



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

Report No: L061911303



Report No: L061911303

Issue Date: 6/13/2019

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

Model Number: 03-220-64BDD-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:	03-220-64BDD-27P1
Driver Model Number:	L.T.F. TECHNOLOGY DA40W24VOC010-0000

Test Summary

Total Lumens:	2445.20
Efficacy:	60.75
Color Redering Index:	96.2
Correlated Color Temperature:	2662
Input Voltage (VAC/60Hz):	120.03
Input Current (Amp):	0.3476
Input Power (W):	40.25
Input Power Factor:	0.9649
Current ATHD (%):	17.2%

Test Condition

Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:35
Total Operating Time (Hours):	1:05

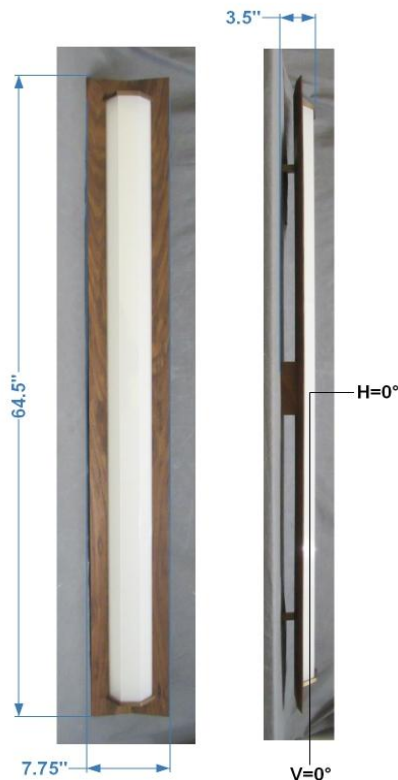
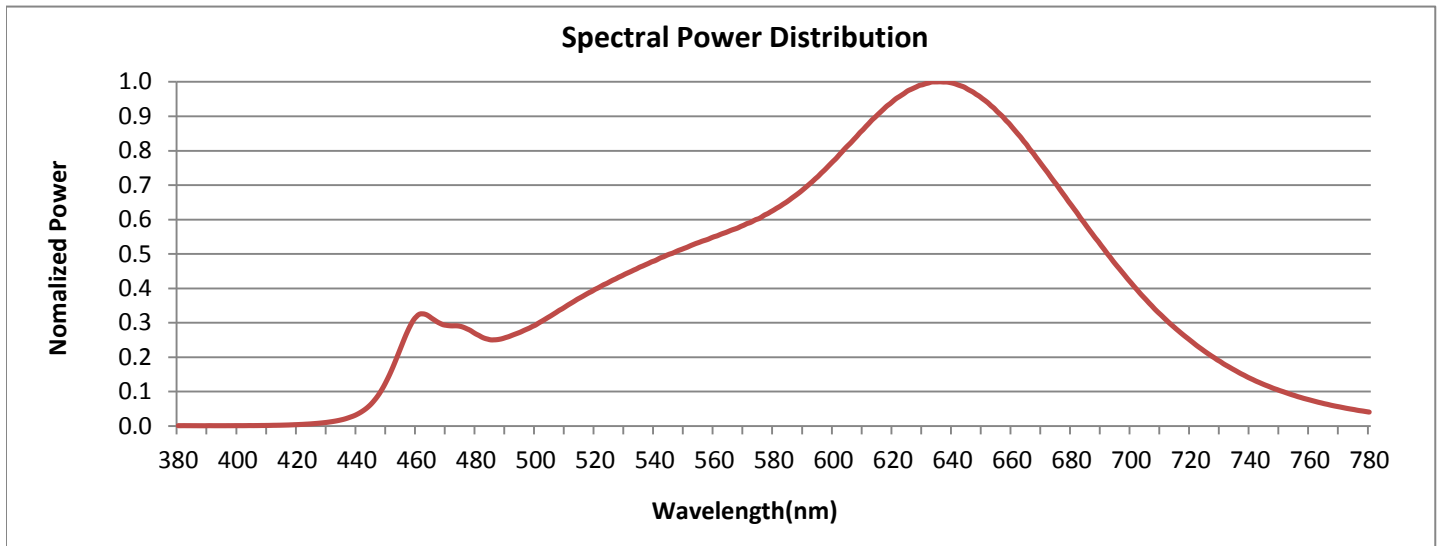


