



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

Test #: L12132803

Date: 12/18/2013



NVLAP LAB CODE 200927-0

**Test Report:** L12132803

**Model Number:** LW96-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 LW96-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.

**LM-79 Test Summary**

<b>Manufacturer:</b>	LUMATEQ
<b>Model Number:</b>	LW96-BRZ-110-00
<b>LAMPCAT:</b>	N/A
<b>Driver Model Number:</b>	YIGUANG TECH LA96W-36-C2770
<b>Total Lumens:</b>	7223.57
<b>Input Voltage (VAC/60Hz):</b>	120.00
<b>Input Current (Amp):</b>	0.66
<b>Input Power (W):</b>	77.46
<b>Input Power Factor:</b>	0.98
<b>Total Harmonic Distortion @ 120V(%):</b>	17%
<b>Total Harmonic Distortion @ 277V(%):</b>	N/A
<b>Efficacy:</b>	93
<b>Color Rendering Index (CRI):</b>	85
<b>Correlated Color Temperature (K):</b>	5406
<b>Chromaticity Coordinate x:</b>	0.3347
<b>Chromaticity Coordinate y:</b>	0.3475
<b>Ambient Temperature (°F):</b>	77.0
<b>Stabilization Time (Hours):</b>	0:55
<b>Total Operating Time (Hours):</b>	2:00
<b>Off State Power(W):</b>	0.00

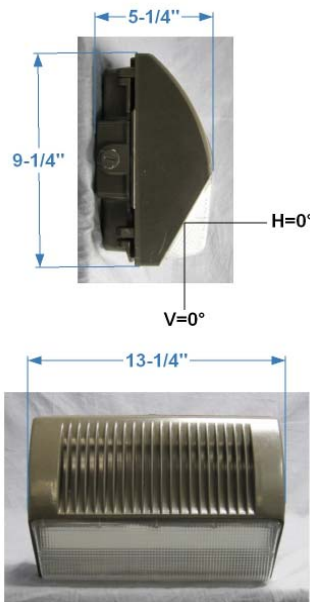
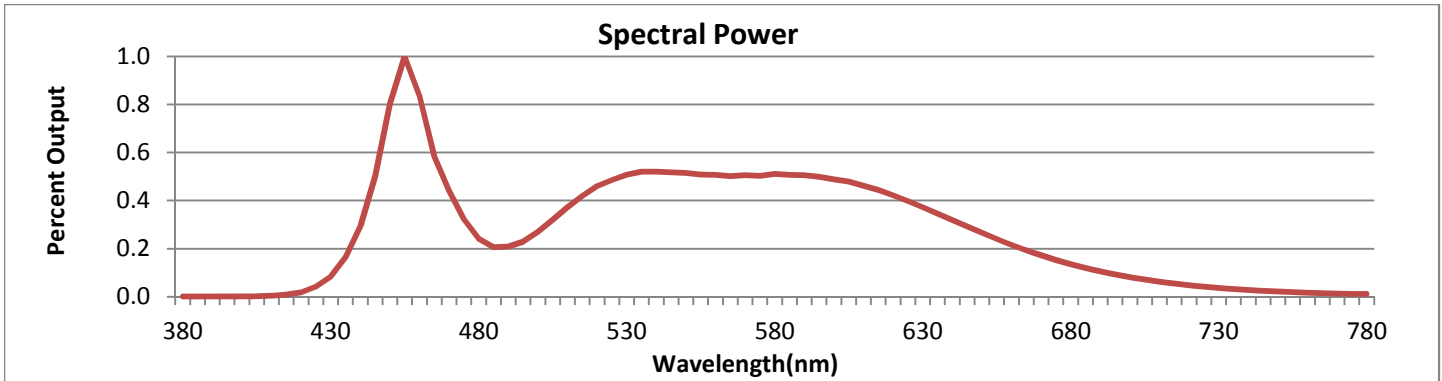


