



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

Report No: L051706704



**Report No:** L051706704

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

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

**Model Number:** 204220-015

**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>	204220-015
<b>Driver Model Number:</b>	GE 232MAXP-N/Ultra
<b>Total Lumens:</b>	1687.87
<b>Input Voltage (VAC/60Hz):</b>	120.00
<b>Input Current (Amp):</b>	0.12
<b>Input Power (W):</b>	13.87
<b>Input Power Factor:</b>	1.00
<b>Current ATHD @ 120V(%):</b>	7%
<b>Current ATHD @ 277V(%):</b>	N/A
<b>Efficacy:</b>	122
<b>Color Rendering Index (CRI):</b>	85
<b>Correlated Color Temperature (K):</b>	4989
<b>Chromaticity Coordinate x:</b>	0.3458
<b>Chromaticity Coordinate y:</b>	0.3559
<b>Ambient Temperature (°C):</b>	25.0
<b>Stabilization Time (Hours):</b>	0:35
<b>Total Operating Time (Hours):</b>	1:05

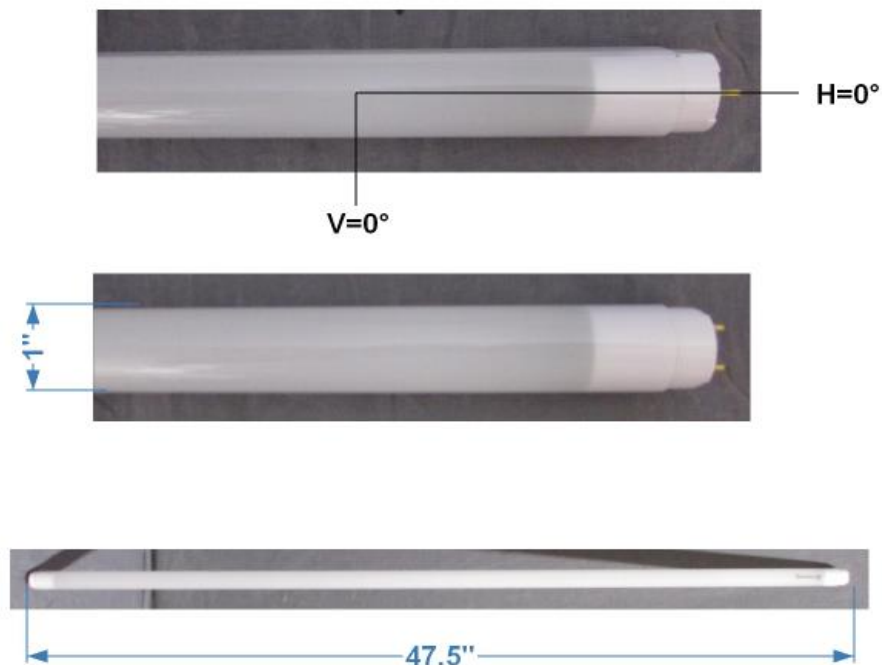
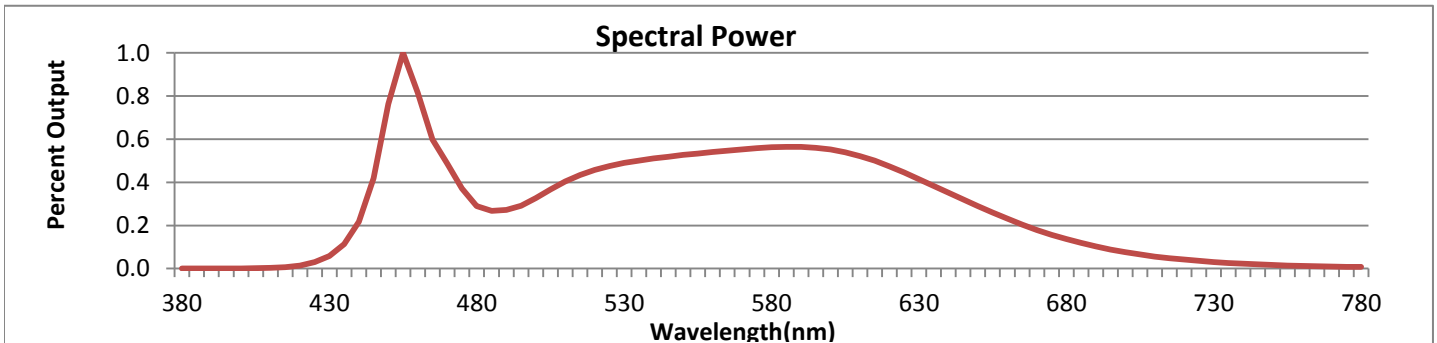