FIG. 1 LUMINAIRE

Colorimetry Test Results

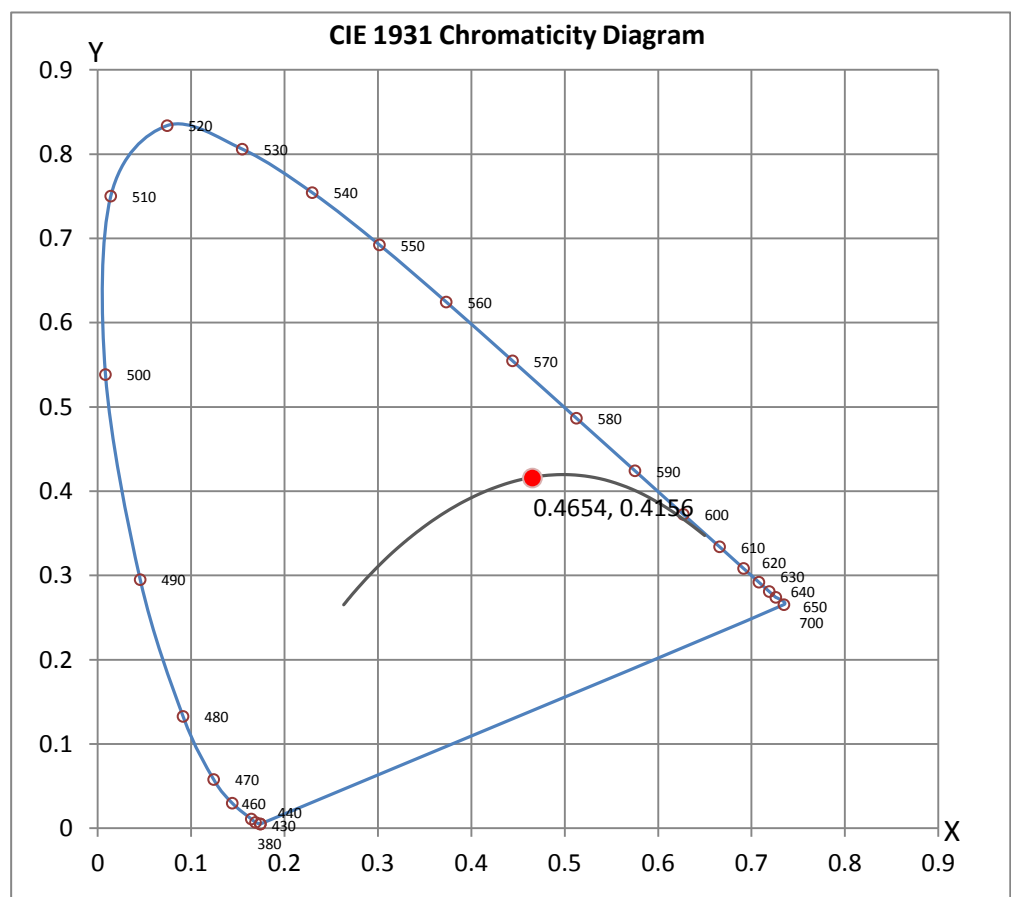


CRI & CCT

x	0.4654
y	0.4156
u'	0.2638
v'	0.5301
CRI	96.20
CCT	2662
Duv	0.00139

R Values

R1	98.11
R2	97.70
R3	98.90
R4	95.47
R5	96.68
R6	94.69
R7	94.02
R8	94.15
R9	91.58
R10	96.73
R11	96.55
R12	84.45
R13	97.66
R14	98.64
R15	97.36





