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

Test #: L12132805
Date: 12/18/2013

NVLAP LAB CODE 200927-0

Test Report: **L12132805**

Model Number: **LC52-BRZ-110-00**

Report Prepared For: LUMATEQ

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 LC52-BRZ-110-00 . Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 12/10/13

Date of Tests: 12/17/13 - 12/17/13

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.

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LM-79 Test Summary	
Manufacturer:	LUMATEQ
Model Number:	LC52-BRZ-110-00
LAMPCAT:	N/A
Driver Model Number:	YIGUANG TECH LP50W-36-C1400
Total Lumens:	3415.49
Input Voltage (VAC/60Hz):	120.00
Input Current (Amp):	0.43
Input Power (W):	50.87
Input Power Factor:	0.98
Total Harmonic Distortion @ 120V(%):	19%
Total Harmonic Distortion @ 277V(%):	N/A
Efficacy:	67
Color Rendering Index (CRI):	85
Correlated Color Temperature (K):	5196
Chromaticity Coordinate x:	0.3397
Chromaticity Coordinate y:	0.3443
Ambient Temperature (°F):	77.0
Stabilization Time (Hours):	0:35
Total Operating Time (Hours):	1:25
Off State Power(W):	0.00

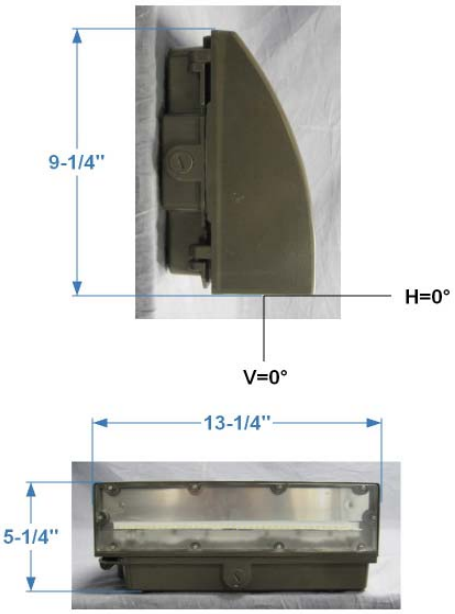

FIG.1 LUMINAIRE

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

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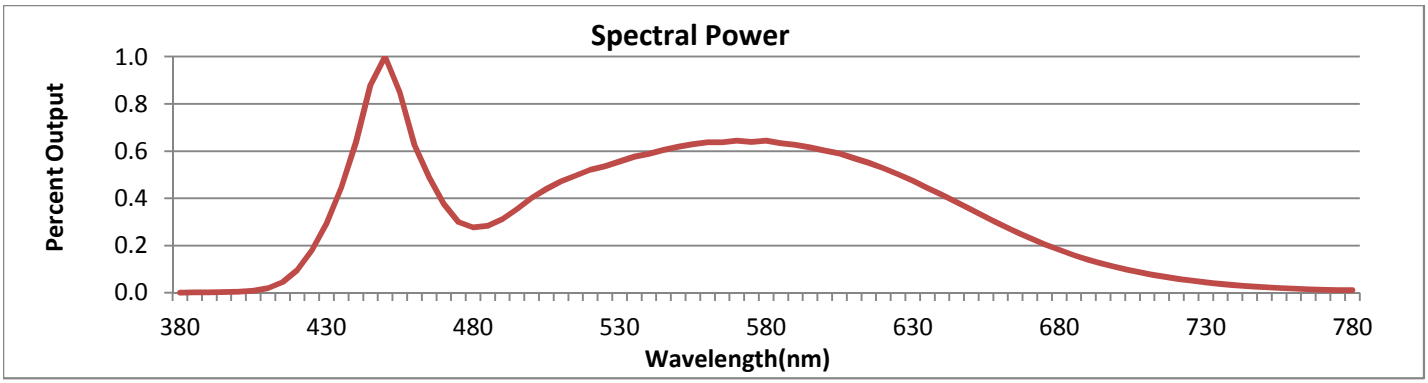


