



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

Report No: L051706709



**Report No:** L051706709

**Issue Date:** 5/22/2017

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

**Model Number:** 204221-015

**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:** GE 232MAXP-N/Ultra driver was connected to two led tubes from the driver output. Photometric measurements were measured from a single led tube while the other lamp was powered and covered with black velvet to prevent any light pollution. Input power of single measured module is calculated from the total power divided by two.

**Sample Arrival Date:** 5/19/17

**Date of Tests:** 5/20/17 - 5/22/17

**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.

**Test Summary**

<b>Manufacturer:</b>	Revolution Lighting Technologies (RVL)
<b>Model Number:</b>	204221-015
<b>Driver Model Number:</b>	GE 232MAXP-N/Ultra
<b>Total Lumens:</b>	1854.32
<b>Input Voltage (VAC/60Hz):</b>	120.00
<b>Input Current (Amp):</b>	0.13
<b>Input Power (W):</b>	15.67
<b>Input Power Factor:</b>	1.00
<b>Current ATHD @ 120V(%):</b>	7%
<b>Current ATHD @ 277V(%):</b>	N/A
<b>Efficacy:</b>	118
<b>Color Rendering Index (CRI):</b>	84
<b>Correlated Color Temperature (K):</b>	4991
<b>Chromaticity Coordinate x:</b>	0.3461
<b>Chromaticity Coordinate y:</b>	0.3597
<b>Ambient Temperature (°C):</b>	25.0
<b>Stabilization Time (Hours):</b>	0:35
<b>Total Operating Time (Hours):</b>	1:05

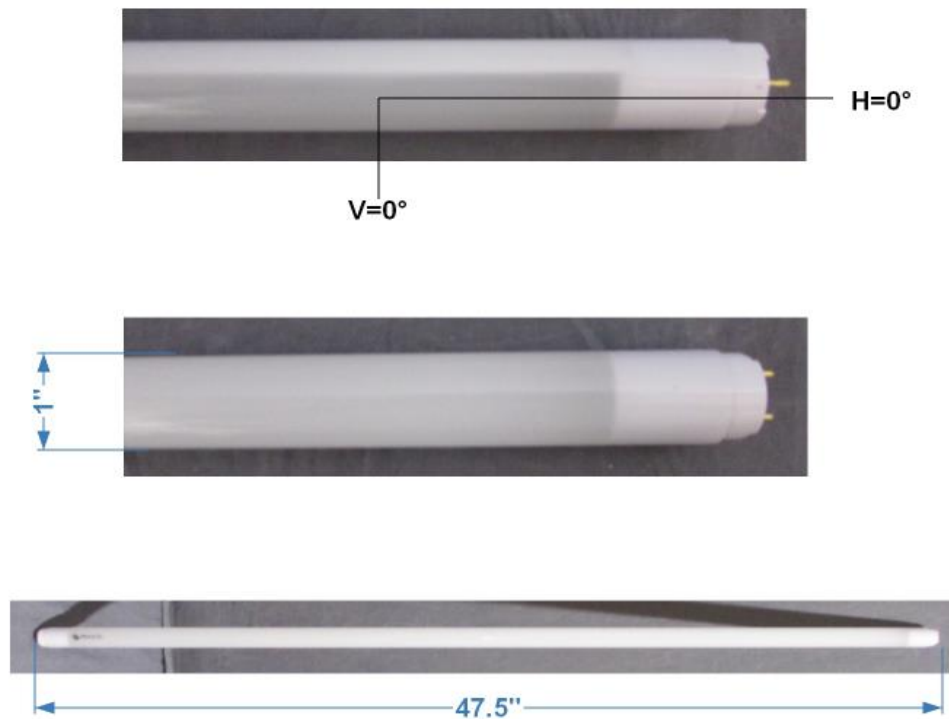
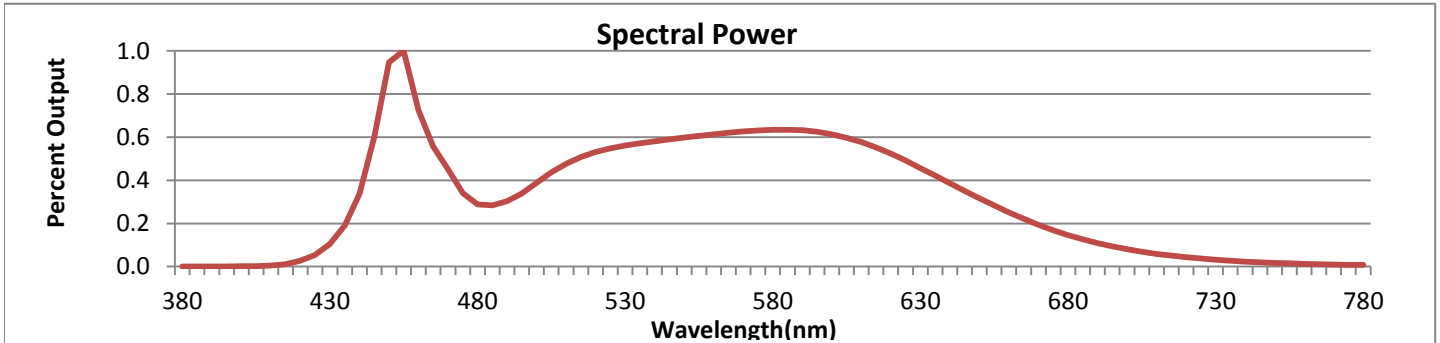


