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Report No: L111603206R01

Date: 11/30/2016



NVLAP LAB CODE 200927-0

**Report No:** L111603206R01

**Report Prepared For:** Vode Lighting  
 1206 E. MacArthur St. #3 Sonoma, CA 95476

**Model Number:** 707-Z3-48-Z-SO-35-U2

**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 707-Z3-48-Z-SO-35-U2 . Received in working and undamaged condition. No modifications were necessary.

**Testing Condition:** Fixture is tested with no special conditions.

**Sample Arrival Date:** 11/15/16

**Date of Tests:** 11/17/16 - 11/18/16

**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.

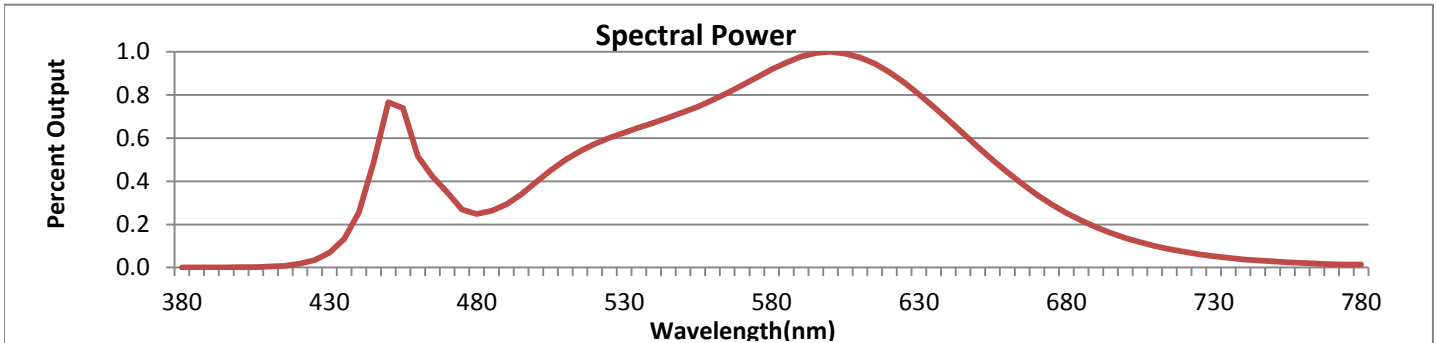
**Test Summary**

<b>Manufacturer:</b>	Vode Lighting
<b>Model Number:</b>	707-Z3-48-Z-SO-35-U2
<b>Driver Model Number:</b>	MEAN WELL HLG-40H-36A
<b>Total Lumens:</b>	3616.95
<b>Input Voltage (VAC/60Hz):</b>	120.00
<b>Input Current (Amp):</b>	0.23
<b>Input Power (W):</b>	27.60
<b>Input Power Factor:</b>	0.99
<b>Current ATHD @ 120V(%):</b>	9%
<b>Current ATHD @ 277V(%):</b>	N/A
<b>Efficacy:</b>	131
<b>Color Rendering Index (CRI):</b>	84
<b>Correlated Color Temperature (K):</b>	3464
<b>Chromaticity Coordinate x:</b>	0.4093
<b>Chromaticity Coordinate y:</b>	0.3970
<b>Ambient Temperature (°C):</b>	25.0
<b>Stabilization Time (Hours):</b>	0:30
<b>Total Operating Time (Hours):</b>	1:25
<b>Off State Power(W):</b>	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.



