



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

Test #: L10138202

Date: 10/25/2013



NVLAP LAB CODE 200927-0

**Test Report:** L10138202

**Model Number:** LUX-LED-360°-4S-UNV-U

**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-U. 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:** 10/10/13 - 10/10/13

**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**

<b>Manufacturer:</b>	LUX DYNAMICS - Phase III
<b>Model Number:</b>	LUX-LED-360°-4S-UNV-U
<b>LAMPCAT:</b>	N/A
<b>Driver Model Number:</b>	OSRAM OPTPTRONIC OT100W/4X600C/UNV/DIM
<b>Total Lumens:</b>	3347.86
<b>Input Voltage (VAC/60Hz):</b>	120.00
<b>Input Current (Amp):</b>	0.41
<b>Input Power (W):</b>	48.83
<b>Input Power Factor:</b>	0.99
<b>Total Harmonic Distortion @ 120V(%):</b>	11%
<b>Total Harmonic Distortion @ 277V(%):</b>	N/A
<b>Efficacy:</b>	69
<b>Color Rendering Index (CRI):</b>	85
<b>Correlated Color Temperature (K):</b>	4953
<b>Chromaticity Coordinate x:</b>	0.3467
<b>Chromaticity Coordinate y:</b>	0.3557
<b>Ambient Temperature (°F):</b>	77.0
<b>Stabilization Time (Hours):</b>	0:50
<b>Total Operating Time (Hours):</b>	2:20
<b>Off State Power(W):</b>	0.00

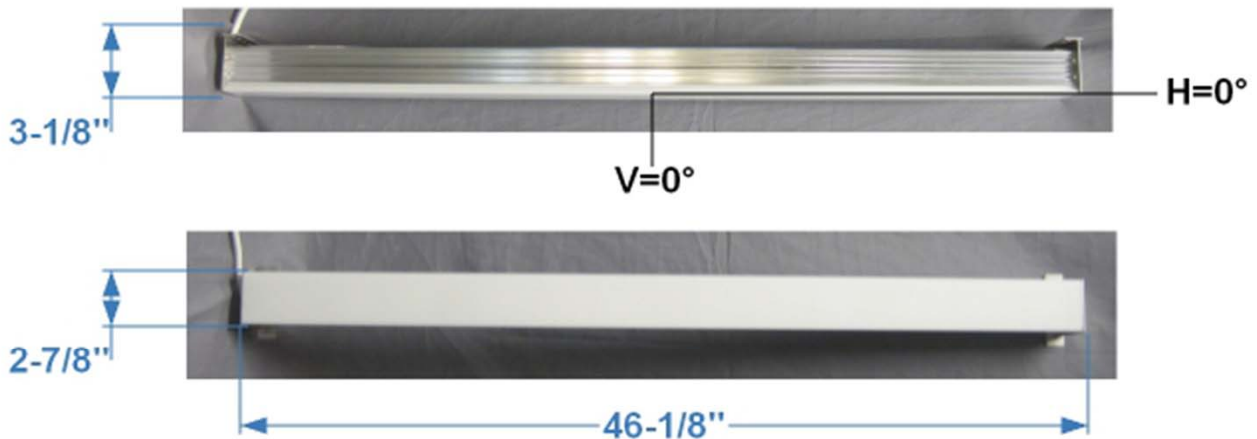
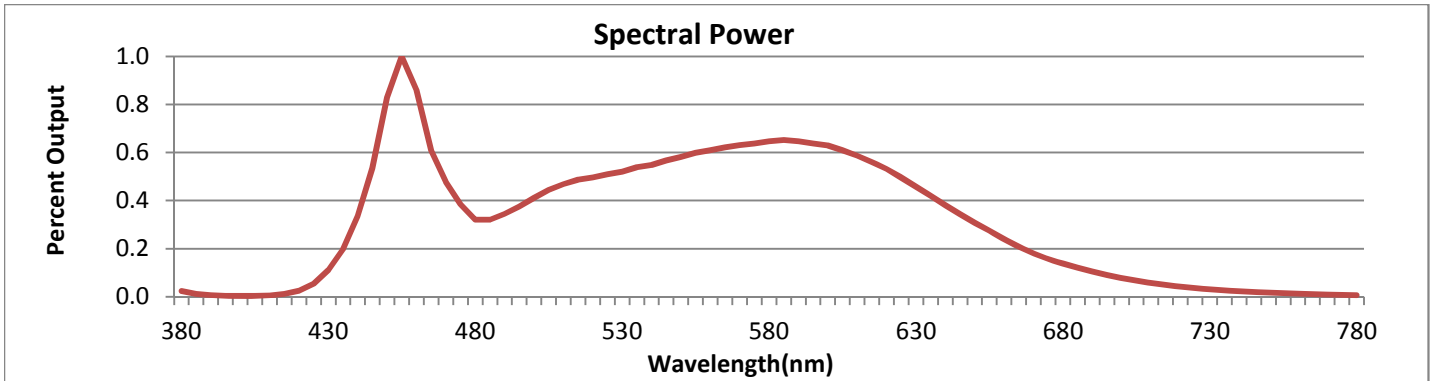