FIG. 1 LUMINAIRE

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



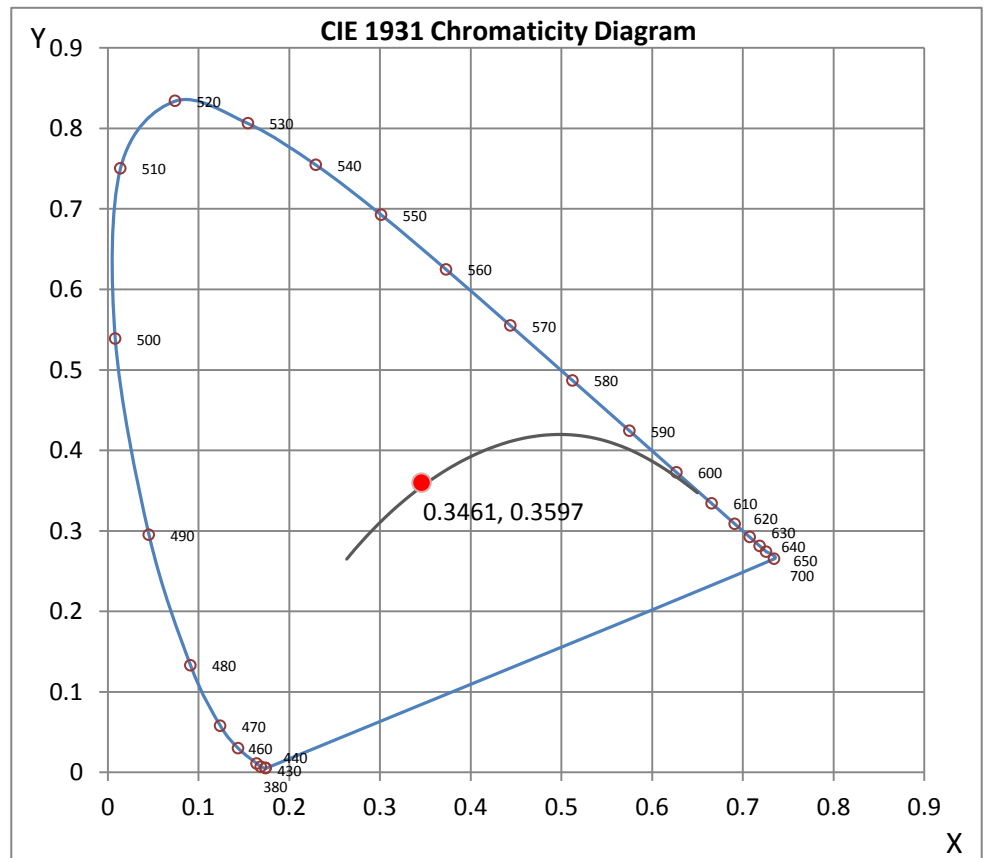
Wavelength	W/m <sup>2</sup> nm	440	0.3376	510	0.4774	580	0.6345	650	0.3169	720	0.0434
380	0.0010	450	0.9473	520	0.5318	590	0.6322	660	0.2518	730	0.0318
390	0.0010	460	0.7266	530	0.5610	600	0.6140	670	0.1930	740	0.0235
400	0.0015	470	0.4500	540	0.5811	610	0.5776	680	0.1461	750	0.0174
410	0.0047	480	0.2880	550	0.5986	620	0.5240	690	0.1090	760	0.0129
420	0.0267	490	0.3033	560	0.6136	630	0.4567	700	0.0805	770	0.0097
430	0.1046	500	0.3883	570	0.6274	640	0.3864	710	0.0589	780	0.0084