FIG.1 LUMINAIRE

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



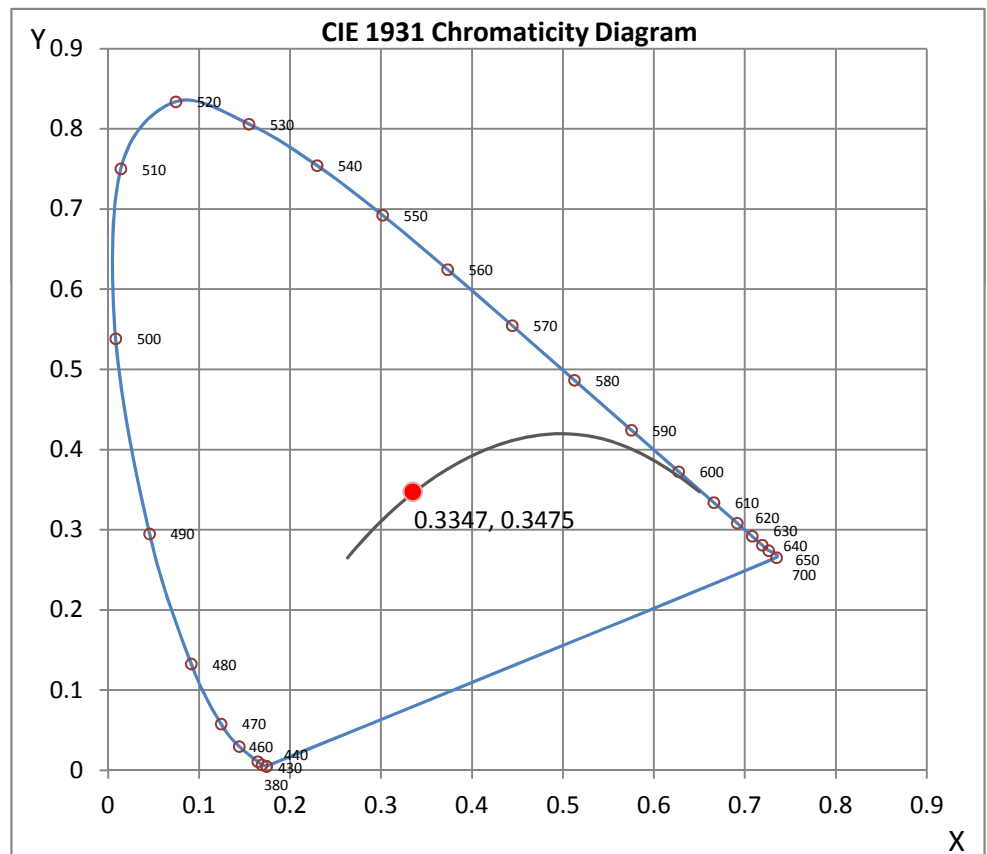
Wavelength	W/m <sup>2</sup> nm	440	0.0429	510	0.0545	580	0.0747	650	0.0389	720	0.0069
380	0.0001	450	0.1173	520	0.0672	590	0.0738	660	0.0316	730	0.0053
390	0.0001	460	0.1218	530	0.0741	600	0.0715	670	0.0252	740	0.0041
400	0.0002	470	0.0643	540	0.0760	610	0.0674	680	0.0198	750	0.0031
410	0.0006	480	0.0351	550	0.0752	620	0.0617	690	0.0153	760	0.0024
420	0.0027	490	0.0305	560	0.0741	630	0.0545	700	0.0118	770	0.0018
430	0.0123	500	0.0395	570	0.0739	640	0.0467	710	0.0091	780	0.0016

**CRI & CCT**

x	0.3347
y	0.3475
u'	0.2060
v'	0.4811
CRI	84.90
CCT	5406
Duv	0.00230

**R Values**

R1	84.59
R2	89.77
R3	90.73
R4	83.96
R5	82.99
R6	83.41
R7	89.68
R8	73.77
R9	24.99
R10	72.64
R11	82.11
R12	55.15
R13	86.43
R14	94.44



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



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

Test #: L12132803  
 Date: 12/18/2013



NVLAP LAB CODE 200927-0

**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 : THI NGUYEN

Test Report Released by:

Test Report Reviewed by:

Jeff Ahn  
 Engineering Manager

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.*



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

# Photometric Test Report

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L12132803.IES**

## DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002  
[TEST] L12132803  
[TESTLAB] LIGHT LABORATORY, INC.  
[ISSUE DATE] 12/18/2013  
[MANUFAC] LUMATEQ  
[LUMCAT] LW96-BRZ-110-00  
[LUMINAIRE] 5-1/4"L. X 13-1/4"W. X 9-1/4"H. LED FIXTURE  
[MORE] PRISMATIC LENS  
[BALLASTCAT] YIGUANG TECH LA96W-36-C2770  
[BALLAST] INPUT: 90-305VAC, 50/60HZ, 1.66A OUTPUT: 25-36VDC, 2770mA  
[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, 77.46W  
[\_TEST PROCEDURE] IESNA:LM-79-08

## CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	7224
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	93
Total Luminaire Watts	77.46
Ballast Factor	1.00
CIE Type	Semi-Direct
Spacing Criterion (0-180)	2.58
Spacing Criterion (90-270)	1.18
Spacing Criterion (Diagonal)	1.62
Basic Luminous Shape	Rectangular w/Sides
Luminous Length (0-180)	0.17 ft
Luminous Width (90-270)	1.04 ft
Luminous Height	0.29 ft

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L12132803.IES**

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

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	66377	58267	45941
55	67708	55594	41031
65	71123	54739	35396
75	79948	58850	27985
85	80110	57580	21667

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L12132803.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>
<b>0</b>	1065	1065	1065	1065	1065	1065	1065	1065	1065	1065
<b>5</b>	1199	1198	1198	1193	1189	1184	1178	1171	1163	1155
<b>10</b>	1439	1440	1432	1424	1411	1394	1374	1353	1326	1296
<b>15</b>	1634	1629	1616	1601	1582	1561	1539	1519	1500	1478
<b>20</b>	1811	1800	1778	1752	1713	1674	1636	1602	1569	1539
<b>25</b>	2101	2087	2061	1996	1918	1824	1731	1651	1602	1556
<b>30</b>	1835	1846	1872	1912	1943	1925	1826	1707	1628	1563
<b>35</b>	1924	1914	1886	1862	1890	1978	2064	1870	1734	1617
<b>40</b>	1785	1801	1811	1806	1771	1692	1742	1774	1738	1590
<b>45</b>	2088	2074	2030	1963	1935	1874	1799	1711	1683	1628
<b>50</b>	2349	2333	2260	2148	2088	2025	1916	1814	1704	1619
<b>55</b>	2194	2198	2213	2187	2037	1983	1874	1792	1674	1575
<b>60</b>	2351	2309	2239	2256	2159	2032	1927	1819	1658	1527
<b>65</b>	2302	2294	2296	2228	2068	1999	1895	1782	1652	1525
<b>70</b>	2542	2495	2410	2407	2215	2127	1956	1783	1618	1481
<b>75</b>	2506	2449	2398	2267	2188	2107	2005	1878	1720	1562
<b>80</b>	2512	2350	2405	2247	2136	2029	1908	1750	1626	1494
<b>85</b>	2353	2310	2195	2101	2007	1914	1808	1675	1537	1406
<b>90</b>	2291	2222	2124	2036	1938	1837	1719	1591	1466	1323
<b>95</b>	2140	2111	1992	1899	1812	1732	1612	1488	1356	1215
<b>100</b>	2025	1937	1852	1767	1697	1605	1501	1387	1269	1136
<b>105</b>	1889	1800	1655	1648	1550	1422	1321	1198	1086	962
<b>110</b>	1605	1481	1431	1565	1374	1307	1214	1089	957	817
<b>115</b>	1236	1197	1225	1282	1121	1069	984	878	773	667
<b>120</b>	977	977	979	960	890	845	773	690	615	533
<b>125</b>	807	797	769	730	693	643	580	525	471	411
<b>130</b>	597	595	589	570	533	497	462	419	377	336
<b>135</b>	474	473	466	454	436	409	389	358	331	298
<b>140</b>	414	412	406	395	381	363	347	331	302	267
<b>145</b>	370	366	358	348	337	325	308	269	231	201
<b>150</b>	296	294	286	274	255	228	197	177	163	144
<b>155</b>	169	168	166	164	159	152	143	133	123	113
<b>160</b>	132	132	129	126	122	117	110	104	96	87
<b>165</b>	96	96	94	92	88	84	80	74	68	62
<b>170</b>	58	58	57	56	54	52	50	47	44	40
<b>175</b>	27	27	27	27	27	27	27	27	26	26
<b>180</b>	0	0	0	0	0	0	0	0	0	0

