

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: INVUE

Report Number: P880163

Luminaire Tested: **EMM2-HTN-VA4-740-U-RW**

Issue Date: 10/01/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P880163  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 10/01/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: INVUE  
Catalog Number: EMM2-HTN-VA4-740-U-RW  
Description: EPIC MODERN TALL HOUSING 4W 70CRI 4000K VISUAL COMFORT FIXTURE w/  
RECTANGULAR WIDE DISTRIBUTION OPTIC  
Light Source: (1) 4000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

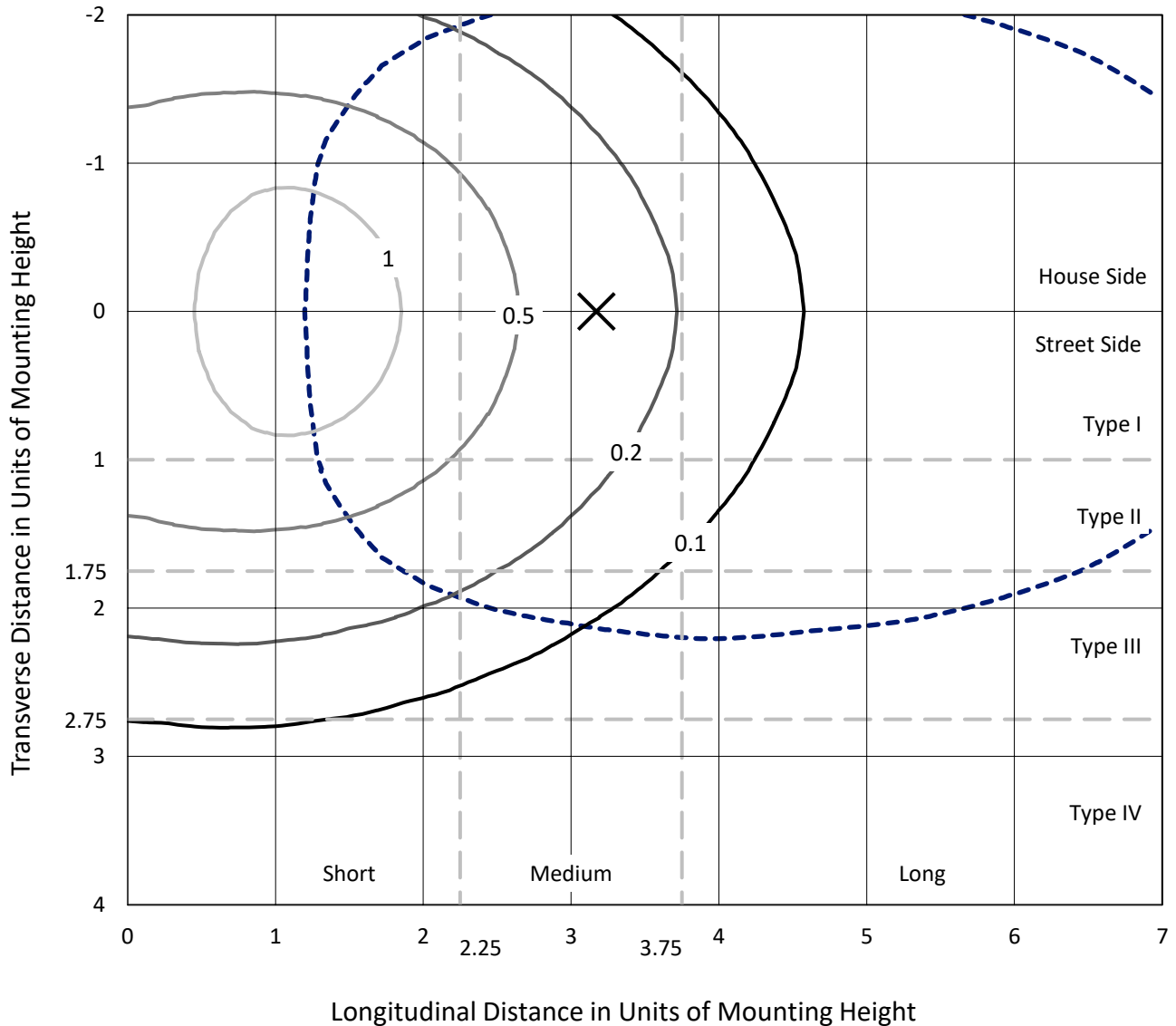
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4939.9 lumens  
Efficiency: N/A  
Efficacy: 83.7 lumens/watt  
Luminous Opening: Circular (Dia: 1.12' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B3 - U0 - G3  
  
Input Watts (W): 59  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.99  
Total Harmonic Distortion (THDi): 8%  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

REPORT NUMBER: P880163  
 CATALOG NUMBER: EMM2-HTN-VA4-740-U-RW

### Iso-Footcandle Lines of Horizontal Illumination

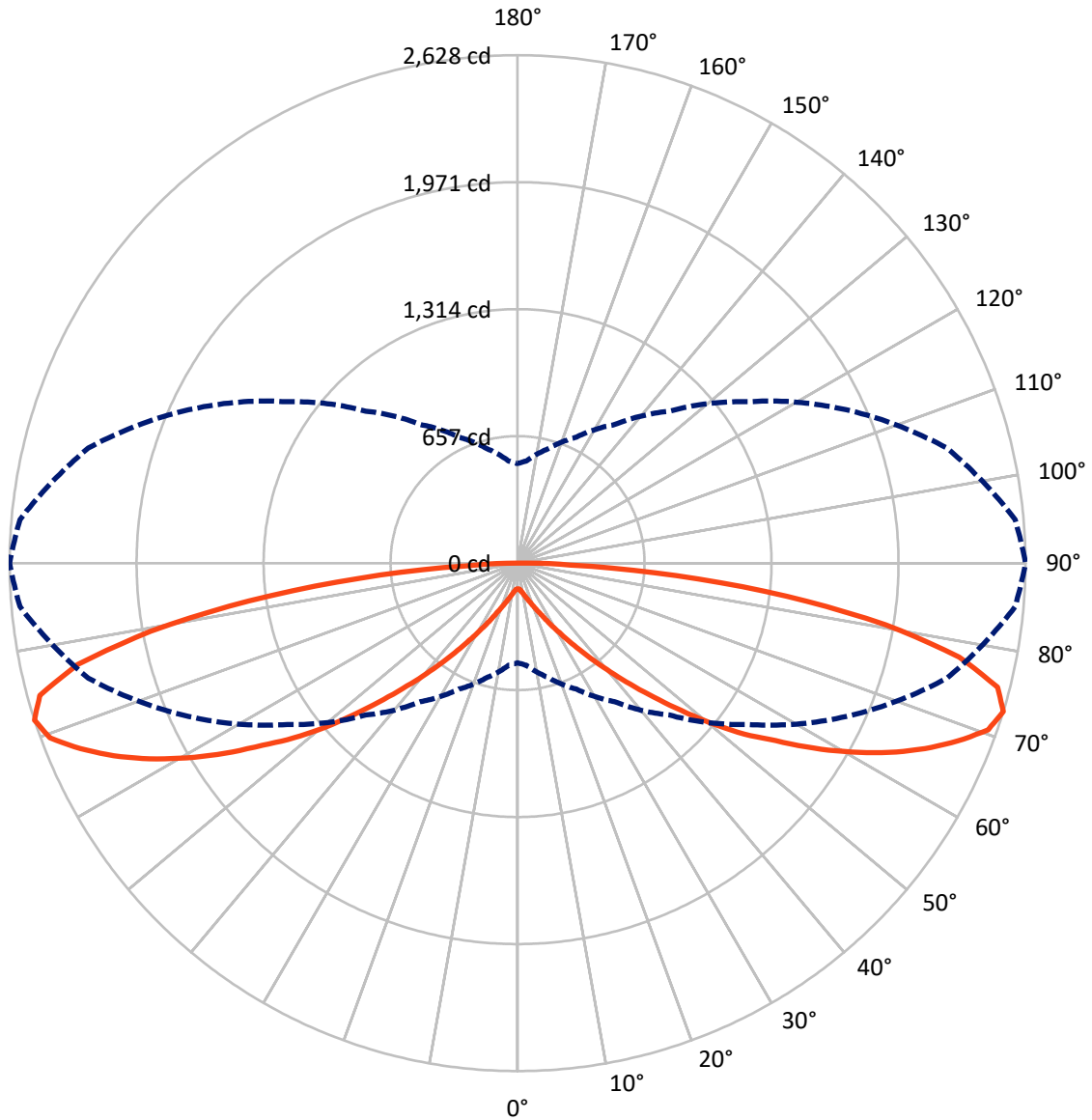
× Max cd  
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 1.6 fc  
 Type III - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 90-Deg Lateral      - - - Horizontal Cone Through 72.5-Deg Vertical