**CRI & CCT**

x	0.3461
y	0.3597
u'	0.2090
v'	0.4887
CRI	84.00
CCT	4991
Duv	0.00363

**R Values**

R1	82.27
R2	89.99
R3	94.55
R4	81.65
R5	81.51
R6	84.74
R7	88.43
R8	69.21
R9	14.84
R10	75.27
R11	80.47
R12	55.54
R13	84.59
R14	96.83



\*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 : 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: 10*



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

# Photometric Test Report

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L051706709.IES**

## DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002  
[TEST] L051706709  
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)  
[ISSUEDATE] 5/22/2017  
[MANUFAC] Revolution Lighting Technologies (RVLT)  
[LUMCAT] 204221-015  
[LUMINAIRE] 14W G2 Uni-Fit Ballast-Ready Tube Lamp 5000K  
[BALLASTCAT] GE 232MAXP-N/Ultra  
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND  
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.  
[\_TEST CONDITION] GE 232MAXP-N/Ultra DRIVER WAS CONNECTED  
[MORE] TO TWO LED TUBES FROM THE DRIVER OUTPUT.  
[MORE] PHOTOMETRIC MEASUREMENTS WERE MEASURED FROM  
[MORE] A SINGLE LED TUBE WHILE THE OTHER LAMP 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.  
[INPUT] 120VAC, 15.67W  
[TEST PROCEDURE] IESNA:LM-79-08

## CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	1854
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	118
Total Luminaire Watts	15.67
Ballast Factor	1.00
CIE Type	Semi-Direct
Spacing Criterion (0-180)	1.22
Spacing Criterion (90-270)	1.40
Spacing Criterion (Diagonal)	1.46
Basic Luminous Shape	Hor. Cylinder Along Length
Luminous Length (0-180)	3.67 ft
Luminous Width (90-270)	0.08 ft (Diameter)
Luminous Height	0.08 ft (Diameter)

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L051706709.IES**

**LUMINANCE DATA (cd/sq.m)**

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	775305	15597	12537
55	505318	13285	11350
65	299510	11008	9988
75	140335	8835	8571
85	22464	6930	7190

