



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

Report No: L012013101



**Report No:** L012013101

**Issue Date:** 1/29/2020

**Report Prepared For:** Boyd Lighting Company  
 200A Harbor Dr, Sausalito, CA 94965

**Model Number:** C-10702

**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:** 1/27/20

**Date of Tests:** 1/27/20 - 1/29/20

**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

<b>Manufacturer:</b>	Boyd Lighting Company
<b>Model Number:</b>	C-10702
<b>Driver Model Number:</b>	MEAN WELL NPF-90D-24

### Test Summary

<b>Total Lumens:</b>	3599.15
<b>Efficacy:</b>	45.32
<b>Color Redering Index:</b>	92.0
<b>Correlated Color Temperature:</b>	2707
<b>Input Voltage (VAC/60Hz):</b>	120.01
<b>Input Current (Amp):</b>	0.6654
<b>Input Power (W):</b>	79.42
<b>Input Power Factor:</b>	0.9945
<b>Current ATHD (%):</b>	5.5%

### Test Condition

<b>Ambient Temperature (°C):</b>	25.0
<b>Stabilization Time (Hours):</b>	0:45
<b>Total Operating Time (Hours):</b>	3:35

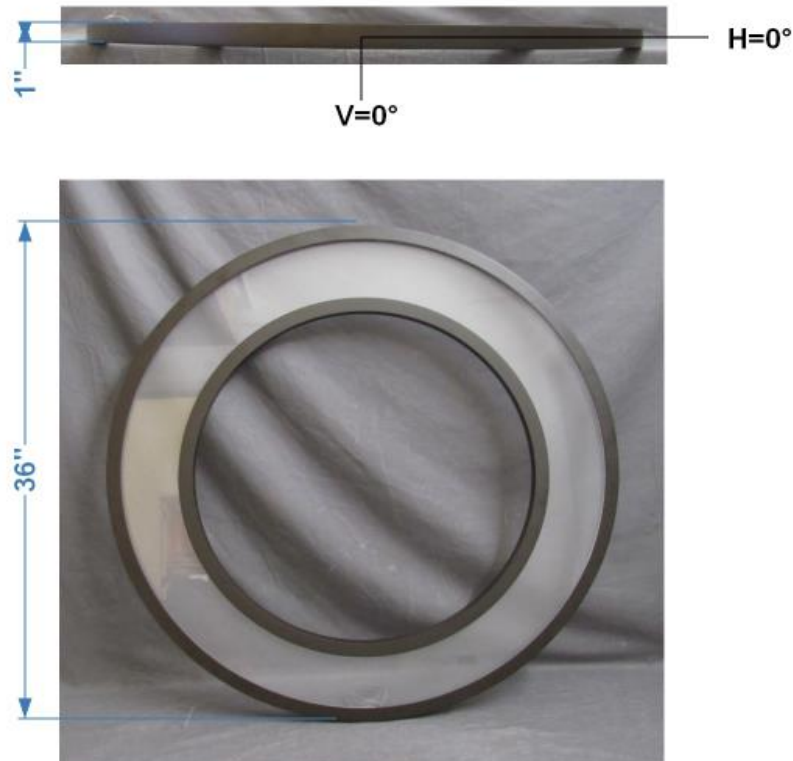
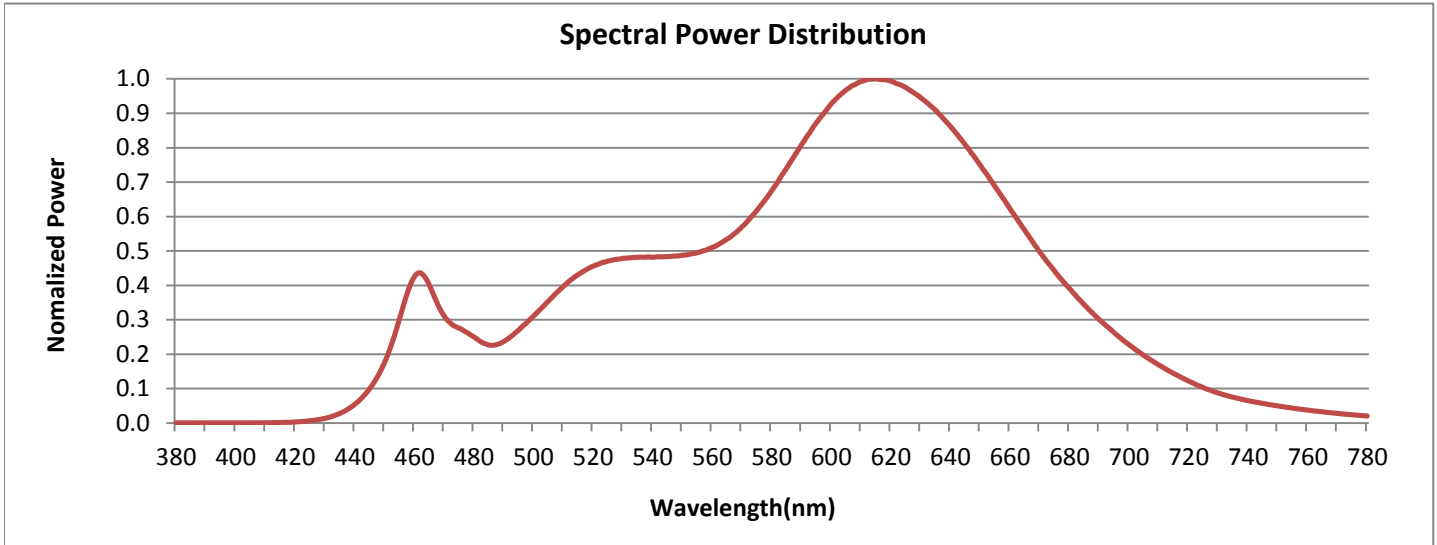