FIG1. LUMINAIRE

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



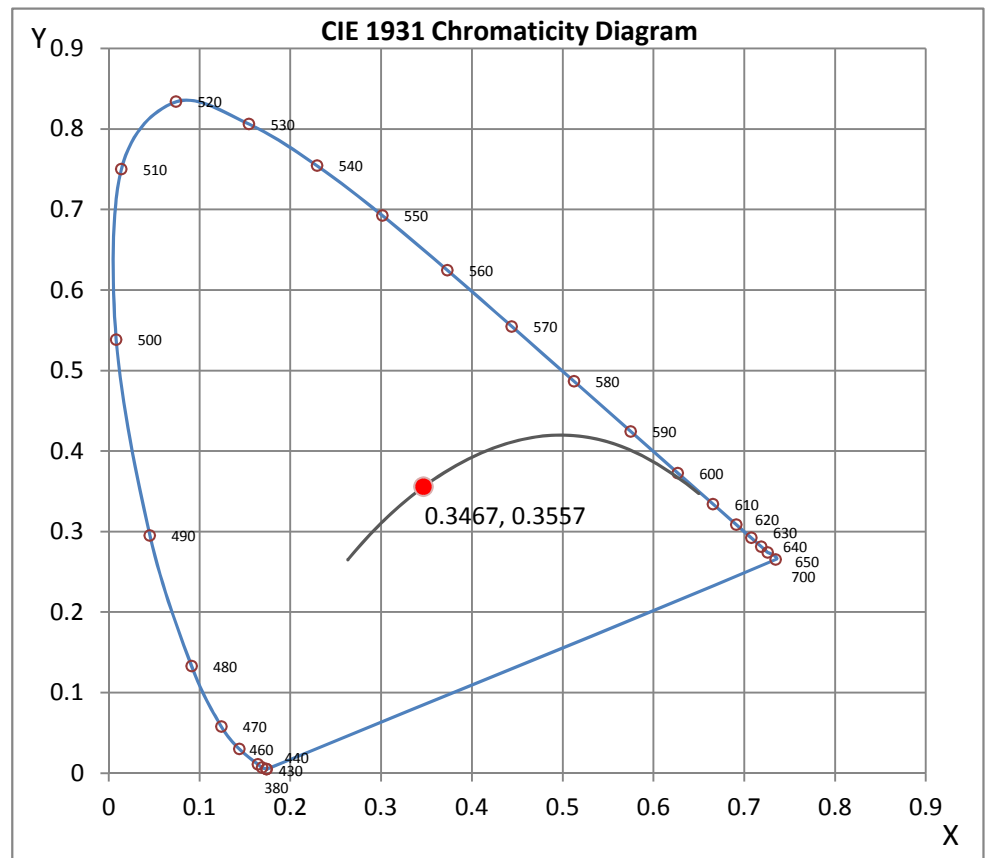
Wavelength	W/m <sup>2</sup> nm	440	0.1363	510	0.1903	580	0.2627	650	0.1245	720	0.0171
380	0.0097	450	0.3364	520	0.2013	590	0.2626	660	0.0969	730	0.0125
390	0.0026	460	0.3490	530	0.2110	600	0.2554	670	0.0736	740	0.0093
400	0.0012	470	0.1940	540	0.2226	610	0.2383	680	0.0558	750	0.0069
410	0.0021	480	0.1302	550	0.2360	620	0.2158	690	0.0423	760	0.0050
420	0.0103	490	0.1396	560	0.2476	630	0.1860	700	0.0315	770	0.0035
430	0.0451	500	0.1671	570	0.2561	640	0.1542	710	0.0232	780	0.0026

