



8165 E Kaiser Blvd. Anaheim, CA 92808
www.lightlaboratory.com

Report No: L061911302



Report No: L061911302

Issue Date: 6/13/2019

Report Prepared For: Cerno LLC
1751 McGaw Ave, Irvine, CA, 92614

Model Number: 03-220-40BDD-27P1

Test: Photometric/Colorimetric/Electrical Test

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. Received in working and undamaged condition. No modifications were necessary.

Special Test Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 6/10/19

Date of Tests: 6/11/19 - 6/13/19

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-S4	1/9/21
BK PRECISION	1747	PS-DC04	1/10/21
Fluke Digital Thermometer	52K/J	MT-TP05	1/10/21
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

General Information

Manufacturer:	Cerno LLC
Model Number:	03-220-40BDD-27P1
Driver Model Number:	L.T.F. TECHNOLOGY DA25W24VBF1D010-0000

Test Summary

Total Lumens:	1394.65
Efficacy:	57.31
Color Redering Index:	96.0
Correlated Color Temperature:	2683
Input Voltage (VAC/60Hz):	119.98
Input Current (Amp):	0.2058
Input Power (W):	24.34
Input Power Factor:	0.9855
Current ATHD (%):	8.0%

Test Condition

Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:30
Total Operating Time (Hours):	1:00

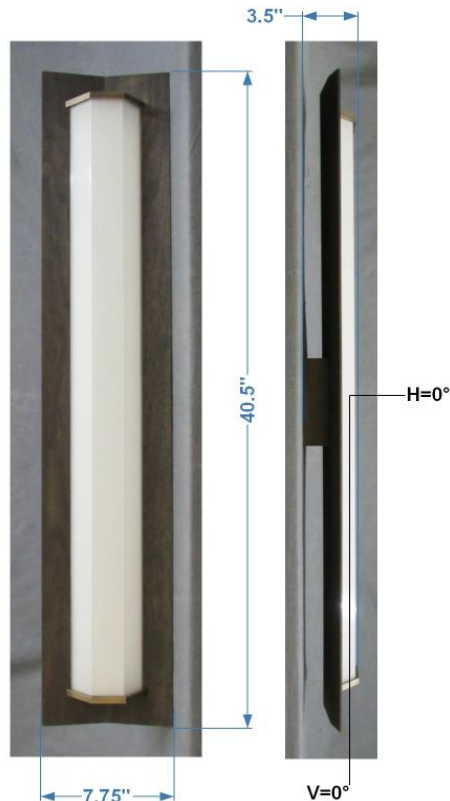
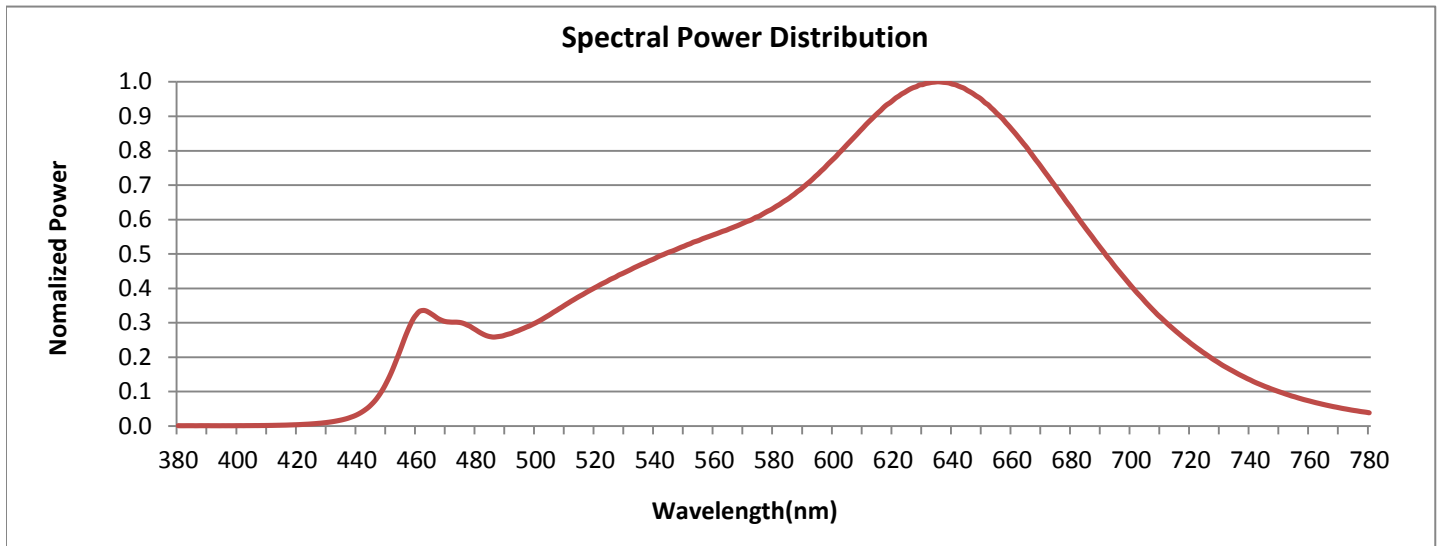


