

Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: FAIL-SAFE

Report Number: P1357027

Luminaire Tested: 3ASL4-20HE-2-40-UNV

Issue Date: 2/17/2026

**Test Information**

Test Method: LM-79-2019  
Report Number: P1357027  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2511-597-7)  
Test Lab: INNOVATION CENTER  
Issue Date: 2/17/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: FAIL-SAFE  
Catalog Number: 3ASL4-20HE-2-40-UNV  
Description: 3FT 2000 LUMEN PER FOOT 4ASL LED LUMINAIRE WITH OPL LENS AND 4000K LEDS 2 ROW  
Light Source: -  
Ballast/Driver: -

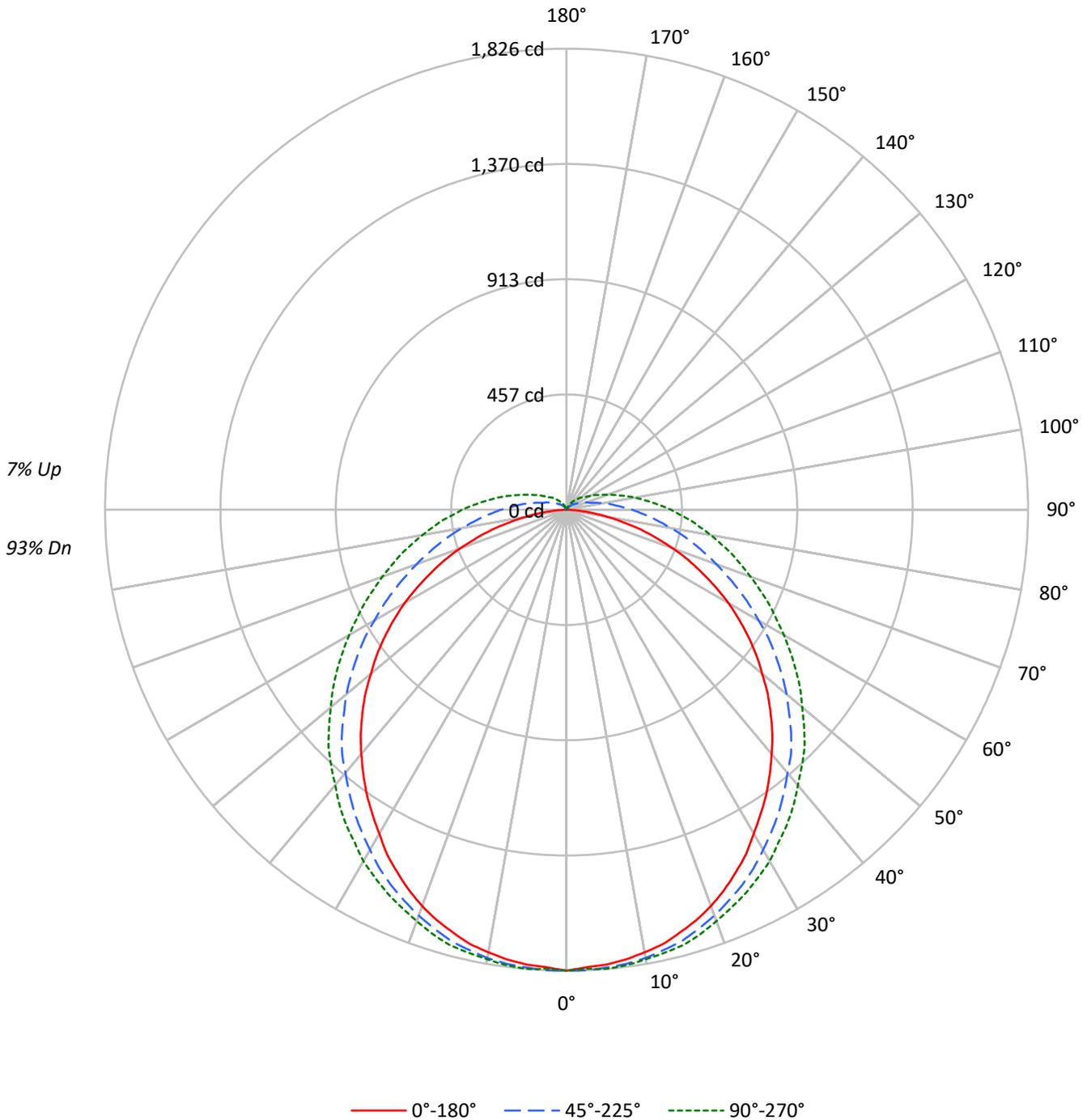
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 6267.0 lumens  
Efficiency: N/A  
Efficacy: 116.7 lumens/watt  
Spacing Criteria (0/90/45): 1.21 / 1.3 / 1.4  
Luminous Opening: Rectangular w/ Sides (W: 0.33' x L: 2.98' x H: 0.1')  
CIE Type: Direct

Input Watts (W): 53.7  
Input Voltage (V): NR  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P1357027  
CATALOG NUMBER: 3ASL4-20HE-2-40-UNV

### Luminous Intensity Polar Plot





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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