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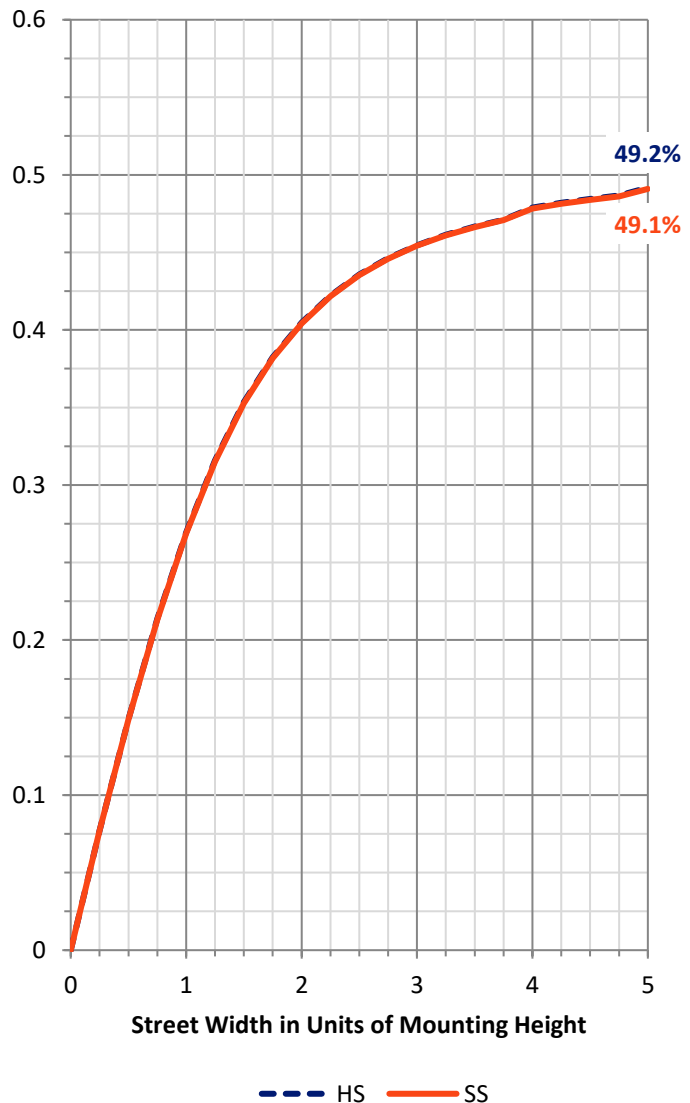
**FLUX DISTRIBUTION:**

		Downward	Upward	Total
<b>House Side</b>	Lumens	2469.9	0.0	2469.9
	% Fixture	50.0	0.0	50.0
<b>Street Side</b>	Lumens	2469.9	0.0	2469.9
	% Fixture	50.0	0.0	50.0
<b>Total</b>	Lumens	4939.9	0.0	4939.9
	% Fixture	100.0	0.0	100.0

**Coefficient of Utilization**

**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	13.6	0.3
10°-20°	50.6	1.0
20°-30°	116.8	2.4
30°-40°	250.3	5.1
40°-50°	516.9	10.5
50°-60°	949.4	19.2
60°-70°	1353.7	27.4
70°-80°	1259.2	25.5
80°-90°	429.3	8.7
90°-100°	0.0	0.0
100°-110°	0.0	0.0
110°-120°	0.0	0.0
120°-130°	0.0	0.0
130°-140°	0.0	0.0
140°-150°	0.0	0.0
150°-160°	0.0	0.0
160°-170°	0.0	0.0
170°-180°	0.0	0.0
0°-90°	4939.9	100.0
0°-180°	4939.9	100.0



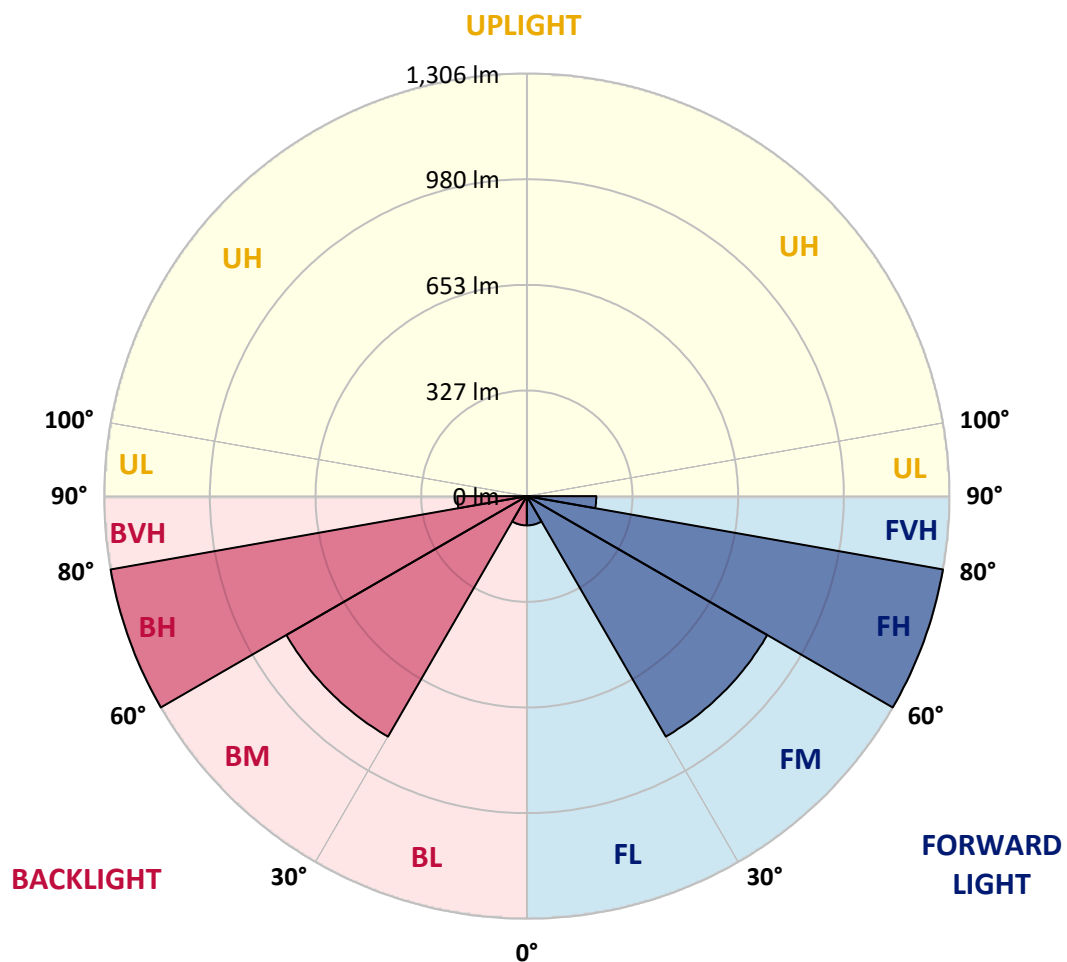
REPORT NUMBER: P880163  
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

