



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

Report No: L061801701



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Issue Date: 6/29/2018

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

Model Number: 08-100-24D-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.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 6/25/18

Date of Tests: 6/25/18 - 6/29/18

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	1/9/19
BK PRECISION	1747	PS-DC04	1/10/19
Fluke Digital Thermometer	52K/J	MT-TP05	1/10/19
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.

Test Summary

Manufacturer:	Cerno LLC
Model Number:	08-100-24D-27P1
Driver Model Number:	EFORE RCL030-0700B
Total Lumens:	1345.91
Input Voltage (VAC/60Hz):	120.00
Input Current (Amp):	0.19
Input Power (W):	22.38
Input Power Factor:	0.98
Current ATHD @ 120V(%):	14%
Current ATHD @ 277V(%):	N/A
Efficacy:	60.14
Color Rendering Index (CRI):	95
Correlated Color Temperature (K):	2619
Chromaticity Coordinate x:	0.4653
Chromaticity Coordinate y:	0.4098
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:45
Total Operating Time (Hours):	2:00

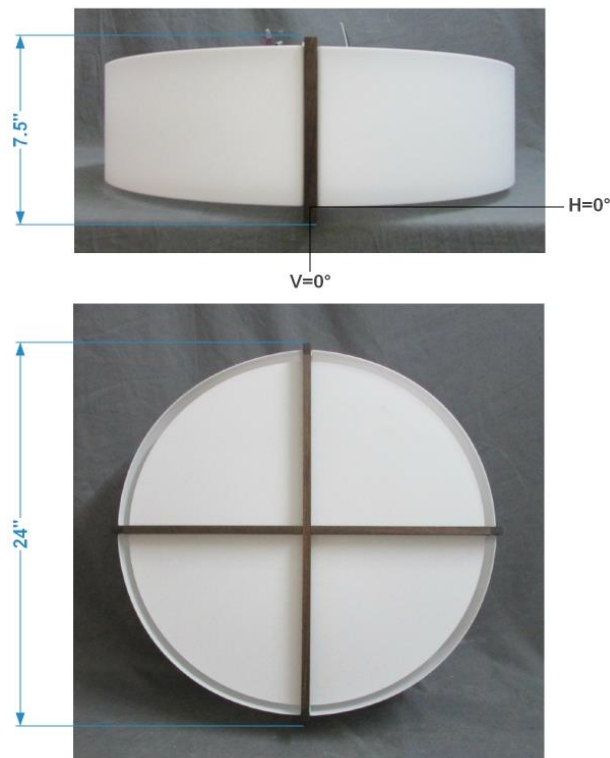
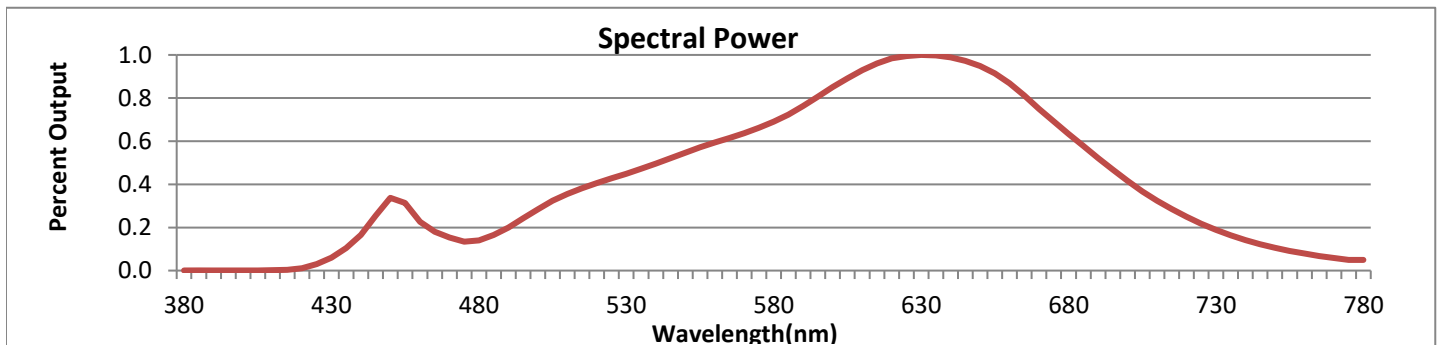


