



8165 E Kaiser Blvd. Anaheim, CA 92808
 p. 714.282.2270
 f. 714.676.5558

Test #: L10138203

Date: 10/28/2013



NVLAP LAB CODE 200927-0

Test Report: L10138203

Model Number: LUX-LED-360°-4S-UNV-URDL

Report Prepared For: LUX DYNAMICS - Phase III
 1350 Capitol Blvd. Reno, NV. 89502

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 LUX-LED-360°-4S-UNV-URDL. Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 10/17/13

Date of Tests: 10/22/13 - 10/28/13

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	01/04/14
Xitron Power Analysis System	2503AH	MT-EL01	01/09/14
Fluke Digital Thermometer	52k/J	MT-TP02-GC	01/04/14
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

Manufacturer:	LUX DYNAMICS - Phase III
Model Number:	LUX-LED-360°-4S-UNV-URDL
LAMPCAT:	N/A
Driver Model Number:	OSRAM OPTPTRONIC OT100W/4X600C/UNV/DIM
Total Lumens:	6879.30
Input Voltage (VAC/60Hz):	120.00
Input Current (Amp):	0.75
Input Power (W):	90.00
Input Power Factor:	0.99
Total Harmonic Distortion @ 120V(%):	9%
Total Harmonic Distortion @ 277V(%):	N/A
Efficacy:	76
Color Rendering Index (CRI):	86
Correlated Color Temperature (K):	4879
Chromaticity Coordinate x:	0.3487
Chromaticity Coordinate y:	0.3555
Ambient Temperature (°F):	77.0
Stabilization Time (Hours):	1:20
Total Operating Time (Hours):	2:20
Off State Power(W):	0.00

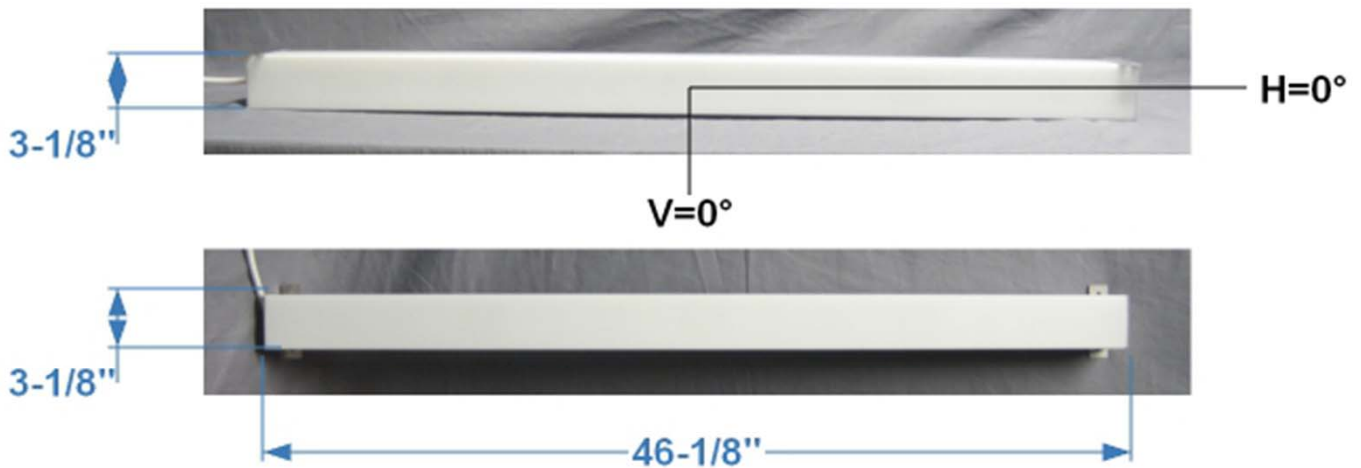
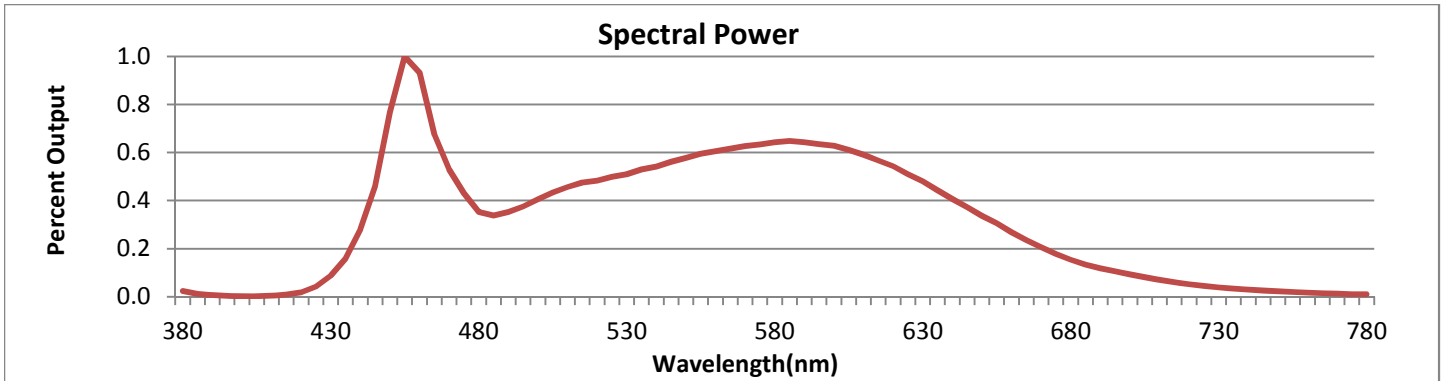