**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>	<u>95</u>
<b>0</b>	1065	1065	1065	1065	1065	1065	1065	1065	1065	1065
<b>5</b>	1146	1136	1125	1115	1103	1092	1080	1068	1056	1033
<b>10</b>	1261	1222	1181	1157	1133	1107	1082	1056	1030	987
<b>15</b>	1440	1376	1308	1236	1161	1115	1071	1026	982	920
<b>20</b>	1506	1473	1436	1342	1247	1151	1080	1009	937	856
<b>25</b>	1510	1473	1438	1400	1307	1210	1111	1001	890	785
<b>30</b>	1501	1468	1437	1383	1320	1223	1133	982	832	706
<b>35</b>	1540	1521	1456	1398	1333	1240	1116	958	790	634
<b>40</b>	1527	1489	1442	1392	1300	1190	1065	919	753	566
<b>45</b>	1586	1574	1483	1355	1227	1133	1011	861	683	494
<b>50</b>	1552	1519	1420	1289	1225	1113	967	800	614	432
<b>55</b>	1484	1432	1397	1331	1198	1023	869	713	541	376
<b>60</b>	1392	1285	1207	1230	1097	962	831	654	469	324

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L12132803.IES**

**CANDELA TABULATION - (Cont.)**

<b>65</b>	1380	1228	1098	994	939	894	716	568	393	275
<b>70</b>	1319	1180	1039	899	785	703	606	466	312	229
<b>75</b>	1398	1194	1010	853	711	579	475	367	243	181
<b>80</b>	1324	1160	974	789	629	497	367	261	175	149
<b>85</b>	1266	1092	917	757	594	438	294	183	130	91
<b>90</b>	1182	1024	842	671	518	381	240	147	91	75
<b>95</b>	1073	910	756	608	461	324	205	124	80	69
<b>100</b>	995	833	678	530	391	272	174	108	70	63
<b>105</b>	836	717	581	447	330	233	150	93	62	57
<b>110</b>	693	576	473	365	267	188	123	80	56	51
<b>115</b>	567	471	377	292	217	156	106	69	50	46
<b>120</b>	453	379	301	237	184	136	92	59	44	41
<b>125</b>	359	304	250	209	162	115	76	51	39	37
<b>130</b>	297	264	229	187	133	94	64	45	35	33
<b>135</b>	271	235	188	147	105	79	57	40	32	30
<b>140</b>	234	185	145	115	91	69	49	36	30	28
<b>145</b>	168	134	117	97	78	59	41	33	28	27
<b>150</b>	126	112	96	80	63	49	34	30	26	25
<b>155</b>	101	89	77	63	51	39	31	28	25	24
<b>160</b>	78	68	58	49	40	31	28	26	24	23
<b>165</b>	56	49	43	36	29	27	26	25	23	23
<b>170</b>	36	32	28	27	26	26	25	24	23	23
<b>175</b>	26	26	25	25	25	24	24	24	23	23
<b>180</b>	0	0	0	0	0	0	0	0	0	0

**Vert. Horizontal Angles**

	<u><b>100</b></u>	<u><b>105</b></u>	<u><b>110</b></u>	<u><b>115</b></u>	<u><b>120</b></u>	<u><b>125</b></u>	<u><b>130</b></u>	<u><b>135</b></u>	<u><b>140</b></u>	<u><b>145</b></u>
<b>0</b>	1065	1065	1065	1065	1065	1065	1065	1065	1065	1065
<b>5</b>	1011	989	968	947	928	909	891	874	859	846
<b>10</b>	944	903	862	823	786	741	699	660	625	592
<b>15</b>	860	801	748	677	613	551	491	456	438	421
<b>20</b>	778	705	616	533	452	423	399	376	355	354
<b>25</b>	684	588	495	412	388	363	349	350	349	346
<b>30</b>	584	488	392	366	344	342	347	343	328	314
<b>35</b>	496	404	349	334	331	337	327	310	296	288
<b>40</b>	424	336	319	313	314	307	291	277	264	255
<b>45</b>	367	295	290	288	285	268	254	240	227	215
<b>50</b>	321	267	259	256	245	229	213	200	182	160
<b>55</b>	282	240	227	219	205	189	172	157	133	118
<b>60</b>	248	211	194	181	166	152	131	114	99	88
<b>65</b>	214	180	160	145	130	115	97	84	74	67
<b>70</b>	178	147	127	112	98	84	71	61	51	46
<b>75</b>	138	114	97	84	71	60	50	41	36	30
<b>80</b>	102	86	73	62	52	45	39	34	31	28
<b>85</b>	77	68	60	52	46	41	37	33	30	28
<b>90</b>	69	61	55	49	44	39	35	32	30	28
<b>95</b>	63	57	51	46	42	37	34	31	29	28
<b>100</b>	58	52	47	43	39	35	32	30	29	28
<b>105</b>	52	48	44	40	37	33	31	30	29	28
<b>110</b>	47	44	40	37	34	32	30	29	29	28
<b>115</b>	43	40	37	35	32	31	29	29	28	28
<b>120</b>	38	36	34	32	31	29	29	28	28	27
<b>125</b>	35	33	32	30	29	28	28	27	27	27
<b>130</b>	32	31	30	29	28	27	27	26	26	26
<b>135</b>	29	29	28	28	27	27	26	26	26	26