**CRI & CCT**

x	0.3467
y	0.3557
u'	0.2109
v'	0.4869
CRI	84.50
CCT	4953
Duv	0.00142

**R Values**

R1	83.27
R2	92.52
R3	95.45
R4	80.77
R5	82.61
R6	87.48
R7	86.43
R8	67.81
R9	14.86
R10	81.06
R11	79.98
R12	59.51
R13	86.87
R14	97.74



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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*

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# Photometric Test Report

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L10138202.IES**

**DESCRIPTION INFORMATION (From Photometric File)**

IESNA:LM-63-2002  
 [TEST] L010138202  
 [TESTLAB] LIGHT LABORATORY, INC.  
 [ISSUEDATE] 10/25/2013  
 [MANUFAC] LUX DYNAMICS  
 [LUMCAT] LUX-LED-360°-4S-UNV-U  
 [LUMINAIRE] 46-1/8"L. X 2-7/8"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, 48.83W  
 [\_TEST PROCEDURE] IESNA:LM-79-08

**CHARACTERISTICS**

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	3348
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	69
Total Luminaire Watts	48.83
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 w/Sides
Luminous Length (0-180)	3.84 ft
Luminous Width (90-270)	0.24 ft
Luminous Height	0.04 ft

**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	12380	11102	10679
55	11967	10285	9974
65	11208	9250	9011
75	9547	7559	7449
85	5623	4901	5254

**IES INDOOR REPORT**  
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**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>	1117	1117	1117	1117	1117	1117	1117	1117	1117	1117
<b>5</b>	1113	1113	1113	1113	1113	1113	1113	1113	1113	1113
<b>10</b>	1099	1099	1099	1099	1099	1099	1099	1099	1099	1099
<b>15</b>	1076	1076	1076	1076	1076	1076	1076	1075	1076	1076
<b>20</b>	1043	1043	1043	1043	1043	1043	1043	1044	1044	1044
<b>25</b>	1002	1002	1002	1002	1002	1003	1003	1003	1003	1002
<b>30</b>	952	952	952	952	953	953	953	953	952	952
<b>35</b>	895	895	895	895	896	896	895	895	894	894
<b>40</b>	830	830	830	831	831	831	830	830	829	829
<b>45</b>	758	758	758	759	759	759	758	758	757	757
<b>50</b>	680	680	681	681	681	680	680	680	679	679
<b>55</b>	597	597	597	597	597	597	596	596	596	596
<b>60</b>	508	508	509	508	508	508	508	507	509	511
<b>65</b>	415	415	415	415	415	414	415	418	421	425
<b>70</b>	318	319	318	318	318	320	323	327	331	335
<b>75</b>	220	221	221	221	223	227	232	237	242	246
<b>80</b>	127	127	127	130	134	139	145	150	156	161
<b>85</b>	47	47	49	54	59	65	72	78	84	89
<b>90</b>	2	4	9	15	22	29	36	43	49	55
<b>95</b>	0	0	0	0	0	0	0	0	0	0
<b>100</b>	0	0	0	0	0	0	0	0	0	0
<b>105</b>	0	0	0	0	0	0	0	0	0	0
<b>110</b>	0	0	0	0	0	0	0	0	0	0
<b>115</b>	0	0	0	0	0	0	0	0	0	0
<b>120</b>	0	0	0	0	0	0	0	0	0	0
<b>125</b>	0	0	0	0	0	0	0	0	0	0
<b>130</b>	0	0	0	0	0	0	0	0	0	0
<b>135</b>	0	0	0	0	0	0	0	0	0	0
<b>140</b>	0	0	0	0	0	0	0	0	0	0
<b>145</b>	0	0	0	0	0	0	0	0	0	0
<b>150</b>	0	0	0	0	0	0	0	0	0	0
<b>155</b>	0	0	0	0	0	0	0	0	0	0
<b>160</b>	0	0	0	0	0	0	0	0	0	0
<b>165</b>	0	0	0	0	0	0	0	0	0	0
<b>170</b>	0	0	0	0	0	0	0	0	0	0
<b>175</b>	0	0	0	0	0	0	0	0	0	0
<b>180</b>	0	0	0	0	0	0	0	0	0	0