FIG1. LUMINAIRE



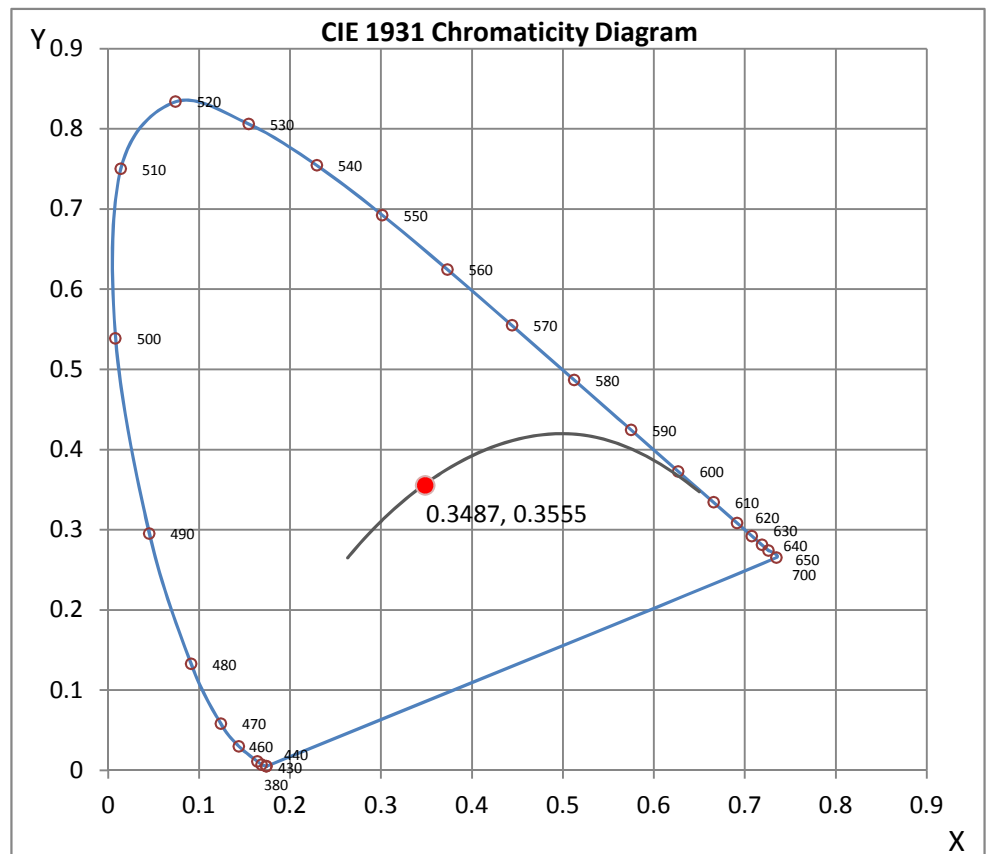
Wavelength	W/m ² nm	440	0.1235	510	0.2009	580	0.2828	650	0.1482	720	0.0229
380	0.0105	450	0.3376	520	0.2126	590	0.2828	660	0.1179	730	0.0170
390	0.0028	460	0.4100	530	0.2242	600	0.2760	670	0.0905	740	0.0129
400	0.0012	470	0.2332	540	0.2383	610	0.2597	680	0.0679	750	0.0098
410	0.0017	480	0.1551	550	0.2540	620	0.2386	690	0.0521	760	0.0075
420	0.0082	490	0.1549	560	0.2666	630	0.2113	700	0.0409	770	0.0056
430	0.0386	500	0.1784	570	0.2755	640	0.1788	710	0.0306	780	0.0042