FIG. 1 LUMINAIRE

Colorimetry Test Results

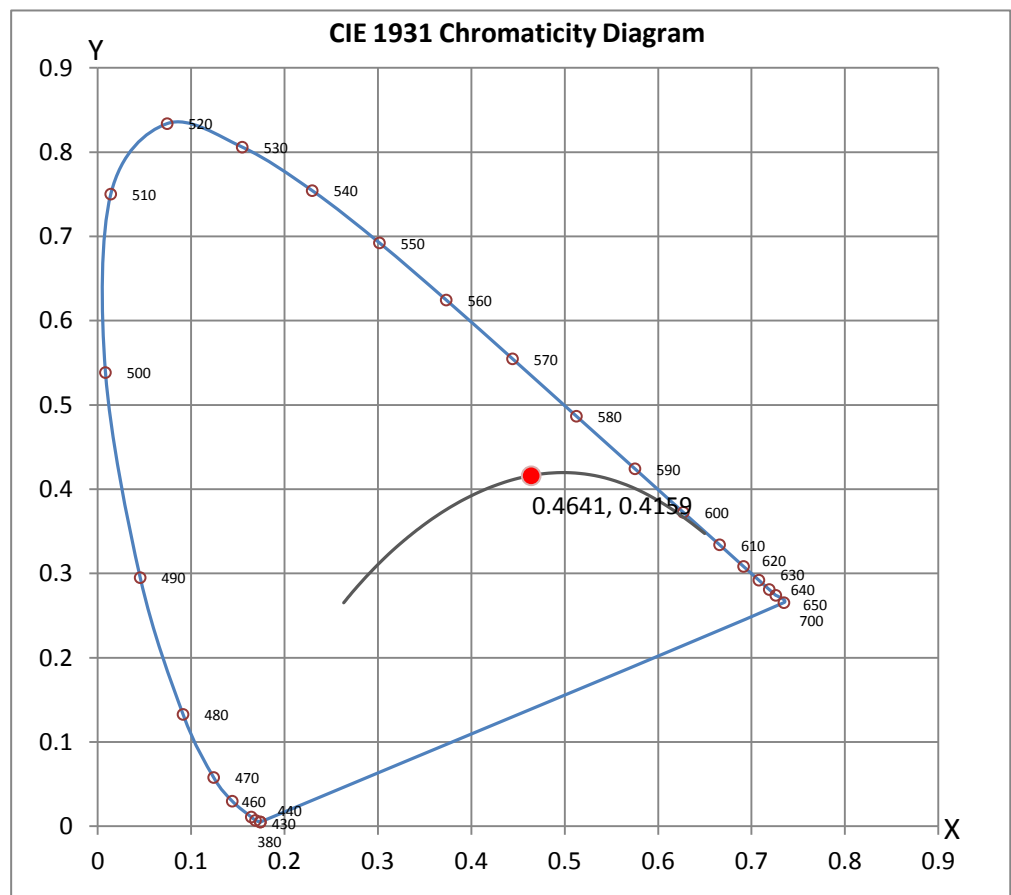


CRI & CCT

x	0.4641
y	0.4159
u'	0.2628
v'	0.5300
CRI	96.00
CCT	2683
Duv	0.00160

R Values

R1	98.27
R2	97.69
R3	98.72
R4	95.05
R5	96.62
R6	94.74
R7	93.62
R8	93.65
R9	90.69
R10	96.71
R11	96.51
R12	84.16
R13	97.80
R14	98.70
R15	97.08