FIG. 1 LUMINAIRE



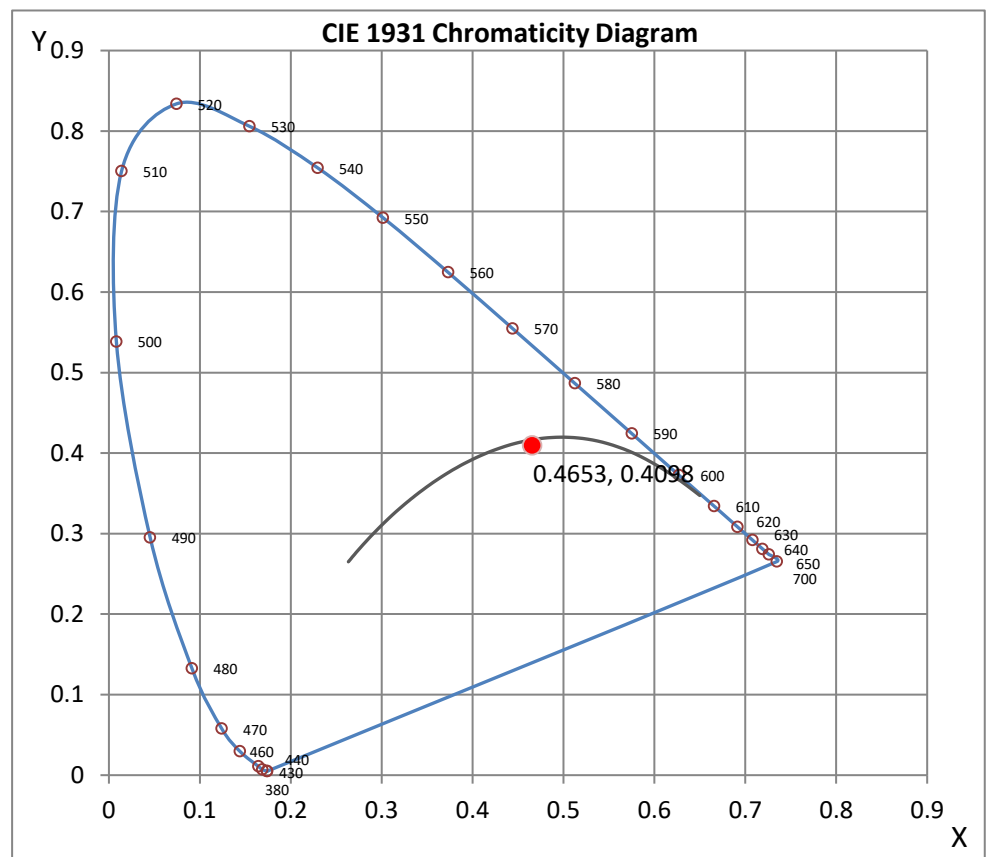
Wavelength	W/m ² nm	440	0.1657	510	0.3553	580	0.6904	650	0.9488	720	0.2496
380	0.0007	450	0.3370	520	0.4056	590	0.7629	660	0.8683	730	0.1888
390	0.0007	460	0.2257	530	0.4484	600	0.8502	670	0.7506	740	0.1409
400	0.0009	470	0.1535	540	0.4969	610	0.9302	680	0.6348	750	0.1062
410	0.0016	480	0.1400	550	0.5473	620	0.9838	690	0.5210	760	0.0788
420	0.0116	490	0.1998	560	0.5938	630	1.0000	700	0.4156	770	0.0580
430	0.0603	500	0.2845	570	0.6376	640	0.9891	710	0.3238	780	0.0496

CRI & CCT

x	0.4653
y	0.4098
u'	0.2664
v'	0.5279
CRI	94.70
CCT	2619
Duv	-0.00070

R Values

R1	95.56
R2	96.93
R3	96.51
R4	95.54
R5	95.13
R6	96.42
R7	94.22
R8	87.36
R9	72.23
R10	91.77
R11	96.40
R12	87.02
R13	95.95
R14	97.06