FIG. 1 LUMINAIRE

**Colorimetry Test Results**

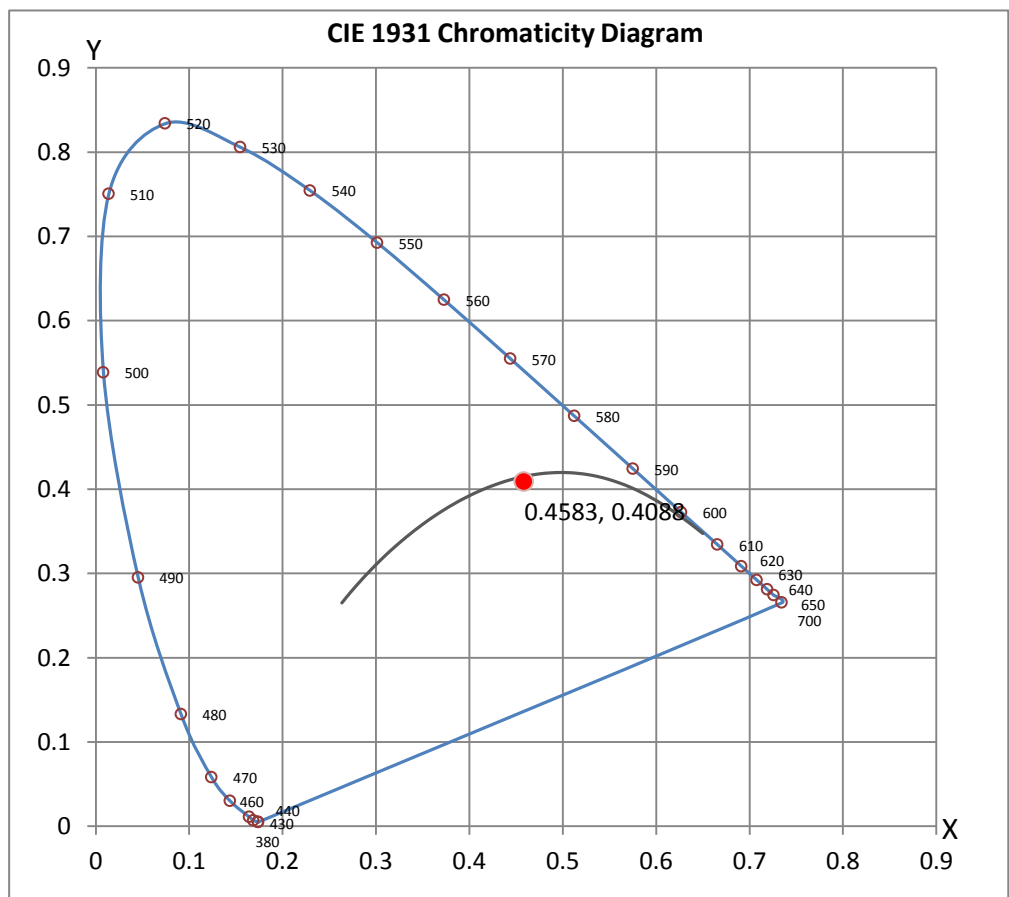


**CRI & CCT**

x	0.4583
y	0.4088
u'	0.2623
v'	0.5264
CRI	92.00
CCT	2707
Duv	-0.00053

**R Values**

R1	97.46
R2	97.70
R3	93.44
R4	95.91
R5	97.36
R6	90.41
R7	86.62
R8	77.31
R9	55.13
R10	95.27
R11	96.66
R12	82.71
R13	99.33
R14	97.39
R15	89.45



