7.80	13.42	24.29	42.33	51.60
135	7.05	11.66	21.23	35.87	42.96
140	6.29	10.19	18.38	30.29	35.74
145	5.71	8.94	15.73	25.55	30.21
150	5.29	7.64	12.96	21.31	25.51
155	4.70	6.42	10.78	17.28	21.06
160	4.11	5.41	8.52	13.05	16.19
165	2.94	4.78	6.88	9.02	10.91
170	2.52	3.69	4.95	6.67	7.13
175	2.52	2.60	2.64	3.15	3.61
180	0.00	0.00	0.00	0.00	0.00

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L011606605.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	182.34	N.A.	9.40
0-30	388.08	N.A.	19.90
0-40	638.93	N.A.	32.80
0-60	1162.55	N.A.	59.70
0-80	1560.02	N.A.	80.10
0-90	1686.47	N.A.	86.60
10-90	1639.32	N.A.	84.20
20-40	456.59	N.A.	23.50
20-50	723.99	N.A.	37.20
40-70	746.13	N.A.	38.30
60-80	397.47	N.A.	20.40
70-80	174.96	N.A.	9.00
80-90	126.44	N.A.	6.50
90-110	151.36	N.A.	7.80
90-120	194.34	N.A.	10.00
90-130	223.19	N.A.	11.50
90-150	252.30	N.A.	13.00
90-180	260.19	N.A.	13.40
110-180	108.82	N.A.	5.60
0-180	1946.65	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	47.15
10-20	135.19
20-30	205.74
30-40	250.85
40-50	267.40
50-60	256.22
60-70	222.51
70-80	174.96
80-90	126.44
90-100	89.00
100-110	62.36
110-120	42.98
120-130	28.85
130-140	18.32
140-150	10.80
150-160	5.53
160-170	2.04
170-180	0.32

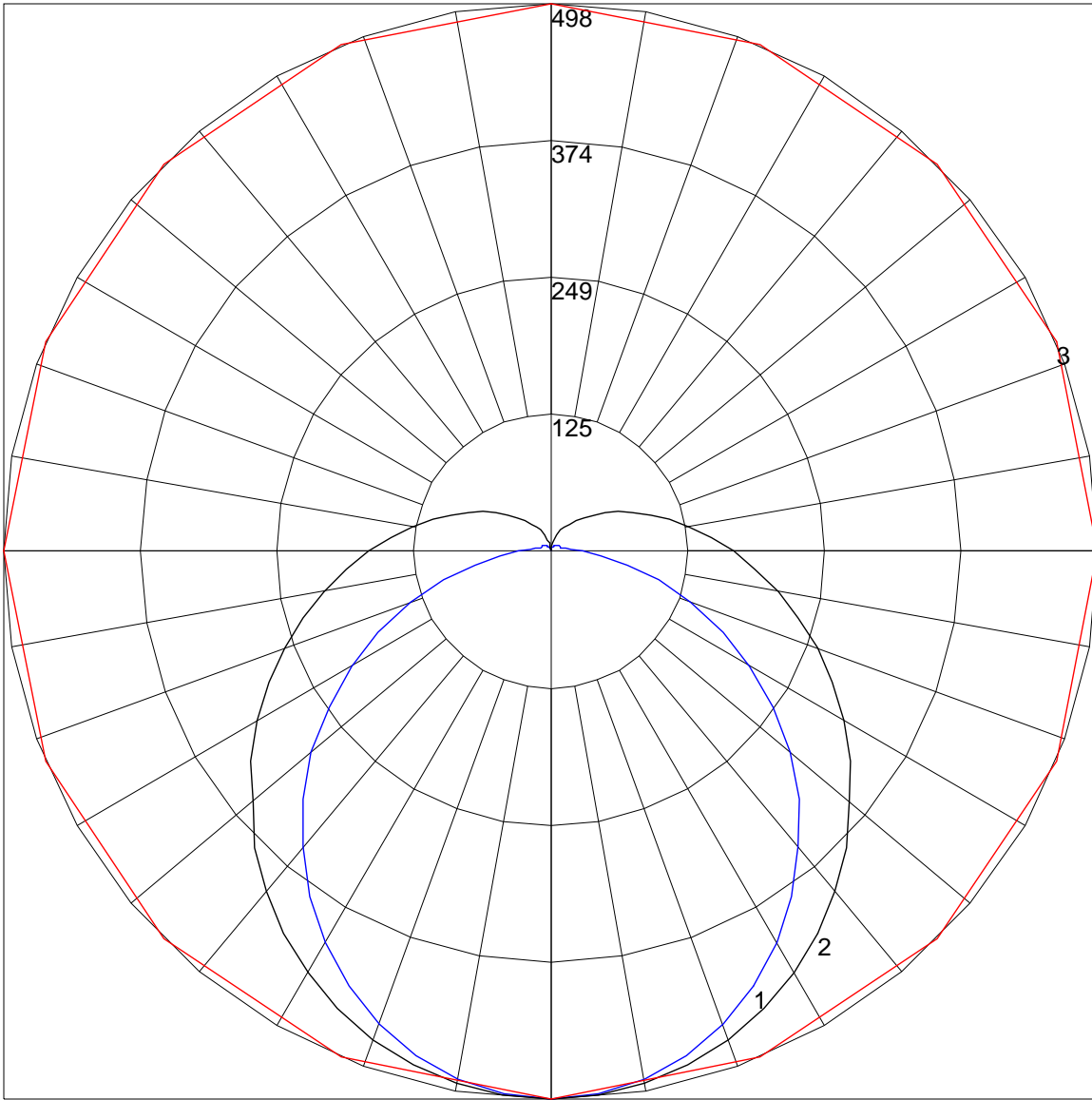
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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	
0	116	116	116	116	112	112	112	112	104	104	104	96	96	96	90	90	90	87
1	103	97	92	88	99	94	89	85	87	83	80	81	78	75	75	73	70	67
2	93	84	76	70	89	81	74	68	75	69	64	70	65	61	65	61	57	54
3	84	73	64	57	81	70	62	56	65	59	53	61	55	50	56	52	48	45
4	77	64	55	48	73	62	53	47	58	50	45	54	48	43	50	45	41	38
5	71	57	48	41	67	55	46	40	51	44	38	48	42	37	45	39	35	32
6	65	51	42	35	62	50	41	35	46	39	33	43	37	32	41	35	31	28
7	60	46	37	31	58	45	36	30	42	35	29	39	33	28	37	31	27	25
8	56	42	33	27	54	41	33	27	38	31	26	36	30	25	34	28	24	22
9	52	39	30	25	50	37	30	24	35	28	23	33	27	22	31	26	22	20
10	49	35	27	22	47	34	27	22	33	26	21	31	25	20	29	24	20	18

POLAR GRAPH



Maximum Candela = 498.28 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.)