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 : Joseph Shin

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: 9*



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Photometric Test Report

IES INDOOR REPORT

PHOTOMETRIC FILENAME : L061801701.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L061801701
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 6/29/2018
[MANUFAC] Cerno LLC
[LUMCAT] 08-100-24D-27P1
[LUMINAIRE] Plura 24 Integrated LED
[BALLASTCAT] EFORE RCL030-0700B
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[INPUT] 120VAC, 22.38W
[TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	1346
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	60
Total Luminaire Watts	22.38
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	Circular w/ Sides
Luminous Length (0-180)	1.98 ft (Diameter)
Luminous Width (90-270)	1.98 ft (Diameter)
Luminous Height	1.46 ft

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	369	362	372
55	312	302	312
65	258	247	258
75	201	189	201
85	154	150	154

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L061801701.IES

CANDELA TABULATION

	<u>0.0</u>	<u>22.5</u>	<u>45.0</u>	<u>67.5</u>	<u>90.0</u>
0	198	198	198	198	198
5	197	197	197	197	198
10	197	196	196	196	197
15	195	194	194	194	195
20	191	190	189	190	191
25	184	183	182	183	185
30	177	175	174	175	177
35	168	165	164	166	168
40	157	155	154	155	158
45	145	143	142	143	146
50	133	130	129	130	133
55	120	117	116	117	120
60	108	105	104	105	108
65	94	91	90	91	94
70	80	77	76	77	80
75	67	64	63	64	67
80	55	52	51	52	55
85	45	44	44	44	45
90	44	43	43	44	44
95	50	50	50	50	50
100	60	60	60	60	61
105	72	72	72	72	73
110	87	86	87	86	87
115	102	101	102	101	102
120	114	114	115	114	114
125	124	124	124	124	124
130	132	132	132	132	132
135	138	137	138	138	138
140	141	141	141	141	142
145	144	144	143	144	144
150	145	145	144	145	145
155	145	145	144	145	145
160	143	143	142	143	143
165	140	140	139	140	140
170	137	137	137	137	137
175	131	131	131	131	130
180	126	126	126	126	126

IES INDOOR REPORT
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ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	73.63	N.A.	5.50
0-30	158.11	N.A.	11.70
0-40	261.91	N.A.	19.50
0-60	478.03	N.A.	35.50
0-80	637.14	N.A.	47.30
0-90	687.45	N.A.	51.10
10-90	668.66	N.A.	49.70
20-40	188.28	N.A.	14.00
20-50	298.93	N.A.	22.20
40-70	306.81	N.A.	22.80
60-80	159.11	N.A.	11.80
70-80	68.42	N.A.	5.10
80-90	50.32	N.A.	3.70
90-110	132.37	N.A.	9.80
90-120	232.43	N.A.	17.30
90-130	343.16	N.A.	25.50
90-150	539.31	N.A.	40.10
90-180	658.46	N.A.	48.90
110-180	526.08	N.A.	39.10
0-180	1345.91	N.A.	100.00

Total Luminaire Efficiency = N.A. %

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	18.80
10-20	54.83
20-30	84.49
30-40	103.79
40-50	110.66
50-60	105.47
60-70	90.68
70-80	68.42
80-90	50.32
90-100	55.52
100-110	76.85
110-120	100.05
120-130	110.73
130-140	106.14
140-150	90.01
150-160	66.79
160-170	39.70
170-180	12.65

