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Report No: L011505701R01

Date: 3/12/2015



NVLAP LAB CODE 200927-0

Report No: L011505701R01

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

Model Number: 8924-22-XX

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 8924-22-XX. Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 1/14/15

Date of Tests: 1/22/15 - 1/27/15

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	11/10/15
Xitron Power Analysis System	2503AH	MT-EL01	10/20/15
BK Precision DC Power Supply	1747	PSDC-04	01/08/16
Fluke Digital Thermometer	52k/J	MT-TP02-GC	01/05/16
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

Manufacturer:	AION LED
Model Number:	8924-22-XX
Driver Model Number:	N/A
Total Lumens:	334.07
Input Voltage (VDC):	24.00
Input Current (Amp):	0.23
Input Power (W):	5.48
Input Power Factor:	1.00
Current ATHD @ 120V(%):	N/A
Current ATHD @ 277V(%):	N/A
Efficacy:	61
Color Rendering Index (CRI):	94
Correlated Color Temperature (K):	2127
Chromaticity Coordinate x:	0.5083
Chromaticity Coordinate y:	0.4081
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:30
Total Operating Time (Hours):	1:20
Off State Power(W):	0.00

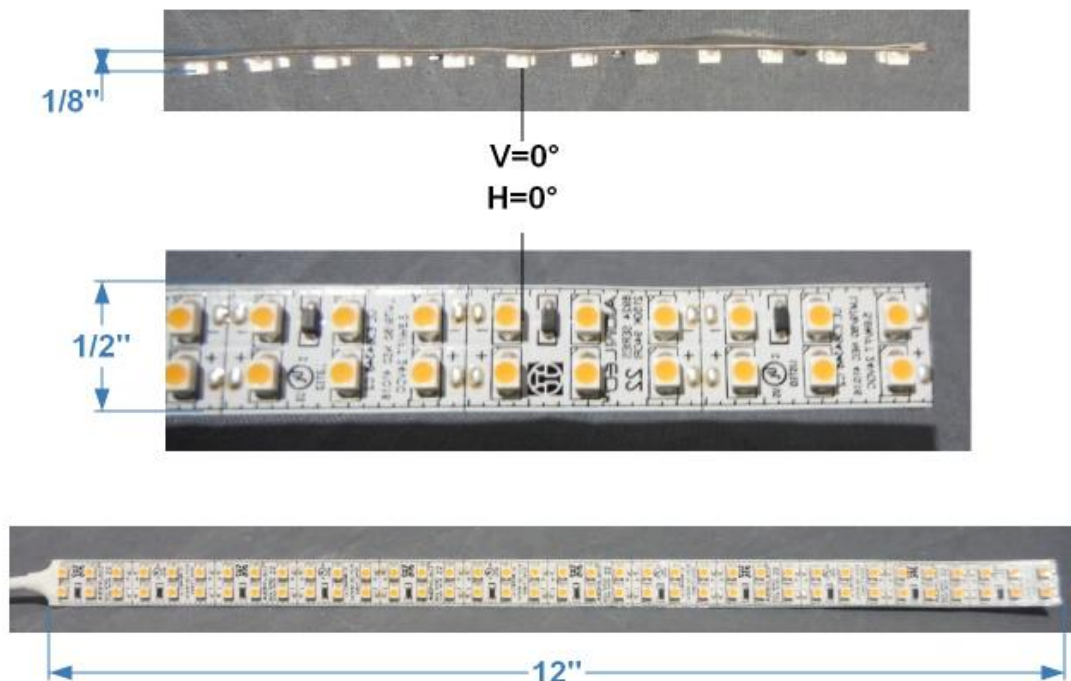
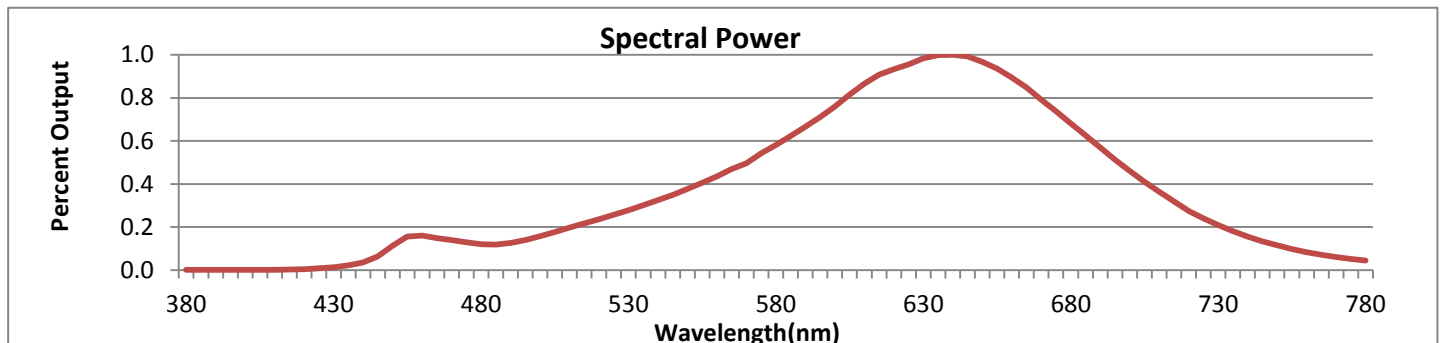