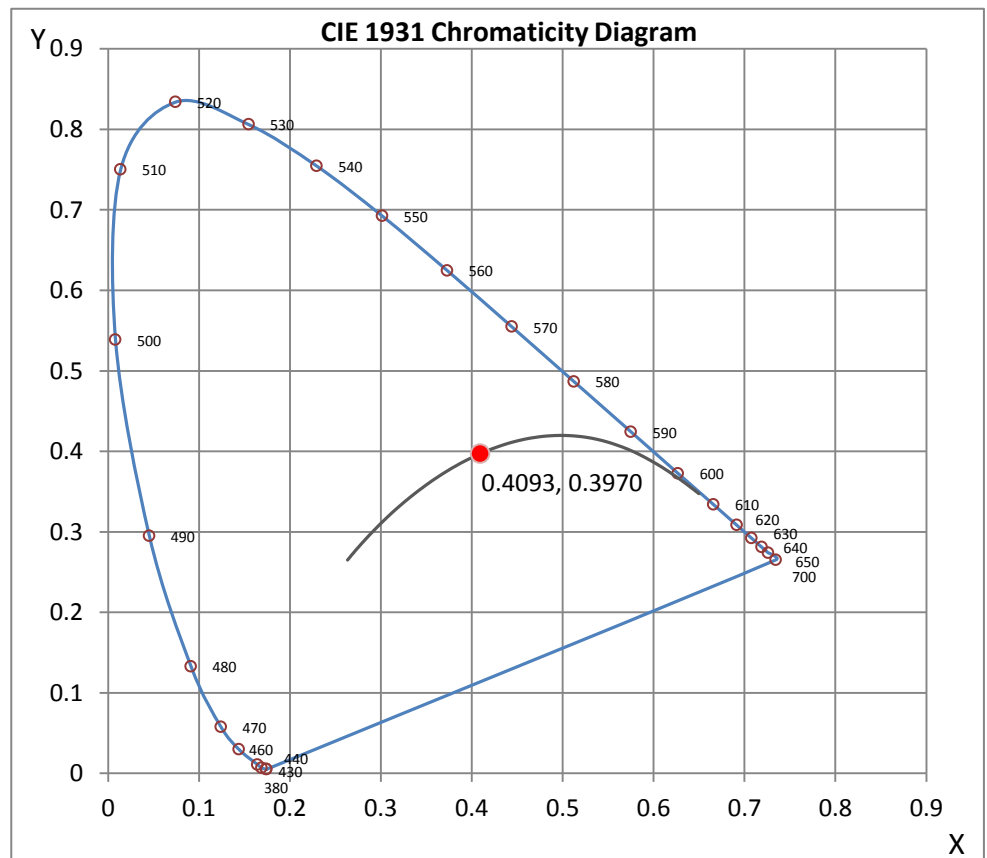
Wavelength	W/m <sup>2</sup> nm	440	0.2564	510	0.4996	580	0.9187	650	0.5601	720	0.0727
380	0.0008	450	0.7655	520	0.5732	590	0.9782	660	0.4423	730	0.0524
390	0.0010	460	0.5171	530	0.6257	600	1.0000	670	0.3376	740	0.0382
400	0.0014	470	0.3488	540	0.6710	610	0.9746	680	0.2534	750	0.0281
410	0.0044	480	0.2480	550	0.7195	620	0.9063	690	0.1874	760	0.0208
420	0.0178	490	0.2925	560	0.7768	630	0.8034	700	0.1375	770	0.0153
430	0.0682	500	0.3958	570	0.8455	640	0.6843	710	0.1002	780	0.0133

**CRI & CCT**

x	0.4093
y	0.3970
u'	0.2357
v'	0.5144
CRI	83.50
CCT	3464
Duv	0.00186

**R Values**

R1	81.84
R2	90.39
R3	96.69
R4	81.86
R5	81.45
R6	87.09
R7	85.48
R8	63.11
R9	10.61
R10	77.18
R11	80.92
R12	63.70
R13	83.97
R14	98.22



\*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 : L111603206R01.IES**

**DESCRIPTION INFORMATION (From Photometric File)**

IESNA:LM-63-2002  
 [TEST] L111603206R01  
 [TESTLAB] LIGHT LABORATORY, INC.  
 [ISSUEDATE] 11/30/2016  
 [MANUFAC] VODE LIGHTING  
 [LUMCAT] 707-Z3-48-Z-SO-35-U2  
 [LUMINAIRE] ZIPTHREE, 48", 3500K, ZIPPER BOARD,  
 [MORE] CEILING WASH UPLIGHT ONLY (with EDGE GLOW), STANDARD OUTPUT  
 [BALLASTCAT] MEAN WELL HLG-40H-36A  
 [LAMPPOSITION] 0,0  
 [LAMPCAT] N/A  
 [OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND  
 [MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.  
 [INPUT] 120VAC, 27.60W  
 [TEST PROCEDURE] IESNA:LM-79-08

**CHARACTERISTICS**

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	3621
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	131
Total Luminaire Watts	27.6
Ballast Factor	1.00
CIE Type	Indirect
Spacing Criterion (0-180)	N.A.
Spacing Criterion (90-270)	N.A.
Spacing Criterion (Diagonal)	N.A.
Basic Luminous Shape	Rectangular
Luminous Length (0-180)	0.06 ft
Luminous Width (90-270)	3.98 ft
Luminous Height	0.00 ft