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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 : Dennis Malonzo

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 : L061911302.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L061911302
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 6/13/2019
[MANUFAC] Cerno LLC
[LUMCAT] 03-220-40BDD-27P1
[LUMINAIRE] Penna 40 LED Sconce, 2700K, P1 Driver
[BALLASTCAT] L.T.F. TECHNOLOGY DA25W24VBF1D010-0000
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[INPUT] 119.98VAC, 24.34W
[TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	1395
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	57
Total Luminaire Watts	24.34
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)	0.06 ft
Luminous Width (90-270)	0.33 ft
Luminous Height	3.00 ft

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	4110	3511	3685
55	4326	3688	3982
65	4500	3845	4209
75	4632	3956	4399
85	4725	4025	4525

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L061911302.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	2.41	2.41	2.41	2.41	2.41	2.41	2.41	2.41	2.41	2.41
5	10.33	10.55	10.77	10.70	10.68	10.59	10.42	10.17	9.85	9.45
10	34.60	34.88	34.43	33.80	32.83	31.53	29.92	28.50	26.73	24.66
15	68.39	68.62	67.30	65.61	63.31	60.82	57.73	54.08	49.93	45.58
20	108.48	108.61	106.21	103.33	99.64	94.93	89.41	83.64	77.22	71.28
25	143.62	142.97	140.91	137.71	133.29	127.94	121.72	114.53	106.96	98.60
30	176.61	175.85	173.45	169.49	164.37	158.21	151.09	143.09	134.28	125.21
35	208.12	207.30	204.51	199.91	194.37	187.54	179.72	170.47	160.27	149.66
40	241.37	240.11	236.56	231.10	224.22	216.03	206.91	196.57	185.15	173.10
45	272.89	271.77	267.66	261.31	253.78	244.84	233.91	221.68	208.86	195.55
50	302.92	301.49	296.85	290.01	281.90	272.02	259.80	246.17	231.34	216.45
55	330.82	329.32	324.30	316.81	308.32	297.29	283.91	268.91	253.00	236.30
60	356.16	354.86	349.33	341.80	332.93	320.59	305.82	289.22	272.25	254.61
65	378.96	377.56	371.39	364.50	354.61	341.00	325.25	308.12	289.60	271.06
70	398.40	397.08	390.76	384.53	372.62	358.26	341.99	323.92	304.19	284.72
75	414.09	412.56	407.81	399.83	387.57	372.62	355.44	336.26	315.99	295.85
80	426.02	424.07	420.38	411.13	398.81	383.38	365.26	345.35	324.59	303.89
85	434.07	434.13	428.95	419.16	405.83	389.57	371.12	350.99	330.02	309.09
90	440.00	438.63	431.72	421.87	408.39	392.57	373.79	353.41	332.36	311.17
95	435.28	435.21	430.00	420.16	406.76	390.62	371.99	351.83	330.65	309.63
100	427.90	426.15	422.38	412.91	400.55	385.09	366.95	346.89	326.15	305.11
105	416.77	415.33	410.57	402.55	390.13	375.04	357.78	338.55	318.09	297.75
110	401.89	400.45	394.19	387.80	375.76	361.17	344.88	326.82	306.79	287.18
115	382.85	381.45	375.23	367.93	358.25	344.60	328.66	311.21	292.32	273.72
120	360.45	359.11	353.55	345.79	336.80	324.46	309.47	292.72	275.44	257.86
125	335.11	333.67	328.62	321.19	312.47	301.30	287.77	272.40	256.23	239.91
130	307.35	305.81	301.25	294.29	285.94	275.95	263.84	250.00	234.95	219.79
135	277.31	275.99	271.83	265.43	257.76	248.80	237.82	225.23	212.04	198.12
140	245.53	244.37	240.77	235.20	228.14	219.91	210.56	199.94	188.28	176.33
145	212.14	211.25	208.41	203.73	197.95	190.86	182.61	173.54	163.59	152.84
150	180.23	179.27	176.72	172.75	167.58	161.31	154.11	146.09	137.07	127.72
155	146.57	145.97	143.96	140.72	136.26	130.89	124.66	117.48	109.57	100.98
160	111.17	111.31	108.92	106.04	102.33	97.57	91.95	85.97	79.28	73.25
165	70.80	71.04	69.69	67.98	65.65	63.08	59.92	56.20	51.97	47.59
170	36.61	36.89	36.42	35.77	34.77	33.43	31.77	30.30	28.49	26.37
175	11.67	11.90	12.12	12.01	11.97	11.83	11.61	11.30	10.91	10.43
180	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

