



8165 E Kaiser Blvd. Anaheim, CA 92808  
p. 714.282.2270  
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Test #: L04142406R01

Date: 3/12/2015



NVLAP LAB CODE 200927-0

**Test Report:** L04142406R01

**Model Number:** 4924-27-XX

**Report Prepared For:** AION LED  
2325 3RD ST #330 SAN FRANCISCO, CA 94107

**Test:** Electrical and Photometric tests as required by the IESNA test standards.

**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. Fixture catalog number is 4924-27-XX . Received in working and undamaged condition. No modifications were necessary.

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

**Sample Arrival Date:** 4/3/14

**Date of Tests:** 4/11/14 - 4/16/14

**Seasoning of Sample SSL:** 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	01/04/15
Xitron Power Analysis System	2503AH	MT-EL01	01/09/15
BK Precision DC Power Supply	1747	PSDC-04	01/08/15
Fluke Digital Thermometer	52k/J	MT-TP02-GC	01/04/15
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.

### LM-79 Test Summary

<b>Manufacturer:</b>	AION LED
<b>Model Number:</b>	4924-27-XX
<b>LAMPCAT:</b>	N/A
<b>Driver Model Number:</b>	N/A
<b>Total Lumens:</b>	165.23
<b>Input Voltage (VDC):</b>	24.00
<b>Input Current (Amp):</b>	0.09
<b>Input Power (W):</b>	2.19
<b>Input Power Factor:</b>	1.00
<b>Total Harmonic Distortion @ 120V(%)</b>	N/A
<b>Total Harmonic Distortion @ 277V(%)</b>	N/A
<b>Efficacy:</b>	76
<b>Color Rendering Index (CRI):</b>	92
<b>Correlated Color Temperature (K):</b>	2657
<b>Chromaticity Coordinate x:</b>	0.4606
<b>Chromaticity Coordinate y:</b>	0.4065
<b>Ambient Temperature (°F):</b>	77.0
<b>Stabilization Time (Hours):</b>	0:55
<b>Total Operating Time (Hours):</b>	1:55
<b>Off State Power(W):</b>	0.00

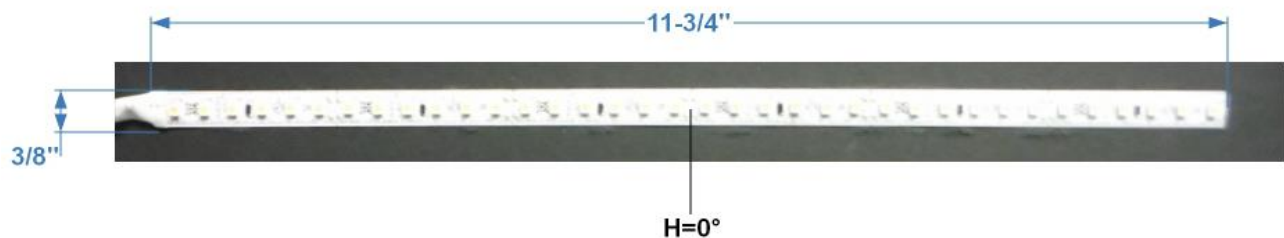
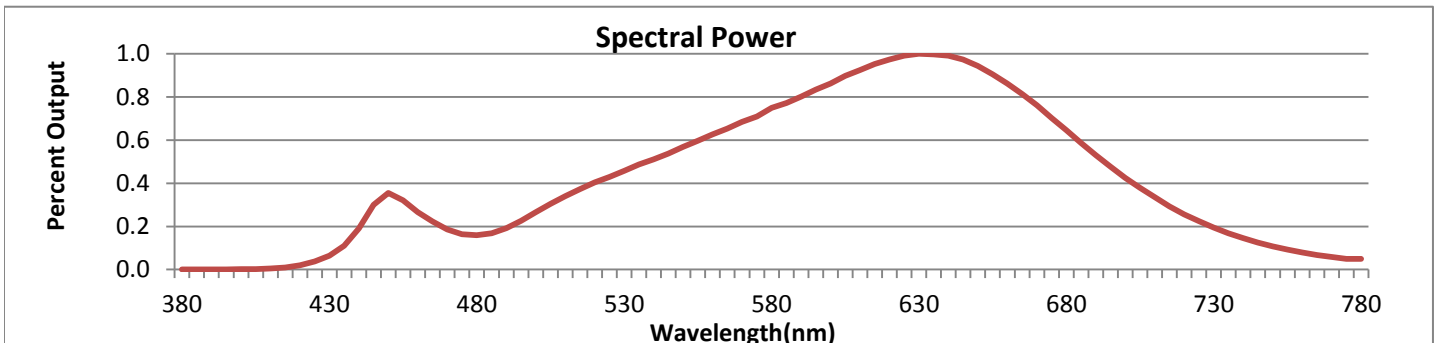


