

**Report No:** L051706701

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

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

**Model Number:** 204220-012

**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 (RVLT)	
<b>Model Number:</b>	204220-012	
<b>Driver Model Number:</b>	GE 232MAXP-N/Ultra	
<b>Total Lumens:</b>	1759.16	
<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>	10% (0.05A, 13.9W, 0.95PF)	
<b>Efficacy:</b>	127	
<b>Color Rendering Index (CRI):</b>	83	
<b>Correlated Color Temperature (K):</b>	3414	
<b>Chromaticity Coordinate x:</b>	0.4106	
<b>Chromaticity Coordinate y:</b>	0.3942	
<b>Ambient Temperature (°C):</b>	25.0	
<b>Stabilization Time (Hours):</b>	0:30	
<b>Total Operating Time (Hours):</b>	1:00	

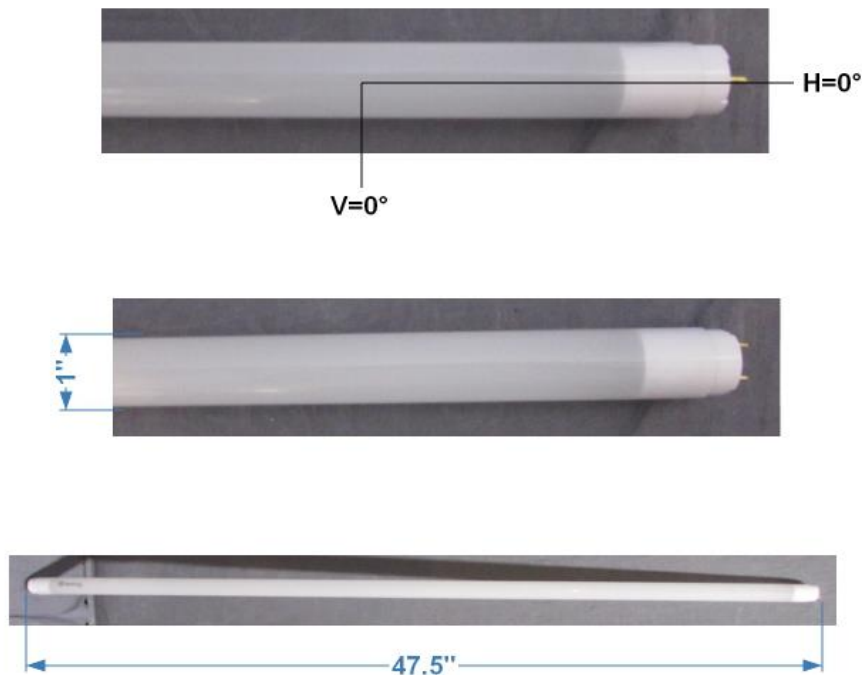
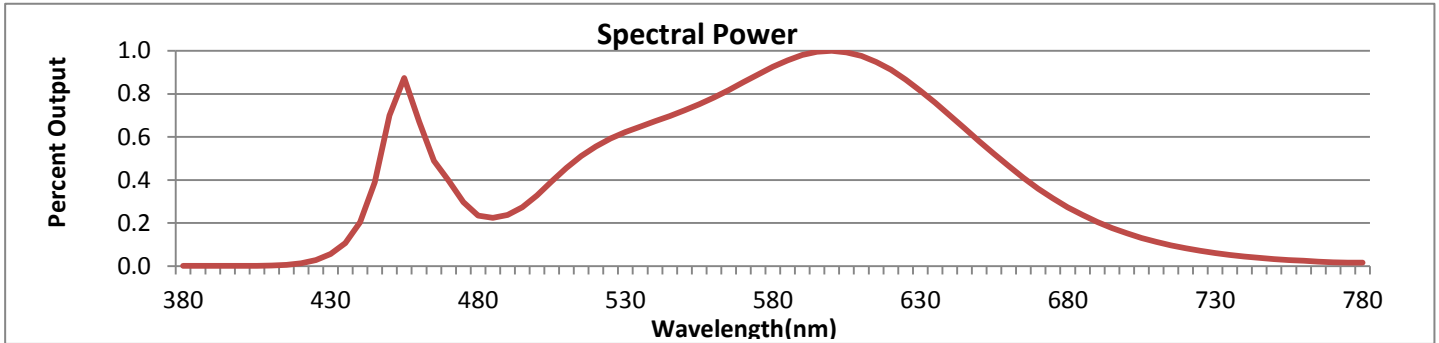