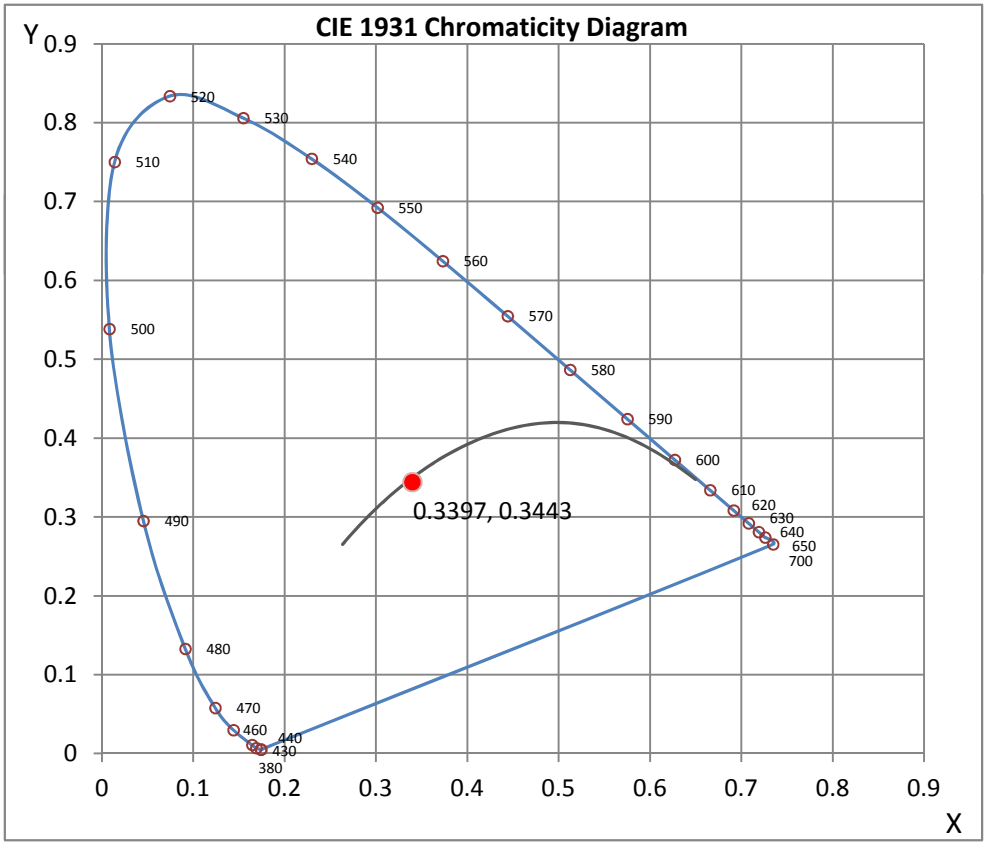
Wavelength	W/m²nm	440	0.0373	510	0.0276	580	0.0377	650	0.0206	720	0.0035
380	0.0001	450	0.0586	520	0.0305	590	0.0367	660	0.0169	730	0.0026
390	0.0001	460	0.0367	530	0.0326	600	0.0353	670	0.0136	740	0.0019
400	0.0002	470	0.0221	540	0.0345	610	0.0334	680	0.0106	750	0.0014
410	0.0011	480	0.0162	550	0.0362	620	0.0309	690	0.0082	760	0.0010
420	0.0055	490	0.0183	560	0.0373	630	0.0278	700	0.0062	770	0.0008
430	0.0172	500	0.0235	570	0.0377	640	0.0243	710	0.0047	780	0.0007

CRI & CCT

x	0.3397
y	0.3443
u'	0.2106
v'	0.4803
CRI	84.90
CCT	5196
Duv	-0.00148

R Values

R1	84.46
R2	88.50
R3	90.04
R4	85.59
R5	84.91
R6	83.13
R7	88.16
R8	74.72
R9	27.94
R10	71.61
R11	84.85
R12	67.63
R13	85.18
R14	94.11



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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^{o}C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25^{o}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^{o}C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25^{o}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 : THI NGUYEN

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: 12*

*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 : L12132805.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L12132805
[TESTLAB] LIGHT LABORATORY, INC.
[ISSUEDATE] 12/18/2013
[MANUFAC] LUMATEQ
[LUMCAT] LC52-BRZ-110-00
[LUMINAIRE] 5-1/4"L. X 13-1/4"W. X 9-1/4"H. LED FIXTURE
[MORE] CLEAR LENS
[BALLASTCAT] YIGUANG TECH LP50W-36-C1400
[BALLAST] INPUT: 90-305VAC, 50/60HZ, 0.71A OUTPUT: 22-36VDC, 1400mA
[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, 50.87W
[_TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	3415
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	67
Total Luminaire Watts	50.87
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	3.86
Spacing Criterion (90-270)	1.44
Spacing Criterion (Diagonal)	2.78
Basic Luminous Shape	Rectangular
Luminous Length (0-180)	0.17 ft
Luminous Width (90-270)	1.04 ft
Luminous Height	0.00 ft