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

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	0	0	0
55	0	0	0
65	0	0	0
75	0	0	0
85	0	0	0

CANDELA TABULATION

	<u>0</u>	<u>5</u>	<u>10</u>	<u>15</u>	<u>20</u>	<u>25</u>	<u>30</u>	<u>35</u>	<u>40</u>	<u>45</u>
<b>0</b>	0	0	0	0	0	0	0	0	0	0
<b>5</b>	0	0	0	0	0	0	0	0	0	0
<b>10</b>	0	0	0	0	0	0	0	0	0	0
<b>15</b>	0	0	0	0	0	0	0	0	0	0
<b>20</b>	0	0	0	0	0	0	0	0	0	0
<b>25</b>	0	0	0	0	0	0	0	0	0	0
<b>30</b>	0	0	0	0	0	0	0	0	0	0
<b>35</b>	0	0	0	0	0	0	0	0	0	0
<b>40</b>	0	0	0	0	0	0	0	0	0	0
<b>45</b>	0	0	0	0	0	0	0	0	0	0
<b>50</b>	0	0	0	0	0	0	0	0	0	0
<b>55</b>	0	0	0	0	0	0	0	0	0	0
<b>60</b>	0	0	0	0	0	0	0	0	0	0
<b>65</b>	0	0	0	0	0	0	0	0	0	0
<b>70</b>	0	0	0	0	0	0	0	0	0	0
<b>75</b>	0	0	0	0	0	0	0	0	0	0
<b>80</b>	0	0	0	0	0	0	0	0	0	0
<b>85</b>	0	0	0	0	0	0	0	0	0	0
<b>90</b>	21	21	21	20	20	19	18	16	15	14
<b>95</b>	58	58	58	57	57	56	55	55	54	53
<b>100</b>	114	114	114	114	114	114	114	114	113	113
<b>105</b>	188	188	188	189	189	190	190	190	191	191
<b>110</b>	279	279	279	280	281	282	283	284	285	286
<b>115</b>	385	386	386	387	388	389	390	391	393	394
<b>120</b>	504	504	505	505	507	508	509	511	513	515
<b>125</b>	629	629	629	630	631	632	634	636	638	640
<b>130</b>	752	752	753	753	754	756	757	759	761	763
<b>135</b>	868	868	868	869	869	871	872	874	876	878
<b>140</b>	971	971	972	972	973	974	975	976	977	979
<b>145</b>	1061	1061	1061	1061	1062	1063	1063	1064	1065	1066
<b>150</b>	1136	1136	1137	1137	1137	1138	1138	1139	1139	1140
<b>155</b>	1199	1199	1199	1199	1199	1199	1199	1200	1200	1200
<b>160</b>	1247	1247	1247	1247	1247	1247	1247	1247	1248	1247
<b>165</b>	1283	1283	1283	1283	1283	1283	1283	1283	1283	1284
<b>170</b>	1308	1308	1308	1308	1308	1308	1308	1308	1308	1308
<b>175</b>	1322	1322	1322	1322	1322	1322	1322	1322	1322	1322
<b>180</b>	1324	1324	1324	1324	1324	1324	1324	1324	1324	1324

Vert. Horizontal Angles  
 Angles

	<u>50</u>	<u>55</u>	<u>60</u>	<u>65</u>	<u>70</u>	<u>75</u>	<u>80</u>	<u>85</u>	<u>90</u>
<b>0</b>	0	0	0	0	0	0	0	0	0
<b>5</b>	0	0	0	0	0	0	0	0	0
<b>10</b>	0	0	0	0	0	0	0	0	0
<b>15</b>	0	0	0	0	0	0	0	0	0
<b>20</b>	0	0	0	0	0	0	0	0	0
<b>25</b>	0	0	0	0	0	0	0	0	0
<b>30</b>	0	0	0	0	0	0	0	0	0
<b>35</b>	0	0	0	0	0	0	0	0	0
<b>40</b>	0	0	0	0	0	0	0	0	0
<b>45</b>	0	0	0	0	0	0	0	0	0
<b>50</b>	0	0	0	0	0	0	0	0	0
<b>55</b>	0	0	0	0	0	0	0	0	0
<b>60</b>	0	0	0	0	0	0	0	0	0