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>	<u>95</u>
0	2.41	2.41	2.41	2.41	2.41	2.41	2.41	2.41	2.41	2.41
5	8.97	8.43	7.82	7.15	6.43	5.67	4.88	4.06	3.22	3.14
10	22.28	19.64	16.82	15.41	13.84	12.11	10.23	8.25	6.17	5.50
15	41.46	37.74	33.61	29.10	24.25	21.06	17.72	14.16	10.39	8.30
20	65.05	58.31	51.17	45.13	38.55	31.49	26.53	21.44	16.03	11.39
25	89.58	80.63	71.53	61.79	53.25	44.52	36.41	29.65	22.46	15.18
30	114.89	103.32	91.26	79.72	67.68	57.21	46.32	37.88	29.03	19.01
35	138.36	125.69	111.43	97.13	83.02	69.56	56.76	46.09	35.94	23.07
40	160.13	145.95	130.67	114.55	98.39	82.03	67.14	54.08	42.51	27.35
45	181.16	165.68	148.51	130.99	112.91	94.27	77.01	61.54	48.41	31.79
50	201.20	184.10	165.57	146.15	126.29	105.81	86.23	68.56	53.91	36.33
55	219.65	201.46	181.65	160.41	138.69	116.57	94.93	75.00	58.80	40.41
60	236.73	217.26	196.19	173.43	149.81	126.03	102.76	81.06	63.29	44.44

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CANDELA TABULATION - (Cont.)

65	252.20	231.42	208.79	184.74	159.71	134.28	109.48	86.04	67.12	48.12
70	264.94	243.26	219.46	194.29	168.18	141.54	115.23	90.43	70.67	51.37
75	275.40	252.77	228.34	202.45	175.07	147.32	119.81	93.67	73.22	54.03
80	283.01	260.05	234.99	208.37	179.96	151.31	123.07	96.54	74.89	55.54
85	288.00	264.57	239.05	211.64	183.49	153.90	125.44	98.02	76.17	56.46
90	289.58	266.12	240.37	212.95	184.05	154.88	126.12	98.43	76.64	56.79
95	288.54	265.28	239.68	212.26	183.98	154.50	125.64	98.09	76.37	56.60
100	283.98	261.12	235.94	209.18	180.89	151.88	123.68	97.08	75.43	55.95
105	277.00	254.36	229.86	203.66	176.15	148.32	120.67	94.40	73.82	54.70
110	267.15	245.28	221.43	196.02	169.63	142.74	116.23	91.23	71.41	52.16
115	254.70	233.85	211.08	186.73	161.47	136.00	110.80	87.18	68.26	48.65
120	239.63	219.81	198.73	175.58	151.72	127.72	104.25	82.34	64.57	44.73
125	222.63	203.97	184.10	162.83	140.65	118.45	96.72	76.51	59.87	41.10
130	204.02	186.77	168.34	148.86	128.21	107.71	88.11	70.16	54.58	37.00
135	184.06	168.46	151.56	133.50	114.87	96.27	78.96	63.12	49.15	32.82
140	163.48	148.89	133.27	116.75	100.55	84.12	68.83	55.31	43.18	28.49
145	141.05	128.06	113.82	99.48	85.56	71.87	58.44	47.43	37.01	23.99
150	117.26	105.71	93.71	82.24	70.23	59.03	47.40	39.22	30.64	20.11
155	91.91	83.02	74.01	64.33	55.35	46.07	37.63	31.02	24.00	16.26
160	67.13	60.55	53.52	47.24	40.38	33.02	27.97	22.80	17.30	12.30
165	43.45	39.65	35.39	30.72	25.66	22.28	18.76	15.05	11.13	8.84
170	23.96	21.27	18.43	16.81	15.04	13.08	10.97	8.76	6.44	5.71
175	9.87	9.23	8.52	7.74	6.91	6.04	5.13	4.18	3.22	3.13
180	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