RF	20				20				20				20				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	50	30	10	0
RCR																					
0	117	117	117	117	114	114	114	114	107	107	107	101	101	101	95	95	95	95	95	95	93
1	105	100	95	90	102	97	92	88	91	87	84	86	83	80	81	79	77	77	77	77	74
2	95	86	79	72	92	84	77	71	79	73	68	74	70	65	70	66	63	63	63	63	60
3	86	75	66	59	83	73	65	58	69	62	56	65	59	55	62	57	53	53	53	53	50
4	79	66	57	50	76	64	56	49	61	54	48	58	51	46	55	49	45	45	45	45	42
5	72	59	50	43	70	57	49	42	54	47	41	52	45	40	49	43	39	39	39	39	36
6	67	53	44	37	64	52	43	37	49	41	36	47	40	35	44	39	34	34	34	34	32
7	62	48	39	33	60	47	38	32	45	37	32	43	36	31	41	35	30	30	30	30	28
8	58	44	35	29	56	43	34	29	41	33	28	39	32	28	37	31	27	27	27	27	25
9	54	40	32	26	52	39	31	26	37	30	25	36	29	25	34	29	24	24	24	24	22
10	50	37	29	24	49	36	28	23	35	28	23	33	27	22	32	26	22	22	22	22	20

**AVERAGE LUMINANCE (cd/sqm):**

	0°	45°	90°
0°	19787	19787	19787
5°	19616	19384	19334
10°	19467	19015	18864
15°	19274	18615	18486
20°	19027	18113	17956
25°	18645	17617	17498
30°	18171	17052	17043
35°	17795	16527	16516
40°	17360	15960	15960
45°	16920	15471	15554
50°	16355	14825	14953
55°	15808	14133	14476
60°	15136	13356	13968
65°	14108	12632	13577
70°	12948	11948	13215
75°	11273	11413	13096
80°	8673	10930	13055
85°	5100	10875	13430

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 16920 cd/sqm



TEST NUMBER: P1357027  
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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	173.1	2.8
10°-20°	497.6	7.9
20°-30°	754.1	12.0
30°-40°	912.0	14.6
40°-50°	961.5	15.3
50°-60°	897.4	14.3
60°-70°	740.9	11.8
70°-80°	537.5	8.6
80°-90°	339.6	5.4
90°-100°	202.7	3.2
100°-110°	116.2	1.9
110°-120°	66.0	1.1
120°-130°	37.6	0.6
130°-140°	20.4	0.3
140°-150°	8.9	0.1
150°-160°	1.6	0.0
160°-170°	0.0	0.0
170°-180°	0.0	0.0
0°-30°	1424.8	22.7
0°-40°	2336.8	37.3
0°-60°	4195.6	66.9
0°-90°	5813.6	92.8
90°-120°	384.9	6.1
90°-150°	451.8	7.2
90°-180°	453.0	7.2
0°-180°	6267.0	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	1826	1826	1826	1826	1826	
5°	1808	1826	1820	1820	1826	172
15°	1734	1757	1768	1774	1785	489
25°	1584	1607	1642	1665	1676	730
35°	1378	1412	1464	1504	1521	861
45°	1142	1188	1257	1309	1332	881
55°	878	930	1010	1079	1108	785
65°	591	654	752	844	884	587
75°	304	385	522	632	677	320
85°	57	178	333	448	494	70
90°	0	109	258	367	413	2
95°	0	69	195	298	339	0
105°	0	23	109	189	218	0
115°	0	12	63	115	138	0
125°	0	6	40	75	86	0
135°	0	0	23	46	57	0
145°	0	0	12	29	34	0
155°	0	0	0	6	12	0
165°	0	0	0	0	0	0
175°	0	0	0	0	0	0
180°	0	0	0	0	0	0



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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	1825.5	1825.5	1825.5	1825.5	1825.5
2.5°	1814.0	1831.3	1825.5	1819.8	1819.8
5°	1808.3	1825.5	1819.8	1819.8	1825.5
7.5°	1796.8	1814.0	1814.0	1814.0	1819.8
10°	1779.6	1802.5	1802.5	1802.5	1808.3
12.5°	1762.4	1779.6	1785.3	1791.1	1796.8
15°	1733.7	1756.6	1768.1	1773.8	1785.3
17.5°	1705.0	1722.2	1739.4	1756.6	1762.4
20°	1670.5	1693.5	1710.7	1727.9	1733.7
22.5°	1630.3	1653.3	1676.3	1693.5	1705.0
25°	1584.4	1607.4	1641.8	1664.8	1676.3
27.5°	1538.5	1561.4	1601.6	1630.3	1641.8
30°	1481.1	1515.5	1555.7	1590.1	1607.4
32.5°	1429.4	1463.9	1509.8	1550.0	1561.4
35°	1377.7	1412.2	1463.9	1504.0	1521.3
37.5°	1320.3	1360.5	1412.2	1458.1	1475.3
40°	1262.9	1303.1	1360.5	1412.2	1423.7
42.5°	1205.5	1245.7	1314.6	1360.5	1377.7
45°	1142.4	1188.3	1257.2	1308.9	1331.8
47.5°	1079.2	1125.2	1194.0	1251.5	1274.4
50°	1010.3	1062.0	1136.6	1194.0	1217.0
52.5°	947.2	998.9	1073.5	1136.6	1165.3
55°	878.3	930.0	1010.3	1079.2	1107.9
57.5°	809.4	861.1	947.2	1021.8	1050.5
60°	740.5	792.2	878.3	964.4	993.1
62.5°	665.9	723.3	815.2	901.3	935.7
65°	591.3	654.4	752.0	843.9	884.1
67.5°	522.4	585.5	688.9	792.2	826.6
70°	447.8	516.7	631.5	734.8	775.0
72.5°	373.1	447.8	574.1	683.1	723.3
75°	304.3	384.6	522.4	631.5	677.4
77.5°	229.6	327.2	470.7	585.5	625.7
80°	166.5	269.8	419.1	539.6	579.8
82.5°	109.1	218.1	373.1	493.7	533.9
85°	57.4	178.0	333.0	447.8	493.7
87.5°	17.2	137.8	292.8	407.6	447.8
90°	0.0	109.1	258.3	367.4	413.3
92.5°	0.0	86.1	223.9	333.0	373.1
95°	0.0	68.9	195.2	298.5	338.7
97.5°	0.0	57.4	172.2	269.8	304.3
100°	0.0	45.9	149.3	241.1	275.5
102.5°	0.0	34.4	126.3	212.4	246.8
105°	0.0	23.0	109.1	189.4	218.1
107.5°	0.0	17.2	91.8	166.5	195.2
110°	0.0	17.2	86.1	143.5	172.2