**IES INDOOR REPORT**  
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**CANDELA TABULATION - (Cont.)**

<b>65</b>	0	0	0	0	0	0	0	0	0
<b>70</b>	0	0	0	0	0	0	0	0	0
<b>75</b>	0	0	0	0	0	0	0	0	0
<b>80</b>	0	0	0	0	0	0	0	0	0
<b>85</b>	0	0	0	0	0	0	0	0	0
<b>90</b>	13	11	10	9	8	8	7	6	6
<b>95</b>	52	51	50	49	49	48	47	47	46
<b>100</b>	113	113	113	113	112	112	111	111	111
<b>105</b>	192	193	193	193	193	193	193	193	193
<b>110</b>	287	288	289	290	291	291	291	292	292
<b>115</b>	396	398	399	401	402	403	404	404	404
<b>120</b>	517	519	521	522	524	525	526	526	527
<b>125</b>	643	645	647	648	650	651	652	652	652
<b>130</b>	766	768	770	771	772	773	774	774	774
<b>135</b>	879	881	883	884	885	886	886	886	886
<b>140</b>	981	982	983	984	985	985	986	986	986
<b>145</b>	1067	1068	1069	1069	1070	1070	1070	1071	1071
<b>150</b>	1140	1141	1141	1141	1141	1142	1142	1142	1142
<b>155</b>	1200	1200	1200	1200	1200	1201	1201	1201	1201
<b>160</b>	1248	1248	1248	1248	1248	1248	1248	1248	1248
<b>165</b>	1284	1284	1284	1284	1284	1284	1284	1284	1284
<b>170</b>	1308	1308	1308	1308	1309	1309	1309	1309	1309
<b>175</b>	1322	1322	1322	1322	1322	1322	1322	1322	1322
<b>180</b>	1324	1324	1324	1324	1324	1324	1324	1324	1324

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

Zone	Lumens	%Lamp	%Fixt
0-20	0.00	N.A.	0.00
0-30	0.00	N.A.	0.00
0-40	0.00	N.A.	0.00
0-60	0.00	N.A.	0.00
0-80	0.00	N.A.	0.00
0-90	3.80	N.A.	0.10
10-90	3.80	N.A.	0.10
20-40	0.00	N.A.	0.00
20-50	0.00	N.A.	0.00
40-70	0.00	N.A.	0.00
60-80	0.00	N.A.	0.00
70-80	0.00	N.A.	0.00
80-90	3.80	N.A.	0.10
90-110	269.25	N.A.	7.40
90-120	662.75	N.A.	18.30
90-130	1235.06	N.A.	34.10
90-150	2576.16	N.A.	71.20
90-180	3616.95	N.A.	99.90
110-180	3347.7	N.A.	92.50
0-180	3620.74	N.A.	100.00

Total Luminaire Efficiency = N.A.%

**ZONAL LUMEN SUMMARY**

Zone	Lumens
0-10	0.00
10-20	0.00
20-30	0.00
30-40	0.00
40-50	0.00
50-60	0.00
60-70	0.00
70-80	0.00
80-90	3.80
90-100	63.24
100-110	206.01
110-120	393.50
120-130	572.31
130-140	675.20
140-150	665.90
150-160	552.72
160-170	362.34
170-180	125.72