FIG. 1 LUMINAIRE



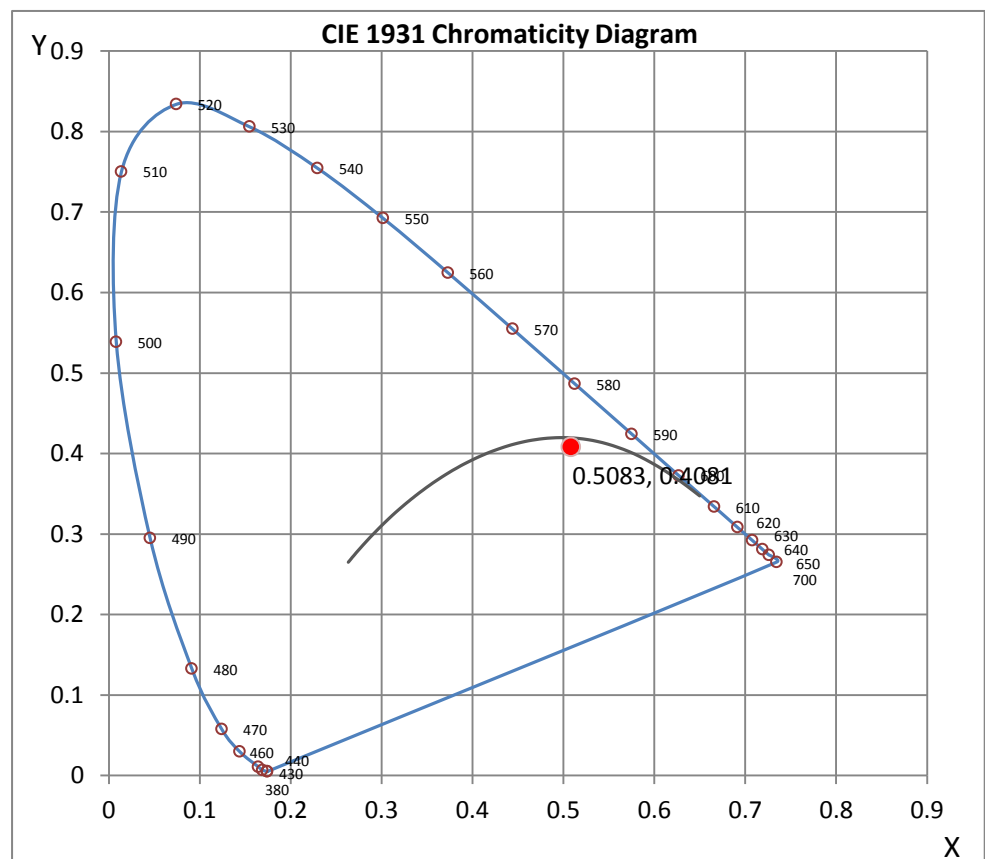
Wavelength	W/m ² nm	440	0.0356	510	0.1972	580	0.5815	650	0.9680	720	0.2751
380	0.0005	450	0.1123	520	0.2362	590	0.6660	660	0.8943	730	0.2090
390	0.0006	460	0.1609	530	0.2783	600	0.7601	670	0.7927	740	0.1563
400	0.0007	470	0.1401	540	0.3246	610	0.8659	680	0.6821	750	0.1149
410	0.0015	480	0.1199	550	0.3770	620	0.9329	690	0.5692	760	0.0829
420	0.0047	490	0.1266	560	0.4354	630	0.9838	700	0.4609	770	0.0609
430	0.0131	500	0.1573	570	0.4955	640	1.0000	710	0.3646	780	0.0442