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
112.5°	0.0	11.5	74.6	132.0	155.0
115°	0.0	11.5	63.1	114.8	137.8
117.5°	0.0	11.5	57.4	103.3	126.3
120°	0.0	11.5	51.7	91.8	109.1
122.5°	0.0	5.7	45.9	80.4	97.6
125°	0.0	5.7	40.2	74.6	86.1
127.5°	0.0	5.7	34.4	68.9	80.4
130°	0.0	5.7	34.4	63.1	74.6
132.5°	0.0	0.0	28.7	57.4	68.9
135°	0.0	0.0	23.0	45.9	57.4
137.5°	0.0	0.0	23.0	40.2	51.7
140°	0.0	0.0	17.2	40.2	45.9
142.5°	0.0	0.0	11.5	34.4	40.2
145°	0.0	0.0	11.5	28.7	34.4
147.5°	0.0	0.0	5.7	23.0	28.7
150°	0.0	0.0	5.7	17.2	23.0
152.5°	0.0	0.0	0.0	11.5	17.2
155°	0.0	0.0	0.0	5.7	11.5
157.5°	0.0	0.0	0.0	0.0	5.7
160°	0.0	0.0	0.0	0.0	0.0
162.5°	0.0	0.0	0.0	0.0	0.0
165°	0.0	0.0	0.0	0.0	0.0
167.5°	0.0	0.0	0.0	0.0	0.0
170°	0.0	0.0	0.0	0.0	0.0
172.5°	0.0	0.0	0.0	0.0	0.0
175°	0.0	0.0	0.0	0.0	0.0
177.5°	0.0	0.0	0.0	0.0	0.0
180°	0.0	0.0	0.0	0.0	0.0



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**CIE UGR TABLE:**

Reflectances:											
Ceiling		0.7	0.7	0.5	0.5	0.3	0.7	0.7	0.5	0.5	0.3
Wall		0.5	0.3	0.5	0.3	0.3	0.5	0.3	0.5	0.3	0.3
Reference plane		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Room dimensions		Viewed crosswise					Viewed endwise				
X=2H	Y=2H	19.67	21.21	20.15	21.67	22.16	21.70	23.24	22.18	23.70	24.19
	3H	21.18	22.58	21.66	23.05	23.58	24.14	25.54	24.63	26.01	26.54
	4H	21.66	22.98	22.16	23.47	24.02	25.34	26.67	25.85	27.16	27.70
	6H	21.93	23.17	22.45	23.67	24.23	26.60	27.83	27.11	28.33	28.89
	8H	21.99	23.17	22.52	23.70	24.26	27.24	28.43	27.77	28.95	29.52
	12H	22.00	23.14	22.54	23.66	24.25	27.95	29.09	28.49	29.60	30.20
4H	2H	20.55	21.87	21.05	22.36	22.91	22.14	23.46	22.64	23.95	24.50
	3H	22.29	23.42	22.81	23.95	24.52	24.81	25.94	25.32	26.47	27.03
	4H	22.90	23.94	23.44	24.48	25.08	26.18	27.22	26.72	27.76	28.36
	6H	23.30	24.22	23.86	24.78	25.40	27.63	28.55	28.19	29.11	29.73
	8H	23.40	24.26	23.96	24.83	25.45	28.38	29.25	28.95	29.81	30.44
	12H	23.45	24.23	24.03	24.82	25.45	29.22	30.00	29.80	30.59	31.22
8H	4H	23.59	24.45	24.15	25.02	25.64	26.40	27.26	26.97	27.83	28.45
	6H	24.17	24.91	24.77	25.51	26.15	28.03	28.76	28.62	29.37	30.00
	8H	24.36	25.02	24.97	25.64	26.28	28.93	29.59	29.53	30.20	30.85
	12H	24.48	25.07	25.09	25.68	26.39	29.94	30.53	30.55	31.14	31.85
12H	4H	23.79	24.57	24.37	25.16	25.79	26.41	27.19	27.00	27.79	28.42
	6H	24.47	25.14	25.08	25.75	26.40	28.07	28.73	28.68	29.35	29.99
	8H	24.76	25.35	25.37	25.96	26.67	29.04	29.62	29.65	30.23	30.94

LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

Fail-Safe

Report Number: SP1-2511-597-4

Test Date: 11/18/2025

Luminaire Tested: 4ASL-2-40-UNV-OPL-1\_600mA

Data in this report applies to families of products including 4ASL

**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2511-597-4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 11/18/2025  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: Fail-Safe  
 Catalog Number: **4ASL-2-40-UNV-OPL-1\_600mA**  
 Description: 2foot 4ASL LED LUMINAIRE WITH OPL LENS AND 4000K LEDs with 1 rows at 600mA

**Spectral Parameters**

CCT (K): 4015  
 CIE u': 0.2259  
 CIE v': 0.4990  
 Duv: -0.0019  
 CIE x: 0.3785  
 CIE y: 0.3715  
 CIE z: 0.2500  
 Peak Wavelength (nm): 630  
 Dominant Wavelength (nm): 580  
 Purity: 25.06827  
 Rf: 90.7  
 Rg: 100.2

CRI (Ra): 93.9  
 R1: 95.7  
 R2: 96.3  
 R3: 94.8  
 R4: 95.2  
 R5: 94.6  
 R6: 93.5  
 R7: 94.0  
 R8: 87.2  
 R9: 66.3  
 R10: 89.1  
 R11: 95.0  
 R12: 73.8  
 R13: 96.0  
 R14: 96.4  
 R15: 93.2



**Test Conditions**

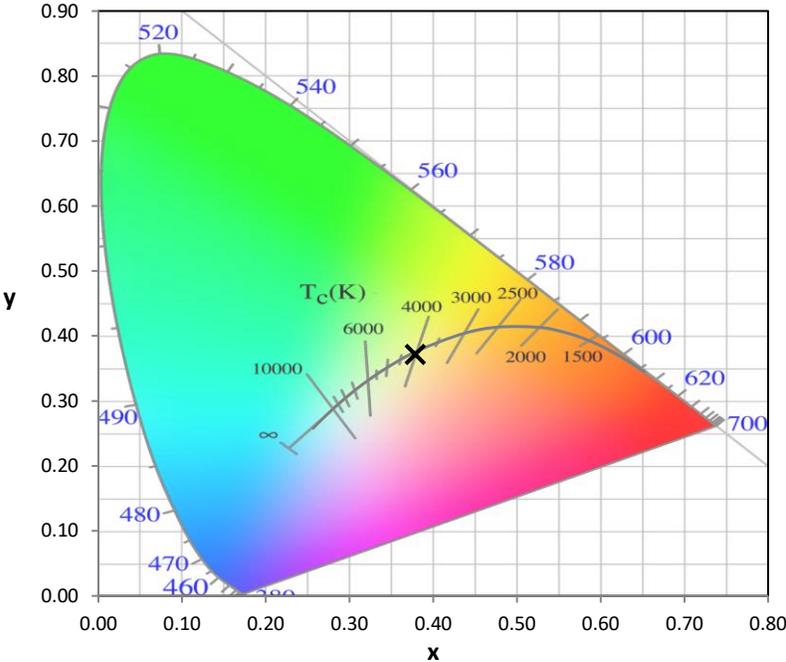
Stabilization Time: 23M  
 Operation Time: 1H 23M  
 Sphere Temperature (°C): 24.1

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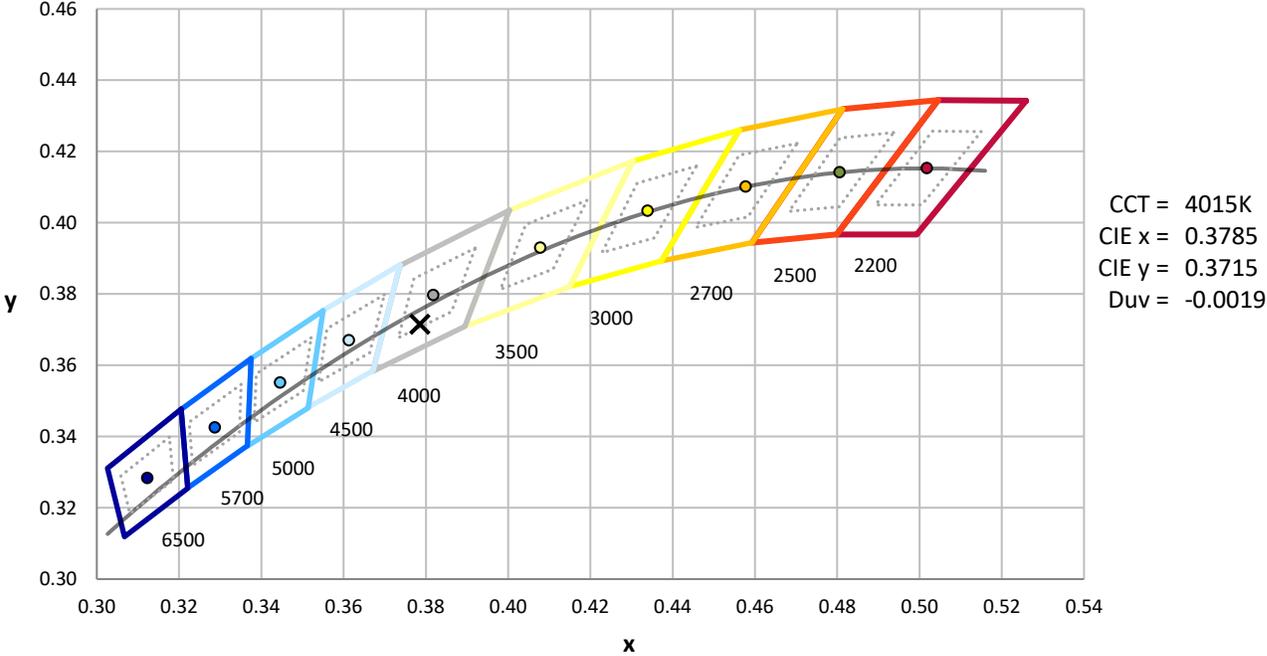
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	76INCH SPHERE IN0058	6/16/2025	12/16/2025
Power Meter	XITRON INXT2011004	10/21/2025	10/21/2026
AC Power Source	CHROMA 61603 IN0063	10/21/2025	10/21/2026
DC Power Source	AGILENT E3634A IN0208	10/21/2025	10/21/2026
Sphere Thermometer	ONSET IN0085	10/21/2025	10/21/2026
Room Thermometer	ONSET IN0046	10/21/2025	10/21/2026

