

AMERICAN GAS LAMP WORKS TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

Model 9000 Kronberg Lamp

PROJECT NUMBER

G105724524

REPORT NUMBER

105724524CRT-002

ISSUE DATE

2/26/2024

REVISION DATE

None

TEST DATES

2/26/2024

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

105724524CRT-002

MODEL NUMBER(s)

MODEL 9000 KRONBERG LAMP

REPORT RENDERED TO:

AMERICAN GAS LAMP WORKS
1299 4TH AVE
NEW KENSINGTON, PA 15068

STATEMENT OF LIMITATION

NVLAP Lab Code 100402-0. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. government.

AUTHORIZATION

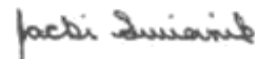
The testing performed was authorized by signed quote number QU-01416591.

TEST STANDARDS

ANSI/IES LM-79-19: Optical and Electrical Measurements of Solid State Lighting Products
IES LM-79-08: Electrical and Photometric Measurements of Solid State Lighting

In Charge of Testing:

Reviewer:



Melanie Brittain
Senior Associate Engineer
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SAMPLE INFORMATION

REPORT NO. 105724524CRT-002

ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received Date	Sampling Date
1	CRT2402191502-005	Model 9000 Kronberg Lamp	6 Sided Outdoor Lamp with Frosted Poly Lens	Production	2/19/2024	N/A
2		CS15761_STRADA-2x2MX-8-SCL	Type II Lens			
3		CS15751_STRADA-2x2MX-8-DWC	Type III Lens			
4		CS15750_STRADA-2x2MX-8-T4-B	Type IV Lens			
5		CS15763_STRADA-2x2MX-8-VSM	Type V Lens			

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	Model 9000 Kronberg Lamp Type II	1, 2
2	Model 9000 Kronberg Lamp Type III	1, 3
3	Model 9000 Kronberg Lamp Type IV	1, 4
4	Model 9000 Kronberg Lamp Type V	1, 5

SUMMARY

REPORT NO. 105724524CRT-002

PRODUCT INFORMATION AND SUMMARY OF DATA

Test Configuration 1	
Product Model No.:	Model 9000 Kronberg Lamp
Product Description:	6 Sided Outdoor Lamp with Frosted Poly Lens
LED Model No.:	Lumileds XR-7070
Driver Model No.:	Inventronics EUM-050S150DT

TEST METHODS

SEASONING IN SAMPLE ORIENTATION - LED PRODUCTS

No seasoning was performed in accordance with ANSI/IES LM-79-19

DUT SAMPLING METHOD

For testing plans, program requirements, or shipments requiring sampling of DUTs or components, the selections for each test were random. All samples are marked with control numbers regardless of being tested.

TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

A Type C Mirror Goniophotometer system was used to measure the luminous intensity (candela) at each angle of distribution for the DUT. Electrical measurements of the unit were measured using a power analyzer. Each DUT was operated at the rated input voltage of the system in its designated orientation. The ambient temperature and relative humidity was measured at 25°C ± 1.2°C and 10-65% respectively at a position within 1.5m and at equal height of the DUT. Stabilization procedures to LM-79-19 were followed. The test distance was ≥ 5x the longest luminous dimension of the DUT.

ANSI/IES Technical Memorandums (TM) reported are not NVLAP accredited

TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

REPORT NO. 105724524CRT-002

Test Configuration	Tested Model No.	Pass/Fail/NA
1	Model 9000 Kronberg Lamp Type II	NA

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS

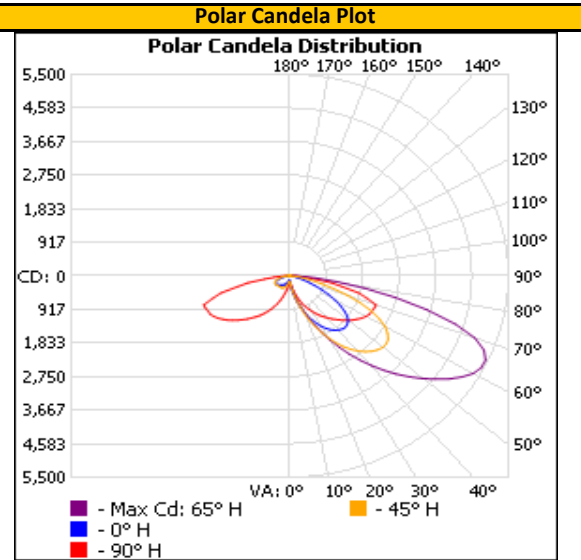
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Down	120.1	902.1	108.3	0.999