FIG. 1 LUMINAIRE

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



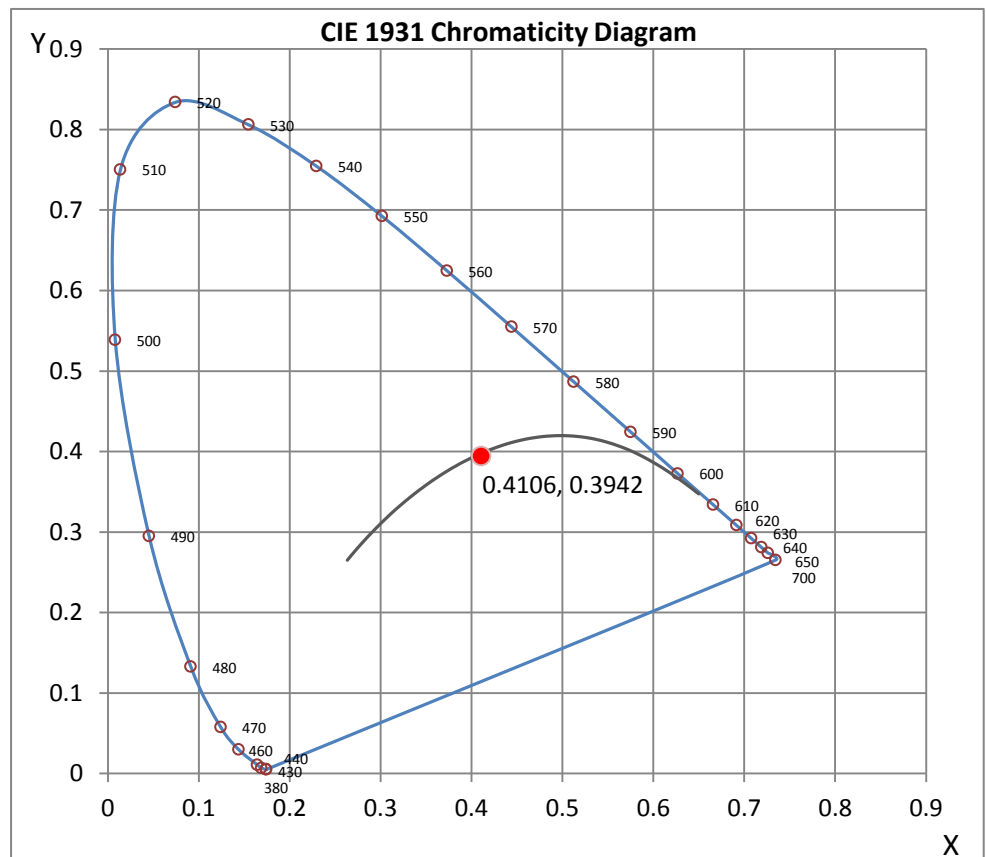
Wavelength	W/m <sup>2</sup> nm	440	0.2035	510	0.4566	580	0.9264	650	0.5798	720	0.0826
380	0.0008	450	0.6998	520	0.5560	590	0.9814	660	0.4648	730	0.0605
390	0.0010	460	0.6698	530	0.6223	600	1.0000	670	0.3597	740	0.0445
400	0.0012	470	0.3963	540	0.6731	610	0.9766	680	0.2740	750	0.0328
410	0.0027	480	0.2350	550	0.7234	620	0.9120	690	0.2053	760	0.0242
420	0.0136	490	0.2382	560	0.7831	630	0.8140	700	0.1527	770	0.0181
430	0.0559	500	0.3290	570	0.8544	640	0.6992	710	0.1124	780	0.0156

**CRI & CCT**

x	0.4106
y	0.3942
u'	0.2377
v'	0.5135
CRI	82.70
CCT	3414
Duv	0.00038

**R Values**

R1	81.32
R2	90.12
R3	95.80
R4	80.05
R5	80.21
R6	85.82
R7	85.07
R8	63.04
R9	11.58
R10	75.57
R11	77.99
R12	59.48
R13	83.53
R14	97.61



\*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*



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# Photometric Test Report

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L051706701.IES**

## DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002  
 [TEST] L051706701  
 [TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)  
 [ISSUE DATE] 5/22/2017  
 [MANUFAC] Revolution Lighting Technologies (RVLT)  
 [LUMCAT] 204220-012  
 [LUMINAIRE] 12W G2 Uni-Fit Ballast-Ready Tube Lamp 3500K  
 [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	1759
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	127
Total Luminaire Watts	13.87
Ballast Factor	1.00
CIE Type	Semi-Direct
Spacing Criterion (0-180)	1.20
Spacing Criterion (90-270)	1.38
Spacing Criterion (Diagonal)	1.42
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**  
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**LUMINANCE DATA (cd/sq.m)**