CRI & CCT

x	0.3487
y	0.3555
u'	0.2123
v'	0.4871
CRI	85.80
CCT	4879
Duv	0.00053

R Values

R1	85.29
R2	94.57
R3	95.31
R4	80.89
R5	83.96
R6	89.33
R7	86.30
R8	70.37
R9	25.05
R10	85.29
R11	80.24
R12	60.29
R13	89.01
R14	97.91



*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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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: 11*

**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 : L10138203.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L010138203
[TESTLAB] LIGHT LABORATORY, INC.
[ISSUEDATE] 10/25/2013
[MANUFAC] LUX DYNAMICS
[LUMCAT] LUX-LED-360°-4S-UNV-URDL
[LUMINAIRE] 46-1/8"L. X 3-1/8"W. X 3-1/8"H. LED LUMINAIRE
[MORE] ACRYLIC LENS
[BALLASTCAT] OSRAM OPTOTRONIC OT100W/4X600C/UNV/DIM
[BALLAST] INPUT: 120-277VAC, 1.0-0.5A, 50/60Hz. OUTPUT: 100W, 10-40VDC, 4X600mA
[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, 90.00W
[_TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	6879
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	76
Total Luminaire Watts	90
Ballast Factor	1.00
CIE Type	General Diffuse
Spacing Criterion (0-180)	N.A.
Spacing Criterion (90-270)	N.A.
Spacing Criterion (Diagonal)	N.A.
Basic Luminous Shape	Rectangular w/Sides
Luminous Length (0-180)	3.84 ft
Luminous Width (90-270)	0.26 ft
Luminous Height	0.26 ft

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L10138203.IES

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	6049	5841	6139
55	5668	5711	6040
65	5052	5547	5909
75	3987	5363	5787
85	1811	5557	6194

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L10138203.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	605	605	605	605	605	605	605	605	605	605
5	612	612	612	612	612	612	613	613	614	615
10	607	607	608	609	611	614	617	622	628	633
15	596	597	599	602	606	614	622	632	642	653
20	580	581	584	590	599	611	625	640	655	669
25	558	560	564	574	588	606	625	644	663	682
30	531	533	540	554	574	597	620	644	667	688
35	500	502	513	531	555	583	611	638	665	689
40	464	468	481	504	533	565	596	627	657	684
45	424	429	446	473	506	541	576	611	644	673
50	379	386	406	438	475	515	552	589	624	656
55	331	339	364	400	440	483	523	562	599	632
60	281	291	319	358	402	447	490	531	569	604
65	227	239	272	314	360	408	452	495	534	570
70	173	187	223	268	316	365	411	454	495	531
75	120	135	174	220	270	321	368	412	454	492
80	68	87	127	175	228	279	327	370	417	457
85	26	45	87	138	192	246	296	343	391	433
90	4	24	75	121	175	230	282	328	377	421
95	26	45	87	138	192	246	296	343	391	433
100	68	87	127	175	228	279	327	370	417	457
105	120	135	174	220	270	321	368	412	454	492
110	173	187	223	268	316	365	411	454	495	531
115	227	239	272	314	360	408	452	495	534	570
120	281	291	319	358	402	447	490	531	569	604
125	331	339	364	400	440	483	523	562	599	632
130	379	386	406	438	475	515	552	589	624	656
135	424	429	446	473	506	541	576	611	644	673
140	464	468	481	504	533	565	596	627	657	684
145	500	502	513	531	555	583	611	638	665	689
150	531	533	540	554	574	597	620	644	667	688
155	558	560	564	574	588	606	625	644	663	682
160	580	581	584	590	599	611	625	640	655	669
165	596	597	599	602	606	614	622	632	642	653
170	607	607	608	609	611	614	617	622	628	633
175	612	612	612	612	612	612	613	613	614	615
180	605	605	605	605	605	605	605	605	605	605