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CIE 1931 Chromaticity Diagram



CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles

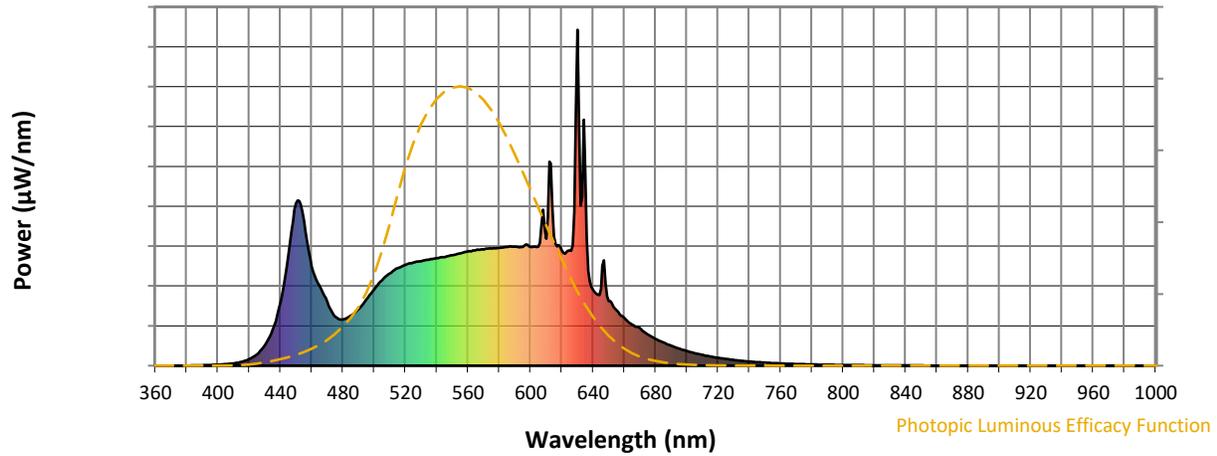


CCT = 4015K  
 CIE x = 0.3785  
 CIE y = 0.3715  
 Duv = -0.0019

Point lies inside the ANSI 4000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



**Photopic Lumens: NR**

λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)
360	0	NR	490	169	NR	620	343	NR	750	9	NR	880	0	NR
365	0	NR	495	197	NR	625	343	NR	755	8	NR	885	0	NR
370	0	NR	500	228	NR	630	1000	NR	760	7	NR	890	0	NR
375	0	NR	505	254	NR	635	591	NR	765	6	NR	895	0	NR
380	0	NR	510	274	NR	640	225	NR	770	5	NR	900	0	NR
385	1	NR	515	290	NR	645	229	NR	775	4	NR	905	0	NR
390	1	NR	520	300	NR	650	193	NR	780	4	NR	910	0	NR
395	2	NR	525	307	NR	655	165	NR	785	3	NR	915	0	NR
400	3	NR	530	311	NR	660	142	NR	790	3	NR	920	0	NR
405	5	NR	535	316	NR	665	122	NR	795	2	NR	925	0	NR
410	7	NR	540	320	NR	670	112	NR	800	2	NR	930	0	NR
415	11	NR	545	323	NR	675	93	NR	805	2	NR	935	0	NR
420	20	NR	550	329	NR	680	80	NR	810	2	NR	940	0	NR
425	35	NR	555	334	NR	685	69	NR	815	1	NR	945	0	NR
430	61	NR	560	340	NR	690	59	NR	820	1	NR	950	0	NR
435	108	NR	565	344	NR	695	51	NR	825	1	NR	955	0	NR
440	187	NR	570	346	NR	700	43	NR	830	1	NR	960	0	NR
445	329	NR	575	349	NR	705	37	NR	835	1	NR	965	0	NR
450	484	NR	580	351	NR	710	32	NR	840	1	NR	970	0	NR
455	433	NR	585	353	NR	715	27	NR	845	1	NR	975	0	NR
460	296	NR	590	354	NR	720	23	NR	850	1	NR	980	0	NR
465	237	NR	595	353	NR	725	20	NR	855	0	NR	985	0	NR
470	188	NR	600	354	NR	730	17	NR	860	0	NR	990	0	NR
475	146	NR	605	354	NR	735	15	NR	865	0	NR	995	0	NR
480	138	NR	610	378	NR	740	12	NR	870	0	NR	1000	0	NR
485	149	NR	615	385	NR	745	11	NR	875	0	NR			