Light Output (lm)	Efficacy (lm/W)
7549.1	69.7

LUMINOUS INTENSITY SUMMARY (candela)

Vertical Angle (°)	Horizontal				
	0	30	45	65	90
0	170	170	170	170	170
5	288	280	271	245	205
10	490	480	463	421	333
15	754	751	742	693	506
20	1044	1064	1111	1045	707
25	1331	1391	1527	1487	919
30	1586	1680	1962	2012	1123
35	1796	1910	2358	2600	1317
40	1920	2064	2676	3192	1498
45	1978	2139	2910	3785	1688
50	1914	2122	3043	4357	1883
55	1677	1965	3018	4900	2061
60	1312	1645	2769	5327	2209
65	877	1178	2262	5432	2272
70	502	727	1540	4956	2307
75	255	380	836	3576	1797
80	128	178	384	1897	1061
85	70	85	154	674	394
90	46	49	70	175	139
95	34	31	40	56	57
100	26	21	26	30	32
105	20	15	18	21	21
110	16	11	14	15	15
115	14	10	11	12	12
120	12	9	9	10	10
125	11	9	9	9	10
130	10	8	8	9	9
135	9	8	8	8	9
140	8	7	7	7	8
145	7	7	6	6	7
150	5	5	5	4	5
155	3	4	3	3	4
160	1	2	2	1	2
165	0	0	0	0	0
170	0	0	0	0	0
175	0	0	0	0	0
180	0	0	0	0	0

Full luminous intensity matrix found in .IES file



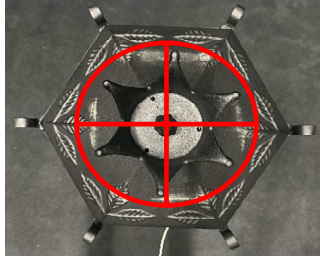
REPORT NO. 105724524CRT-002

ORIENTATION AND ALIGNMENT OF DUT

Luminous Opening		
Length (ft)	Width (ft)	Height (ft)
1.42	1.42	1.46
0°-180° H	90°-270° H	0°-180° V