## 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 : Keyur Patel

Test Report Reviewed by:



Steve Kang  
Quality Assurance

*\*Attached are photometric data reports. Total number of pages: 9*



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

# Photometric Test Report

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L012013101.IES**

**DESCRIPTION INFORMATION (From Photometric File)**

IESNA:LM-63-2002  
 [TEST] L012013101  
 [TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)  
 [ISSUEDATE] 1/29/2020  
 [MANUFAC] Boyd Lighting Company  
 [LUMCAT] C-10702  
 [LUMINAIRE] Ghost Pendant 36"  
 [BALLASTCAT] MEAN WELL NPF-90D-24  
 [OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND  
 [MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.  
 [INPUT] 120.01VAC, 79.42W  
 [TEST PROCEDURE] IESNA:LM-79-08

**CHARACTERISTICS**

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	3599
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	45
Total Luminaire Watts	79.42
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)	2.85 ft (Diameter)
Luminous Width (90-270)	2.85 ft (Diameter)
Luminous Height	0.04 ft

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

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	977	977	977
55	1113	1113	1113
65	1205	1205	1205
75	1142	1142	1142
85	658	658	658

IES INDOOR REPORT  
PHOTOMETRIC FILENAME : L012013101.IES

CANDELA TABULATION

	<u>0</u>
0	350.44
5	352.68
10	358.20
15	366.41
20	377.12
25	389.72
30	401.24
35	411.22
40	417.01
45	417.16
50	409.11
55	388.52
60	358.92
65	313.57
70	253.81
75	187.07
80	116.19
85	40.95
90	17.28
95	32.96
100	136.34
105	236.54
110	318.08
115	375.31
120	403.73
125	409.92
130	399.99
135	380.33
140	358.45
145	337.91
150	320.56
155	307.24
160	296.34
165	288.73
170	283.10
175	279.41
180	277.98

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L012013101.IES**

**ZONAL LUMEN SUMMARY**

Zone	Lumens	%Lamp	%Fixt
0-20	138.10	N.A.	3.80
0-30	318.62	N.A.	8.90
0-40	576.45	N.A.	16.00
0-60	1244.06	N.A.	34.60
0-80	1747.59	N.A.	48.60
0-90	1806.23	N.A.	50.20
10-90	1772.4	N.A.	49.20
20-40	438.35	N.A.	12.20
20-50	759.76	N.A.	21.10
40-70	974.76	N.A.	27.10
60-80	503.53	N.A.	14.00
70-80	196.38	N.A.	5.50
80-90	58.64	N.A.	1.60
90-110	304.50	N.A.	8.50
90-120	669.46	N.A.	18.60
90-130	1033.63	N.A.	28.70
90-150	1541.24	N.A.	42.80
90-180	1792.92	N.A.	49.80
110-180	1488.42	N.A.	41.40
0-180	3599.15	N.A.	100.00

Total Luminaire Efficiency = N.A.%

**ZONAL LUMEN SUMMARY**

Zone	Lumens
0-10	33.84
10-20	104.26
20-30	180.52
30-40	257.82
40-50	321.41
50-60	346.20
60-70	307.15
70-80	196.38
80-90	58.64
90-100	59.76
100-110	244.74
110-120	364.96
120-130	364.17
130-140	294.47
140-150	213.15
150-160	142.75
160-170	82.14
170-180	26.79