**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>	1117	1117	1117	1117	1117	1117	1117	1117	1117
<b>5</b>	1113	1113	1113	1113	1113	1113	1113	1113	1112
<b>10</b>	1099	1098	1098	1098	1098	1098	1098	1098	1098
<b>15</b>	1076	1076	1076	1076	1076	1076	1076	1076	1076
<b>20</b>	1044	1043	1043	1043	1043	1043	1043	1043	1042
<b>25</b>	1002	1002	1001	1001	1001	1001	1001	1001	1000
<b>30</b>	952	951	951	951	951	951	950	950	950
<b>35</b>	893	893	893	893	892	892	892	892	892
<b>40</b>	828	828	828	828	827	827	827	827	827
<b>45</b>	756	756	756	755	755	755	756	756	755
<b>50</b>	678	678	679	679	681	682	682	683	682
<b>55</b>	597	599	601	603	605	606	607	608	607
<b>60</b>	514	517	520	522	524	526	527	528	527

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CANDELA TABULATION - (Cont.)

65	428	431	435	437	440	441	443	444	443
70	340	343	347	350	352	354	355	356	356
75	251	254	258	261	264	266	267	268	268
80	165	169	173	176	179	181	183	184	183
85	94	99	103	106	109	111	113	114	114
90	61	66	70	74	77	79	81	82	82
95	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0



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

Zone	Lumens	%Lamp	%Fixt
0-20	409.41	N.A.	12.20
0-30	871.11	N.A.	26.00
0-40	1430.29	N.A.	42.70
0-60	2550.34	N.A.	76.20
0-80	3231.62	N.A.	96.50
0-90	3334.26	N.A.	99.60
10-90	3228.49	N.A.	96.40
20-40	1020.88	N.A.	30.50
20-50	1604.89	N.A.	47.90
40-70	1542.06	N.A.	46.10
60-80	681.28	N.A.	20.30
70-80	259.27	N.A.	7.70
80-90	102.64	N.A.	3.10
90-110	13.60	N.A.	0.40
90-120	13.60	N.A.	0.40
90-130	13.60	N.A.	0.40
90-150	13.60	N.A.	0.40
90-180	13.60	N.A.	0.40
110-180	0.00	N.A.	0.00
0-180	3347.86	N.A.	100.00

Total Luminaire Efficiency = N.A.%

**ZONAL LUMEN SUMMARY**

Zone	Lumens
0-10	105.77
10-20	303.64
20-30	461.70
30-40	559.17
40-50	584.01
50-60	536.04
60-70	422.01
70-80	259.27
80-90	102.64
90-100	13.60
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