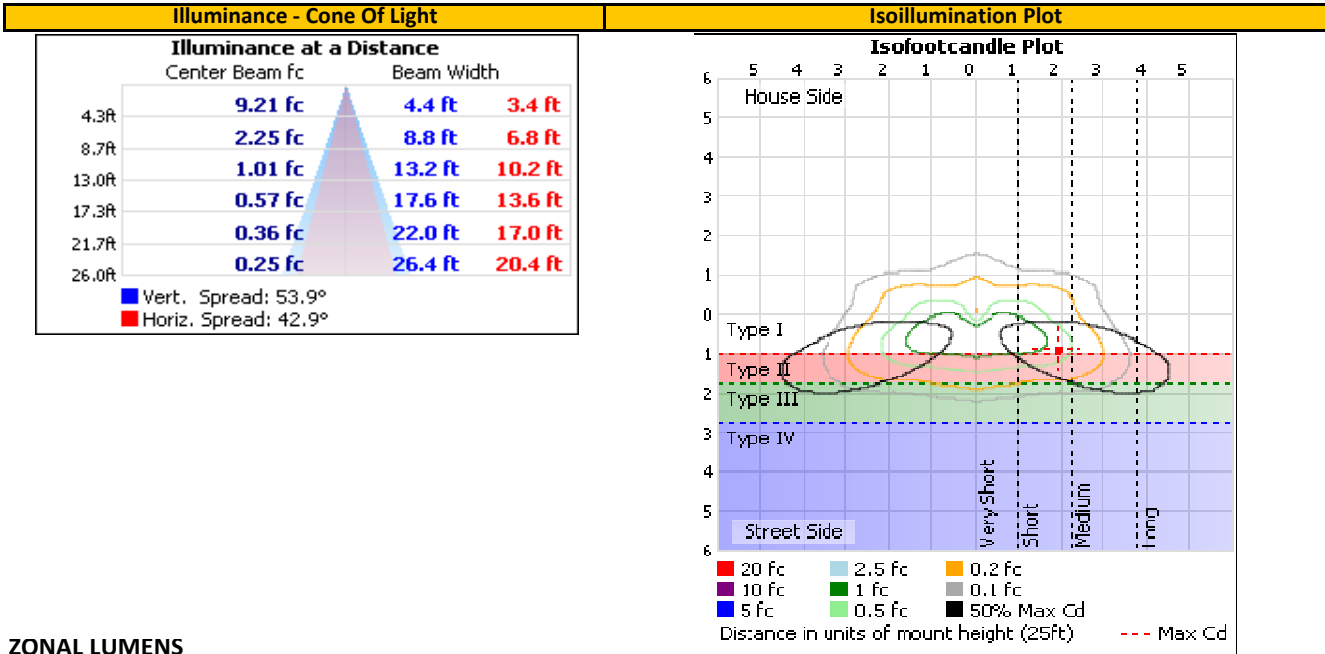
Test Distance (ft)
29.2

PHOTOMETRIC CENTER OF DUT



REPORT NO. 105724524CRT-002

ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary

Zone (°)	Lumens	Luminaire
0-30	596.3	7.9%
0-40	1,424.5	18.9%
0-60	4,321.9	57.2%
60-90	3,110.2	41.2%
70-100	1,487.6	19.7%
90-120	96.2	1.3%
0-90	7,432.1	98.4%
90-180	117.0	1.6%
0-180	7,549.1	100.0%

Zone (°)	Lumens	Total	Zone (°)	Lumens	Total
0-10	23.9	0.3%	90-100	61.0	0.8%
10-20	147.5	2.0%	100-110	22.8	0.3%
20-30	424.9	5.6%	110-120	12.3	0.2%
30-40	828.2	11.0%	120-130	8.7	0.1%
40-50	1267.0	16.8%	130-140	6.5	0.1%
50-60	1630.4	21.6%	140-150	4.0	0.1%
60-70	1683.6	22.3%	150-160	1.5	0.0%
70-80	1113.3	14.7%	160-170	0.2	0.0%
80-90	313.3	4.1%	170-180	0.0	0.0%

LUM. CLASSIFICATION SYSTEM (LCS)

CS Zone	Lumens	% Lamp	% Lum
FL (0-30)	444.7	N.A.	5.9
FM (30-60)	2962.9	N.A.	39.3
FH (60-80)	2063.5	N.A.	27.3
FVH (80-90)	193.7	N.A.	2.6
BL (0-30)	150.3	N.A.	2.0
BM (30-60)	761.7	N.A.	10.1
BH (60-80)	733.8	N.A.	9.7
BVH (80-90)	119.7	N.A.	1.6
UL (90-100)	61.0	N.A.	0.8
UH (100-180)	56.0	N.A.	0.7
Total	7547.3	N.A.	100.0
BUG Rating	B2-U3-G2		

TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

REPORT NO. 105724524CRT-002

Test Configuration	Tested Model No.	Pass/Fail/NA
2	Model 9000 Kronberg Lamp Type III	NA

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS

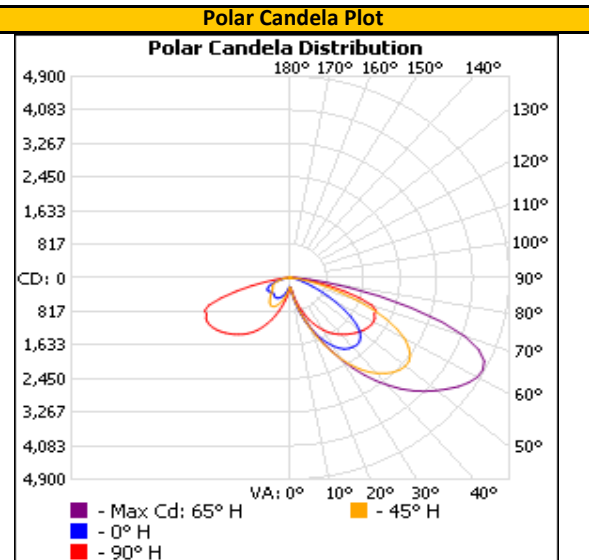
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Down	120.1	903.5	108.5	0.999

Light Output (lm)	Efficacy (lm/W)
7901.1	72.9

LUMINOUS INTENSITY SUMMARY (candela)

Vertical Angle (°)	Horizontal				
	0	30	45	65	90
0	237	237	237	237	237
5	355	349	340	319	288
10	599	585	564	533	468
15	926	908	894	856	704
20	1282	1274	1316	1256	968
25	1623	1662	1794	1742	1228
30	1909	1997	2278	2303	1461
35	2108	2253	2707	2879	1647
40	2188	2416	3028	3409	1794
45	2187	2469	3246	3879	1919
50	2031	2387	3351	4263	2029
55	1659	2111	3280	4604	2112
60	1173	1641	2957	4830	2145
65	715	1089	2369	4788	2071
70	401	632	1596	4161	1940
75	222	330	850	2803	1255
80	125	161	366	1332	586
85	73	81	137	443	232
90	49	48	64	124	96
95	36	31	40	51	50
100	27	22	27	32	31
105	21	16	20	22	21
110	17	12	15	17	16
115	15	11	13	14	13
120	13	10	11	12	12
125	13	10	10	11	11
130	12	10	10	11	11
135	11	10	10	10	11
140	10	9	9	9	10
145	8	8	8	8	8
150	6	7	6	6	7
155	4	5	4	4	5
160	2	3	2	2	3
165	0	1	0	0	1
170	0	0	0	0	0
175	0	0	0	0	0
180	0	0	0	0	0