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L012013101.IES**

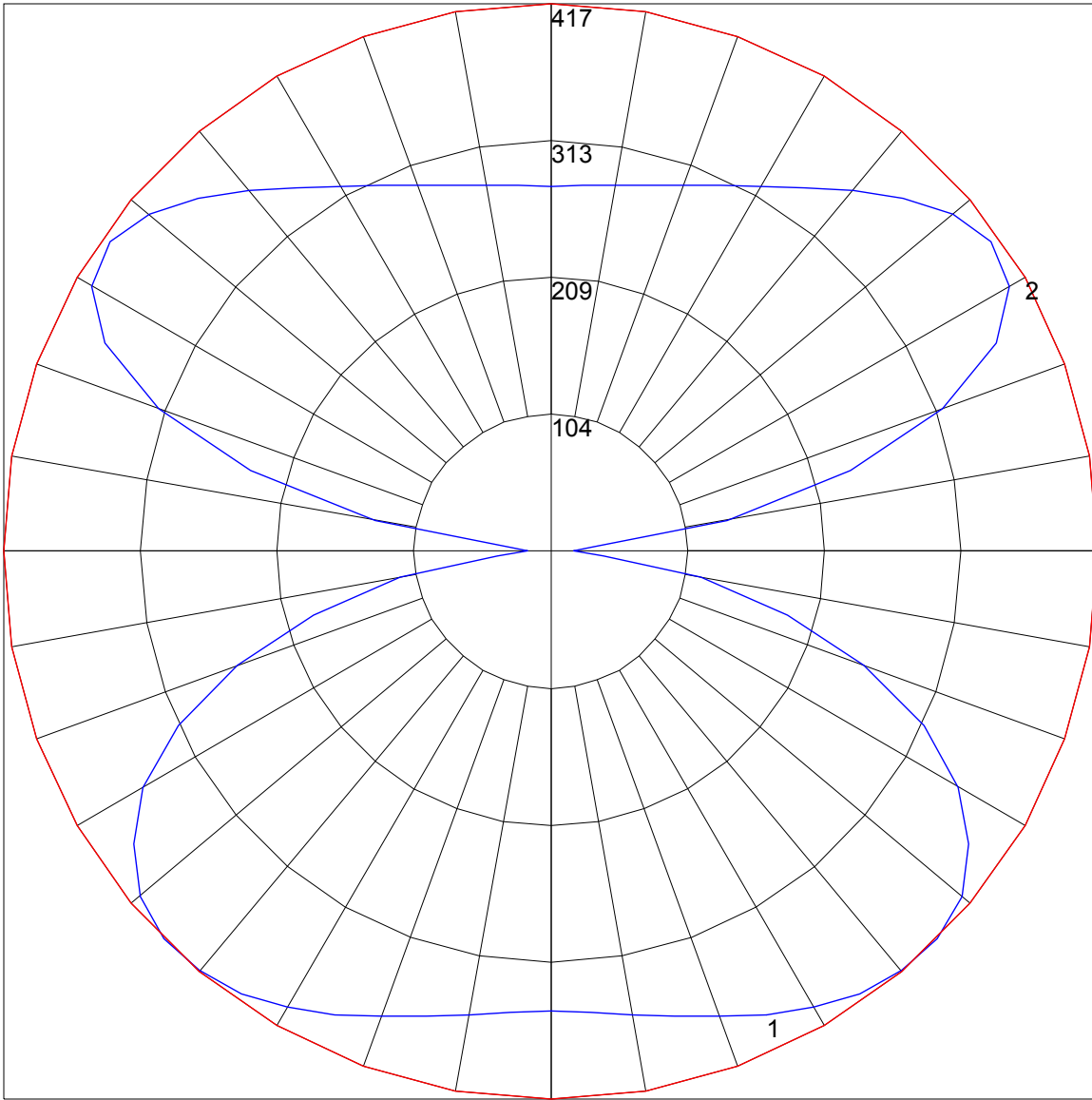
**COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD**

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	107	107	107	107	99	99	99	99	83	83	83	69	69	69	56	56	56	50
1	97	92	88	84	89	85	81	78	71	69	66	59	57	55	48	47	45	40
2	87	79	72	67	80	73	67	62	61	57	53	51	47	45	41	39	36	32
3	79	68	60	54	72	63	56	50	53	48	43	44	40	36	35	32	30	26
4	72	60	51	45	65	55	48	42	46	41	36	38	34	30	31	27	25	21
5	65	53	44	38	60	49	41	35	41	35	30	34	29	26	27	24	21	18
6	60	47	38	32	55	43	36	30	37	30	26	30	26	22	24	21	18	15
7	55	42	34	28	50	39	31	26	33	27	22	27	22	19	22	18	16	13
8	51	38	30	24	47	35	28	23	30	24	20	25	20	17	20	16	14	11
9	47	34	27	21	43	32	25	20	27	21	17	23	18	15	18	15	12	10
10	44	31	24	19	40	29	22	18	25	19	15	21	16	13	17	13	11	9



POLAR GRAPH



Maximum Candela = 417.16 Located At Horizontal Angle = 0, Vertical Angle = 45  
# 1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)  
# 2 - Horizontal Cone Through Vertical Angle (45) (Through Max. Cd.)