FIG.1 LUMINAIRE



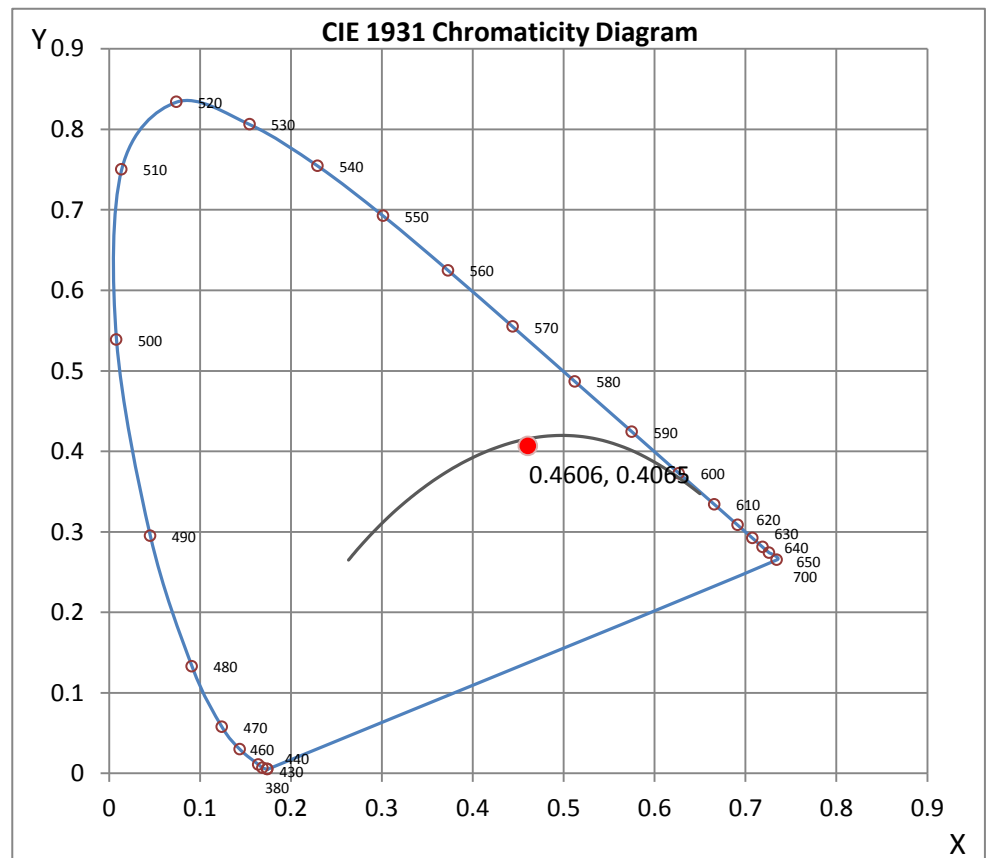
Wavelength	W/m <sup>2</sup> nm	440	0.0006	510	0.0011	580	0.0024	650	0.0031	720	0.0008
380	0.0000	450	0.0012	520	0.0013	590	0.0026	660	0.0028	730	0.0006
390	0.0000	460	0.0009	530	0.0015	600	0.0028	670	0.0025	740	0.0005
400	0.0000	470	0.0006	540	0.0017	610	0.0030	680	0.0021	750	0.0004
410	0.0000	480	0.0005	550	0.0018	620	0.0032	690	0.0017	760	0.0003
420	0.0001	490	0.0006	560	0.0020	630	0.0032	700	0.0014	770	0.0002
430	0.0002	500	0.0009	570	0.0022	640	0.0032	710	0.0011	780	0.0002