FIG. 1 LUMINAIRE

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



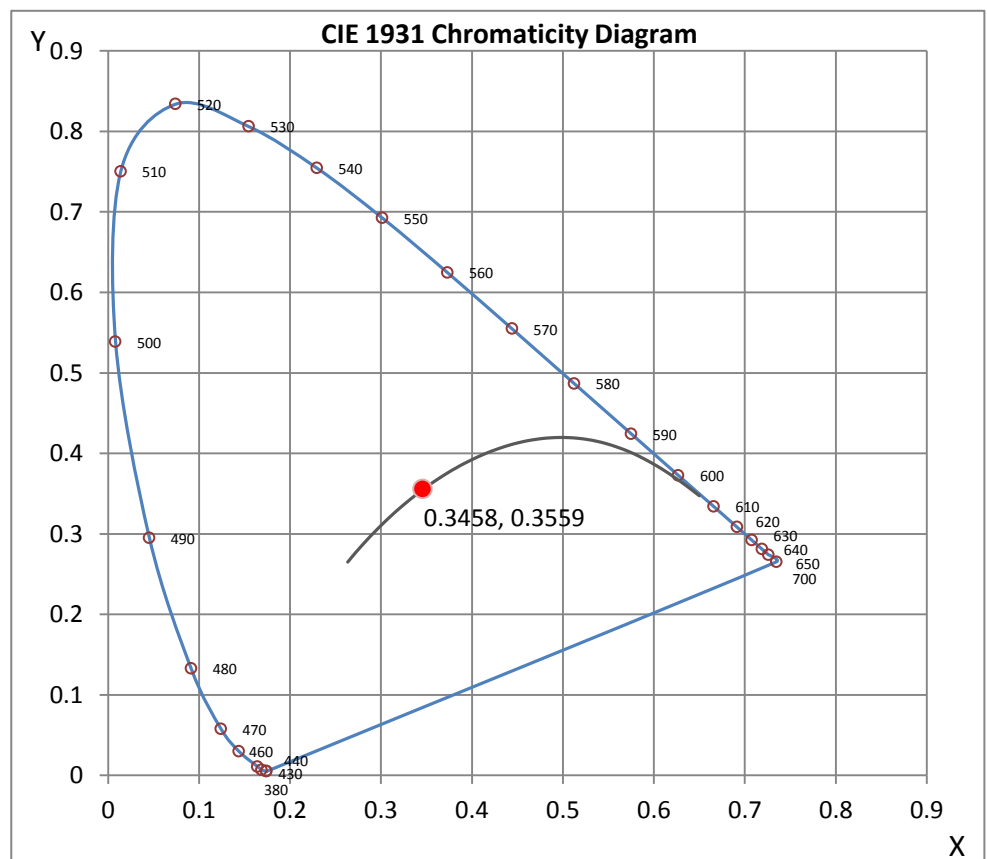
Wavelength	W/m <sup>2</sup> nm	440	0.2175	510	0.4036	580	0.5627	650	0.2897	720	0.0413
380	0.0008	450	0.7630	520	0.4572	590	0.5643	660	0.2323	730	0.0304
390	0.0009	460	0.8159	530	0.4898	600	0.5526	670	0.1793	740	0.0225
400	0.0012	470	0.4878	540	0.5108	610	0.5219	680	0.1365	750	0.0167
410	0.0029	480	0.2905	550	0.5266	620	0.4746	690	0.1025	760	0.0124
420	0.0144	490	0.2722	560	0.5402	630	0.4145	700	0.0760	770	0.0093
430	0.0590	500	0.3264	570	0.5530	640	0.3516	710	0.0559	780	0.0081

**CRI & CCT**

x	0.3458
y	0.3559
u'	0.2102
v'	0.4869
CRI	85.00
CCT	4989
Duv	0.00188

**R Values**

R1	84.35
R2	92.71
R3	95.38
R4	80.79
R5	82.52
R6	87.01
R7	87.30
R8	70.30
R9	21.82
R10	80.37
R11	79.76
R12	54.69
R13	87.29
R14	97.56



\*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 : 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 : L051706704.IES**

## DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002  
[TEST] L051706704  
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)  
[ISSUEDATE] 5/22/2017  
[MANUFAC] Revolution Lighting Technologies (RVLT)  
[LUMCAT] 204220-015  
[LUMINAIRE] 12W 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, 13.87W  
[TEST PROCEDURE] IESNA:LM-79-08

## CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	1688
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	122
Total Luminaire Watts	13.87
Ballast Factor	1.00
CIE Type	Semi-Direct
Spacing Criterion (0-180)	1.22
Spacing Criterion (90-270)	1.42
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 : L051706704.IES**