**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L12132803.IES**

**CANDELA TABULATION - (Cont.)**

140	27	27	27	27	26	26	26	25	25	26
145	26	26	26	25	25	25	25	25	25	25
150	24	24	24	24	25	25	25	25	25	25
155	23	23	23	23	24	24	24	24	25	25
160	23	22	22	23	23	23	24	24	24	24
165	23	22	22	22	22	23	23	23	24	24
170	23	23	22	22	22	22	22	22	23	23
175	23	23	23	23	23	22	22	22	22	22
180	0	0	0	0	0	0	0	0	0	0

**Vert. Horizontal Angles**

	<u>150</u>	<u>155</u>	<u>160</u>	<u>165</u>	<u>170</u>	<u>175</u>	<u>180</u>
0	1065	1065	1065	1065	1065	1065	1065
5	834	823	815	808	803	801	800
10	564	538	516	500	488	480	478
15	405	391	380	370	363	359	358
20	353	353	353	353	353	354	354
25	338	331	326	323	321	319	319
30	306	304	304	303	303	304	304
35	284	280	277	275	273	272	271
40	248	241	230	221	215	211	211
45	197	182	169	158	148	141	139
50	145	130	119	115	111	110	111
55	107	101	94	91	89	89	90
60	84	80	75	71	69	69	69
65	63	59	53	49	48	47	48
70	41	37	32	30	29	28	28
75	27	24	22	22	22	22	21
80	26	24	0	0	22	22	0
85	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L12132803.IES**

**ZONAL LUMEN SUMMARY**

Zone	Lumens	%Lamp	%Fixt
0-20	373.25	N.A.	5.20
0-30	830.63	N.A.	11.50
0-40	1431.4	N.A.	19.80
0-60	2930.39	N.A.	40.60
0-80	4545.59	N.A.	62.90
0-90	5287.38	N.A.	73.20
10-90	5190.88	N.A.	71.90
20-40	1058.15	N.A.	14.60
20-50	1767.29	N.A.	24.50
40-70	2305.71	N.A.	31.90
60-80	1615.2	N.A.	22.40
70-80	808.49	N.A.	11.20
80-90	741.78	N.A.	10.30
90-110	1160.12	N.A.	16.10
90-120	1507.19	N.A.	20.90
90-130	1708.3	N.A.	23.60
90-150	1893.55	N.A.	26.20
90-180	1936.2	N.A.	26.80
110-180	776.08	N.A.	10.70
0-180	7223.57	N.A.	100.00