Zone	Lumens	% Fixture	Zone Rating/Lumen Limit		
			B	U	G
FL (0°-30°)	90.5	1.8			
FM (30°-60°)	858.3	17.4			
FH (60°-80°)	1306.4	26.4			G1/1800
FVH (80°-90°)	214.7	4.3			G2/225
BL (0°-30°)	90.5	1.8	B0/110		
BM (30°-60°)	858.3	17.4	B1/1000		
BH (60°-80°)	1306.4	26.4	B3/2500		G3/2500
BVH (80°-90°)	214.7	4.3			G2/225
UL (90°-100°)	0.0	0.0		U0/0	
UH (100°-180°)	0.0	0.0		U0/0	

**BUG Rating: B3-U0-G3**

Type III Short





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CATALOG NUMBER: EMM2-HTN-VA4-740-U-RW

**CANDELA DISTRIBUTION (FULL):**

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	133.0	133.0	133.0	133.0	133.0	133.0	133.0	133.0	133.0	133.0	133.0
2.5°	133.6	133.6	133.6	133.6	134.2	134.2	134.2	134.2	134.2	134.2	134.2
5°	135.5	135.5	135.5	136.1	137.3	138.0	138.6	138.6	139.2	139.2	139.2
7.5°	138.6	138.6	139.2	141.1	142.4	144.2	146.1	146.8	148.6	148.6	148.6
10°	143.0	143.0	144.2	146.1	149.3	153.0	156.2	158.7	159.9	160.5	161.2
12.5°	148.6	148.6	150.5	153.6	158.7	163.1	168.1	171.2	174.3	175.6	175.6
15°	155.5	155.5	158.0	162.4	168.1	174.3	181.2	186.9	191.3	193.2	193.8
17.5°	162.4	163.1	166.2	171.8	179.4	187.5	196.3	203.8	210.7	213.2	214.5
20°	171.2	171.2	175.0	182.5	191.9	203.2	215.1	225.1	233.9	238.9	239.6
22.5°	181.2	181.9	185.6	195.0	207.0	221.4	237.1	250.9	263.4	269.7	269.0
25°	191.3	191.9	197.5	208.8	223.9	244.0	264.0	282.2	299.1	306.7	306.7
27.5°	203.2	203.8	210.7	223.9	244.0	269.0	295.4	321.7	338.7	349.9	353.7
30°	217.6	218.2	226.4	243.3	266.5	297.9	333.0	366.9	389.5	405.8	406.4
32.5°	233.3	234.6	244.6	264.0	294.1	333.6	377.5	419.6	450.9	471.6	471.0
35°	254.6	255.9	269.7	291.6	328.0	375.0	428.3	485.4	521.8	545.6	548.1
37.5°	276.6	279.1	294.8	323.6	367.5	423.9	491.1	555.0	609.0	630.9	637.2
40°	302.3	304.8	324.2	359.4	410.2	482.3	565.1	643.4	705.5	735.6	740.0
42.5°	331.8	336.1	358.7	399.5	463.5	546.9	643.4	740.0	818.4	857.9	855.4
45°	373.8	377.5	406.4	452.2	524.3	620.2	737.5	858.6	943.2	989.0	988.4
47.5°	413.9	418.9	453.4	511.1	594.5	706.2	844.1	982.1	1079.3	1130.1	1138.9
50°	455.3	462.2	506.1	570.7	669.8	806.5	961.4	1109.4	1227.3	1290.0	1305.1
52.5°	525.5	531.8	578.2	646.0	751.9	903.1	1081.2	1247.4	1377.8	1444.3	1468.8
55°	573.2	583.2	642.2	726.9	847.3	1007.2	1202.9	1394.8	1542.1	1607.4	1621.2
57.5°	588.9	599.5	670.4	775.1	924.4	1116.9	1330.2	1535.9	1695.8	1784.2	1806.2
60°	589.5	602.7	679.2	792.7	962.0	1194.1	1443.7	1687.6	1868.9	1966.1	1984.9
62.5°	609.6	624.6	706.2	812.1	980.9	1229.8	1520.8	1816.2	2038.2	2136.7	2157.4
65°	632.2	649.7	736.3	854.2	1023.5	1268.1	1569.7	1909.0	2190.6	2305.4	2315.4
67.5°	609.0	624.0	714.9	837.2	1013.5	1275.6	1604.2	1966.7	2282.2	2448.4	2456.5
70°	570.7	586.4	672.9	784.6	957.6	1218.5	1564.7	1966.7	2336.1	2544.9	2582.6
72.5°	514.9	530.6	612.7	719.3	874.9	1111.3	1455.0	1876.4	2299.1	2583.8	2627.7
75°	446.5	460.9	536.8	634.0	770.1	984.0	1295.7	1704.6	2154.9	2511.7	2564.4
77.5°	372.5	385.7	450.3	528.7	644.1	834.1	1101.3	1471.3	1902.7	2268.4	2336.7
80°	292.9	306.0	355.6	417.0	509.9	655.4	876.7	1183.4	1556.6	1862.6	1929.7
82.5°	219.5	225.8	260.9	305.4	365.0	472.9	635.9	874.9	1153.9	1373.4	1403.5
85°	138.0	143.6	167.4	198.2	233.9	290.4	392.0	535.6	697.4	820.9	822.8
87.5°	42.6	49.5	57.1	75.3	85.9	103.5	124.2	175.0	230.2	290.4	272.8
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-176-5

Test Date: 09/24/2024

Luminaire Tested: MEM2-HTN-VA-30-740-U-WQ

Data in this report applies to families of products including MEM2-HTN-VA-30-740-U-WQ



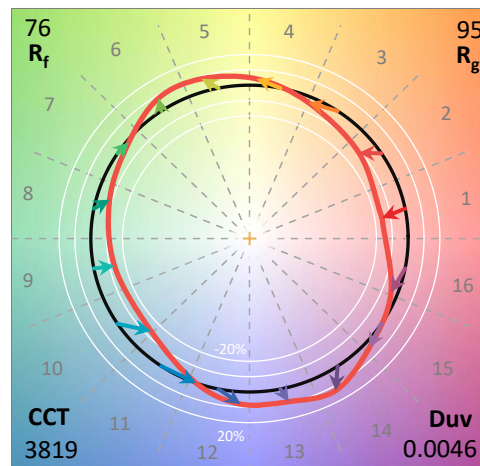
**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2407-176-5  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 09/27/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: Streetworks  
 Catalog Number: **MEM2-HTN-VA-30-740-U-WQ**  
 Description: EPIC MODERN VISUAL COMFORT 30W WAVESTREAM WIDE