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

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	607476	12645	10481
55	391891	10939	9663
65	231100	9293	8759
75	106115	7773	7804
85	19264	6441	6825

**IES INDOOR REPORT  
PHOTOMETRIC FILENAME : L051706704.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>	332.89	332.89	332.89	332.89	332.89
<b>5</b>	331.82	331.28	332.52	332.02	332.40
<b>10</b>	326.25	326.96	328.87	330.32	330.82
<b>15</b>	316.62	318.28	322.64	326.63	328.49
<b>20</b>	303.25	306.99	313.92	321.10	324.18
<b>25</b>	287.22	292.62	303.71	314.34	318.61
<b>30</b>	269.21	275.72	291.25	306.03	311.97
<b>35</b>	247.53	257.12	277.51	296.73	304.58
<b>40</b>	224.86	237.15	262.35	286.23	295.86
<b>45</b>	200.78	215.85	247.08	274.98	286.14
<b>50</b>	175.79	193.73	230.72	262.94	275.18
<b>55</b>	150.05	171.51	214.15	250.11	263.81
<b>60</b>	124.06	150.34	197.84	236.99	252.10
<b>65</b>	97.90	128.75	182.18	223.62	239.15
<b>70</b>	74.48	108.94	166.74	210.12	225.94
<b>75</b>	47.91	91.01	152.54	196.84	213.07
<b>80</b>	25.99	75.65	138.96	183.51	199.87
<b>85</b>	8.97	62.61	126.47	170.81	186.33
<b>90</b>	1.00	53.10	115.55	158.48	173.38
<b>95</b>	0.58	46.42	105.33	146.44	161.01
<b>100</b>	0.00	42.18	96.49	135.18	149.13
<b>105</b>	0.00	39.86	88.97	125.18	137.84
<b>110</b>	0.00	38.90	82.87	115.67	127.21
<b>115</b>	0.00	38.94	77.22	106.62	117.41
<b>120</b>	0.00	39.61	72.53	98.48	108.20
<b>125</b>	0.00	40.73	68.13	91.38	99.73
<b>130</b>	0.00	42.02	65.35	84.78	92.01
<b>135</b>	0.00	42.14	62.49	78.84	85.03
<b>140</b>	0.00	41.68	59.00	73.40	79.05
<b>145</b>	0.00	40.85	54.93	69.00	72.49
<b>150</b>	0.00	37.49	51.73	64.89	67.92
<b>155</b>	0.00	31.93	49.24	59.16	63.61
<b>160</b>	0.00	28.86	45.67	52.02	59.62
<b>165</b>	0.00	24.12	37.16	44.76	55.05
<b>170</b>	0.00	18.52	28.98	32.01	43.18
<b>175</b>	0.00	13.33	18.14	19.56	19.35
<b>180</b>	0.00	0.00	0.00	0.00	0.00

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L051706704.IES**

**ZONAL LUMEN SUMMARY**

Zone	Lumens	%Lamp	%Fixt
0-20	122.66	N.A.	7.30
0-30	262.62	N.A.	15.60
0-40	436.05	N.A.	25.80
0-60	814.40	N.A.	48.30
0-80	1140.13	N.A.	67.50
0-90	1265.61	N.A.	75.00
10-90	1234.02	N.A.	73.10
20-40	313.38	N.A.	18.60
20-50	502.92	N.A.	29.80
40-70	552.84	N.A.	32.80
60-80	325.73	N.A.	19.30
70-80	151.24	N.A.	9.00
80-90	125.48	N.A.	7.40
90-110	189.40	N.A.	11.20
90-120	259.47	N.A.	15.40
90-130	315.76	N.A.	18.70
90-150	391.17	N.A.	23.20
90-180	422.27	N.A.	25.00
110-180	232.87	N.A.	13.80
0-180	1687.87	N.A.	100.00

Total Luminaire Efficiency = N.A.%

**ZONAL LUMEN SUMMARY**

Zone	Lumens
0-10	31.58
10-20	91.08
20-30	139.95
30-40	173.43
40-50	189.54
50-60	188.81
60-70	174.49
70-80	151.24
80-90	125.48
90-100	103.72
100-110	85.68
110-120	70.07
120-130	56.29
130-140	43.79
140-150	31.62
150-160	20.01
160-170	9.45
170-180	1.63