Vert. Angles	Horizontal Angles									
	<u>100</u>	<u>105</u>	<u>110</u>	<u>115</u>	<u>120</u>	<u>125</u>	<u>130</u>	<u>135</u>	<u>140</u>	<u>145</u>
0	2.41	2.41	2.41	2.41	2.41	2.41	2.41	2.41	2.41	2.41
5	3.05	2.96	2.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	4.79	4.10	3.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	6.16	4.12	2.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	6.74	2.52	2.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	7.79	4.19	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	8.84	5.47	2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	11.74	5.46	2.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40	14.26	4.28	2.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45	17.40	6.17	3.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50	20.59	8.64	2.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55	23.23	9.58	2.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	25.95	9.56	2.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	28.21	8.66	2.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	30.29	8.08	2.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75	31.78	8.24	2.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80	32.33	8.35	2.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00
85	32.57	8.63	2.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	32.72	8.52	2.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	32.76	8.71	2.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	32.54	8.74	2.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	32.14	8.71	2.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	30.81	8.60	2.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115	28.84	8.82	2.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	26.56	9.93	2.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	24.17	10.21	2.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	21.45	9.32	2.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	18.43	6.91	3.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L061911302.IES

CANDELA TABULATION - (Cont.)

140	15.40	4.87	2.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	12.40	5.63	2.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	9.44	5.72	2.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	8.41	4.52	3.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	7.27	2.70	2.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	6.51	4.27	2.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	4.94	4.19	3.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	3.04	2.94	2.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

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	2.41	2.41	2.41	2.41	2.41	2.41	2.41
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
85	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	2.00	2.00	2.00	2.00	2.00	2.00	2.00

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ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	7.52	N.A.	0.50
0-30	29.79	N.A.	2.10
0-40	74.73	N.A.	5.40
0-60	249.66	N.A.	17.90
0-80	530.56	N.A.	38.00
0-90	693.67	N.A.	49.70
10-90	692.98	N.A.	49.70
20-40	67.21	N.A.	4.80
20-50	139.87	N.A.	10.00
40-70	304.69	N.A.	21.80
60-80	280.91	N.A.	20.10
70-80	151.15	N.A.	10.80
80-90	163.11	N.A.	11.70
90-110	315.65	N.A.	22.60
90-120	446.77	N.A.	32.00
90-130	550.48	N.A.	39.50
90-150	670.27	N.A.	48.10
90-180	700.98	N.A.	50.30
110-180	385.33	N.A.	27.60
0-180	1394.65	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	0.68
10-20	6.84
20-30	22.27
30-40	44.94
40-50	72.66
50-60	102.27
60-70	129.76
70-80	151.15
80-90	163.11
90-100	163.49
100-110	152.16
110-120	131.12
120-130	103.71
130-140	73.92
140-150	45.88
150-160	22.86
160-170	7.12
170-180	0.73