**Spectral Parameters**

CCT (K): 3819  
 CIE u': 0.2261  
 CIE v': 0.5108  
 Duv: 0.0046  
 CIE x: 0.3926  
 CIE y: 0.3942  
 CIE z: 0.2132  
 Peak Wavelength (nm): 450  
 Dominant Wavelength (nm): 577  
 Purity: 36.15483  
 Rf: 75.6  
 Rg: 94.8

CRI (Ra):	72.9		
R1:	70.1	R9:	-21.5
R2:	78.4	R10:	48.5
R3:	85.0	R11:	68.4
R4:	72.9	R12:	39.0
R5:	69.1	R13:	71.1
R6:	69.2	R14:	91.3
R7:	82.8	R15:	63.2
R8:	55.4		



**Test Conditions**

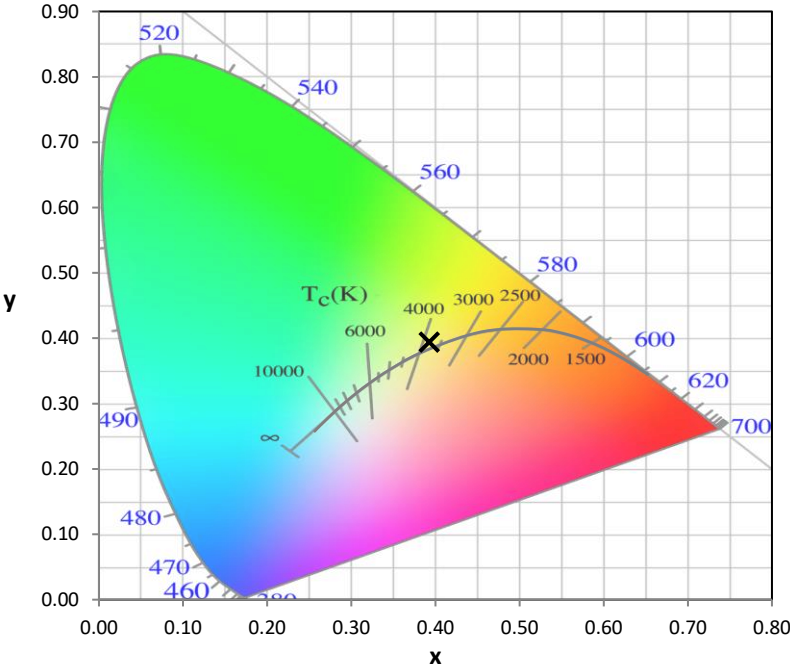
Stabilization Time: 30M  
 Operation Time: 1H 30M  
 Sphere Temperature (°C): 25.2

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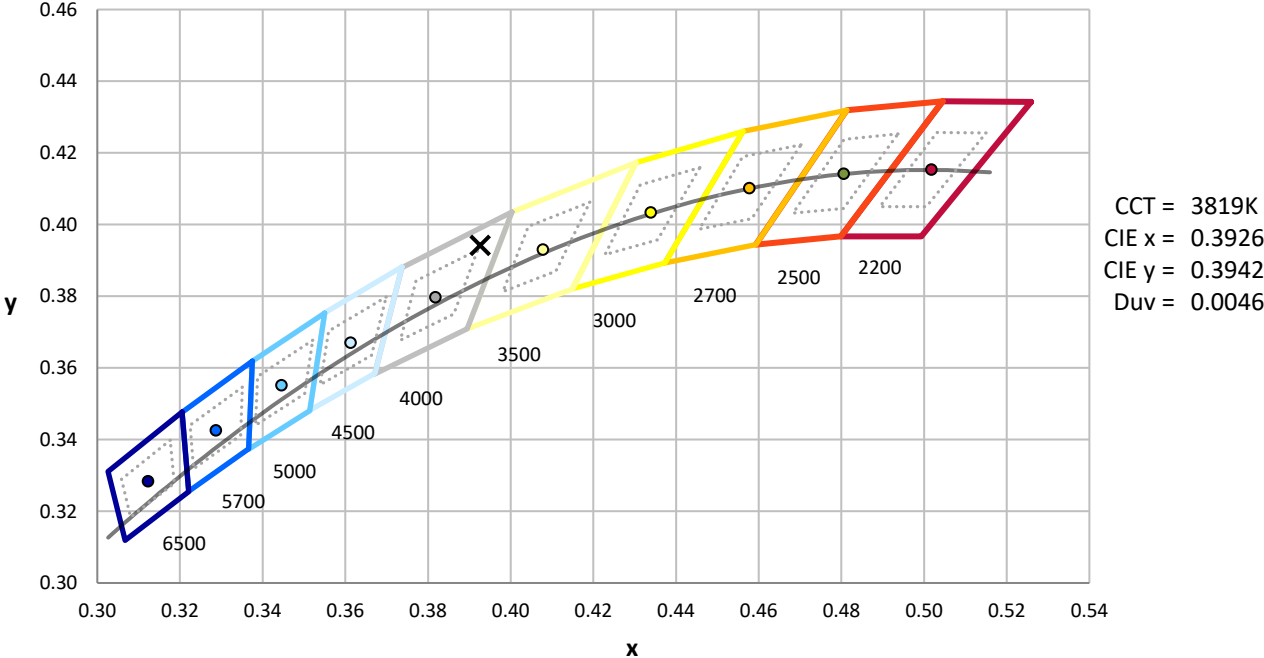
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/24/2023	10/24/2024
DC Power Source	IN0208	10/24/2023	10/24/2024
Sphere Thermometer	IN0085	10/24/2023	10/24/2024
Room Thermometer	IN0046	10/24/2023	10/24/2024

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**CIE 1931 Chromaticity Diagram**



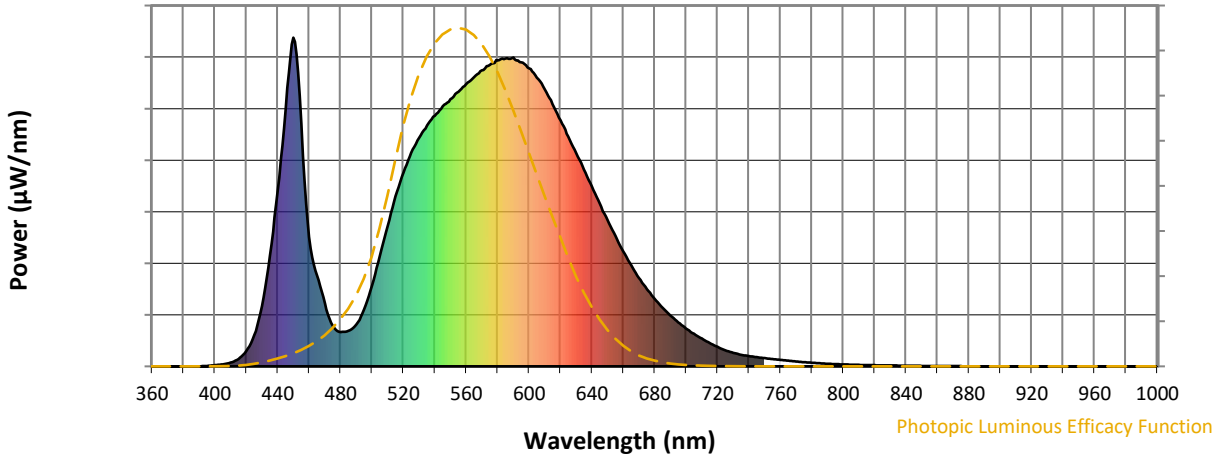
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 4000K 7-step quadrangle