Full luminous intensity matrix found in .IES file



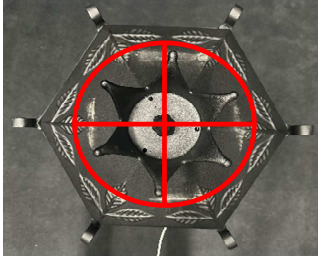
REPORT NO. 105724524CRT-002

ORIENTATION AND ALIGNMENT OF DUT

Luminous Opening		
Length (ft)	Width (ft)	Height (ft)
1.42	1.42	1.46
0°-180° H	90°-270° H	0°-180° V

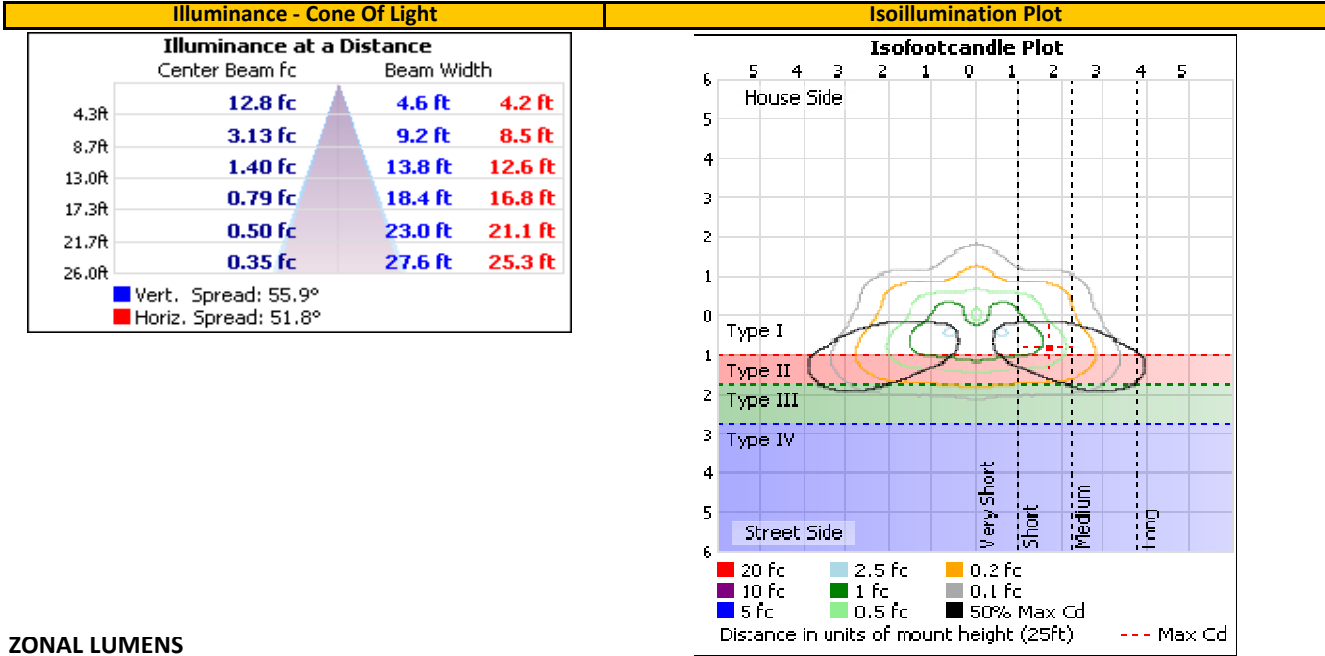
Test Distance (ft)
29.2

PHOTOMETRIC CENTER OF DUT



REPORT NO. 105724524CRT-002

ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary

Zone (°)	Lumens	Luminaire
0-30	809.3	10.2%
0-40	1,857.4	23.5%
0-60	5,029.9	63.7%
60-90	2,753.1	34.8%
70-100	1,207.8	15.3%
90-120	92.8	1.2%
0-90	7,783.0	98.5%
90-180	118.1	1.5%
0-180	7,901.1	100.0%