**CRI & CCT**

x	0.4606
y	0.4065
u'	0.2648
v'	0.5259
CRI	92.20
CCT	2657
Duv	-0.00157

**R Values**

R1	92.36
R2	95.34
R3	96.26
R4	91.66
R5	91.55
R6	93.60
R7	92.71
R8	84.18
R9	66.04
R10	88.00
R11	91.41
R12	82.43
R13	92.95
R14	97.07





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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 : 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*

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



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## Photometric Test Report

### IES INDOOR REPORT

PHOTOMETRIC FILENAME : L04142406R01.IES

### DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002  
[TEST] L04142406R01  
[TESTLAB] LIGHT LABORATORY, INC.  
[ISSUEDATE] 3/12/2015  
[MANUFAC] AION LED  
[LUMCAT] 4924-27-XX  
[LUMINAIRE] 3/8"L. X 11-3/4"W. X 1/8"H. LED STRIP  
[LAMPPOSITION] 0,0  
[LAMPCAT] N/A  
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND  
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.  
[\_INPUT] 24VDC, 2.19W  
[\_TEST PROCEDURE] IESNA:LM-79-08

### CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	165
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	75
Total Luminaire Watts	2.19
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	1.28
Spacing Criterion (90-270)	1.28
Spacing Criterion (Diagonal)	1.40
Basic Luminous Shape	Rectangular
Luminous Length (0-180)	0.01 ft
Luminous Width (90-270)	0.96 ft
Luminous Height	0.00 ft

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

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	61039	61172	61172
55	59184	59348	59346
65	55625	55737	55848
75	47596	48141	48319
85	33456	35602	34522

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L04142406R01.IES**

**CANDELA TABULATION**

	<b>0</b>	<b>5</b>	<b>10</b>	<b>15</b>	<b>20</b>	<b>25</b>	<b>30</b>	<b>35</b>	<b>40</b>	<b>45</b>
<b>0</b>	56.409	56.409	56.409	56.409	56.409	56.409	56.409	56.409	56.409	56.409
<b>5</b>	56.326	56.326	56.326	56.284	56.326	56.326	56.326	56.284	56.284	56.284
<b>10</b>	55.361	55.361	55.361	55.340	55.361	55.361	55.382	55.361	55.361	55.361
<b>15</b>	54.395	54.395	54.395	54.395	54.395	54.395	54.437	54.437	54.437	54.437
<b>20</b>	52.632	52.591	52.611	52.611	52.611	52.611	52.632	52.632	52.632	52.632
<b>25</b>	50.869	50.786	50.827	50.827	50.827	50.827	50.827	50.827	50.827	50.827
<b>30</b>	48.183	48.142	48.162	48.204	48.204	48.204	48.183	48.183	48.183	48.183
<b>35</b>	45.497	45.497	45.497	45.581	45.581	45.581	45.539	45.539	45.539	45.539
<b>40</b>	42.224	42.182	42.182	42.182	42.182	42.181	42.181	42.223	42.223	42.265
<b>45</b>	38.530	38.530	38.530	38.530	38.530	38.530	38.572	38.614	38.614	38.614
<b>50</b>	34.585	34.585	34.585	34.585	34.585	34.585	34.627	34.669	34.627	34.627
<b>55</b>	30.304	30.346	30.388	30.388	30.388	30.388	30.388	30.430	30.388	30.388
<b>60</b>	25.771	25.771	25.771	25.771	25.813	25.855	25.855	25.771	25.855	25.855
<b>65</b>	20.986	20.986	20.986	20.986	20.986	21.028	20.986	20.986	21.028	21.028
<b>70</b>	16.033	16.033	16.033	16.033	16.033	16.075	16.033	16.075	16.117	16.117
<b>75</b>	10.997	10.997	10.997	11.039	11.081	11.081	11.123	11.123	11.165	11.123
<b>80</b>	6.380	6.380	6.380	6.422	6.464	6.422	6.464	6.464	6.548	6.464
<b>85</b>	2.603	2.603	2.603	2.645	2.687	2.687	2.687	2.729	2.687	2.770
<b>90</b>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