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**Photopic Flux vs. Wavelength**

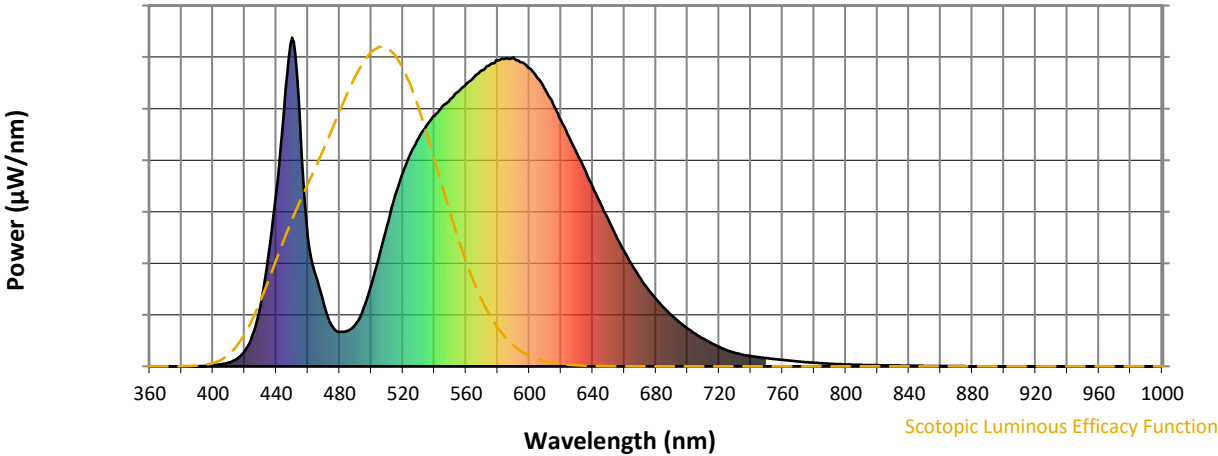


**Photopic Lumens: NR**

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	127	NR	620	748	NR	750	25	NR	880	0	NR
365	0	NR	495	173	NR	625	699	NR	755	22	NR	885	0	NR
370	0	NR	500	246	NR	630	648	NR	760	20	NR	890	0	NR
375	0	NR	505	335	NR	635	599	NR	765	17	NR	895	0	NR
380	0	NR	510	427	NR	640	547	NR	770	15	NR	900	0	NR
385	0	NR	515	517	NR	645	495	NR	775	13	NR	905	0	NR
390	0	NR	520	589	NR	650	445	NR	780	11	NR	910	0	NR
395	1	NR	525	649	NR	655	396	NR	785	9	NR	915	0	NR
400	4	NR	530	695	NR	660	349	NR	790	8	NR	920	0	NR
405	6	NR	535	733	NR	665	308	NR	795	7	NR	925	0	NR
410	11	NR	540	763	NR	670	269	NR	800	6	NR	930	0	NR
415	23	NR	545	792	NR	675	235	NR	805	5	NR	935	0	NR
420	46	NR	550	813	NR	680	205	NR	810	5	NR	940	0	NR
425	95	NR	555	835	NR	685	178	NR	815	4	NR	945	0	NR
430	183	NR	560	859	NR	690	155	NR	820	3	NR	950	0	NR
435	338	NR	565	880	NR	695	134	NR	825	3	NR	955	0	NR
440	534	NR	570	900	NR	700	115	NR	830	3	NR	960	0	NR
445	782	NR	575	918	NR	705	99	NR	835	2	NR	965	0	NR
450	1000	NR	580	931	NR	710	84	NR	840	2	NR	970	0	NR
455	739	NR	585	937	NR	715	71	NR	845	2	NR	975	0	NR
460	393	NR	590	939	NR	720	59	NR	850	1	NR	980	0	NR
465	276	NR	595	925	NR	725	49	NR	855	1	NR	985	0	NR
470	190	NR	600	907	NR	730	41	NR	860	1	NR	990	0	NR
475	123	NR	605	878	NR	735	35	NR	865	1	NR	995	0	NR
480	105	NR	610	842	NR	740	31	NR	870	1	NR	1000	0	NR
485	108	NR	615	797	NR	745	28	NR	875	1	NR			

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Scotopic Flux vs. Wavelength