Zone (°)	Lumens	Total	Zone (°)	Lumens	Total
0-10	33.5	0.4%	90-100	55.3	0.7%
10-20	204.9	2.6%	100-110	23.8	0.3%
20-30	570.9	7.2%	110-120	13.7	0.2%
30-40	1048.1	13.3%	120-130	10.2	0.1%
40-50	1466.1	18.6%	130-140	7.9	0.1%
50-60	1706.4	21.6%	140-150	5.0	0.1%
60-70	1600.7	20.3%	150-160	2.0	0.0%
70-80	923.8	11.7%	160-170	0.3	0.0%
80-90	228.7	2.9%	170-180	0.0	0.0%

LUM. CLASSIFICATION SYSTEM (LCS)

CS Zone	Lumens	% Lamp	% Lum
FL (0-30)	535.1	N.A.	6.8
FM (30-60)	3139.8	N.A.	39.7
FH (60-80)	1807.5	N.A.	22.9
FVH (80-90)	137.2	N.A.	1.7
BL (0-30)	272.5	N.A.	3.4
BM (30-60)	1080.1	N.A.	13.7
BH (60-80)	717.4	N.A.	9.1
BVH (80-90)	91.5	N.A.	1.2
UL (90-100)	55.3	N.A.	0.7
UH (100-180)	62.8	N.A.	0.8
Total	7899.2	N.A.	100.0
BUG Rating	B2-U3-G2		

TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

REPORT NO. 105724524CRT-002

Test Configuration	Tested Model No.	Pass/Fail/NA
3	Model 9000 Kronberg Lamp Type IV	NA

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS

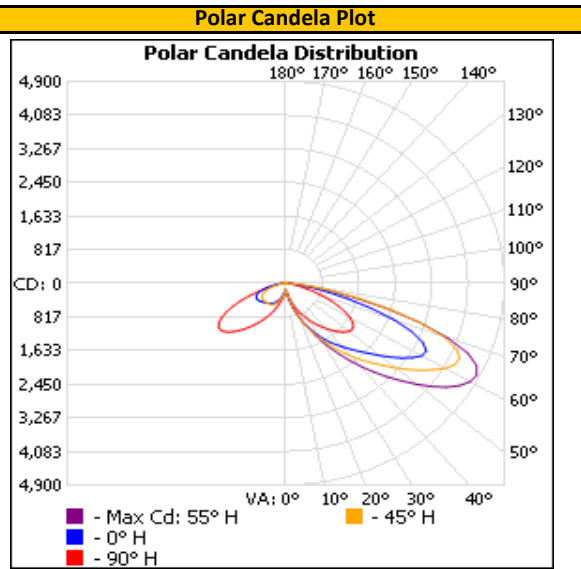
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Down	120.12	903.5	108.5	0.999

Light Output (lm)	Efficacy (lm/W)
8075.3	74.5

LUMINOUS INTENSITY SUMMARY (candela)

Vertical Angle (°)	Horizontal				
	0	30	45	65	90
0	169	169	169	169	169
5	234	231	227	217	199
10	389	379	366	350	313
15	610	589	577	554	463
20	872	847	855	820	638
25	1161	1130	1181	1151	825
30	1459	1419	1550	1571	1022
35	1750	1701	1934	2068	1229
40	2024	1974	2323	2624	1442
45	2337	2259	2730	3239	1657
50	2717	2596	3187	3835	1819
55	3157	3004	3679	4302	1842
60	3520	3439	4128	4394	1659
65	3388	3608	4297	3890	1303
70	2582	3186	3758	2830	864
75	1437	2256	2421	1500	453
80	601	964	1091	563	220
85	202	319	332	180	120
90	80	98	99	73	77
95	46	40	45	45	50
100	32	24	28	31	31
105	24	17	20	22	19
110	18	13	15	16	14
115	15	11	12	13	11
120	13	10	11	11	10
125	11	9	10	10	9
130	10	9	9	9	9
135	9	8	8	8	8
140	8	8	7	7	8
145	7	7	6	6	7
150	5	5	5	4	5
155	3	4	3	3	4
160	2	2	2	1	2
165	0	1	0	0	1
170	0	0	0	0	0
175	0	0	0	0	0
180	0	0	0	0	0