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

Report No: L012013102



**Report No:** L012013102

**Issue Date:** 1/29/2020

**Report Prepared For:** Boyd Lighting Company  
 200A Harbor Dr, Sausalito, CA 94965

**Model Number:** C-10703

**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:** 1/27/20

**Date of Tests:** 1/27/20 - 1/29/20

**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**

<b>Manufacturer:</b>	Boyd Lighting Company
<b>Model Number:</b>	C-10703
<b>Driver Model Number:</b>	MEAN WELL NPF-90D-24

**Test Summary**

<b>Total Lumens:</b>	3618.62
<b>Efficacy:</b>	45.92
<b>Color Redering Index:</b>	92.3
<b>Correlated Color Temperature:</b>	2725
<b>Input Voltage (VAC/60Hz):</b>	119.99
<b>Input Current (Amp):</b>	0.6602
<b>Input Power (W):</b>	78.80
<b>Input Power Factor:</b>	0.9948
<b>Current ATHD (%):</b>	5.3%

**Test Condition**

<b>Ambient Temperature (°C):</b>	25.0
<b>Stabilization Time (Hours):</b>	0:45
<b>Total Operating Time (Hours):</b>	3:45

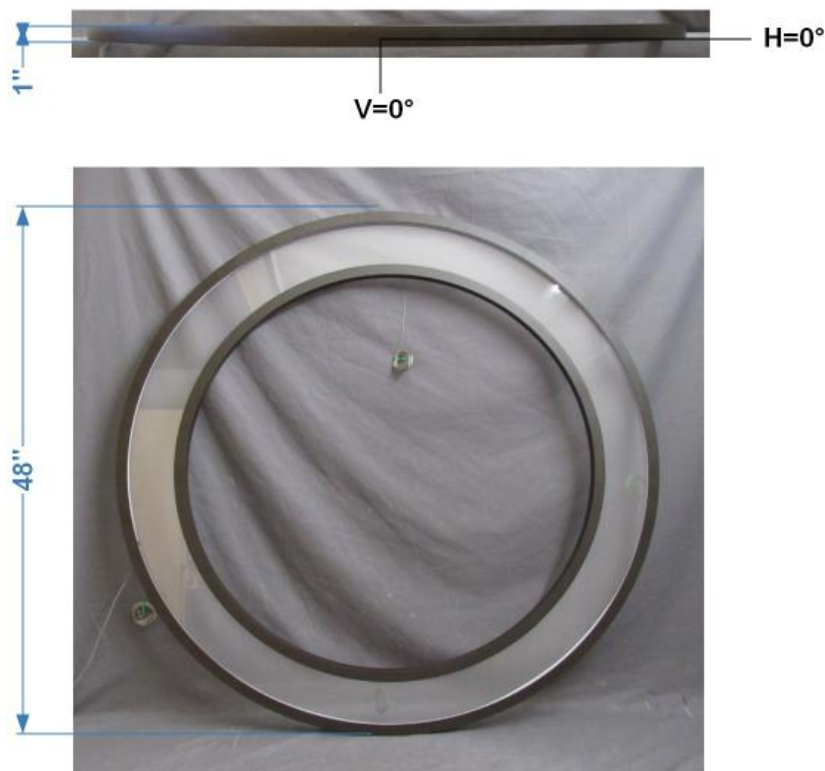
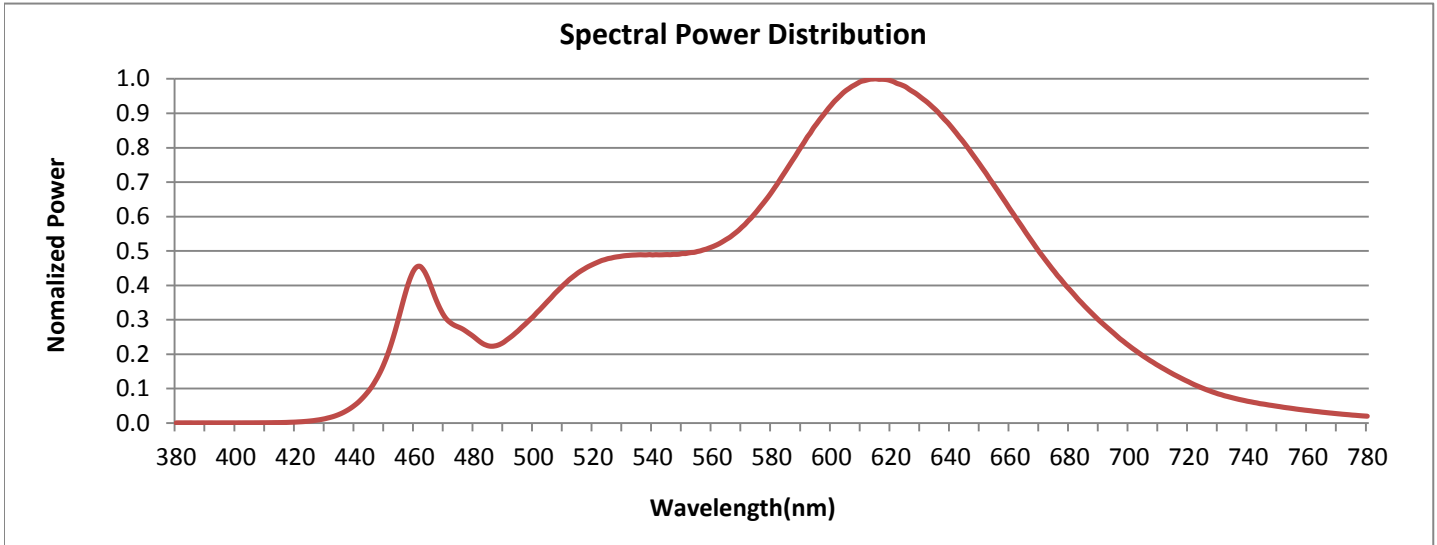