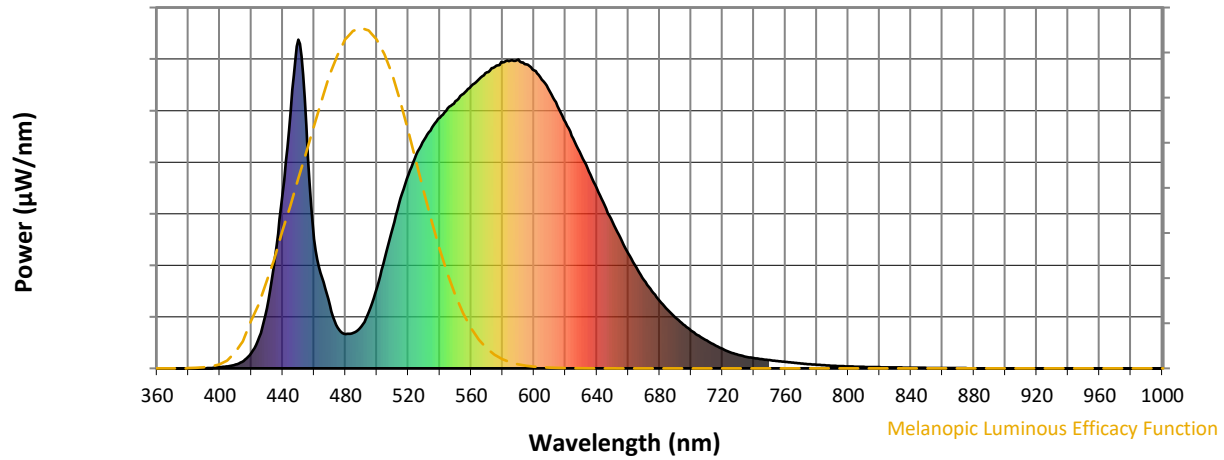


Scotopic Lumens: NR S/P: 1.45

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	127	NR	620	748	NR	750	25	NR	880	0	NR
365	0	NR	495	173	NR	625	699	NR	755	22	NR	885	0	NR
370	0	NR	500	246	NR	630	648	NR	760	20	NR	890	0	NR
375	0	NR	505	335	NR	635	599	NR	765	17	NR	895	0	NR
380	0	NR	510	427	NR	640	547	NR	770	15	NR	900	0	NR
385	0	NR	515	517	NR	645	495	NR	775	13	NR	905	0	NR
390	0	NR	520	589	NR	650	445	NR	780	11	NR	910	0	NR
395	1	NR	525	649	NR	655	396	NR	785	9	NR	915	0	NR
400	4	NR	530	695	NR	660	349	NR	790	8	NR	920	0	NR
405	6	NR	535	733	NR	665	308	NR	795	7	NR	925	0	NR
410	11	NR	540	763	NR	670	269	NR	800	6	NR	930	0	NR
415	23	NR	545	792	NR	675	235	NR	805	5	NR	935	0	NR
420	46	NR	550	813	NR	680	205	NR	810	5	NR	940	0	NR
425	95	NR	555	835	NR	685	178	NR	815	4	NR	945	0	NR
430	183	NR	560	859	NR	690	155	NR	820	3	NR	950	0	NR
435	338	NR	565	880	NR	695	134	NR	825	3	NR	955	0	NR
440	534	NR	570	900	NR	700	115	NR	830	3	NR	960	0	NR
445	782	NR	575	918	NR	705	99	NR	835	2	NR	965	0	NR
450	1000	NR	580	931	NR	710	84	NR	840	2	NR	970	0	NR
455	739	NR	585	937	NR	715	71	NR	845	2	NR	975	0	NR
460	393	NR	590	939	NR	720	59	NR	850	1	NR	980	0	NR
465	276	NR	595	925	NR	725	49	NR	855	1	NR	985	0	NR
470	190	NR	600	907	NR	730	41	NR	860	1	NR	990	0	NR
475	123	NR	605	878	NR	735	35	NR	865	1	NR	995	0	NR
480	105	NR	610	842	NR	740	31	NR	870	1	NR	1000	0	NR
485	108	NR	615	797	NR	745	28	NR	875	1	NR			

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Melanopic Flux vs. Wavelength



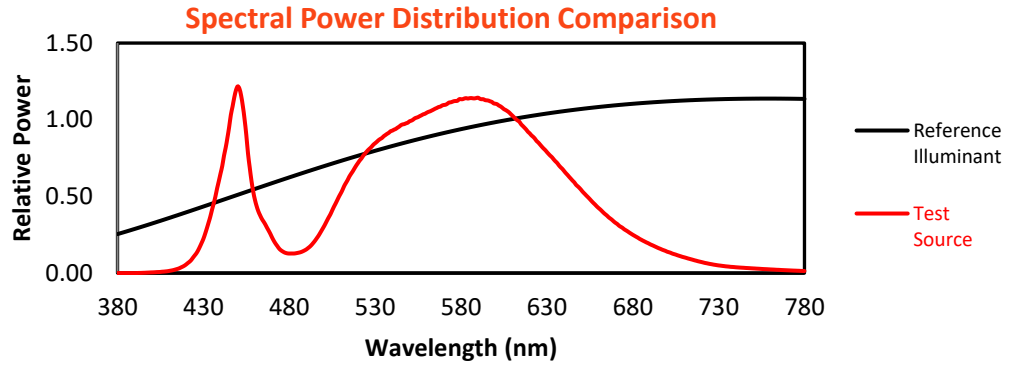
Melanopic Lumens: NR

M/P: 2.76

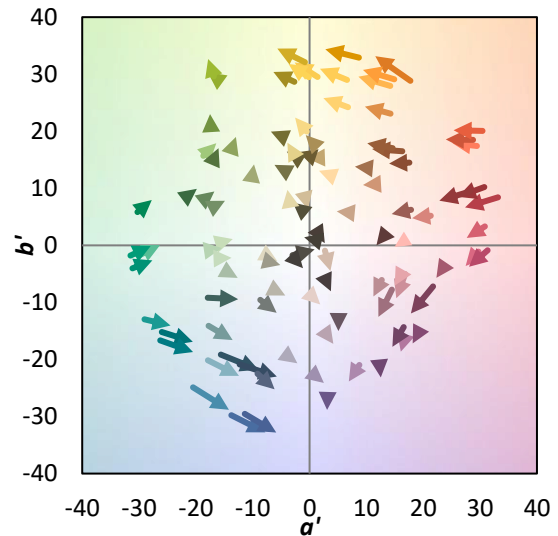
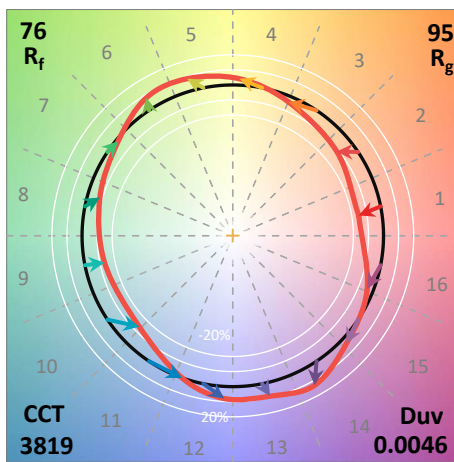
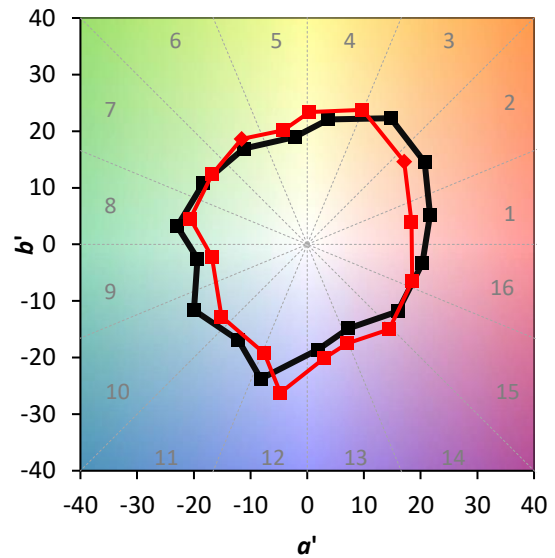
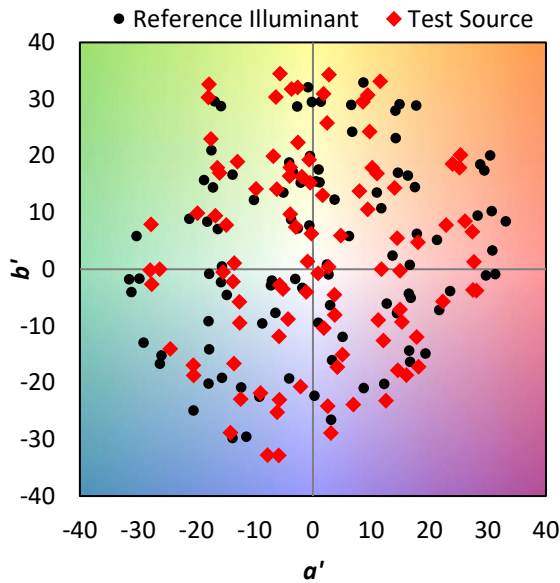
λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)
360	0	NR	490	127	NR	620	748	NR	750	25	NR	880	0	NR
365	0	NR	495	173	NR	625	699	NR	755	22	NR	885	0	NR
370	0	NR	500	246	NR	630	648	NR	760	20	NR	890	0	NR
375	0	NR	505	335	NR	635	599	NR	765	17	NR	895	0	NR
380	0	NR	510	427	NR	640	547	NR	770	15	NR	900	0	NR
385	0	NR	515	517	NR	645	495	NR	775	13	NR	905	0	NR
390	0	NR	520	589	NR	650	445	NR	780	11	NR	910	0	NR
395	1	NR	525	649	NR	655	396	NR	785	9	NR	915	0	NR
400	4	NR	530	695	NR	660	349	NR	790	8	NR	920	0	NR
405	6	NR	535	733	NR	665	308	NR	795	7	NR	925	0	NR
410	11	NR	540	763	NR	670	269	NR	800	6	NR	930	0	NR
415	23	NR	545	792	NR	675	235	NR	805	5	NR	935	0	NR
420	46	NR	550	813	NR	680	205	NR	810	5	NR	940	0	NR
425	95	NR	555	835	NR	685	178	NR	815	4	NR	945	0	NR
430	183	NR	560	859	NR	690	155	NR	820	3	NR	950	0	NR
435	338	NR	565	880	NR	695	134	NR	825	3	NR	955	0	NR
440	534	NR	570	900	NR	700	115	NR	830	3	NR	960	0	NR
445	782	NR	575	918	NR	705	99	NR	835	2	NR	965	0	NR
450	1000	NR	580	931	NR	710	84	NR	840	2	NR	970	0	NR
455	739	NR	585	937	NR	715	71	NR	845	2	NR	975	0	NR
460	393	NR	590	939	NR	720	59	NR	850	1	NR	980	0	NR
465	276	NR	595	925	NR	725	49	NR	855	1	NR	985	0	NR
470	190	NR	600	907	NR	730	41	NR	860	1	NR	990	0	NR
475	123	NR	605	878	NR	735	35	NR	865	1	NR	995	0	NR
480	105	NR	610	842	NR	740	31	NR	870	1	NR	1000	0	NR
485	108	NR	615	797	NR	745	28	NR	875	1	NR			