Full luminous intensity matrix found in .IES file



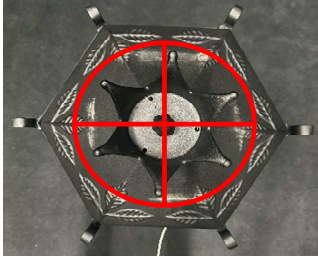
REPORT NO. 105724524CRT-002

ORIENTATION AND ALIGNMENT OF DUT

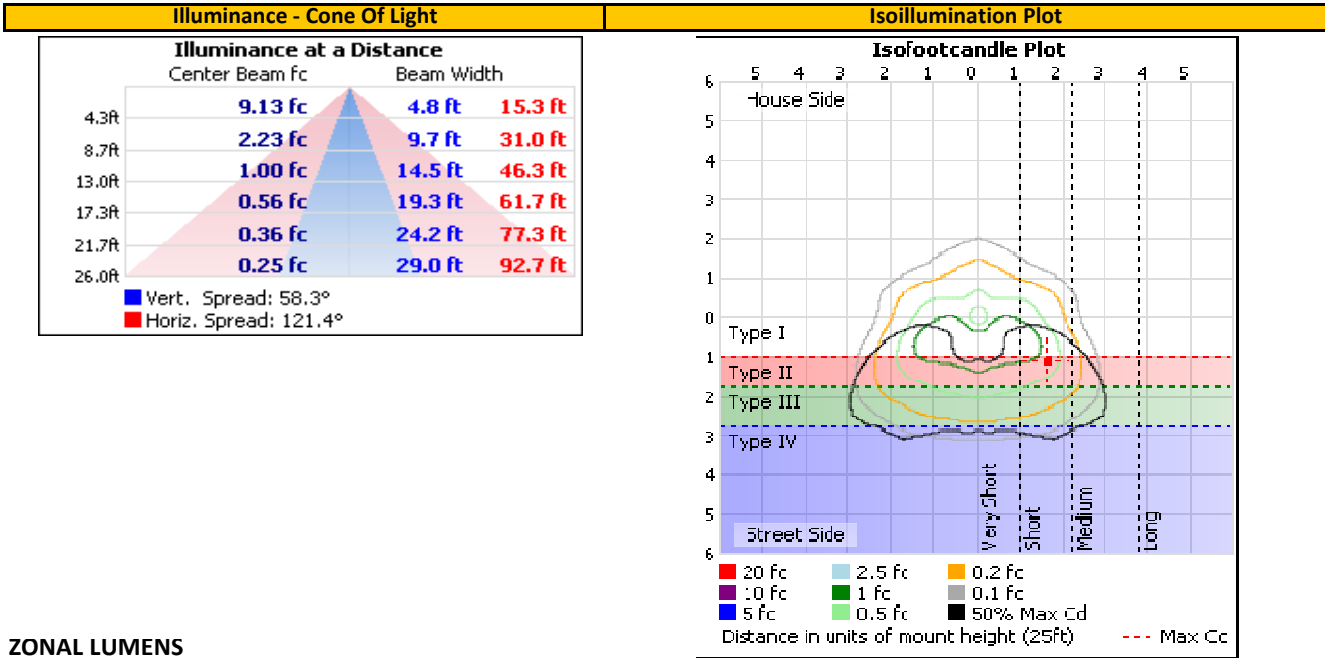
Luminous Opening		
Length (ft)	Width (ft)	Height (ft)
1.42	1.42	1.46
0°-180° H	90°-270° H	0°-180° V

Test Distance (ft)
29.2

PHOTOMETRIC CENTER OF DUT



ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary

Zone (°)	Lumens	Luminaire
0-30	563.1	7.0%
0-40	1,363.6	16.9%
0-60	4,581.1	56.7%
60-90	3,376.0	41.8%
70-100	1,404.4	17.4%
90-120	96.9	1.2%
0-90	7,957.1	98.5%
90-180	118.2	1.5%
0-180	8,075.3	100.0%

Zone (°)	Lumens	Total	Zone (°)	Lumens	Total
0-10	23.2	0.3%	90-100	59.5	0.7%
10-20	140.0	1.7%	100-110	24.4	0.3%
20-30	399.8	5.0%	110-120	13.0	0.2%
30-40	800.5	9.9%	120-130	9.0	0.1%
40-50	1321.5	16.4%	130-140	6.5	0.1%
50-60	1896.0	23.5%	140-150	4.0	0.0%
60-70	2031.0	25.2%	150-160	1.6	0.0%
70-80	1103.7	13.7%	160-170	0.2	0.0%
80-90	241.2	3.0%	170-180	0.0	0.0%

LUM. CLASSIFICATION SYSTEM (LCS)

CS Zone	Lumens	% Lamp	% Lum	
FL	(0-30)	361.2	N.A.	4.5
FM	(30-60)	3040.6	N.A.	37.7
FH	(60-80)	2541.0	N.A.	31.5
FVH	(80-90)	160.3	N.A.	2.0
BL	(0-30)	200.7	N.A.	2.5
BM	(30-60)	976.0	N.A.	12.1
BH	(60-80)	594.4	N.A.	7.4
BVH	(80-90)	81.0	N.A.	1.0
UL	(90-100)	59.5	N.A.	0.7
UH	(100-180)	58.7	N.A.	0.7
Total	-----	8073.4	N.A.	100.0
BUG Rating		B2-U3-G2		

TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

REPORT NO. 105724524CRT-002

Test Configuration	Tested Model No.	Pass/Fail/NA
4	Model 9000 Kronberg Lamp Type V	NA

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS

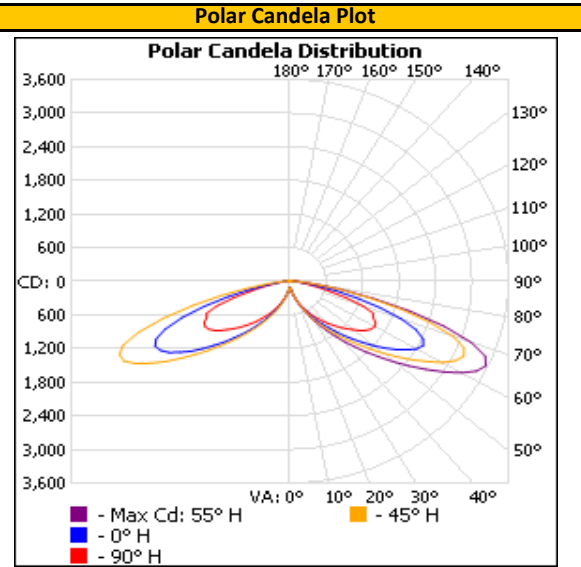
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Down	120.11	903.7	108.47	0.999

Light Output (lm)	Efficacy (lm/W)
8819.6	81.3

LUMINOUS INTENSITY SUMMARY (candela)

Vertical Angle (°)	Horizontal				
	0	30	45	65	90
0	111	111	111	111	111
5	122	124	124	126	126
10	184	189	185	189	191
15	285	283	281	288	283
20	406	404	413	420	394
25	554	549	576	586	520
30	727	716	772	803	661
35	930	917	1008	1071	812
40	1159	1156	1272	1391	976
45	1445	1452	1595	1774	1154
50	1773	1809	1985	2207	1336
55	2113	2230	2429	2712	1520
60	2410	2659	2892	3175	1612
65	2420	2844	3160	3329	1510
70	1956	2531	2863	2841	1284
75	1143	1772	1880	1737	673
80	513	778	859	731	318
85	203	281	287	259	154
90	104	112	112	116	92
95	65	58	62	69	57
100	42	35	38	42	34
105	27	22	25	27	20
110	19	14	17	18	13
115	14	11	13	14	10
120	12	9	10	11	8
125	10	8	9	9	7
130	9	7	8	8	7
135	7	6	6	7	6
140	6	6	6	6	5
145	5	5	4	4	4
150	4	4	3	3	3
155	2	2	2	2	2
160	1	1	1	1	1
165	0	0	0	0	0
170	0	0	0	0	0
175	0	0	0	0	0
180	0	0	0	0	0

Full luminous intensity matrix found in .IES file



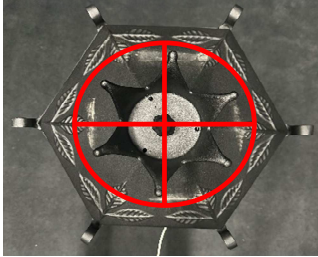
REPORT NO. 105724524CRT-002

ORIENTATION AND ALIGNMENT OF DUT

Luminous Opening		
Length (ft)	Width (ft)	Height (ft)
1.42	1.42	1.46
0°-180° H	90°-270° H	0°-180° V