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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 : L061911303.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L061911303
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 6/13/2019
[MANUFAC] Cerno LLC
[LUMCAT] 03-220-64BDD-27P1
[LUMINAIRE] Penna 64 LED Sconce, 2700K, P1 Driver
[BALLASTCAT] L.T.F. TECHNOLOGY DA40W24VOC010-0000
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[INPUT] 120.03VAC, 40.25W
[TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	2445
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	61
Total Luminaire Watts	40.25
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	5.00 ft

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	4289	3932	4365
55	4450	3908	4375
65	4578	3938	4456
75	4672	4012	4560
85	4732	4049	4629

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L061911303.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	33.52	33.52	33.52	33.52	33.52	33.52	33.52	33.52	33.52	33.52
5	59.14	59.46	59.78	59.21	58.84	58.26	57.50	56.54	55.40	54.08
10	109.16	109.50	108.32	106.79	104.55	101.64	98.08	94.62	90.51	85.83
15	170.30	170.52	167.91	164.65	160.23	155.26	149.16	142.00	133.87	125.25
20	237.75	237.78	233.57	228.50	221.96	213.68	204.00	193.57	181.81	170.14
25	296.89	295.63	291.99	286.10	278.14	268.83	258.25	246.12	231.74	215.86
30	353.61	352.26	347.99	340.76	331.13	319.60	306.49	291.93	275.89	259.11
35	405.51	404.47	399.66	391.37	380.15	367.26	352.77	335.25	316.19	296.53
40	451.91	451.05	445.62	436.11	423.76	410.06	393.38	374.32	353.57	331.05
45	470.95	471.31	469.50	464.00	457.12	447.12	428.55	407.89	385.03	361.66
50	519.62	518.19	511.20	499.15	485.63	473.48	458.95	438.60	413.44	387.56
55	564.01	562.36	554.09	540.56	527.76	510.90	491.06	468.83	442.46	414.56
60	604.37	602.46	592.42	579.15	566.42	546.70	523.36	496.90	468.56	439.40
65	640.18	638.25	625.23	615.15	600.48	578.74	551.68	522.46	491.53	460.68
70	670.35	667.48	654.05	646.52	628.75	604.23	576.60	546.46	513.06	480.63
75	694.62	689.03	681.84	670.93	650.03	624.39	596.09	564.88	532.25	498.86
80	712.99	703.94	702.68	685.62	665.22	640.72	612.49	581.15	546.79	511.45
85	724.12	722.67	711.80	698.25	679.01	652.96	622.51	588.99	553.46	517.90
90	728.84	727.00	716.61	701.19	679.87	653.72	623.62	590.09	554.49	519.22
95	724.52	722.28	712.34	698.16	678.74	652.35	622.24	588.69	553.16	517.57
100	713.26	705.25	702.60	685.67	665.62	640.80	612.94	580.73	546.06	510.83
105	694.89	689.35	682.24	670.71	649.90	624.95	596.39	564.87	532.18	498.78
110	670.35	667.43	655.07	646.75	628.12	603.81	576.31	545.58	512.61	480.71
115	640.04	637.86	625.55	614.98	599.89	578.09	551.06	522.18	491.92	461.11
120	603.84	601.71	591.85	579.10	565.95	545.95	523.15	497.40	468.95	440.14
125	563.21	560.86	552.71	540.15	526.83	511.44	493.28	469.09	442.35	414.73
130	517.75	516.20	509.08	498.03	486.57	475.88	459.88	438.10	413.10	387.31
135	467.86	468.21	466.81	462.79	457.40	447.65	428.44	407.33	384.39	361.02
140	451.23	450.44	444.95	435.60	423.31	409.34	392.34	373.03	352.08	329.53
145	403.76	402.51	397.70	389.49	378.34	365.43	350.80	333.14	313.90	294.11
150	350.39	349.17	344.94	337.64	328.04	316.59	303.46	288.85	272.77	255.85
155	292.73	291.47	287.76	281.86	273.89	264.58	253.97	241.82	227.43	211.49
160	231.85	231.93	227.72	222.69	216.32	208.17	198.56	188.14	176.35	164.80
165	163.46	163.79	161.29	158.14	153.86	149.06	143.14	136.15	128.19	119.71
170	102.32	102.77	101.78	100.46	98.45	95.80	92.53	89.36	85.56	81.19
175	55.25	55.58	55.91	55.58	55.38	55.01	54.48	53.80	52.95	51.96
180	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00