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 1.79**

$\lambda$ (nm)	Power W <sup>^</sup> /nm	Lumens ( $\phi$ /nm)	$\lambda$ (nm)	Power W <sup>^</sup> /nm	Lumens ( $\phi$ /nm)	$\lambda$ (nm)	Power W <sup>^</sup> /nm	Lumens ( $\phi$ /nm)	$\lambda$ (nm)	Power W <sup>^</sup> /nm	Lumens ( $\phi$ /nm)	$\lambda$ (nm)	Power W <sup>^</sup> /nm	Lumens ( $\phi$ /nm)
360	0	NR	490	169	NR	620	343	NR	750	9	NR	880	0	NR
365	0	NR	495	197	NR	625	343	NR	755	8	NR	885	0	NR
370	0	NR	500	228	NR	630	1000	NR	760	7	NR	890	0	NR
375	0	NR	505	254	NR	635	591	NR	765	6	NR	895	0	NR
380	0	NR	510	274	NR	640	225	NR	770	5	NR	900	0	NR
385	1	NR	515	290	NR	645	229	NR	775	4	NR	905	0	NR
390	1	NR	520	300	NR	650	193	NR	780	4	NR	910	0	NR
395	2	NR	525	307	NR	655	165	NR	785	3	NR	915	0	NR
400	3	NR	530	311	NR	660	142	NR	790	3	NR	920	0	NR
405	5	NR	535	316	NR	665	122	NR	795	2	NR	925	0	NR
410	7	NR	540	320	NR	670	112	NR	800	2	NR	930	0	NR
415	11	NR	545	323	NR	675	93	NR	805	2	NR	935	0	NR
420	20	NR	550	329	NR	680	80	NR	810	2	NR	940	0	NR
425	35	NR	555	334	NR	685	69	NR	815	1	NR	945	0	NR
430	61	NR	560	340	NR	690	59	NR	820	1	NR	950	0	NR
435	108	NR	565	344	NR	695	51	NR	825	1	NR	955	0	NR
440	187	NR	570	346	NR	700	43	NR	830	1	NR	960	0	NR
445	329	NR	575	349	NR	705	37	NR	835	1	NR	965	0	NR
450	484	NR	580	351	NR	710	32	NR	840	1	NR	970	0	NR
455	433	NR	585	353	NR	715	27	NR	845	1	NR	975	0	NR
460	296	NR	590	354	NR	720	23	NR	850	1	NR	980	0	NR
465	237	NR	595	353	NR	725	20	NR	855	0	NR	985	0	NR
470	188	NR	600	354	NR	730	17	NR	860	0	NR	990	0	NR
475	146	NR	605	354	NR	735	15	NR	865	0	NR	995	0	NR
480	138	NR	610	378	NR	740	12	NR	870	0	NR	1000	0	NR
485	149	NR	615	385	NR	745	11	NR	875	0	NR			

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**Melanopic Flux vs. Wavelength**