**Summary**

$R_f = 75.6$   
 $R_g = 94.8$   
 $CIE R_a = 72.9$   
 $R_g = -21.5$

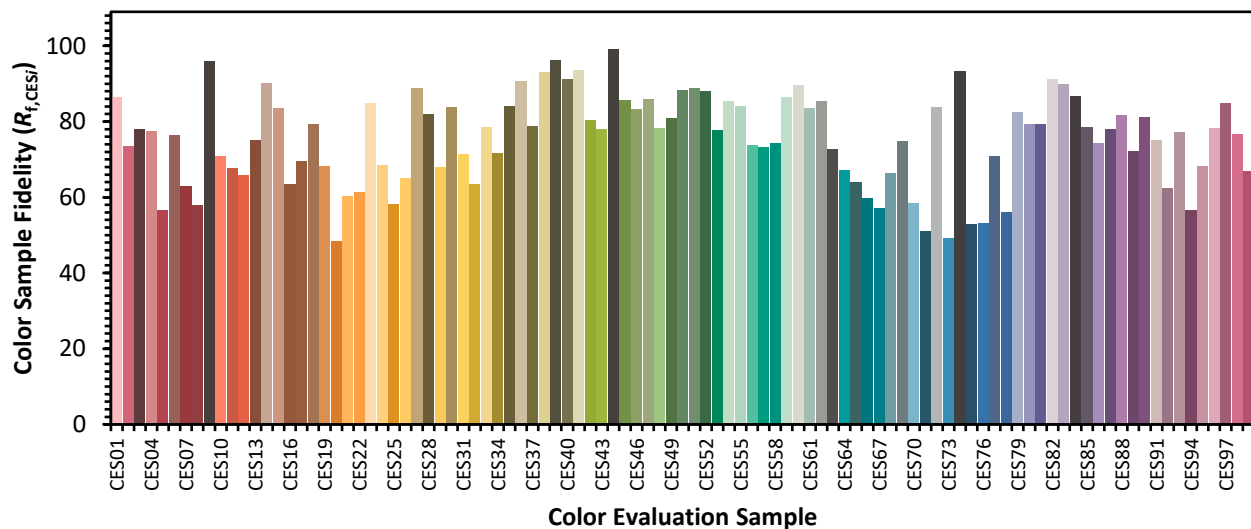


**Color Vector Graphics**



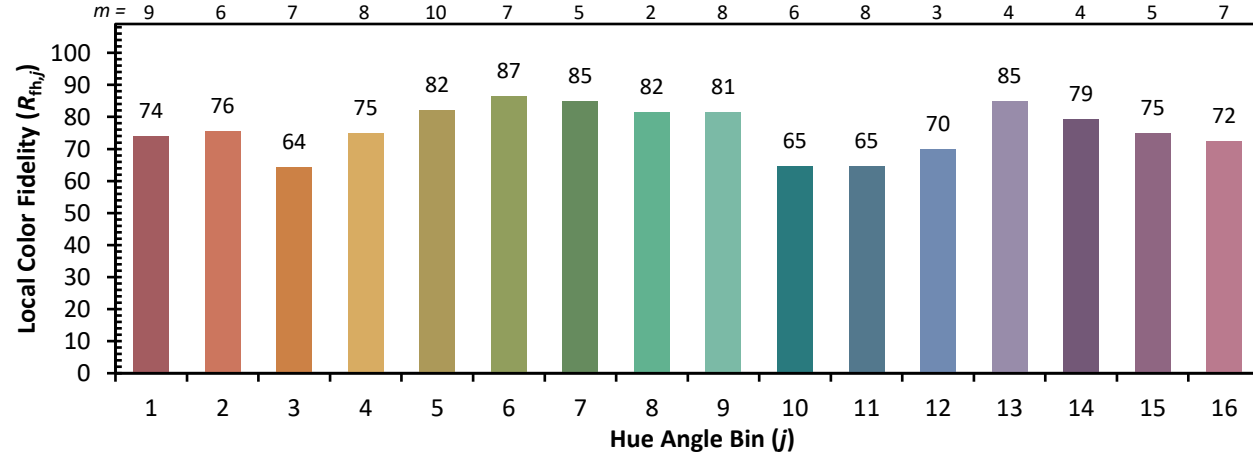
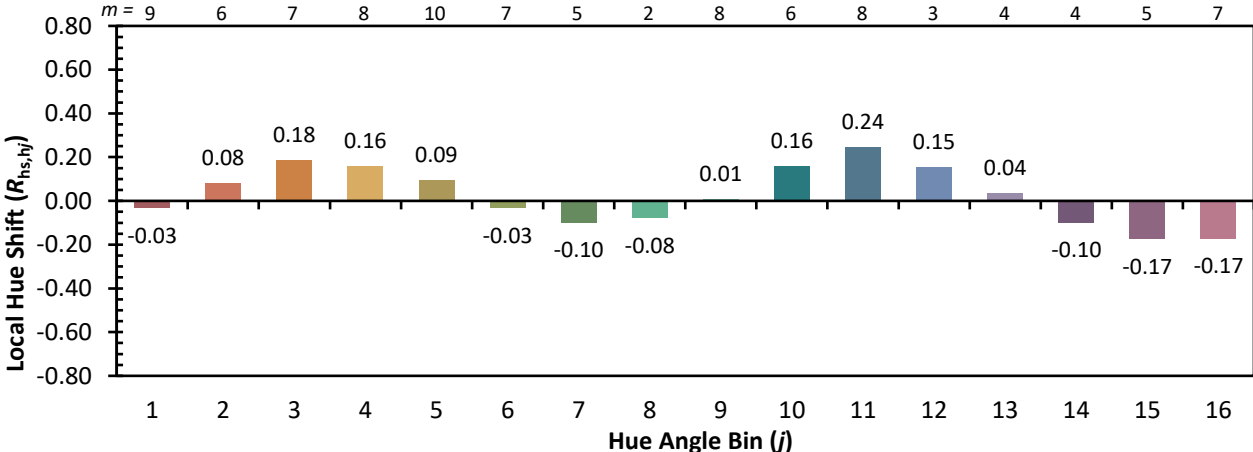
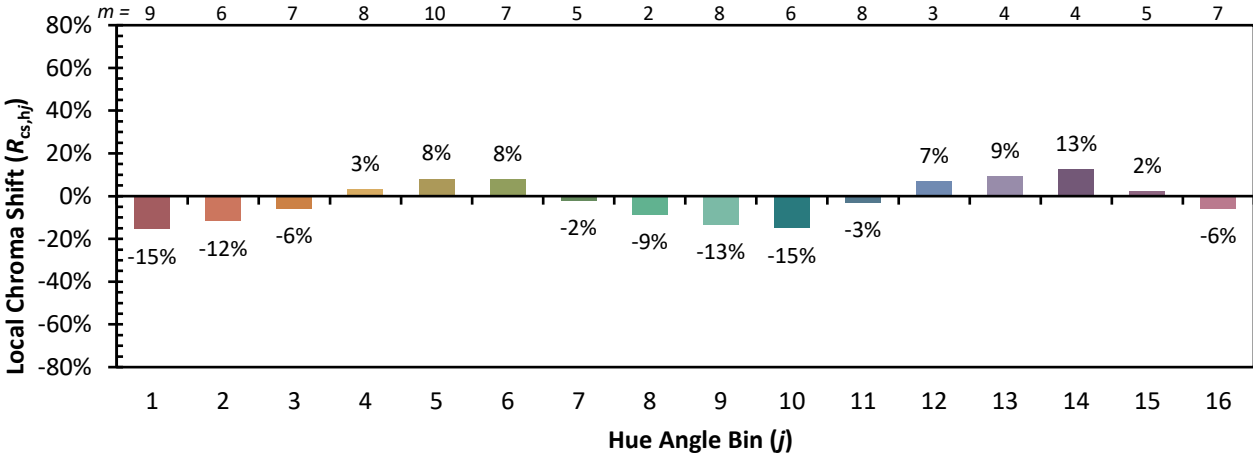
**Individual Sample Fidelity Index ( $R_{f,i}$ )**