**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	33.52	33.52	33.52	33.52	33.52	33.52	33.52	33.52	33.52	33.52
5	52.60	50.97	49.19	47.30	45.28	43.18	41.02	38.76	36.47	36.05
10	80.61	74.89	68.90	65.08	61.03	56.68	52.09	47.33	42.38	40.36
15	116.72	108.47	99.44	89.70	79.34	72.25	65.01	57.48	49.62	44.61
20	157.78	144.42	130.26	117.22	103.36	88.78	78.55	68.19	57.39	49.51
25	198.91	181.53	163.45	144.26	126.67	108.84	92.49	79.04	65.04	54.68
30	239.82	218.14	195.35	172.43	148.69	127.42	105.61	89.26	72.48	59.56
35	276.26	253.63	226.65	199.05	171.50	145.07	119.63	98.58	78.78	63.75
40	307.94	283.50	255.68	223.94	192.46	161.05	132.51	107.38	84.95	67.39
45	336.20	309.62	280.87	246.89	211.53	176.77	145.08	116.56	91.79	72.27
50	361.46	332.67	301.61	267.37	229.47	192.89	157.96	125.92	98.56	76.72
55	386.22	355.75	322.33	286.45	246.92	207.55	169.40	134.17	104.60	80.87
60	409.60	377.76	342.45	304.03	262.66	220.48	179.64	141.91	110.29	84.52

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CANDELA TABULATION - (Cont.)

65	429.93	396.62	359.58	319.17	276.11	231.98	189.37	149.79	116.13	88.38
70	448.14	413.02	374.06	331.83	287.58	242.32	197.92	156.01	121.02	92.26
75	464.65	427.11	386.55	343.07	297.26	250.70	204.94	160.84	125.05	95.17
80	475.98	437.41	395.93	351.29	304.39	257.00	209.82	164.93	127.66	97.34
85	482.32	443.41	401.34	356.52	309.51	261.16	212.60	166.88	129.40	98.48
90	483.62	444.93	402.69	357.64	309.76	261.56	213.42	167.29	129.67	98.56
95	482.06	443.08	401.00	355.83	309.01	260.61	212.66	166.34	128.93	97.40
100	475.47	437.04	395.51	350.83	304.18	256.14	208.75	164.19	127.26	95.82
105	464.18	426.46	385.82	342.12	296.35	250.00	203.56	159.71	124.24	93.59
110	448.16	412.59	373.39	330.98	286.22	240.89	196.63	154.13	120.15	90.83
115	430.45	397.09	359.35	318.18	274.48	230.00	187.23	147.18	114.85	87.04
120	410.13	377.75	342.29	302.93	260.87	218.22	176.98	139.32	108.62	82.38
125	386.35	355.33	321.56	284.95	244.88	204.97	166.72	131.85	102.99	78.34
130	361.34	331.68	300.05	265.26	226.84	189.90	155.07	123.67	97.09	74.46
135	335.29	308.27	279.07	244.01	207.89	173.42	141.94	113.98	90.31	69.74
140	306.23	281.44	253.17	220.60	188.59	157.02	128.64	104.19	82.87	64.58
145	273.61	250.57	223.20	195.27	167.40	140.88	115.74	95.74	77.24	61.13
150	236.30	214.29	191.20	168.29	144.58	123.60	102.04	86.66	70.80	57.23
155	194.40	176.92	158.85	139.66	122.42	104.92	89.20	76.96	64.17	52.92
160	152.57	139.29	125.21	112.65	99.25	85.14	75.90	66.57	56.79	48.36
165	111.41	103.57	94.96	85.64	75.69	69.43	63.03	56.35	49.35	45.02
170	76.29	70.88	65.19	62.09	58.74	55.10	51.23	47.19	42.98	41.43
175	50.82	49.55	48.15	46.64	45.03	43.34	41.61	39.79	37.95	37.69
180	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00