Total Luminaire Efficiency = N.A.%

**ZONAL LUMEN SUMMARY**

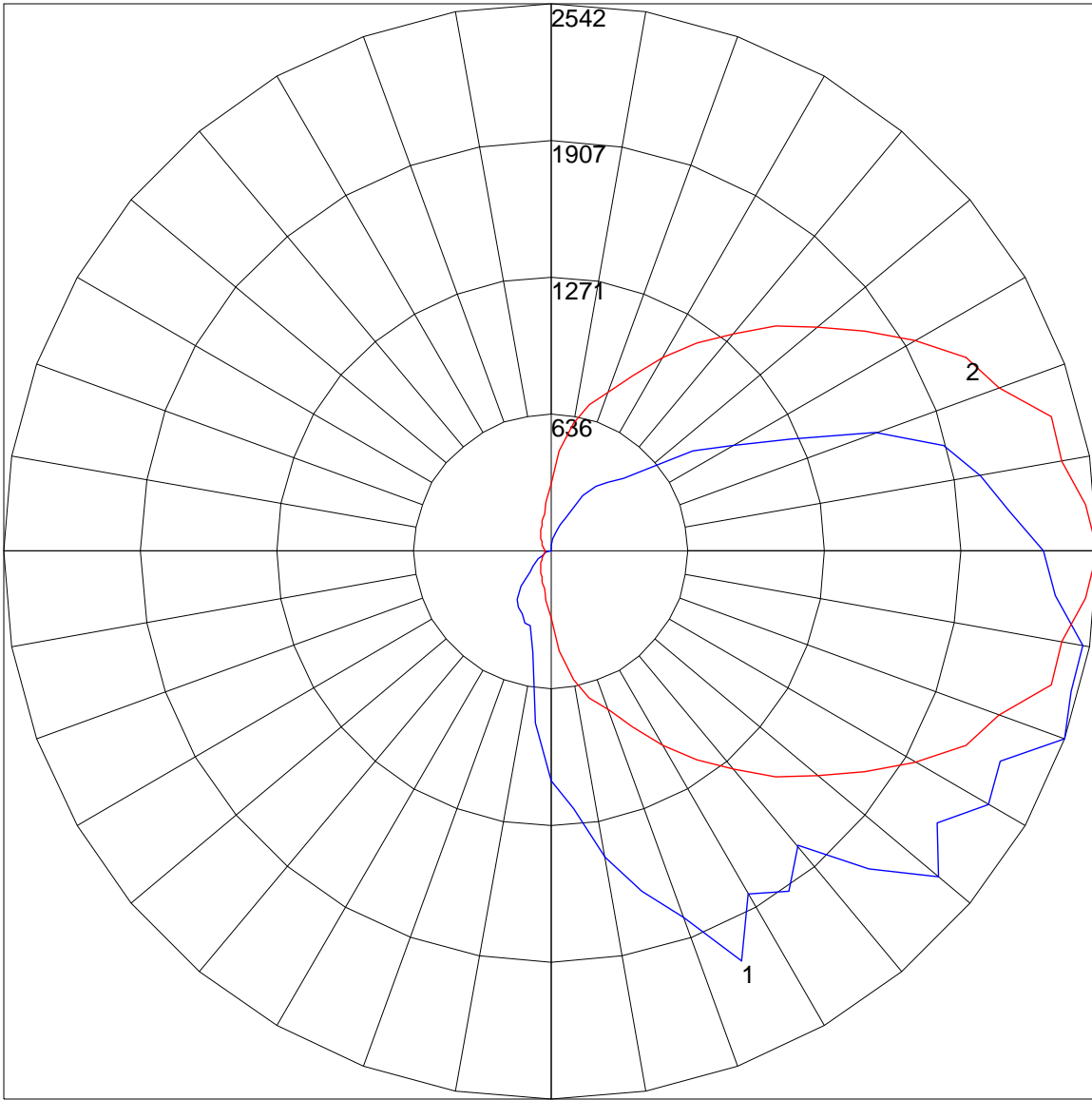
Zone	Lumens
0-10	96.50
10-20	276.75
20-30	457.38
30-40	600.77
40-50	709.14
50-60	789.85
60-70	806.71
70-80	808.49
80-90	741.78
90-100	646.51
100-110	513.61
110-120	347.07
120-130	201.12
130-140	116.61
140-150	68.64
150-160	29.78
160-170	10.93
170-180	1.94

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	113	113	113	113	107	107	107	107	96	96	96	86	86	86	77	77	77	73
1	98	91	85	80	92	86	81	76	77	73	69	68	65	62	61	58	55	51
2	87	77	69	62	82	73	65	59	65	59	53	57	52	48	51	47	43	39
3	79	66	57	49	74	63	54	47	56	49	43	49	43	39	43	39	35	31
4	71	58	48	40	67	55	46	39	49	41	35	43	37	32	38	33	29	25
5	65	51	41	34	61	48	39	33	43	35	30	38	32	27	34	28	24	21
6	60	45	36	29	56	43	34	28	38	31	25	34	28	23	30	25	21	18
7	55	41	32	25	52	39	30	24	35	27	22	31	25	20	27	22	18	16
8	51	37	28	22	48	35	27	21	32	24	19	28	22	18	25	20	16	14
9	48	34	25	19	45	32	24	19	29	22	17	26	20	16	23	18	14	12
10	44	31	23	17	42	29	22	17	27	20	15	24	18	14	21	16	13	11

POLAR GRAPH



Maximum Candela = 2542 Located At Horizontal Angle = 0, Vertical Angle = 70  
# 1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)  
# 2 - Horizontal Cone Through Vertical Angle (70) (Through Max. Cd.)