CRI & CCT

x	0.5083
y	0.4081
u'	0.2955
v'	0.5338
CRI	93.90
CCT	2127
Duv	-0.00222

R Values

R1	95.45
R2	99.34
R3	97.29
R4	93.61
R5	95.95
R6	95.93
R7	90.16
R8	83.30
R9	69.54
R10	98.37
R11	95.34
R12	88.84
R13	96.93
R14	99.44





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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: 9*

**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 : L011505701R01.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L011505701R01
[TESTLAB] LIGHT LABORATORY, INC.
[ISSUEDATE] 3/12/2015
[MANUFAC] AION LED
[LUMCAT] 8924-22-XX
[LUMINAIRE] 1/2"L. X 12"W. X 1/8"H. LED STRIP
[BALLASTCAT] N.A.
[BALLAST] N.A.
[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, 5.48W
[TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	334
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	61
Total Luminaire Watts	5.48
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	1.26
Spacing Criterion (90-270)	1.28
Spacing Criterion (Diagonal)	1.40
Basic Luminous Shape	Rectangular
Luminous Length (0-180)	0.04 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	30951	30987	31018
55	29827	29935	29954
65	27778	27891	27891
75	23415	23599	23599
85	14716	15680	15263

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L011505701R01.IES

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>
0	116.13	116.13	116.13	116.13	116.13	116.13	116.13	116.13	116.13	116.13
5	115.74	115.74	115.74	115.74	115.70	115.74	115.74	115.70	115.70	115.70
10	114.13	114.09	114.09	114.09	114.09	114.09	114.04	114.13	114.09	114.13
15	111.67	111.67	111.67	111.63	111.67	111.67	111.71	111.75	111.71	111.75
20	108.10	108.06	108.10	108.15	108.19	108.15	108.10	108.15	108.15	108.10
25	103.86	103.86	103.86	103.86	103.90	103.82	103.90	103.86	103.86	103.86
30	98.52	98.56	98.56	98.56	98.73	98.60	98.60	98.68	98.68	98.68
35	92.41	92.49	92.49	92.58	92.53	92.49	92.58	92.58	92.58	92.58
40	85.70	85.74	85.74	85.74	85.79	85.79	85.79	85.79	85.91	85.87
45	78.15	78.11	78.11	78.11	78.15	78.19	78.24	78.24	78.24	78.24
50	69.92	69.96	69.96	70.00	70.00	70.05	70.00	70.17	70.17	70.13
55	61.09	61.09	61.09	61.18	61.18	61.18	61.22	61.26	61.31	61.31
60	51.76	51.72	51.76	51.76	51.80	51.85	51.85	51.89	51.93	51.97