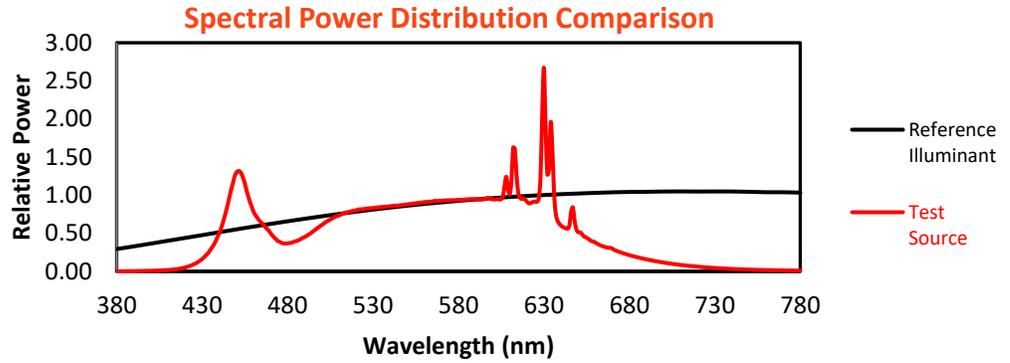
**Melanopic Lumens: NR**

**M/P: 3.74**

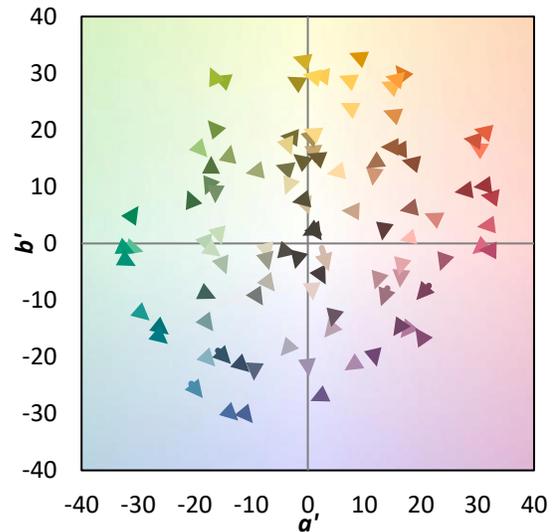
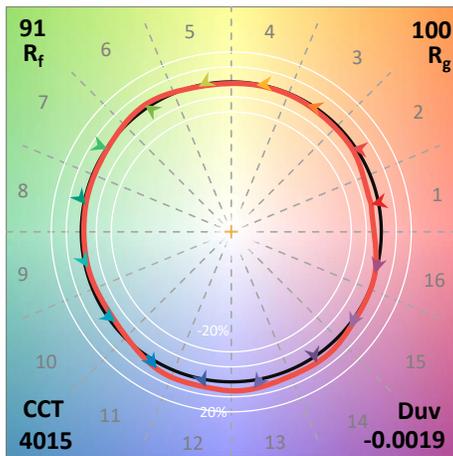
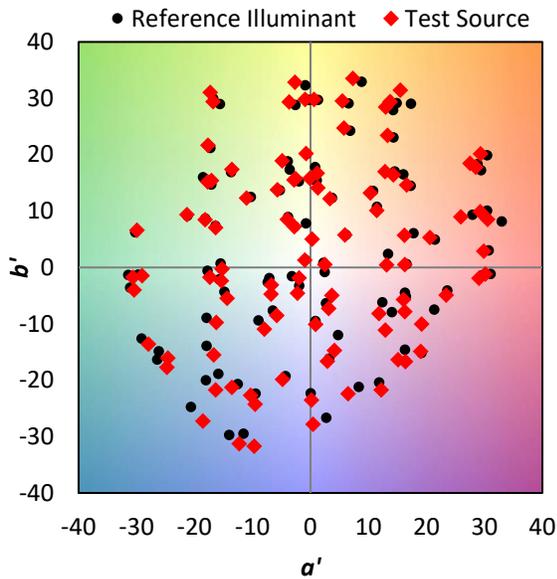
λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)
360	0	NR	490	169	NR	620	343	NR	750	9	NR	880	0	NR
365	0	NR	495	197	NR	625	343	NR	755	8	NR	885	0	NR
370	0	NR	500	228	NR	630	1000	NR	760	7	NR	890	0	NR
375	0	NR	505	254	NR	635	591	NR	765	6	NR	895	0	NR
380	0	NR	510	274	NR	640	225	NR	770	5	NR	900	0	NR
385	1	NR	515	290	NR	645	229	NR	775	4	NR	905	0	NR
390	1	NR	520	300	NR	650	193	NR	780	4	NR	910	0	NR
395	2	NR	525	307	NR	655	165	NR	785	3	NR	915	0	NR
400	3	NR	530	311	NR	660	142	NR	790	3	NR	920	0	NR
405	5	NR	535	316	NR	665	122	NR	795	2	NR	925	0	NR
410	7	NR	540	320	NR	670	112	NR	800	2	NR	930	0	NR
415	11	NR	545	323	NR	675	93	NR	805	2	NR	935	0	NR
420	20	NR	550	329	NR	680	80	NR	810	2	NR	940	0	NR
425	35	NR	555	334	NR	685	69	NR	815	1	NR	945	0	NR
430	61	NR	560	340	NR	690	59	NR	820	1	NR	950	0	NR
435	108	NR	565	344	NR	695	51	NR	825	1	NR	955	0	NR
440	187	NR	570	346	NR	700	43	NR	830	1	NR	960	0	NR
445	329	NR	575	349	NR	705	37	NR	835	1	NR	965	0	NR
450	484	NR	580	351	NR	710	32	NR	840	1	NR	970	0	NR
455	433	NR	585	353	NR	715	27	NR	845	1	NR	975	0	NR
460	296	NR	590	354	NR	720	23	NR	850	1	NR	980	0	NR
465	237	NR	595	353	NR	725	20	NR	855	0	NR	985	0	NR
470	188	NR	600	354	NR	730	17	NR	860	0	NR	990	0	NR
475	146	NR	605	354	NR	735	15	NR	865	0	NR	995	0	NR
480	138	NR	610	378	NR	740	12	NR	870	0	NR	1000	0	NR
485	149	NR	615	385	NR	745	11	NR	875	0	NR			