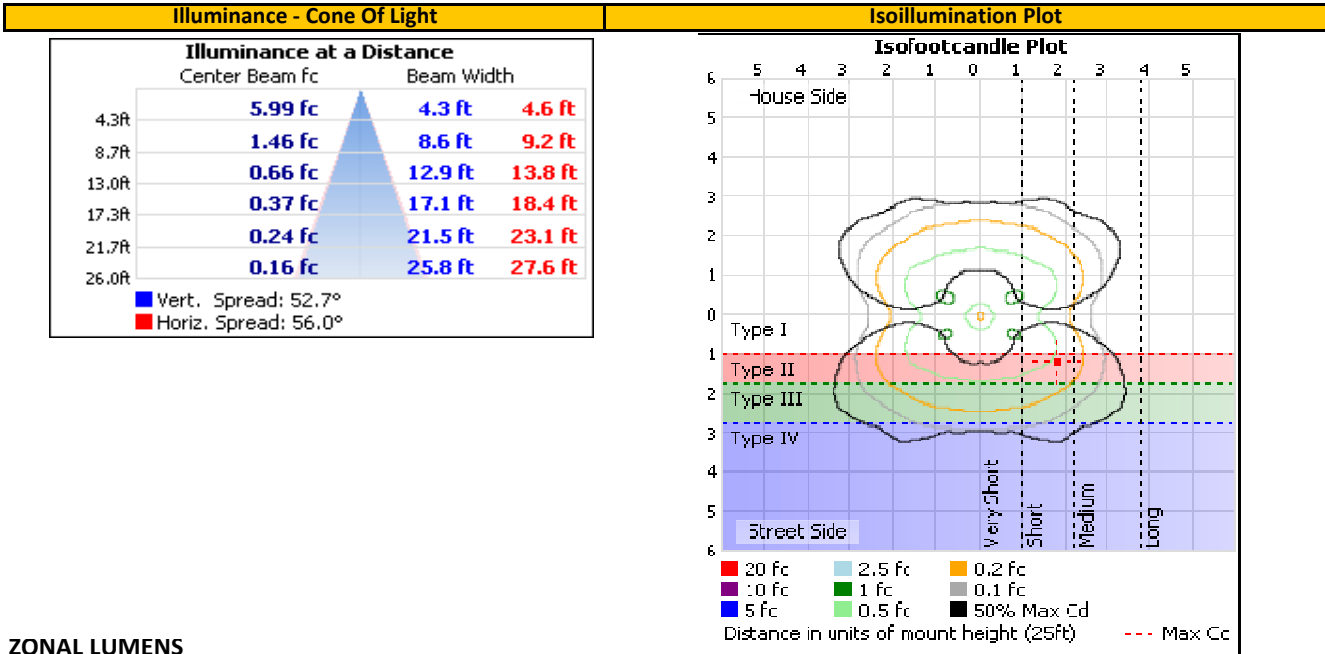
Test Distance (ft)
29.2

PHOTOMETRIC CENTER OF DUT



REPORT NO. 105724524CRT-002

ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary

Zone (°)	Lumens	Luminaire
0-30	377.0	4.3%
0-40	999.3	11.3%
0-60	4,251.2	48.2%
60-90	4,445.6	50.4%
70-100	1,897.4	21.5%
90-120	106.4	1.2%
0-90	8,696.8	98.6%
90-180	122.8	1.4%
0-180	8,819.6	100.0%

Zone (°)	Lumens	Total	Zone (°)	Lumens	Total
0-10	14.7	0.2%	90-100	68.4	0.8%
10-20	88.9	1.0%	100-110	25.8	0.3%
20-30	273.4	3.1%	110-120	12.2	0.1%
30-40	622.4	7.1%	120-130	7.7	0.1%
40-50	1202.4	13.6%	130-140	5.0	0.1%
50-60	2049.5	23.2%	140-150	2.7	0.0%
60-70	2616.6	29.7%	150-160	1.0	0.0%
70-80	1524.5	17.3%	160-170	0.1	0.0%
80-90	304.6	3.5%	170-180	0.0	0.0%

LUM. CLASSIFICATION SYSTEM (LCS)

CS Zone	Lumens	% Lamp	% Lum
FL (0-30)	182.6	N.A.	2.1
FM (30-60)	1910.3	N.A.	21.7
FH (60-80)	2107.2	N.A.	23.9
FVH (80-90)	160.1	N.A.	1.8
BL (0-30)	193.5	N.A.	2.2
BM (30-60)	1961.8	N.A.	22.2
BH (60-80)	2034.4	N.A.	23.1
BVH (80-90)	144.5	N.A.	1.6
UL (90-100)	68.4	N.A.	0.8
UH (100-180)	54.5	N.A.	0.6
Total	8817.3	N.A.	100.0
BUG Rating	B3-U3-G2		

EQUIPMENT LIST

REPORT NO. 105724524CRT-002

#	Equipment	Model No	Control No.	Last Cal	Cal Due
1	LSI Type C Goniophotometer System	6440	---	2/1/2024	5/1/2024
2	Elgar AC Power Supply	CW1251	---	VBU	VBU
3	Yokogawa Power Analyzer	WT210	E464	6/21/2023	6/21/2024
4	Traceable Hygrothermometer	4800	L206	3/7/2023	3/7/2024
5	Omega Thermometer	DPI8-C24	M263	3/9/2023	3/9/2024
6	Tape Measure	Crescent	---	9/21/2021	9/21/2024

The AC power supplies used for testing have a crest factor capable of 0-3.5

REVISION HISTORY

#	Revision Date	Updated By	Reviewed By	Description of Change
---	None	---	---	---
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