Vert. 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	605	605	605	605	605	605	605	605	605
5	616	618	620	621	622	622	622	622	623
10	639	644	649	654	657	659	660	661	663
15	662	671	679	687	692	697	699	700	702
20	683	695	706	716	724	729	733	735	737
25	699	714	728	740	749	757	761	763	765
30	709	727	743	757	768	776	782	785	787
35	713	733	751	766	778	788	795	800	801
40	710	732	752	769	782	793	801	806	808
45	700	725	745	764	778	790	799	804	806
50	685	710	732	752	767	780	789	796	797
55	663	690	714	734	750	763	773	779	781
60	636	663	688	709	726	740	751	757	758

**IES INDOOR REPORT
PHOTOMETRIC FILENAME : L10138203.IES**

CANDELA TABULATION - (Cont.)

65	603	632	657	679	698	712	723	729	729
70	565	596	622	645	664	679	690	696	694
75	527	558	586	610	629	645	656	661	658
80	494	527	556	581	603	619	630	634	631
85	472	507	538	565	587	604	616	622	623
90	463	501	534	565	588	608	622	630	633
95	472	507	538	565	587	604	616	622	623
100	494	527	556	581	603	619	630	634	631
105	527	558	586	610	629	645	656	661	658
110	565	596	622	645	664	679	690	696	694
115	603	632	657	679	698	712	723	729	729
120	636	663	688	709	726	740	751	757	758
125	663	690	714	734	750	763	773	779	781
130	685	710	732	752	767	780	789	796	797
135	700	725	745	764	778	790	799	804	806
140	710	732	752	769	782	793	801	806	808
145	713	733	751	766	778	788	795	800	801
150	709	727	743	757	768	776	782	785	787
155	699	714	728	740	749	757	761	763	765
160	683	695	706	716	724	729	733	735	737
165	662	671	679	687	692	697	699	700	702
170	639	644	649	654	657	659	660	661	663
175	616	618	620	621	622	622	622	622	623
180	605	605	605	605	605	605	605	605	605

IES INDOOR REPORT
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ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	243.70	N.A.	3.50
0-30	553.77	N.A.	8.00
0-40	973.68	N.A.	14.20
0-60	2007.2	N.A.	29.20
0-80	3010.29	N.A.	43.80
0-90	3439.65	N.A.	50.00
10-90	3380.33	N.A.	49.10
20-40	729.98	N.A.	10.60
20-50	1228.48	N.A.	17.90
40-70	1559.1	N.A.	22.70
60-80	1003.09	N.A.	14.60
70-80	477.51	N.A.	6.90
80-90	429.36	N.A.	6.20
90-110	906.87	N.A.	13.20
90-120	1432.45	N.A.	20.80
90-130	1967.47	N.A.	28.60
90-150	2885.88	N.A.	42.00
90-180	3439.65	N.A.	50.00
110-180	2532.78	N.A.	36.80
0-180	6879.3	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	59.32
10-20	184.38
20-30	310.06
30-40	419.91
40-50	498.50
50-60	535.02
60-70	525.58
70-80	477.51
80-90	429.36
90-100	429.36
100-110	477.51
110-120	525.58
120-130	535.02
130-140	498.50
140-150	419.91
150-160	310.06
160-170	184.38
170-180	59.32