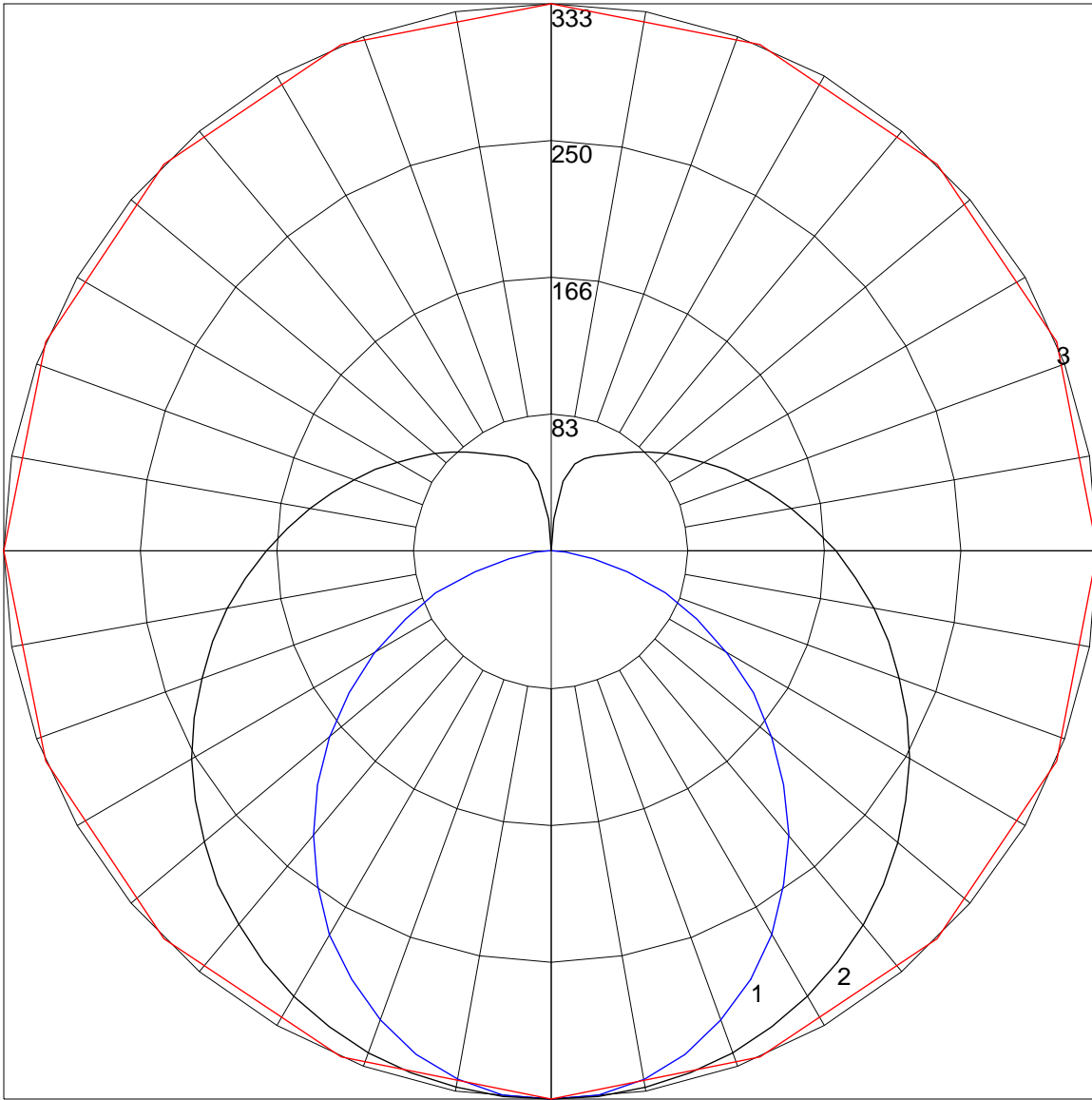
**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L051706704.IES**

**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	113	113	113	113	108	108	108	108	97	97	97	88	88	88	79	79	79	75	0
1	100	94	89	84	95	89	85	80	80	77	73	72	69	66	65	62	60	56	0
2	90	81	73	66	85	76	69	63	69	63	58	62	57	53	55	52	48	45	0
3	81	70	61	54	77	66	58	52	60	53	48	54	48	44	48	44	40	37	0
4	74	61	52	45	70	58	50	43	53	46	40	47	41	37	42	38	34	31	0
5	68	54	45	38	64	52	43	37	47	40	34	42	36	31	38	33	29	26	0
6	62	49	39	33	59	46	38	32	42	35	29	38	32	27	34	29	25	22	0
7	58	44	35	29	54	42	34	28	38	31	26	34	28	24	31	26	22	20	0
8	54	40	31	25	51	38	30	24	35	28	23	32	26	21	29	23	20	17	0
9	50	36	28	23	47	35	27	22	32	25	20	29	23	19	26	21	18	16	0
10	47	33	26	20	44	32	25	20	29	23	18	27	21	17	24	20	16	14	0

POLAR GRAPH



Maximum Candela = 332.89 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.)