FIG. 1 LUMINAIRE

**Colorimetry Test Results**

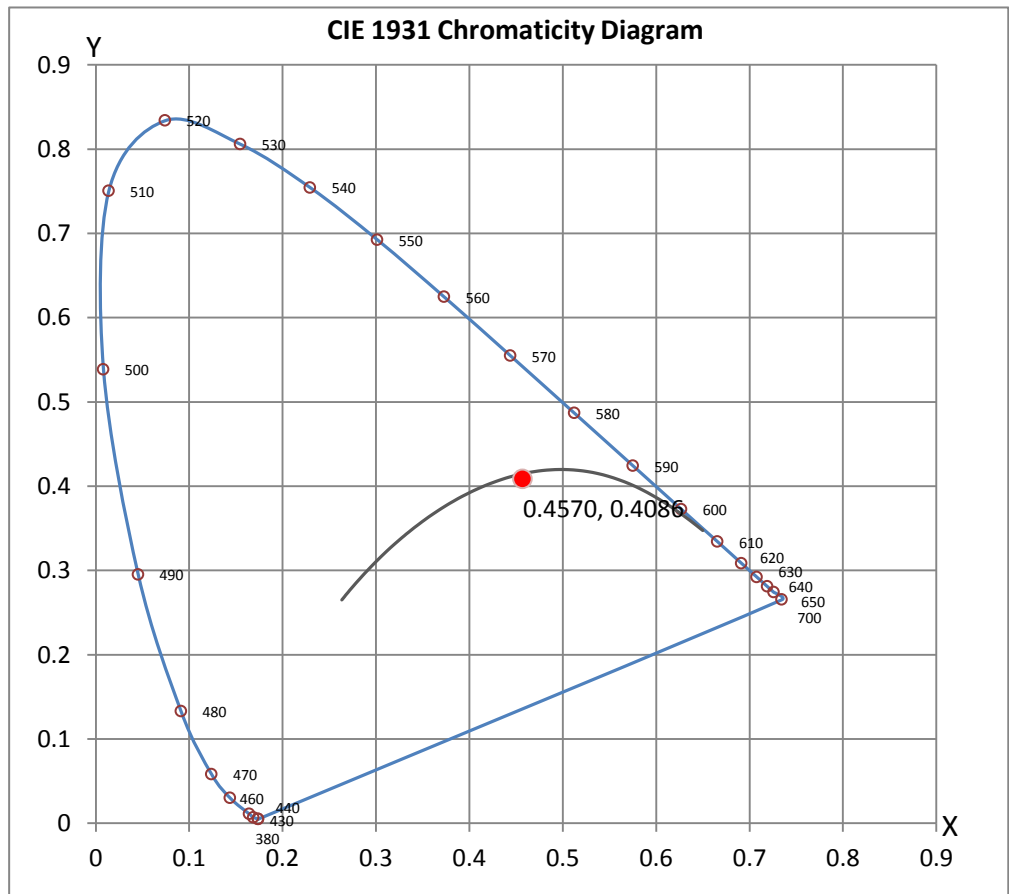


**CRI & CCT**

x	0.4570
y	0.4086
u'	0.2615
v'	0.5262
CRI	92.30
CCT	2725
Duv	-0.00049

**R Values**

R1	97.81
R2	97.64
R3	93.95
R4	96.22
R5	97.33
R6	90.48
R7	87.05
R8	78.17
R9	56.65
R10	95.34
R11	96.24
R12	82.43
R13	99.19
R14	97.69
R15	90.01