**Summary**

$R_f = 90.7$   
 $R_g = 100.2$   
 CIE  $R_a = 93.9$   
 $R_9 = 66.3$

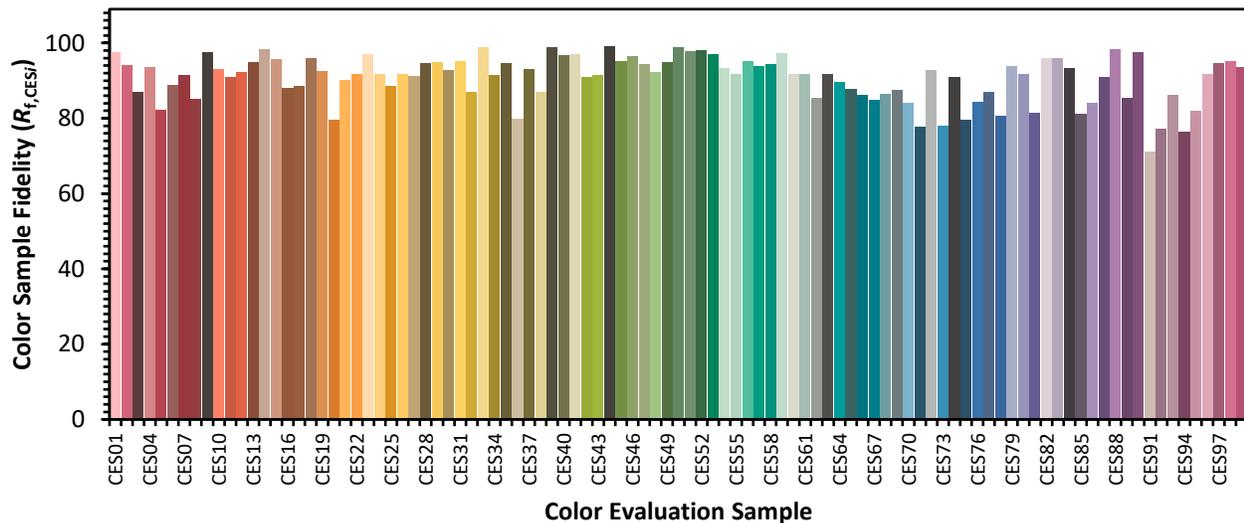


**Color Vector Graphics**

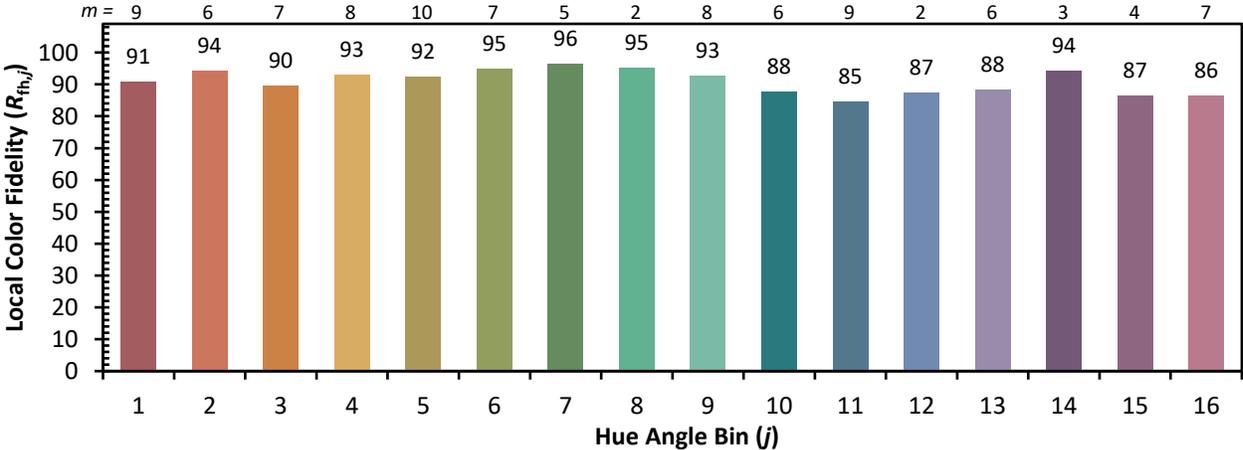


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

CES01 = 86	CES26 = 92	CES51 = 98	CES76 = 84
CES02 = 62	CES27 = 91	CES52 = 98	CES77 = 87
CES03 = 31	CES28 = 95	CES53 = 97	CES78 = 81
CES04 = 69	CES29 = 95	CES54 = 93	CES79 = 94
CES05 = 49	CES30 = 93	CES55 = 92	CES80 = 92
CES06 = 50	CES31 = 95	CES56 = 95	CES81 = 81
CES07 = 42	CES32 = 87	CES57 = 94	CES82 = 96
CES08 = 41	CES33 = 99	CES58 = 94	CES83 = 96
CES09 = 29	CES34 = 91	CES59 = 97	CES84 = 93
CES10 = 74	CES35 = 95	CES60 = 92	CES85 = 81
CES11 = 57	CES36 = 80	CES61 = 92	CES86 = 84
CES12 = 63	CES37 = 93	CES62 = 85	CES87 = 91
CES13 = 43	CES38 = 87	CES63 = 92	CES88 = 98
CES14 = 74	CES39 = 99	CES64 = 90	CES89 = 85
CES15 = 71	CES40 = 97	CES65 = 88	CES90 = 98
CES16 = 47	CES41 = 97	CES66 = 86	CES91 = 71
CES17 = 49	CES42 = 91	CES67 = 85	CES92 = 77
CES18 = 56	CES43 = 91	CES68 = 87	CES93 = 86
CES19 = 71	CES44 = 99	CES69 = 87	CES94 = 76
CES20 = 66	CES45 = 95	CES70 = 84	CES95 = 82
CES21 = 85	CES46 = 96	CES71 = 78	CES96 = 92
CES22 = 78	CES47 = 94	CES72 = 93	CES97 = 95
CES23 = 91	CES48 = 92	CES73 = 78	CES98 = 95
CES24 = 90	CES49 = 95	CES74 = 91	CES99 = 94
CES25 = 71	CES50 = 99	CES75 = 80	



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)