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	674069	13839	11396
55	426366	11735	10262
65	249914	9704	9063
75	112560	7908	7844
85	19436	6373	6661

**IES INDOOR REPORT  
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**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>	379.91	379.91	379.91	379.91	379.91
<b>5</b>	377.32	378.07	378.15	378.86	379.15
<b>10</b>	370.43	371.84	373.37	375.66	376.41
<b>15</b>	358.88	361.25	365.61	370.18	371.67
<b>20</b>	342.69	347.14	354.57	362.25	365.20
<b>25</b>	325.50	329.86	340.49	352.66	357.22
<b>30</b>	303.17	310.23	326.50	341.57	347.18
<b>35</b>	278.17	287.56	309.19	328.87	336.30
<b>40</b>	250.44	263.48	290.21	315.46	324.59
<b>45</b>	222.79	237.90	270.41	300.01	311.14
<b>50</b>	193.56	211.62	249.90	283.99	295.86
<b>55</b>	163.25	185.59	229.72	266.59	280.17
<b>60</b>	133.94	160.80	209.75	249.73	263.89
<b>65</b>	105.87	136.43	190.24	232.25	247.45
<b>70</b>	77.14	113.76	171.60	215.31	230.68
<b>75</b>	50.82	94.00	155.20	198.79	214.15
<b>80</b>	26.74	76.98	139.46	182.39	197.96
<b>85</b>	9.05	62.98	125.14	167.61	181.85
<b>90</b>	0.83	52.44	112.64	153.49	167.32
<b>95</b>	0.58	45.38	101.60	139.96	153.37
<b>100</b>	0.00	40.69	92.38	127.96	140.08
<b>105</b>	0.00	38.24	84.49	117.33	128.46
<b>110</b>	0.00	37.12	78.22	107.87	118.08
<b>115</b>	0.00	37.03	72.78	99.06	108.53
<b>120</b>	0.00	37.78	68.22	91.47	99.73
<b>125</b>	0.00	38.82	64.23	85.03	92.01
<b>130</b>	0.00	40.11	61.32	78.72	85.11
<b>135</b>	0.00	40.19	58.92	73.74	79.30
<b>140</b>	0.00	39.82	55.51	68.59	73.82
<b>145</b>	0.00	39.44	52.19	64.52	68.34
<b>150</b>	0.00	35.79	48.99	60.87	63.19
<b>155</b>	0.00	31.68	47.00	55.26	60.04
<b>160</b>	0.00	28.32	44.63	50.11	57.13
<b>165</b>	0.00	23.00	36.08	43.93	52.31
<b>170</b>	0.00	17.15	28.03	30.85	40.94
<b>175</b>	0.00	13.08	16.73	18.19	16.86
<b>180</b>	0.00	0.00	0.00	0.00	0.00

**IES INDOOR REPORT**  
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**ZONAL LUMEN SUMMARY**

Zone	Lumens	%Lamp	%Fixt
0-20	139.15	N.A.	7.90
0-30	296.51	N.A.	16.90
0-40	489.55	N.A.	27.80
0-60	899.71	N.A.	51.10
0-80	1235.93	N.A.	70.30
0-90	1359.75	N.A.	77.30
10-90	1323.79	N.A.	75.30
20-40	350.40	N.A.	19.90
20-50	558.06	N.A.	31.70
40-70	592.65	N.A.	33.70
60-80	336.22	N.A.	19.10
70-80	153.73	N.A.	8.70
80-90	123.82	N.A.	7.00
90-110	180.51	N.A.	10.30
90-120	246.06	N.A.	14.00
90-130	298.71	N.A.	17.00
90-150	369.68	N.A.	21.00
90-180	399.41	N.A.	22.70
110-180	218.90	N.A.	12.40
0-180	1759.16	N.A.	100.00

Total Luminaire Efficiency = N.A.%

**ZONAL LUMEN SUMMARY**

Zone	Lumens
0-10	35.96
10-20	103.19
20-30	157.36
30-40	193.04
40-50	207.66
50-60	202.50
60-70	182.49
70-80	153.73
80-90	123.82
90-100	99.68
100-110	80.83
110-120	65.55
120-130	52.65
130-140	41.12
140-150	29.85
150-160	19.07
160-170	9.13
170-180	1.54