Vert. Horizontal Angles

Angles	100	105	110	115	120	125	130	135	140	145
0	33.52	33.52	33.52	33.52	33.52	33.52	33.52	33.52	33.52	33.52
5	35.62	35.16	34.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	38.28	36.27	34.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	39.56	34.71	30.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	41.48	33.95	31.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	44.07	35.83	29.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	46.37	33.95	22.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	47.73	29.70	20.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40	47.67	25.57	18.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45	48.96	25.40	14.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50	50.61	26.03	9.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55	52.30	24.72	7.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	53.66	22.56	7.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	55.44	20.48	6.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	57.29	19.36	5.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75	58.54	18.97	5.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80	59.19	18.92	4.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
85	60.29	18.37	3.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	60.01	18.31	3.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	58.95	17.99	3.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	58.16	17.62	4.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	56.96	17.14	4.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	55.13	17.13	5.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115	52.68	18.00	5.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	50.21	19.83	6.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	48.71	22.50	8.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	47.29	23.41	10.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	45.47	21.75	15.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L061911303.IES

CANDELA TABULATION - (Cont.)

140	44.19	21.82	18.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	44.66	28.15	20.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	43.36	33.50	24.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	41.43	34.40	30.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	39.92	32.24	31.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	40.65	36.49	32.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	39.83	38.29	36.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	37.44	37.16	36.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00

Vert. Horizontal Angles
Angles

	<u>150</u>	<u>155</u>	<u>160</u>	<u>165</u>	<u>170</u>	<u>175</u>	<u>180</u>
0	33.52	33.52	33.52	33.52	33.52	33.52	33.52
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	36.00	36.00	36.00	36.00	36.00	36.00	36.00

IES INDOOR REPORT
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ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	22.55	N.A.	0.90
0-30	72.26	N.A.	3.00
0-40	162.64	N.A.	6.70
0-60	475.17	N.A.	19.40
0-80	951.65	N.A.	38.90
0-90	1225.17	N.A.	50.10
10-90	1221.68	N.A.	50.00
20-40	140.09	N.A.	5.70
20-50	273.89	N.A.	11.20
40-70	534.06	N.A.	21.80
60-80	476.47	N.A.	19.50
70-80	254.95	N.A.	10.40
80-90	273.52	N.A.	11.20
90-110	527.93	N.A.	21.60
90-120	748.93	N.A.	30.60
90-130	927.07	N.A.	37.90
90-150	1149.47	N.A.	47.00
90-180	1220.03	N.A.	49.90
110-180	692.09	N.A.	28.30
0-180	2445.2	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	3.49
10-20	19.05
20-30	49.71
30-40	90.38
40-50	133.80
50-60	178.73
60-70	221.52
70-80	254.95
80-90	273.52
90-100	273.34
100-110	254.60
110-120	221.00
120-130	178.14
130-140	132.98
140-150	89.42
150-160	48.72
160-170	18.41
170-180	3.42