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L12132805.IES

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	208941	171695	20043
55	214741	199895	21527
65	176163	186669	24755
75	131135	122440	18566
85	17447	15354	13958

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L12132805.IES

CANDELA TABULATION

	0	5	10	15	20	25	30	35	40	45
0.0	280	280	280	280	280	280	280	280	280	280
5.0	784	781	775	763	749	729	703	675	646	612
15.0	1497	1495	1487	1473	1455	1436	1415	1392	1366	1325
25.0	1963	1957	1943	1915	1877	1829	1774	1709	1641	1563
35.0	2340	2335	2320	2290	2250	2201	2131	2046	1952	1842
37.5	2386	2382	2366	2340	2305	2255	2190	2109	2009	1895
40.0	2425	2420	2404	2379	2343	2295	2228	2154	2057	1938
42.5	2439	2434	2420	2397	2368	2321	2259	2185	2090	1972
45.0	2429	2424	2410	2393	2367	2328	2271	2197	2106	1996
47.5	2385	2381	2371	2359	2339	2308	2257	2191	2107	1998
50.0	2308	2304	2295	2287	2277	2256	2220	2161	2088	1985
52.5	2189	2186	2181	2180	2178	2166	2141	2105	2043	1948
55.0	2025	2023	2022	2027	2032	2032	2025	2005	1961	1885
57.5	1832	1833	1835	1844	1857	1868	1874	1871	1844	1791
60.0	1638	1638	1643	1654	1667	1678	1693	1705	1691	1658
62.5	1430	1435	1439	1449	1463	1481	1498	1508	1506	1496
65.0	1224	1227	1231	1238	1251	1269	1286	1295	1297	1297
67.5	1028	1030	1037	1043	1052	1060	1067	1069	1073	1082
70.0	865	864	866	870	872	871	876	869	864	874
72.5	726	726	725	712	711	717	711	695	691	684
75.0	558	554	552	550	551	551	547	531	531	521
77.5	225	230	250	278	312	350	371	356	359	363
80.0	73	72	71	72	74	83	102	123	158	196
85.0	25	25	24	24	23	23	22	22	22	22
90.0	0	0	0	0	0	0	0	0	0	0

Vert. Angles **Horizontal Angles**

	50	55	60	65	70	75	80	85	90	95
0.0	280	280	280	280	280	280	280	280	280	280
5.0	578	543	505	466	426	388	351	313	283	250
15.0	1273	1207	1110	991	849	694	538	392	282	189
25.0	1480	1398	1335	1267	1159	987	724	472	273	155
35.0	1711	1582	1469	1334	1208	1109	798	548	266	140
37.5	1764	1629	1492	1355	1218	1106	801	564	250	142
40.0	1815	1669	1516	1365	1218	1090	813	595	243	135
42.5	1842	1706	1544	1387	1231	1075	891	610	237	105
45.0	1866	1730	1577	1401	1229	1061	939	622	233	94
47.5	1875	1735	1593	1412	1229	1058	921	611	229	98
50.0	1866	1742	1589	1419	1224	1045	851	613	235	80
52.5	1849	1726	1584	1408	1226	1021	843	631	210	76
55.0	1791	1686	1552	1397	1217	1006	821	625	203	74
57.5	1716	1625	1513	1365	1187	985	736	607	195	72
60.0	1611	1541	1444	1311	1150	963	723	572	199	71
62.5	1473	1432	1355	1244	1103	924	699	538	184	62
65.0	1292	1279	1233	1141	1029	861	671	507	172	58
67.5	1089	1085	1069	1032	938	729	614	446	148	45
70.0	882	888	890	884	827	695	558	387	150	38
72.5	689	688	703	712	683	617	491	334	144	33
75.0	513	506	516	525	534	497	407	281	79	29
77.5	363	358	353	355	365	363	309	219	63	24
80.0	212	215	227	222	222	224	204	152	46	20
85.0	24	26	28	32	42	48	46	38	20	15
90.0	0	0	0	0	0	0	0	0	0	0

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L12132805.IES

CANDELA TABULATION - (Cont.)