**IES INDOOR REPORT  
PHOTOMETRIC FILENAME : L051706709.IES**

**CANDELA TABULATION**

	<u>0.0</u>	<u>22.5</u>	<u>45.0</u>	<u>67.5</u>	<u>90.0</u>
<b>0</b>	413.21	413.21	413.21	413.21	413.21
<b>5</b>	410.87	411.24	411.74	412.03	412.44
<b>10</b>	404.06	405.14	407.25	409.04	410.04
<b>15</b>	392.93	394.88	399.70	404.02	405.88
<b>20</b>	377.82	380.93	389.03	396.87	399.82
<b>25</b>	358.88	364.07	376.20	387.66	391.85
<b>30</b>	334.56	344.10	360.84	376.12	382.22
<b>35</b>	312.88	322.68	343.32	362.91	370.51
<b>40</b>	285.48	297.73	324.80	348.01	357.22
<b>45</b>	256.25	271.99	304.75	331.69	342.28
<b>50</b>	224.61	244.71	282.70	314.96	327.16
<b>55</b>	193.48	216.44	260.07	296.07	309.89
<b>60</b>	160.93	188.45	237.65	277.34	291.54
<b>65</b>	126.88	161.13	215.81	257.21	272.69
<b>70</b>	93.17	134.81	193.93	236.86	253.35
<b>75</b>	63.36	110.23	173.38	218.01	234.00
<b>80</b>	33.55	88.23	153.91	198.91	214.90
<b>85</b>	10.46	70.25	136.06	180.07	196.30
<b>90</b>	0.58	55.64	119.99	162.79	178.36
<b>95</b>	0.00	44.63	105.21	146.64	160.93
<b>100</b>	0.00	36.83	92.13	131.12	145.31
<b>105</b>	0.00	31.39	81.67	116.96	130.12
<b>110</b>	0.00	27.57	71.41	103.92	116.00
<b>115</b>	0.00	24.83	62.69	92.05	102.63
<b>120</b>	0.00	22.79	54.89	82.33	90.93
<b>125</b>	0.00	21.38	48.74	71.33	80.13
<b>130</b>	0.00	20.10	42.97	62.40	69.67
<b>135</b>	0.00	18.56	38.03	54.18	60.20
<b>140</b>	0.00	17.19	33.01	47.00	52.40
<b>145</b>	0.00	16.40	28.07	40.40	44.67
<b>150</b>	0.00	14.86	24.21	34.63	37.37
<b>155</b>	0.00	13.78	21.26	28.32	31.80
<b>160</b>	0.00	11.87	18.56	22.59	26.57
<b>165</b>	0.00	10.50	15.69	18.52	22.59
<b>170</b>	0.00	9.18	11.96	14.08	16.36
<b>175</b>	0.00	7.47	9.09	9.55	8.80
<b>180</b>	0.00	0.00	0.00	0.00	0.00

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L051706709.IES**

**ZONAL LUMEN SUMMARY**

Zone	Lumens	%Lamp	%Fixt
0-20	151.98	N.A.	8.20
0-30	325.28	N.A.	17.50
0-40	539.79	N.A.	29.10
0-60	1002.37	N.A.	54.10
0-80	1381.2	N.A.	74.50
0-90	1515.69	N.A.	81.70
10-90	1476.53	N.A.	79.60
20-40	387.81	N.A.	20.90
20-50	621.02	N.A.	33.50
40-70	669.32	N.A.	36.10
60-80	378.83	N.A.	20.40
70-80	172.09	N.A.	9.30
80-90	134.48	N.A.	7.30
90-110	181.63	N.A.	9.80
90-120	239.28	N.A.	12.90
90-130	280.22	N.A.	15.10
90-150	324.64	N.A.	17.50
90-180	338.63	N.A.	18.30
110-180	157.00	N.A.	8.50
0-180	1854.32	N.A.	100.00

Total Luminaire Efficiency = N.A.%

**ZONAL LUMEN SUMMARY**

Zone	Lumens
0-10	39.15
10-20	112.82
20-30	173.31
30-40	214.50
40-50	233.20
50-60	229.38
60-70	206.74
70-80	172.09
80-90	134.48
90-100	103.30
100-110	78.33
110-120	57.65
120-130	40.94
130-140	27.45
140-150	16.97
150-160	9.25
160-170	3.99
170-180	0.75