CES01 = 85	CES26 = 65	CES51 = 89	CES76 = 53
CES02 = 61	CES27 = 89	CES52 = 88	CES77 = 71
CES03 = 30	CES28 = 82	CES53 = 78	CES78 = 56
CES04 = 70	CES29 = 68	CES54 = 85	CES79 = 83
CES05 = 48	CES30 = 84	CES55 = 84	CES80 = 79
CES06 = 50	CES31 = 71	CES56 = 74	CES81 = 79
CES07 = 40	CES32 = 63	CES57 = 73	CES82 = 91
CES08 = 39	CES33 = 79	CES58 = 74	CES83 = 90
CES09 = 29	CES34 = 72	CES59 = 86	CES84 = 87
CES10 = 74	CES35 = 84	CES60 = 90	CES85 = 78
CES11 = 57	CES36 = 91	CES61 = 84	CES86 = 74
CES12 = 63	CES37 = 79	CES62 = 85	CES87 = 78
CES13 = 42	CES38 = 93	CES63 = 73	CES88 = 82
CES14 = 74	CES39 = 96	CES64 = 67	CES89 = 72
CES15 = 71	CES40 = 91	CES65 = 64	CES90 = 81
CES16 = 47	CES41 = 93	CES66 = 60	CES91 = 75
CES17 = 49	CES42 = 80	CES67 = 57	CES92 = 62
CES18 = 56	CES43 = 78	CES68 = 66	CES93 = 77
CES19 = 72	CES44 = 99	CES69 = 75	CES94 = 57
CES20 = 65	CES45 = 86	CES70 = 58	CES95 = 68
CES21 = 86	CES46 = 83	CES71 = 51	CES96 = 78
CES22 = 78	CES47 = 86	CES72 = 84	CES97 = 85
CES23 = 92	CES48 = 78	CES73 = 49	CES98 = 77
CES24 = 91	CES49 = 81	CES74 = 93	CES99 = 67
CES25 = 72	CES50 = 88	CES75 = 53	

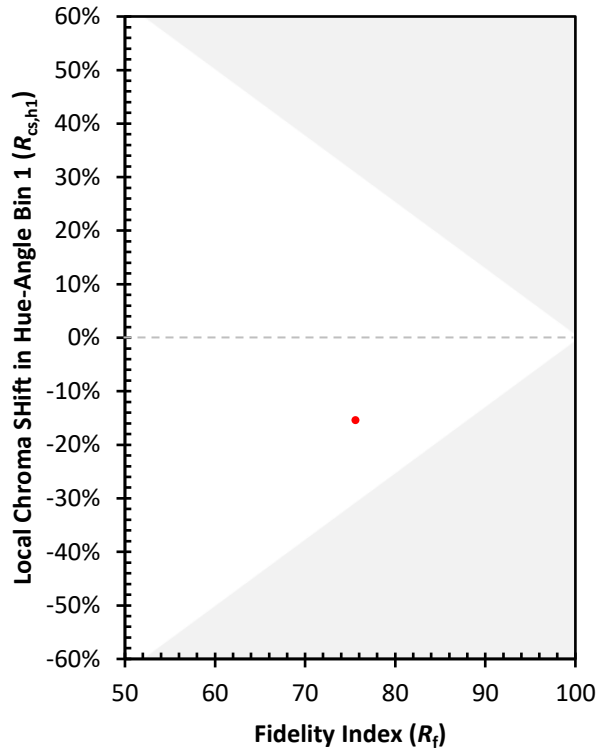
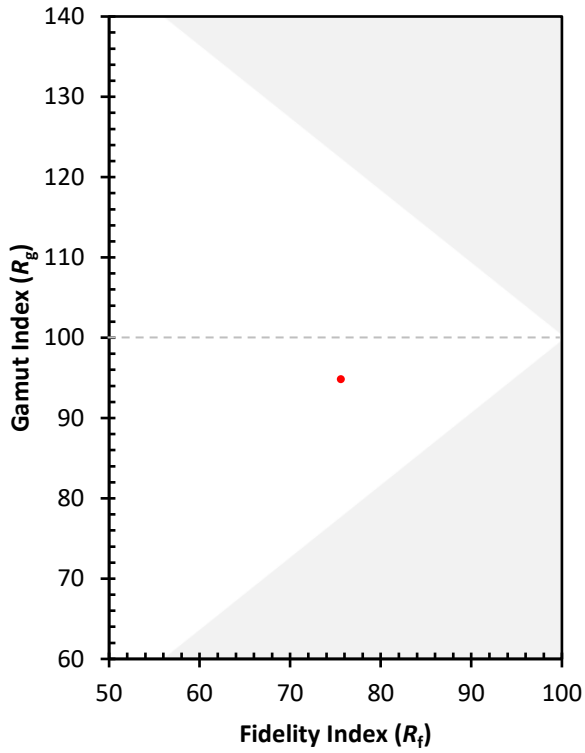




Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)