Vert. Angles	Horizontal Angles									
	100	**105**	**110**	**115**	**120**	**125**	**130**	**135**	**140**	**145**
0.0	280	280	280	280	280	280	280	280	280	280
5.0	222	198	177	159	145	131	121	112	104	97
15.0	151	92	72	65	62	59	57	56	54	53
25.0	77	62	57	54	52	49	47	46	44	42
35.0	68	58	51	47	44	41	39	37	36	35
37.5	68	58	51	46	42	40	37	36	35	34
40.0	68	58	50	44	41	38	36	35	34	34
42.5	68	58	49	43	39	37	35	34	34	34
45.0	67	57	47	41	37	35	35	34	34	34
47.5	65	55	44	39	36	35	34	34	34	34
50.0	63	51	41	37	35	34	34	34	34	35
52.5	61	47	39	36	34	34	34	34	34	35
55.0	58	43	38	35	34	33	33	34	34	35
57.5	54	40	36	34	33	33	33	33	34	34
60.0	51	37	34	33	32	32	32	33	33	34
62.5	44	35	33	32	31	31	32	32	33	34
65.0	38	33	31	31	31	31	31	32	32	33
67.5	34	31	30	29	29	29	30	30	31	32
70.0	31	29	28	28	28	28	29	29	30	30
72.5	28	27	26	26	26	26	27	27	27	28
75.0	25	25	24	24	24	24	24	24	25	25
77.5	22	22	22	22	22	21	21	21	21	21
80.0	19	19	19	19	18	18	18	18	18	18
85.0	14	14	13	13	13	12	11	11	11	11
90.0	0	0	0	0	0	0	0	0	0	0

Vert. Angles	Horizontal Angles						
	150	**155**	**160**	**165**	**170**	**175**	**180**
0.0	280	280	280	280	280	280	280
5.0	93	89	86	84	83	82	82
15.0	52	51	51	50	50	50	50
25.0	41	40	40	39	39	38	38
35.0	35	34	34	34	34	34	34
37.5	34	34	34	35	35	35	35
40.0	34	35	35	35	35	35	35
42.5	34	35	35	35	35	35	35
45.0	35	35	35	35	36	36	36
47.5	35	35	36	36	36	36	36
50.0	35	35	36	36	36	37	37
52.5	35	36	36	36	37	37	37
55.0	35	36	36	37	37	37	37
57.5	35	36	36	37	37	37	37
60.0	35	36	36	37	37	37	37
62.5	34	35	36	36	37	37	37
65.0	34	35	35	36	36	36	36
67.5	33	33	34	34	34	34	34
70.0	31	31	31	32	32	32	31
72.5	28	28	28	29	29	29	28
75.0	25	25	25	25	25	25	25
77.5	21	22	22	22	22	22	22
80.0	18	18	17	17	17	17	17
85.0	11	11	11	11	11	11	11

CANDELA TABULATION - (Cont.)

90.0	0	0	0	0	0	0	0

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L12132805.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	100.42	N.A.	2.90
0-30	357.39	N.A.	10.50
0-40	1099.83	N.A.	32.20
0-60	2544.73	N.A.	74.50
0-80	3381.53	N.A.	99.00
0-90	3415.49	N.A.	100.00
10-90	3407.85	N.A.	99.80
20-40	999.42	N.A.	29.30
20-50	1706.08	N.A.	50.00
40-70	2012.32	N.A.	58.90
60-80	836.80	N.A.	24.50
70-80	269.38	N.A.	7.90
80-90	33.96	N.A.	1.00
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	3415.49	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	7.65
10-20	92.77
20-30	256.97
30-40	742.44
40-50	706.66
50-60	738.23
60-70	567.43
70-80	269.38
80-90	33.96
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