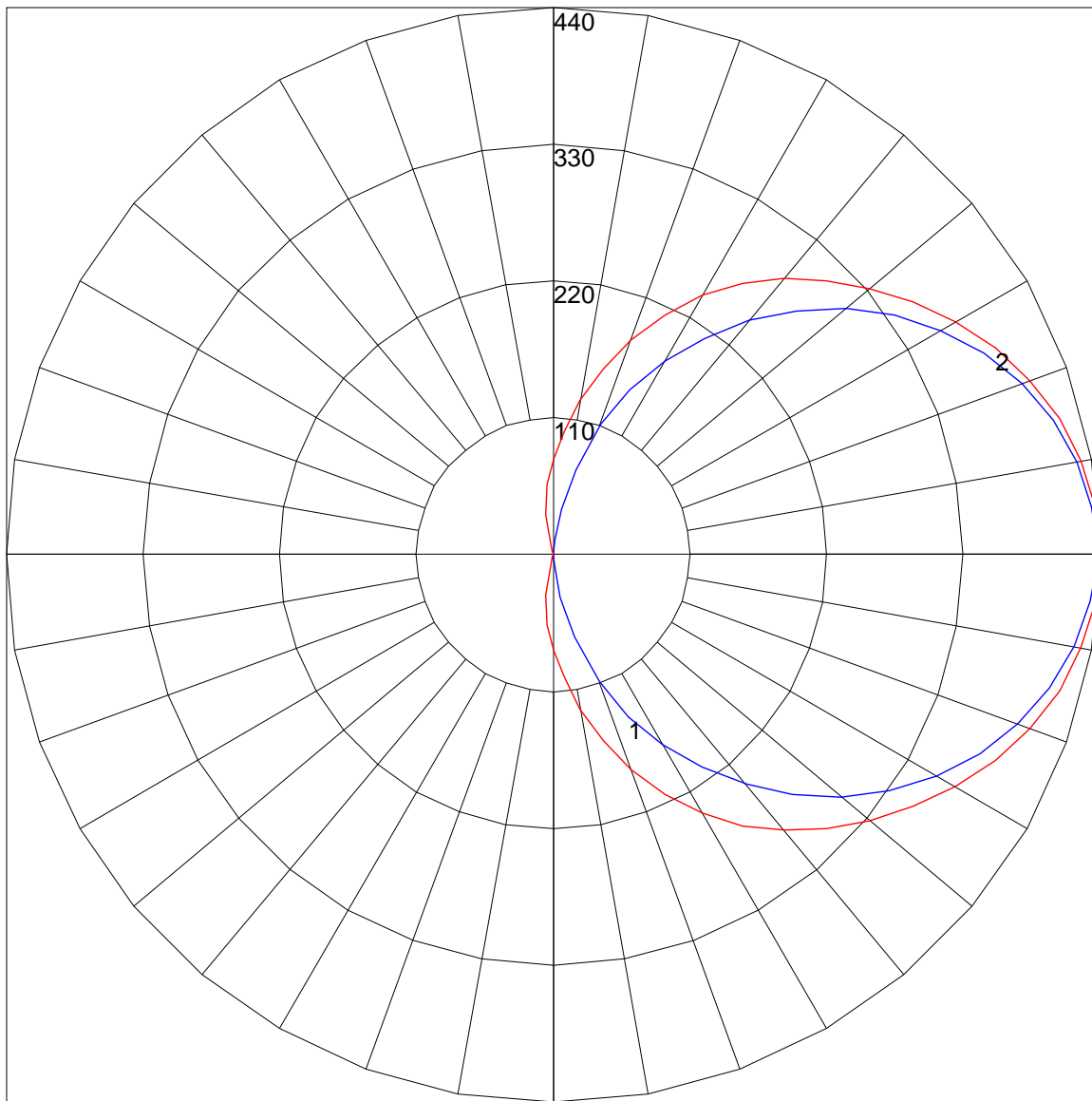
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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	107	107	107	107	99	99	99	99	83	83	83	69	69	69	56	56	56	50
1	92	85	79	73	84	77	72	67	64	60	56	51	48	45	40	37	35	29
2	81	71	62	55	74	64	57	50	53	47	42	42	37	33	32	28	25	20
3	73	60	51	43	66	55	46	39	44	38	32	35	30	25	26	22	19	14
4	66	52	42	35	59	47	39	32	38	31	26	30	25	20	22	18	15	11
5	60	46	36	29	54	41	33	26	34	27	21	26	21	16	19	15	12	8
6	54	40	31	24	49	37	28	22	30	23	18	23	18	14	17	13	10	6
7	50	36	27	20	45	33	24	19	27	20	15	21	15	12	15	11	8	5
8	46	32	23	17	42	29	21	16	24	17	13	19	14	10	14	10	7	4
9	43	29	21	15	39	27	19	14	22	16	11	17	12	8	13	9	6	4
10	40	27	19	13	36	24	17	12	20	14	10	16	11	7	12	8	5	3

POLAR GRAPH



Maximum Candela = 440 Located At Horizontal Angle = 0, Vertical Angle = 90
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (90) (Through Max. Cd.)