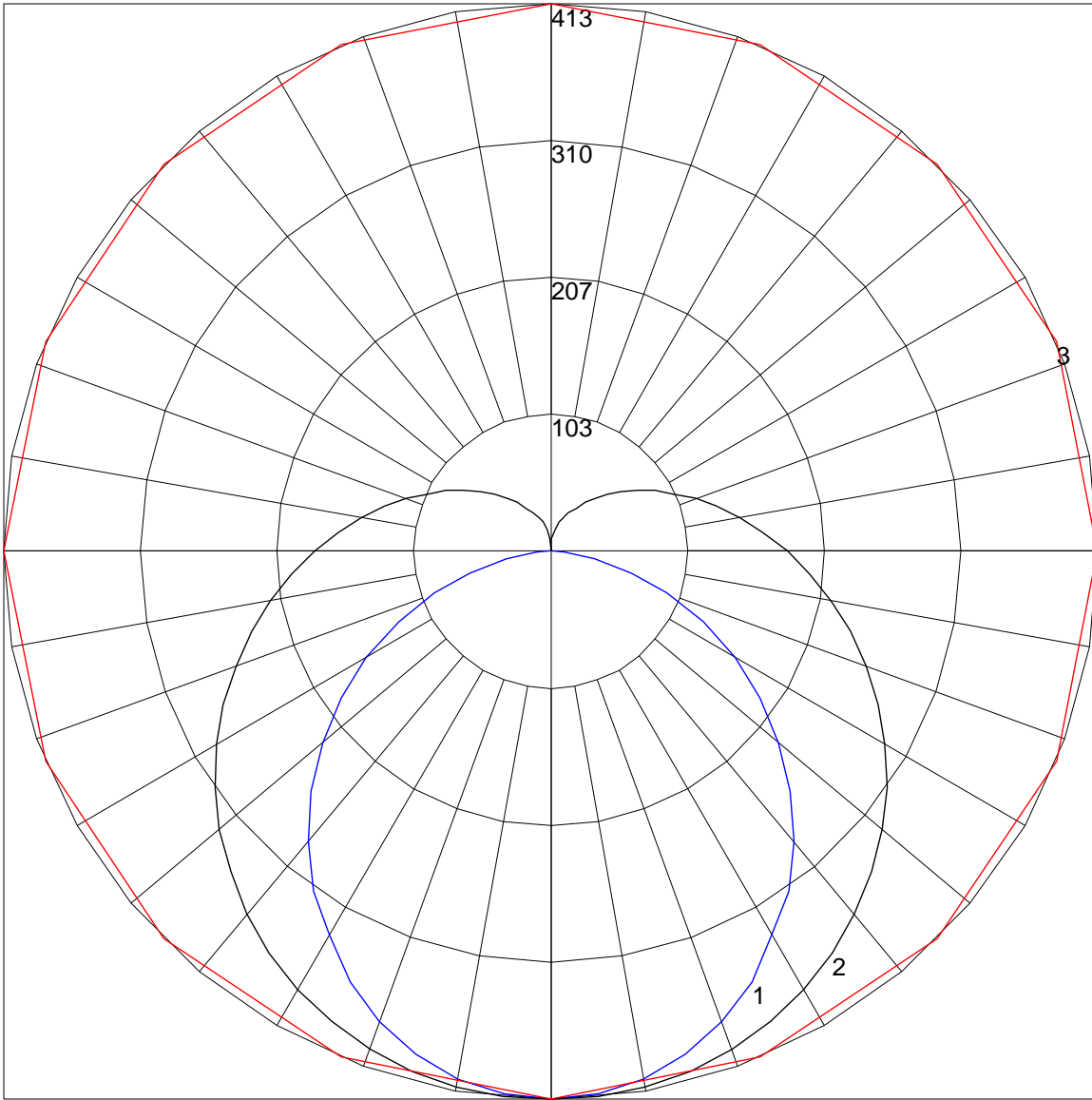


COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Effective Floor Cavity Reflectance 0.20

RC RW	80				70				50			30			10			0
	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	115	115	115	115	110	110	110	110	101	101	101	93	93	93	85	85	85	82
1	102	96	90	86	97	92	87	83	84	80	77	77	74	71	70	68	66	62
2	91	82	74	68	87	78	71	65	72	66	61	66	61	57	60	56	53	50
3	83	71	62	55	79	68	60	53	63	56	50	57	52	47	52	48	44	41
4	75	63	53	46	72	60	51	45	55	48	42	51	44	40	46	41	37	34
5	69	56	46	39	66	53	45	38	49	42	36	45	39	34	41	36	32	29
6	64	50	40	34	60	48	39	33	44	37	31	41	34	29	37	32	28	25
7	59	45	36	30	56	43	35	29	40	33	27	37	31	26	34	29	24	22
8	55	41	32	26	52	39	31	25	36	29	24	34	28	23	31	26	22	20
9	51	37	29	23	49	36	28	23	33	27	22	31	25	21	29	23	20	18
10	48	34	26	21	45	33	26	20	31	24	20	29	23	19	27	22	18	16

POLAR GRAPH



Maximum Candela = 413.21 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.)