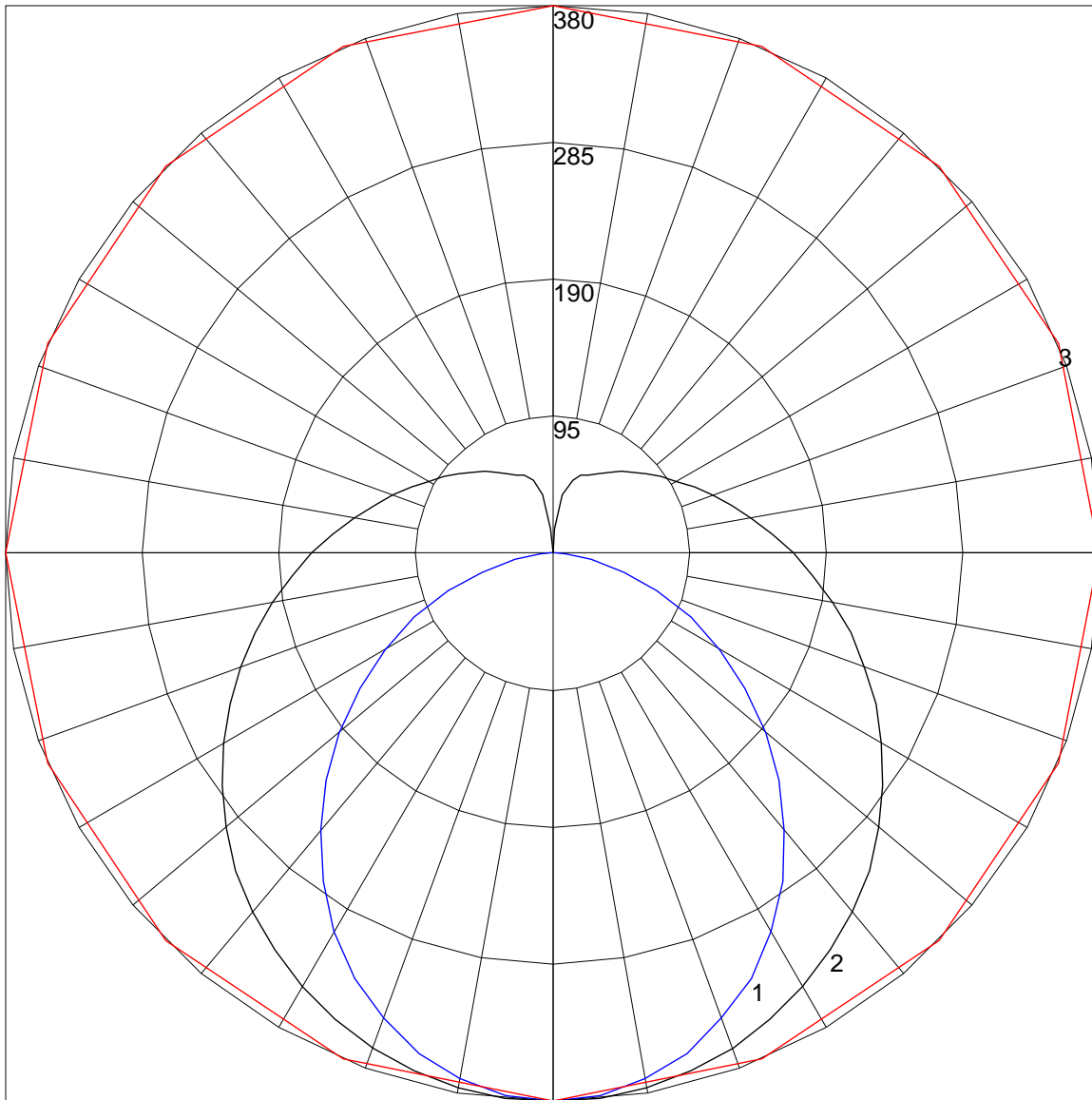
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**COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD**

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	10	0
0	114	114	114	114	114	108	108	108	108	99	99	99	89	89	89	81	81	81	77
1	101	95	90	85	85	96	90	86	82	82	78	75	74	71	68	67	65	63	59
2	91	81	74	67	67	86	78	71	65	70	65	60	64	59	55	57	54	51	47
3	82	71	62	55	55	78	67	59	53	61	55	49	55	50	45	50	46	42	39
4	75	62	53	46	46	71	59	51	44	54	47	41	49	43	38	44	39	35	32
5	69	55	46	39	39	65	53	44	38	48	41	35	44	38	33	40	35	30	28
6	63	50	40	34	34	60	47	39	33	43	36	31	39	33	29	36	31	27	24
7	58	45	36	30	30	55	43	35	29	39	32	27	36	30	25	33	27	23	21
8	54	41	32	26	26	51	39	31	25	36	29	24	33	27	22	30	25	21	19
9	51	37	29	23	23	48	36	28	23	33	26	21	30	24	20	28	23	19	17
10	47	34	26	21	21	45	33	25	20	30	24	19	28	22	18	26	21	17	15

POLAR GRAPH



Maximum Candela = 379.91 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.)