## 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 : Keyur Patel

Test Report Reviewed by:



Steve Kang  
Quality Assurance

*\*Attached are photometric data reports. Total number of pages: 9*



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

# Photometric Test Report

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L012013102.IES**

## DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002  
[TEST] L012013102  
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)  
[ISSUEDATE] 1/29/2020  
[MANUFAC] Boyd Lighting Company  
[LUMCAT] C-10703  
[LUMINAIRE] Ghost Pendant 48"  
[BALLASTCAT] MEAN WELL NPF-90D-24  
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND  
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.  
[INPUT] 119.99VAC, 78.80W  
[TEST PROCEDURE] IESNA:LM-79-08

## CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	3619
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	46
Total Luminaire Watts	78.8
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)	3.83 ft (Diameter)
Luminous Width (90-270)	3.83 ft (Diameter)
Luminous Height	0.04 ft

## LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	550	550	550
55	623	623	623
65	672	672	672
75	631	631	631
85	400	400	400

IES INDOOR REPORT  
PHOTOMETRIC FILENAME : L012013102.IES

CANDELA TABULATION

	<u>0</u>
0	360.74
5	362.99
10	368.56
15	377.39
20	387.88
25	398.86
30	408.98
35	417.72
40	423.03
45	422.37
50	413.10
55	390.32
60	360.20
65	312.88
70	253.12
75	183.72
80	114.75
85	43.01
90	22.61
95	32.96
100	136.34
105	236.54
110	318.08
115	375.31
120	403.73
125	409.92
130	399.99
135	380.33
140	358.45
145	337.91
150	320.56
155	307.24
160	296.34
165	288.73
170	283.10
175	279.41
180	277.98

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L012013102.IES**

**ZONAL LUMEN SUMMARY**

Zone	Lumens	%Lamp	%Fixt
0-20	142.14	N.A.	3.90
0-30	326.89	N.A.	9.00
0-40	588.90	N.A.	16.30
0-60	1262.42	N.A.	34.90
0-80	1763.41	N.A.	48.70
0-90	1824.24	N.A.	50.40
10-90	1789.42	N.A.	49.50
20-40	446.76	N.A.	12.30
20-50	772.11	N.A.	21.30
40-70	980.46	N.A.	27.10
60-80	500.99	N.A.	13.80
70-80	194.05	N.A.	5.40
80-90	60.83	N.A.	1.70
90-110	305.96	N.A.	8.50
90-120	670.92	N.A.	18.50
90-130	1035.09	N.A.	28.60
90-150	1542.7	N.A.	42.60
90-180	1794.38	N.A.	49.60
110-180	1488.42	N.A.	41.10
0-180	3618.62	N.A.	100.00

Total Luminaire Efficiency = N.A.%

**ZONAL LUMEN SUMMARY**

Zone	Lumens
0-10	34.82
10-20	107.32
20-30	184.75
30-40	262.01
40-50	325.35
50-60	348.17
60-70	306.94
70-80	194.05
80-90	60.83
90-100	61.22
100-110	244.74
110-120	364.96
120-130	364.17
130-140	294.47
140-150	213.15
150-160	142.75
160-170	82.14
170-180	26.79