**Vert. Angles**      **Horizontal Angles**

	<b>50</b>	<b>55</b>	<b>60</b>	<b>65</b>	<b>70</b>	<b>75</b>	<b>80</b>	<b>85</b>	<b>90</b>
<b>0</b>	56.409	56.409	56.409	56.409	56.409	56.409	56.409	56.409	56.409
<b>5</b>	56.284	56.284	56.284	56.284	56.284	56.284	56.284	56.284	56.242
<b>10</b>	55.361	55.361	55.382	55.382	55.361	55.361	55.382	55.382	55.319
<b>15</b>	54.437	54.437	54.479	54.479	54.437	54.437	54.479	54.479	54.395
<b>20</b>	52.632	52.632	52.653	52.653	52.632	52.653	52.674	52.653	52.590
<b>25</b>	50.827	50.827	50.827	50.827	50.827	50.869	50.869	50.827	50.785
<b>30</b>	48.204	48.204	48.204	48.183	48.204	48.204	48.225	48.183	48.183
<b>35</b>	45.581	45.581	45.581	45.539	45.581	45.539	45.581	45.539	45.581
<b>40</b>	42.223	42.223	42.223	42.265	42.223	42.223	42.223	42.223	42.223
<b>45</b>	38.614	38.614	38.614	38.614	38.656	38.614	38.614	38.614	38.614
<b>50</b>	34.627	34.669	34.627	34.626	34.668	34.626	34.626	34.626	34.584
<b>55</b>	30.430	30.388	30.429	30.429	30.387	30.471	30.387	30.429	30.387
<b>60</b>	25.855	25.855	25.855	25.813	25.855	25.812	25.854	25.770	25.854
<b>65</b>	21.028	21.070	21.070	21.070	21.028	21.070	20.986	20.986	21.070
<b>70</b>	16.075	16.117	16.117	16.117	16.117	16.117	16.033	16.117	16.033
<b>75</b>	11.165	11.165	11.165	11.165	11.165	11.123	11.164	11.080	11.164
<b>80</b>	6.506	6.548	6.506	6.548	6.506	6.548	6.464	6.506	6.464
<b>85</b>	2.770	2.770	2.770	2.770	2.812	2.770	2.728	2.686	2.686
<b>90</b>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L04142406R01.IES**

**ZONAL LUMEN SUMMARY**

Zone	Lumens	%Lamp	%Fixt
0-20	20.68	N.A.	12.50
0-30	44.06	N.A.	26.70
0-40	72.51	N.A.	43.90
0-60	129.40	N.A.	78.30
0-80	161.99	N.A.	98.00
0-90	165.23	N.A.	100.00
10-90	159.88	N.A.	96.80
20-40	51.83	N.A.	31.40
20-50	81.58	N.A.	49.40
40-70	77.67	N.A.	47.00
60-80	32.59	N.A.	19.70
70-80	11.81	N.A.	7.10
80-90	3.24	N.A.	2.00
90-110	0.00	N.A.	0.00
90-120	0.00	N.A.	0.00
90-130	0.00	N.A.	0.00
90-150	0.00	N.A.	0.00
90-180	0.00	N.A.	0.00
110-180	0.00	N.A.	0.00
0-180	165.23	N.A.	100.00

Total Luminaire Efficiency = N.A.%

**ZONAL LUMEN SUMMARY**

Zone	Lumens
0-10	5.34
10-20	15.34
20-30	23.38
30-40	28.45
40-50	29.75
50-60	27.13
60-70	20.78
70-80	11.81
80-90	3.24
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