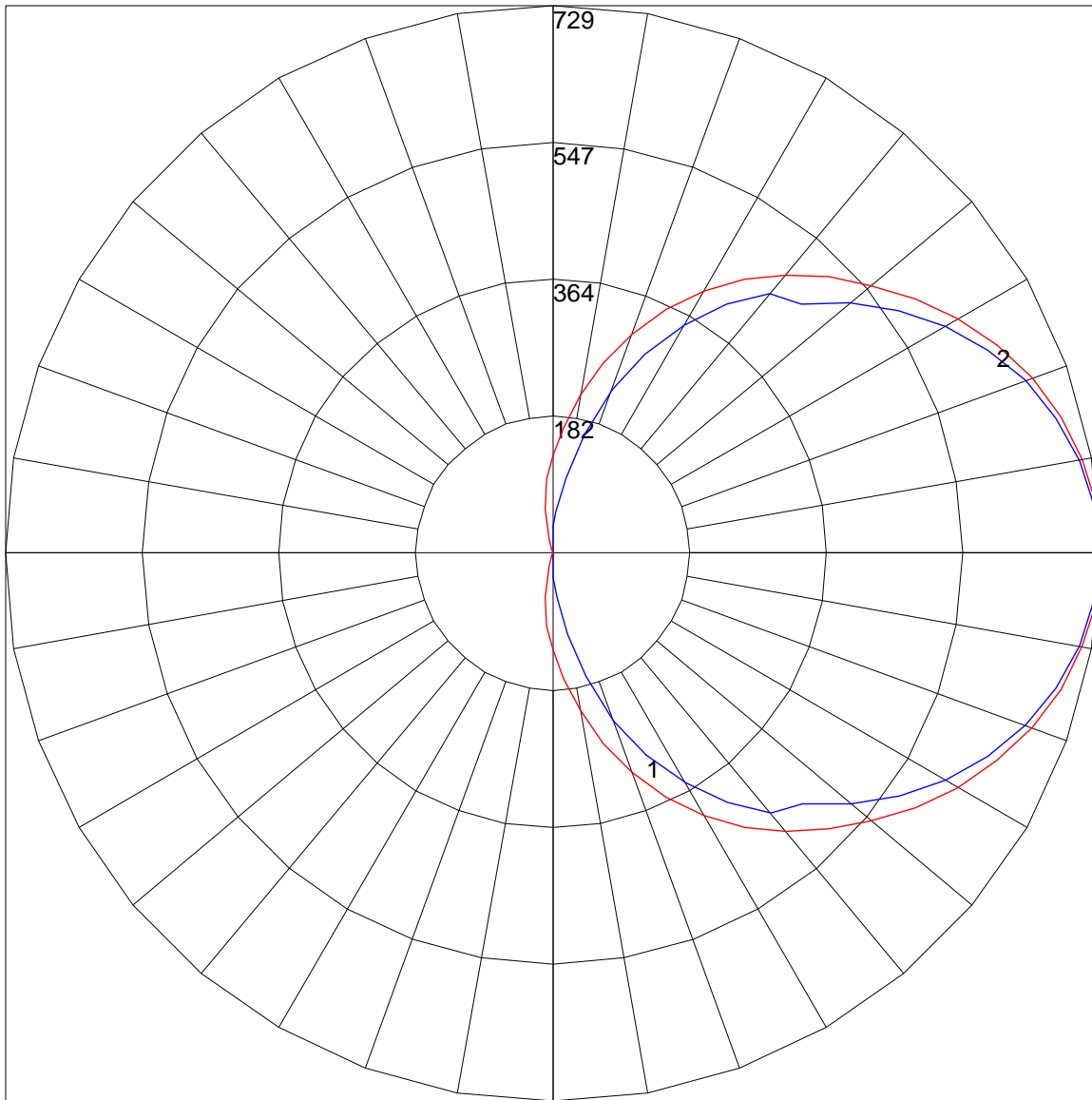
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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	74	84	78	73	68	65	60	57	52	49	46	41	38	36	30
2	82	71	63	56	74	65	58	51	53	48	43	43	38	34	33	29	26	21
3	73	61	51	44	66	56	47	40	45	39	33	36	31	26	27	23	20	15
4	66	53	43	36	60	48	39	33	39	32	27	31	26	21	23	19	16	12
5	60	46	37	29	54	42	33	27	34	27	22	27	22	17	20	16	13	9
6	55	41	32	25	50	37	29	23	30	24	19	24	19	15	18	14	11	7
7	51	37	27	21	46	33	25	19	27	21	16	22	16	12	16	12	9	6
8	47	33	24	18	42	30	22	17	25	18	14	19	14	11	15	11	8	5
9	43	30	21	16	39	27	20	14	22	16	12	18	13	9	13	9	7	4
10	40	27	19	14	37	25	18	13	20	14	10	16	11	8	12	9	6	4

POLAR GRAPH



Maximum Candela = 728.84 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.)