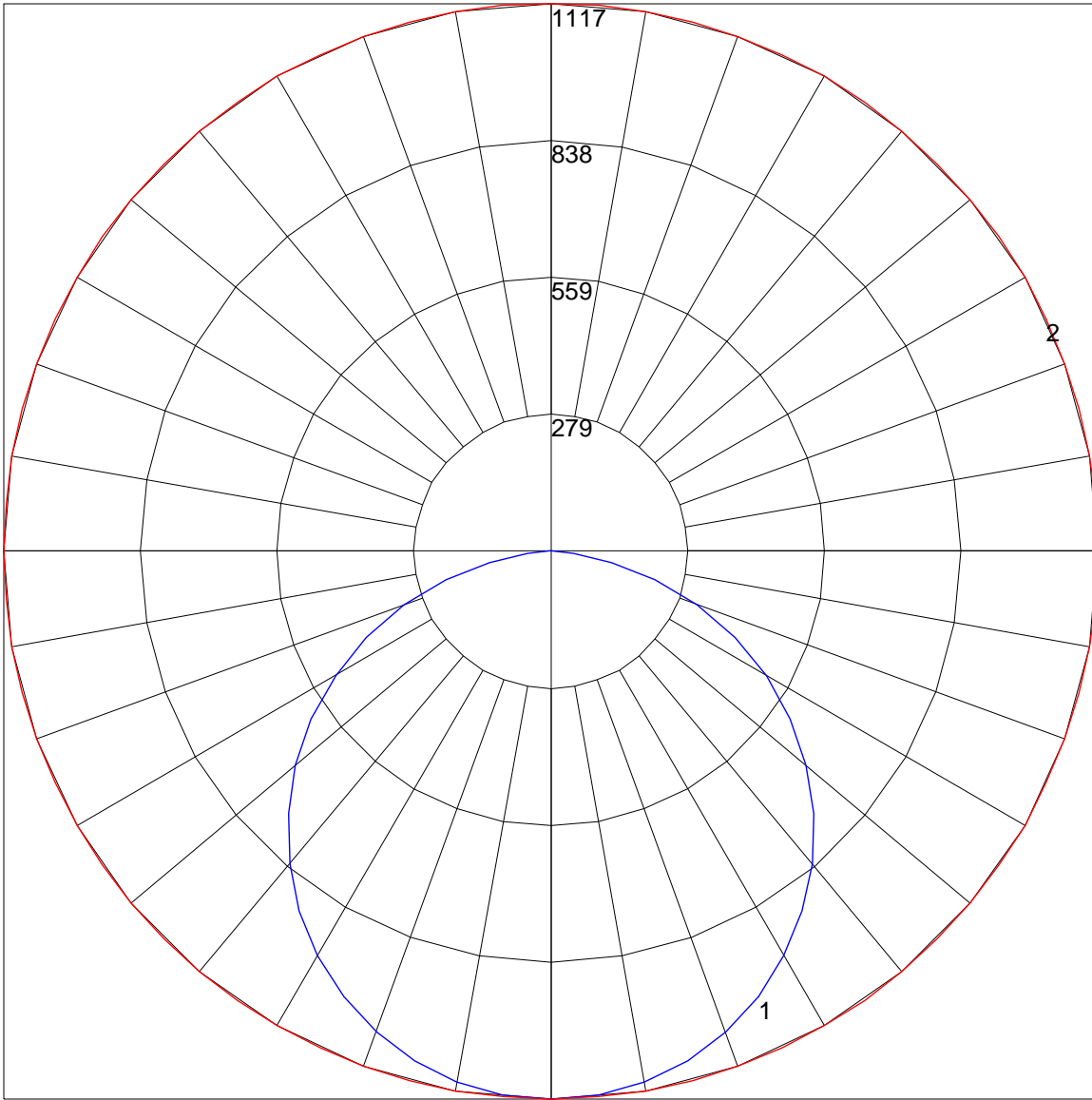
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**COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD**

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	108	103	98	94	105	101	96	93	96	93	90	92	89	87	88	86	84	82
2	98	89	82	76	95	87	81	75	84	78	73	80	76	72	77	73	70	68
3	89	78	70	63	86	76	69	62	73	67	61	71	65	60	68	63	59	57
4	81	69	60	53	79	68	59	53	65	58	52	63	56	51	60	55	50	48
5	75	62	52	46	73	60	52	45	58	51	45	56	49	44	54	48	44	42
6	69	55	46	40	67	54	46	39	53	45	39	51	44	39	49	43	38	36
7	64	50	41	35	62	49	41	35	48	40	35	46	39	34	45	39	34	32
8	59	46	37	31	58	45	37	31	44	36	31	42	36	31	41	35	30	28
9	56	42	34	28	54	41	33	28	40	33	28	39	32	28	38	32	27	26
10	52	39	31	25	51	38	30	25	37	30	25	36	30	25	35	29	25	23

POLAR GRAPH



Maximum Candela = 1117 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.)