**IES INDOOR REPORT**  
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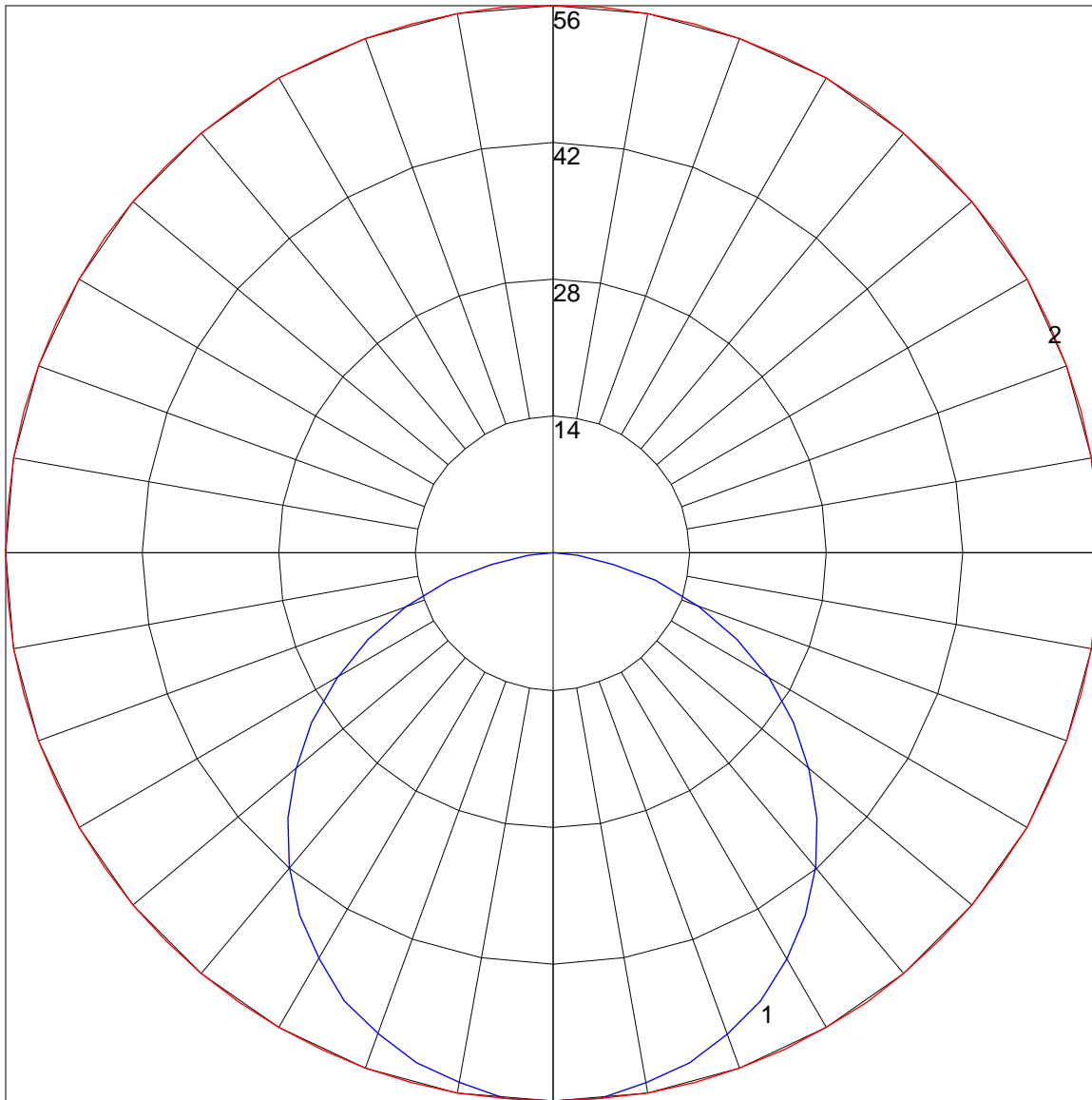
**COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD**

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	119	119	119	119	116	116	116	116	111	111	111	107	107	107	102	102	102	100
1	109	104	100	96	106	102	98	94	97	94	91	93	91	88	90	88	86	84
2	99	90	83	78	96	88	82	77	85	79	75	82	77	73	79	75	71	69
3	90	79	71	64	87	78	70	64	75	68	63	72	66	61	69	64	60	58
4	82	70	61	54	80	69	60	54	66	59	53	64	57	52	62	56	52	49
5	76	62	53	47	73	61	53	46	59	52	46	57	51	45	55	49	45	43
6	70	56	47	41	68	55	47	40	53	46	40	52	45	40	50	44	39	37
7	65	51	42	36	63	50	42	36	48	41	35	47	40	35	46	40	35	33
8	60	46	38	32	58	46	37	32	44	37	32	43	36	31	42	36	31	29
9	56	43	34	29	55	42	34	29	41	33	28	40	33	28	39	33	28	26
10	53	39	31	26	51	39	31	26	38	31	26	37	30	26	36	30	25	24



POLAR GRAPH



Maximum Candela = 56.409 Located At Horizontal Angle = 0, Vertical Angle = 0  
# 1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)  
# 2 - Horizontal Cone Through Vertical Angle (0) (Through Max. Cd.)