65	41.92	41.92	41.96	41.96	42.00	42.00	42.05	42.09	42.09	42.09
70	31.82	31.82	31.78	31.82	31.86	31.86	31.95	31.99	31.99	31.99
75	21.64	21.64	21.64	21.68	21.72	21.81	21.81	21.81	21.81	21.81
80	12.22	12.22	12.22	12.22	12.26	12.26	12.30	12.30	12.30	12.39
85	4.58	4.58	4.63	4.67	4.75	4.75	4.84	4.84	4.88	4.88
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Vert. Angles **Horizontal 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>
0	116.13	116.13	116.13	116.13	116.13	116.13	116.13	116.13	116.13
5	115.74	115.66	115.70	115.74	115.74	115.70	115.70	115.78	115.66
10	114.09	114.09	114.13	114.13	114.13	114.17	114.21	114.17	114.21
15	111.75	111.79	111.75	111.79	111.84	111.75	111.79	111.75	111.75
20	108.15	108.23	108.15	108.27	108.19	108.19	108.15	108.19	108.19
25	103.90	103.90	103.95	103.86	103.90	103.86	103.90	103.86	103.86
30	98.73	98.68	98.68	98.68	98.73	98.77	98.81	98.73	98.60
35	92.66	92.58	92.58	92.53	92.58	92.62	92.66	92.58	92.66
40	85.83	85.91	85.91	85.96	85.91	85.91	85.91	85.87	85.96
45	78.32	78.24	78.28	78.28	78.28	78.28	78.28	78.28	78.32
50	70.13	70.17	70.17	70.13	70.17	70.13	70.13	70.13	70.17
55	61.26	61.26	61.35	61.26	61.35	61.26	61.31	61.35	61.35
60	51.97	51.93	51.97	51.93	51.93	51.97	51.93	51.93	51.93
65	42.13	42.13	42.13	42.17	42.13	42.13	42.05	42.05	42.09
70	31.99	32.03	32.03	32.03	32.03	31.99	31.95	31.99	31.99
75	21.85	21.81	21.85	21.85	21.89	21.81	21.81	21.85	21.81
80	12.39	12.35	12.39	12.43	12.35	12.35	12.30	12.30	12.30
85	4.88	4.88	4.92	4.88	4.88	4.79	4.75	4.75	4.75
90	0.00	0.00	0.00	0.00	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	42.51	N.A.	12.70
0-30	90.38	N.A.	27.10
0-40	148.31	N.A.	44.40
0-60	263.37	N.A.	78.80
0-80	328.11	N.A.	98.20
0-90	334.07	N.A.	100.00
10-90	323.08	N.A.	96.70
20-40	105.80	N.A.	31.70
20-50	166.15	N.A.	49.70
40-70	156.63	N.A.	46.90
60-80	64.75	N.A.	19.40
70-80	23.17	N.A.	6.90
80-90	5.96	N.A.	1.80
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	334.07	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	10.99
10-20	31.52
20-30	47.87
30-40	57.93
40-50	60.35
50-60	54.71
60-70	41.58
70-80	23.17
80-90	5.96
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