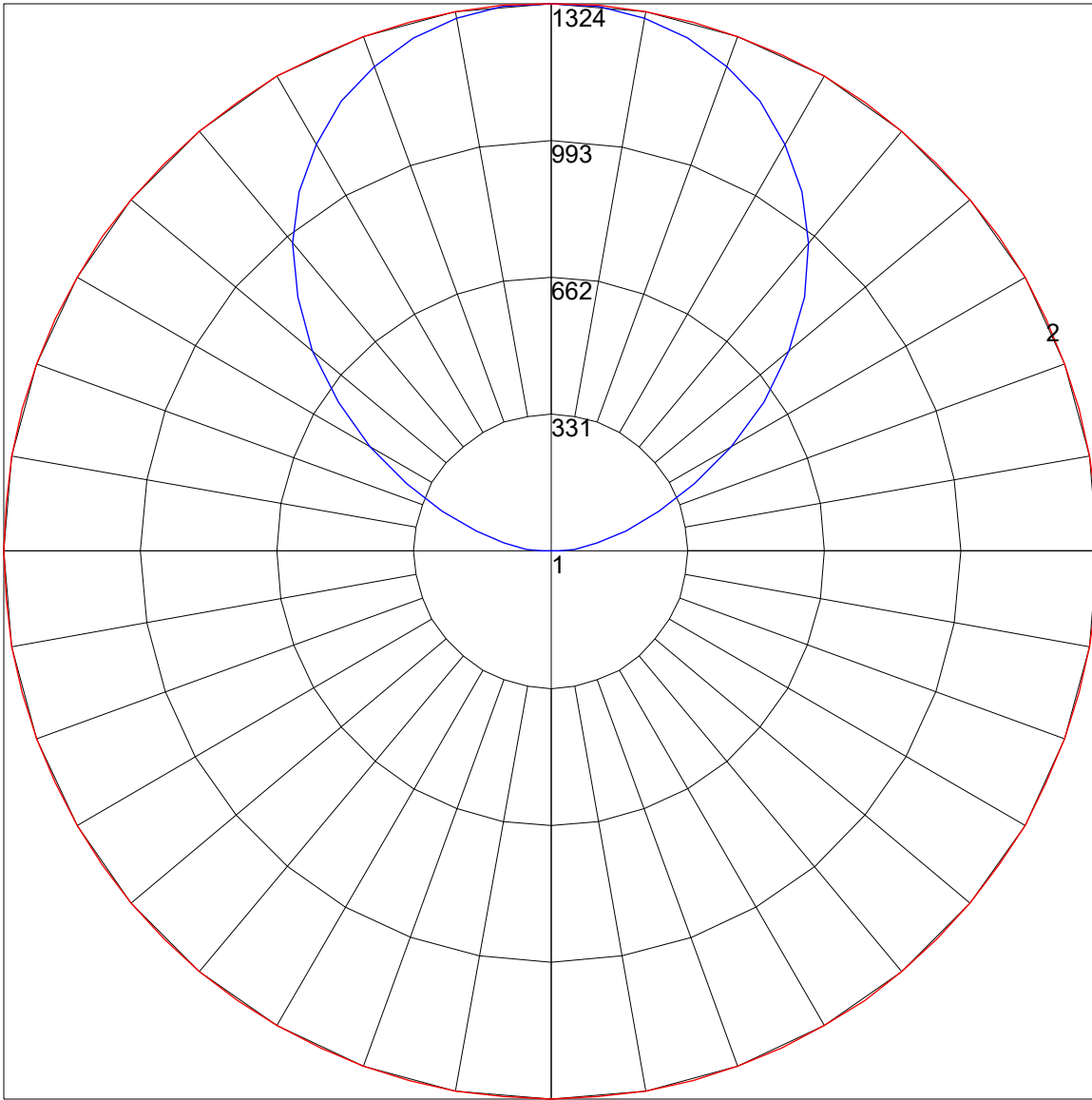
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**COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD**

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	95	95	95	95	81	81	81	81	56	56	56	32	32	32	10	10	10	0
1	87	83	79	76	74	71	68	65	48	47	45	28	27	26	9	9	8	0
2	79	72	66	62	67	62	57	53	42	40	37	24	23	22	8	7	7	0
3	72	63	56	51	61	54	49	44	37	34	31	21	20	18	7	6	6	0
4	65	56	48	43	56	48	42	37	33	29	26	19	17	16	6	6	5	0
5	60	49	42	36	51	42	36	32	29	25	22	17	15	13	5	5	4	0
6	55	44	36	31	47	38	32	27	26	22	19	15	13	11	5	4	4	0
7	50	39	32	27	43	34	28	23	23	19	17	14	11	10	4	4	3	0
8	47	35	28	23	40	30	24	20	21	17	14	12	10	9	4	3	3	0
9	43	32	25	20	37	27	22	18	19	15	13	11	9	8	4	3	3	0
10	40	29	22	18	34	25	19	16	17	14	11	10	8	7	3	3	2	0

POLAR GRAPH



Maximum Candela = 1324 Located At Horizontal Angle = 0, Vertical Angle = 180  
# 1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)  
# 2 - Horizontal Cone Through Vertical Angle (180) (Through Max. Cd.)