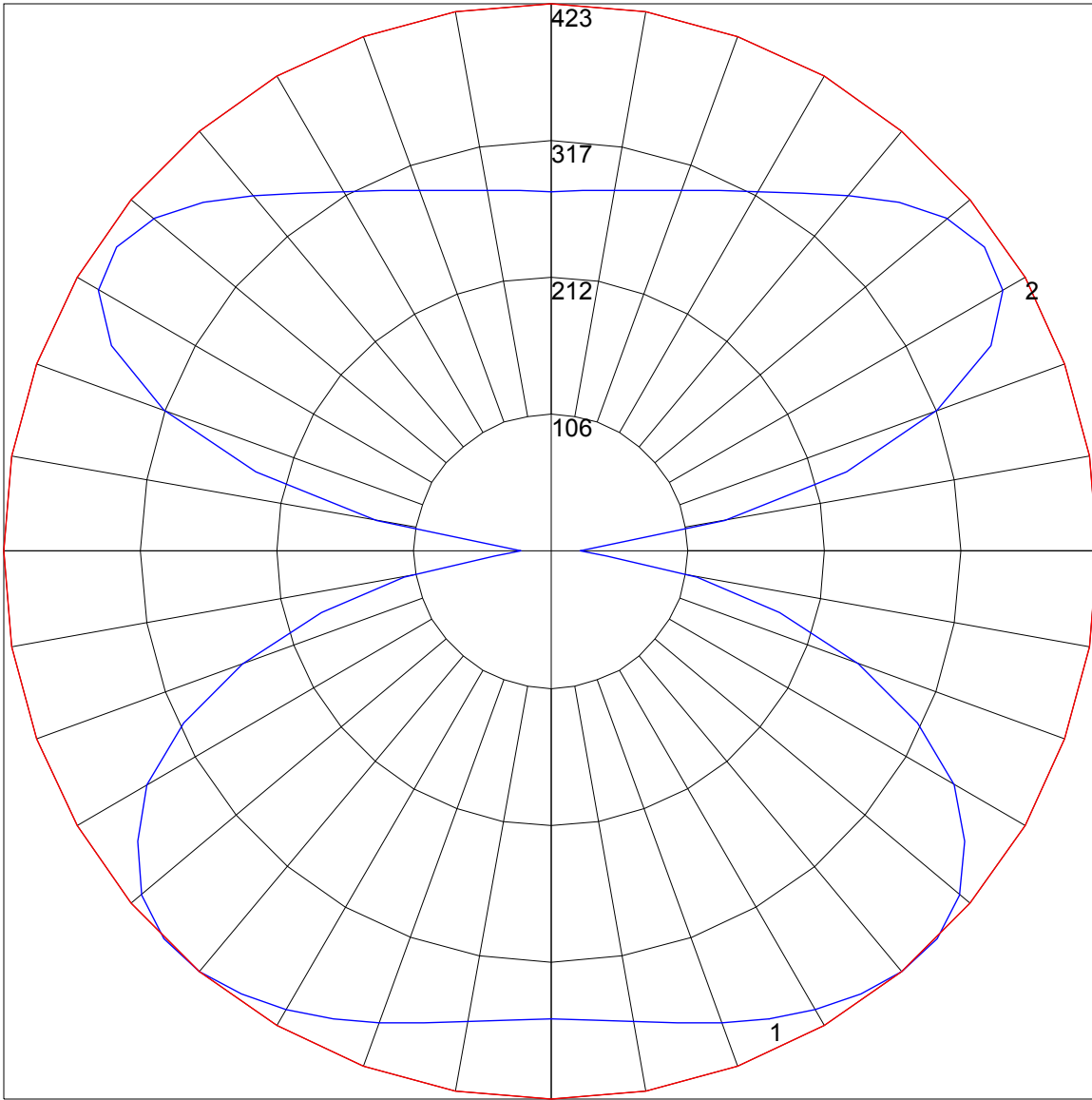
**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L012013102.IES**

**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	107	107	107	107	99	99	99	99	84	84	84	69	69	69	56	56	56	50
1	97	92	88	84	89	85	81	78	72	69	66	59	57	56	48	47	45	40
2	87	79	72	67	80	73	67	62	61	57	53	51	48	45	41	39	37	32
3	79	69	61	54	72	63	56	51	53	48	43	44	40	37	35	33	30	26
4	72	60	51	45	66	55	48	42	47	41	36	39	34	30	31	28	25	21
5	65	53	44	38	60	49	41	35	41	35	30	34	29	26	27	24	21	18
6	60	47	38	32	55	44	36	30	37	31	26	30	26	22	25	21	18	15
7	55	42	34	28	50	39	31	26	33	27	23	27	23	19	22	18	16	13
8	51	38	30	24	47	35	28	23	30	24	20	25	20	17	20	16	14	11
9	47	35	27	21	43	32	25	20	27	21	17	23	18	15	18	15	12	10
10	44	31	24	19	40	29	22	18	25	19	15	21	16	13	17	13	11	9

POLAR GRAPH



Maximum Candela = 423.03 Located At Horizontal Angle = 0, Vertical Angle = 40  
# 1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)  
# 2 - Horizontal Cone Through Vertical Angle (40) (Through Max. Cd.)