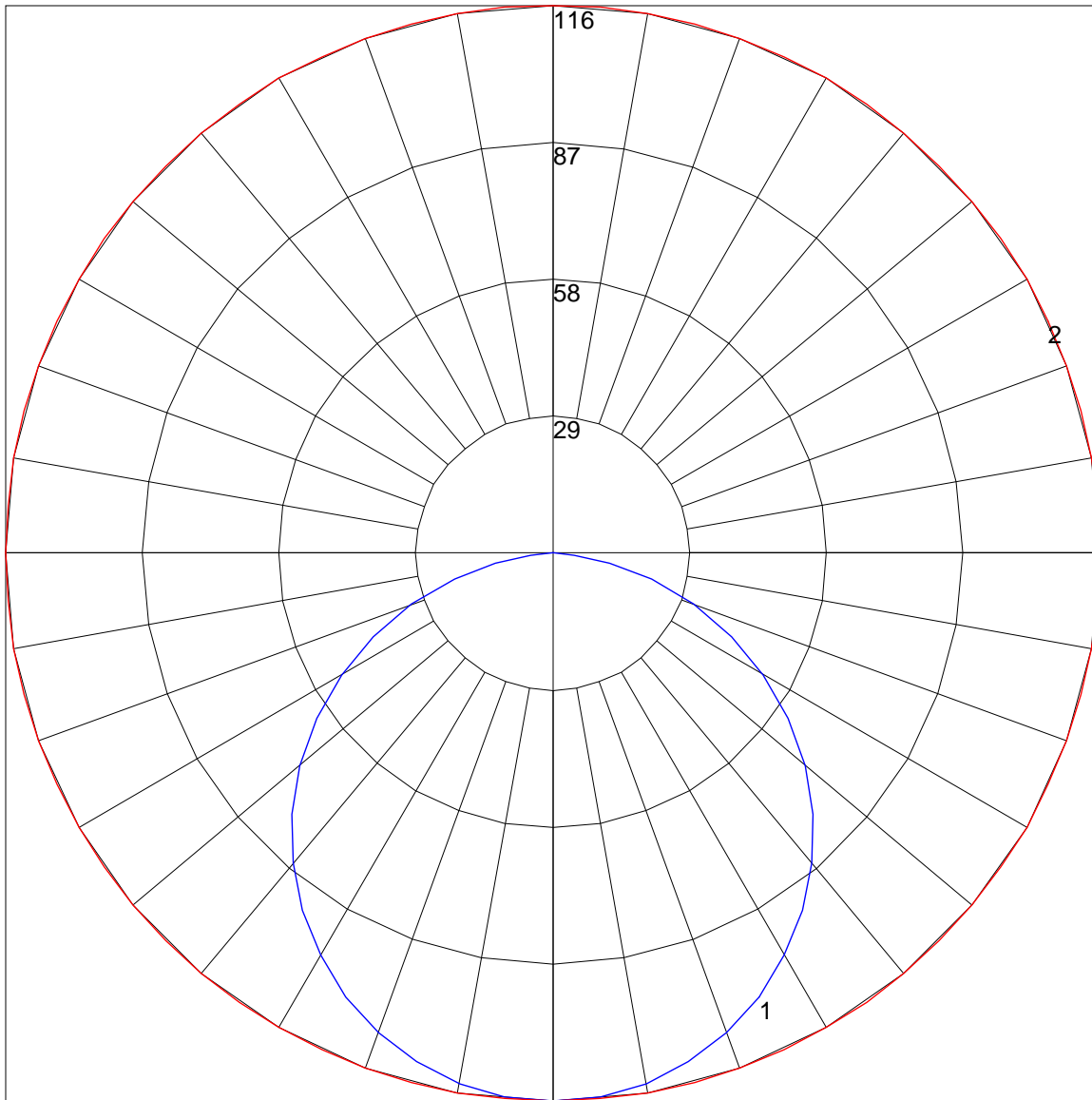
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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	106	106	106	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	84	78	96	89	82	77	85	80	75	82	77	73	79	75	72	70
3	90	79	71	65	87	78	70	64	75	68	63	72	66	62	69	65	61	58
4	82	70	61	55	80	69	61	54	66	59	53	64	58	53	62	56	52	50
5	76	63	54	47	74	62	53	47	59	52	46	57	51	46	56	50	45	43
6	70	56	47	41	68	55	47	41	54	46	40	52	45	40	50	44	40	38
7	65	51	42	36	63	50	42	36	49	41	36	47	40	35	46	40	35	33
8	60	47	38	32	59	46	38	32	45	37	32	43	37	32	42	36	31	30
9	56	43	34	29	55	42	34	29	41	34	29	40	33	28	39	33	28	27
10	53	39	31	26	51	39	31	26	38	31	26	37	30	26	36	30	26	24

POLAR GRAPH



Maximum Candela = 116.13 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.)