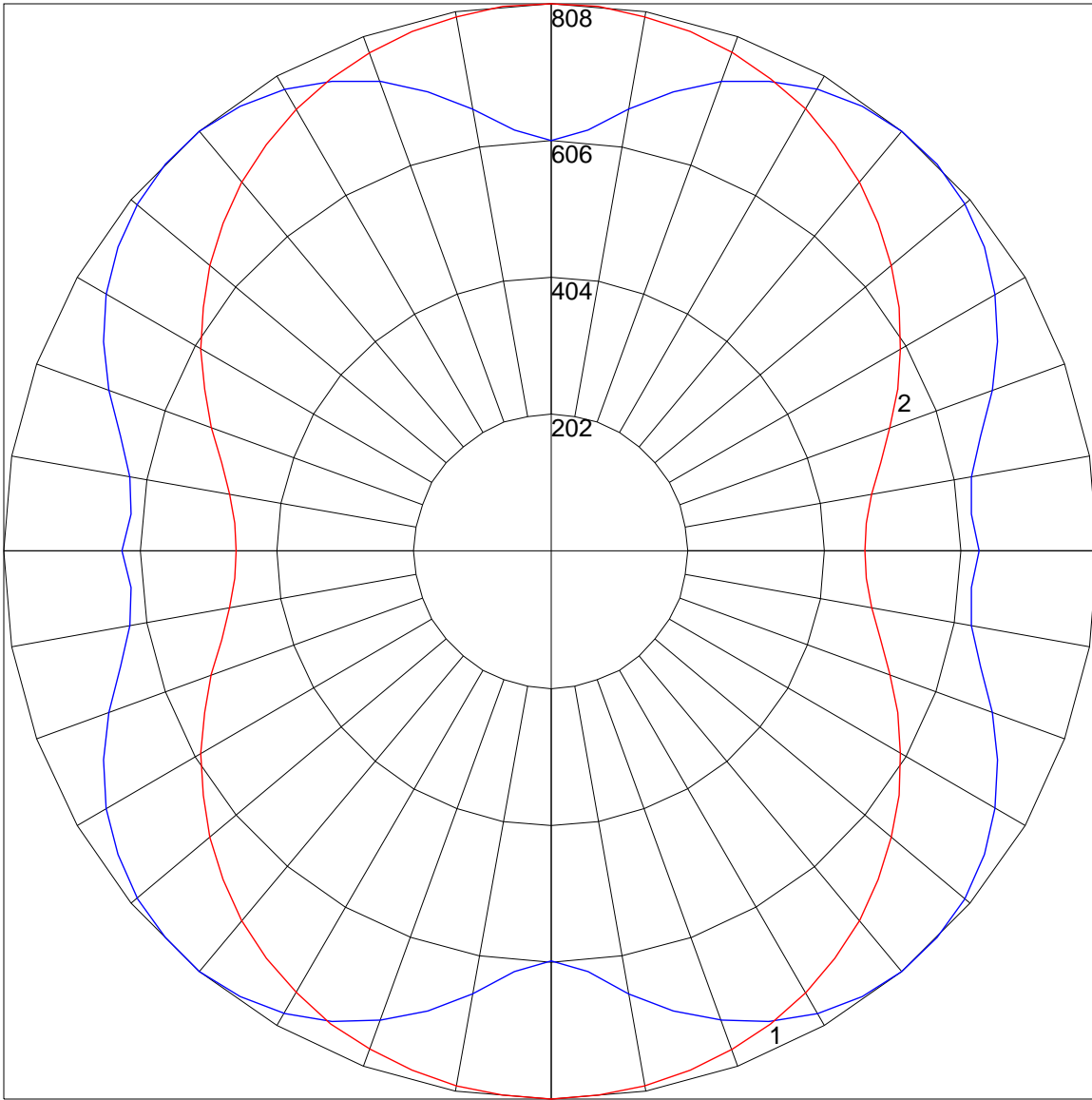
IES INDOOR REPORT
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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	
0	107	107	107	107	99	99	99	99	83	83	83	69	69	69	56	56	56	50
1	95	89	84	80	87	82	78	74	69	65	62	56	54	51	45	43	41	36
2	85	76	69	63	78	70	64	58	58	53	49	48	44	41	38	35	33	28
3	77	66	57	51	70	61	53	47	50	45	40	41	37	33	32	29	26	22
4	70	58	49	42	64	53	45	39	44	38	33	36	31	27	28	25	22	18
5	64	51	42	35	58	47	39	33	39	33	28	32	27	23	25	22	19	15
6	59	45	37	30	53	42	34	28	35	29	24	29	24	20	23	19	16	13
7	54	41	32	26	49	38	30	24	31	25	21	26	21	17	21	17	14	11
8	50	37	28	23	46	34	26	21	29	23	18	23	19	15	19	15	12	10
9	46	33	25	20	42	31	24	19	26	20	16	21	17	13	17	14	11	9
10	43	31	23	18	40	28	21	17	24	18	14	20	15	12	16	12	10	8

POLAR GRAPH



Maximum Candela = 808 Located At Horizontal Angle = 90, Vertical Angle = 40
1 - Vertical Plane Through Horizontal Angles (90 - 270) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (40) (Through Max. Cd.)