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L12132805.IES

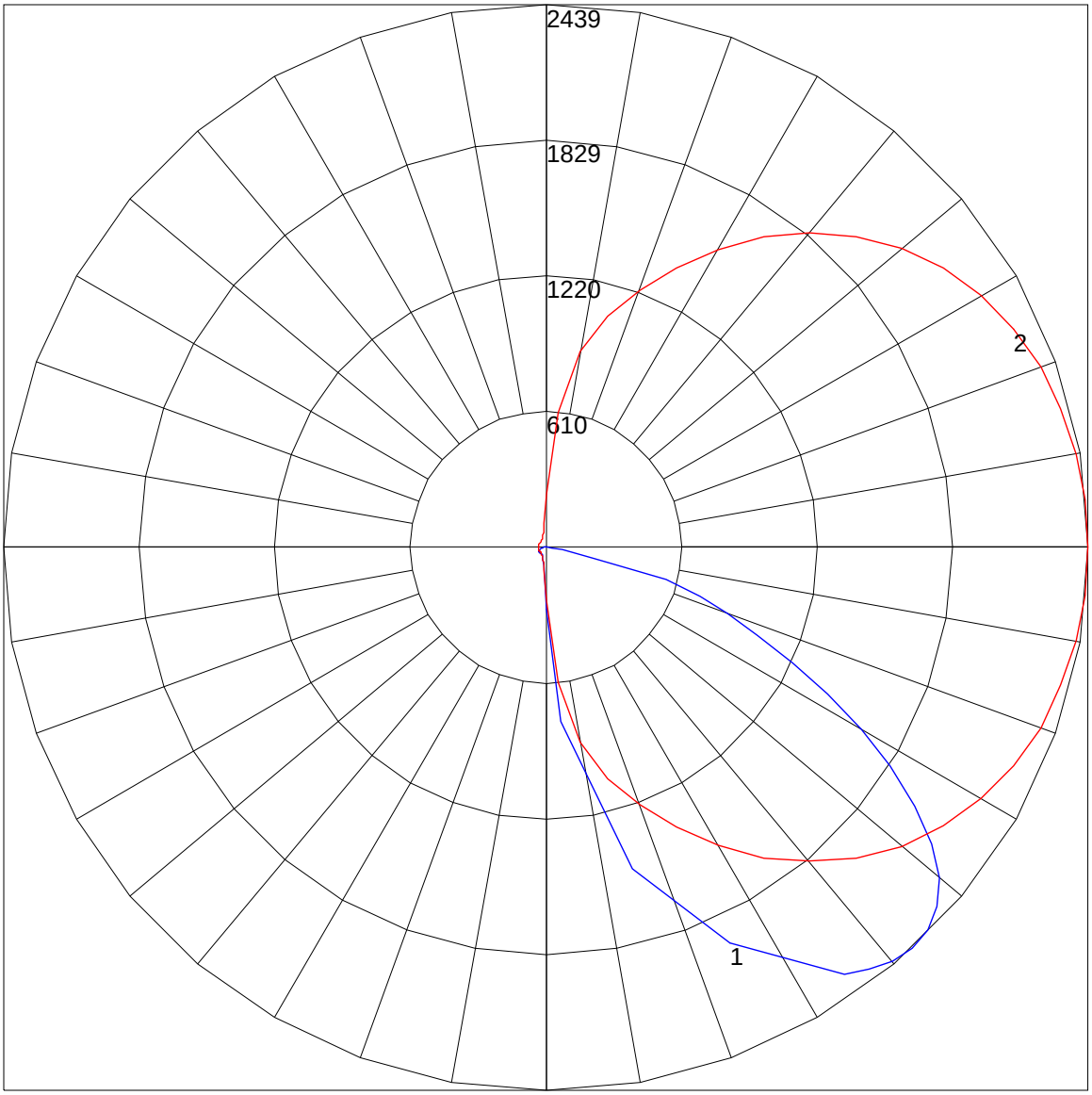
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	100	96	92	96	93	89	92	89	87	88	86	84	82
2	97	87	80	74	94	86	79	73	82	76	71	79	74	69	75	71	68	65
3	87	75	66	59	84	73	65	58	70	63	57	67	61	56	65	59	55	52
4	78	65	55	47	76	63	54	47	61	53	46	58	51	46	56	50	45	43
5	71	56	46	39	68	55	46	39	53	45	38	51	43	38	49	42	37	35
6	64	49	40	32	62	48	39	32	47	38	32	45	37	32	43	36	31	29
7	59	44	34	27	57	43	34	27	41	33	27	40	32	27	38	32	26	24
8	54	39	30	23	52	38	29	23	37	29	23	36	28	23	34	28	23	20
9	50	35	26	20	48	34	26	20	33	25	20	32	25	20	31	24	19	17
10	46	32	23	17	45	31	23	17	30	22	17	29	22	17	28	22	17	15

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L12132805.IES

POLAR GRAPH



Maximum Candela = 2439 Located At Horizontal Angle = 0, Vertical Angle = 42.5
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (42.5) (Through Max. Cd.)