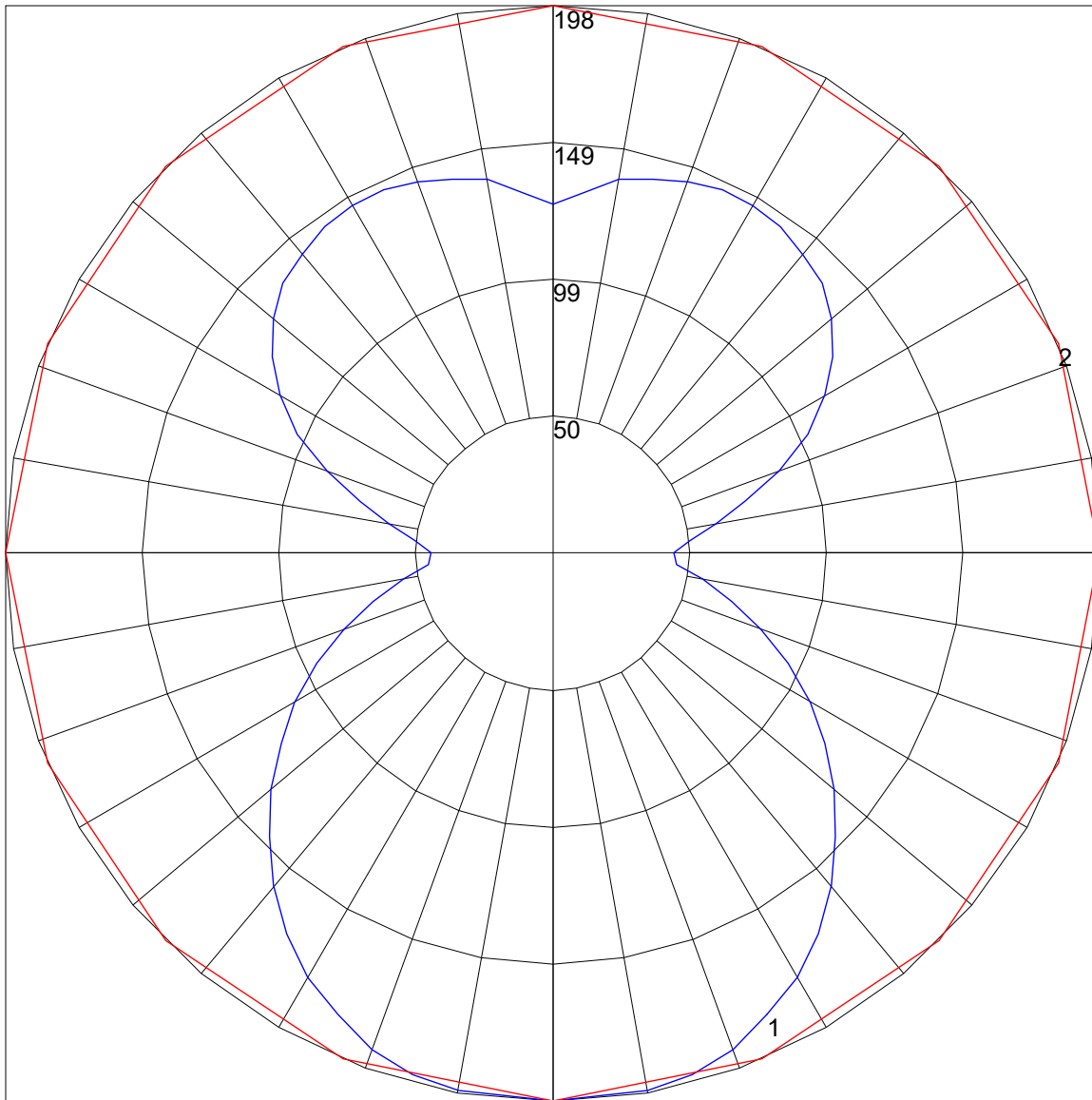
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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	84	84	84	70	70	70	57	57	57	51
1	96	91	87	83	89	84	81	77	71	68	66	59	57	55	48	47	45	40
2	87	79	72	67	80	73	67	62	62	57	53	51	48	45	41	39	37	32
3	79	69	61	55	73	64	57	51	54	49	44	45	41	37	36	33	31	27
4	72	61	52	46	66	56	49	43	48	42	37	40	35	32	32	29	26	22
5	66	54	45	39	61	50	42	37	42	36	32	35	31	27	29	25	23	19
6	61	48	40	34	56	45	37	32	38	32	28	32	27	24	26	22	20	17
7	56	43	35	29	52	40	33	28	34	28	24	29	24	21	24	20	17	15
8	52	39	31	26	48	37	29	24	31	25	21	26	22	18	22	18	15	13
9	48	36	28	23	45	33	26	22	29	23	19	24	20	16	20	16	14	12
10	45	33	25	20	42	31	24	19	26	21	17	22	18	15	19	15	13	11

POLAR GRAPH



Maximum Candela = 198 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.)