

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: P879672

Luminaire Tested: **EMM2-HSN-VA8-730-U-WQ**

Issue Date: 10/01/2024



Test Information

Test Method: LM-79-08
Report Number: P879672
Test Lab: INNOVATION CENTER(G3)
Issue Date: 10/01/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: INVUE
Catalog Number: EMM2-HSN-VA8-730-U-WQ
Description: EPIC MODERN SHORT HOUSING 8W 70CRI 3000K WAVESTREAM FIXTURE w/
TYPE V WIDE DISTRIBUTION OPTIC
Light Source: (1) 3000K CCT, 70 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

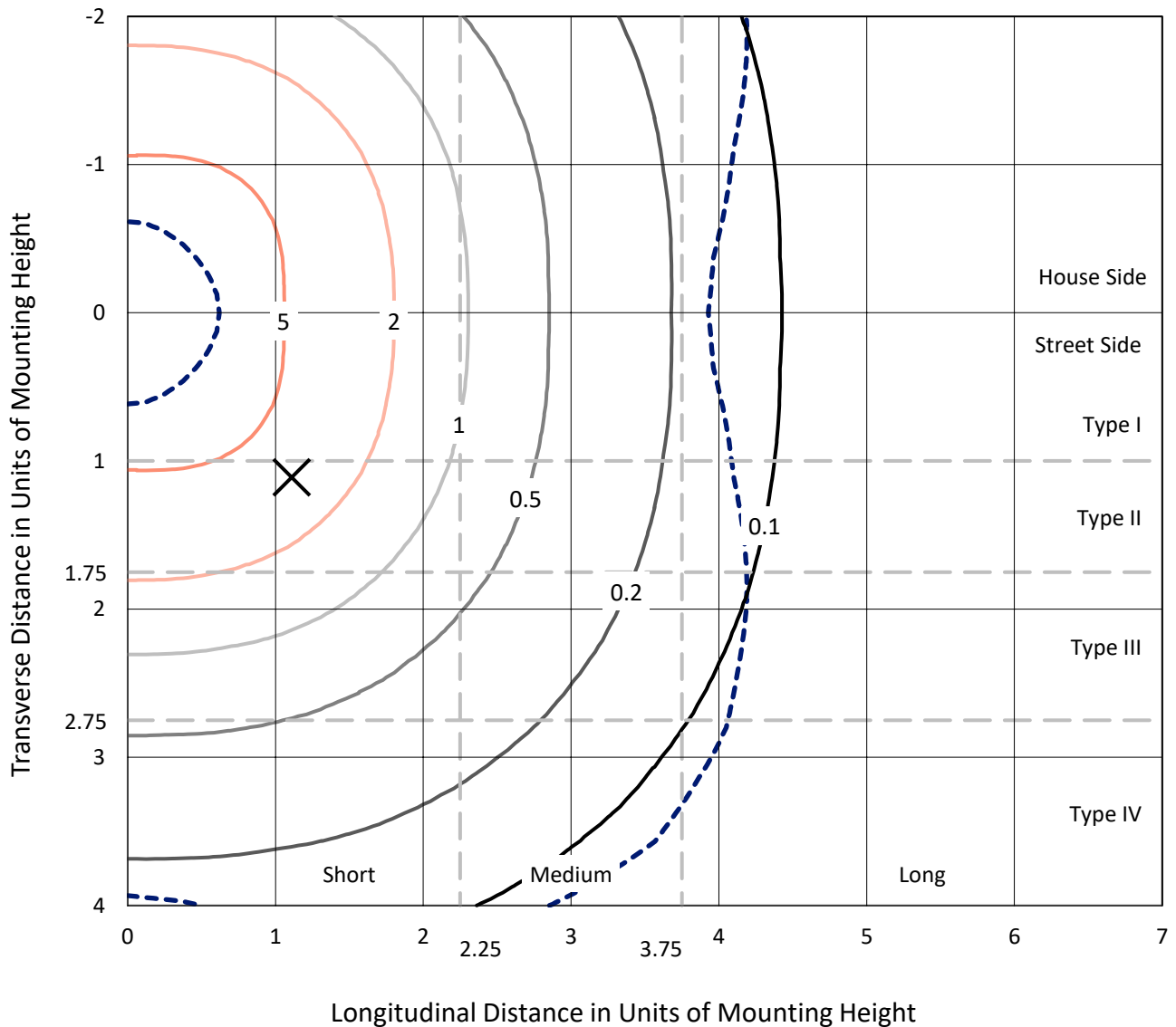
Lumens per Lamp: N/A
Luminaire Lumens: 17545.5 lumens
Efficiency: N/A
Efficacy: 112.5 lumens/watt
Luminous Opening: Circular (Dia: 1.12' x H: 0')
IES Classification: Type V - Short
BUG Rating: B4 - U0 - G3

Input Watts (W): 156
Input Voltage (V): 120
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.995
Total Harmonic Distortion (THDi): 6.6%
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT

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 CATALOG NUMBER: EMM2-HSN-VA8-730-U-WQ

Iso-Footcandle Lines of Horizontal Illumination

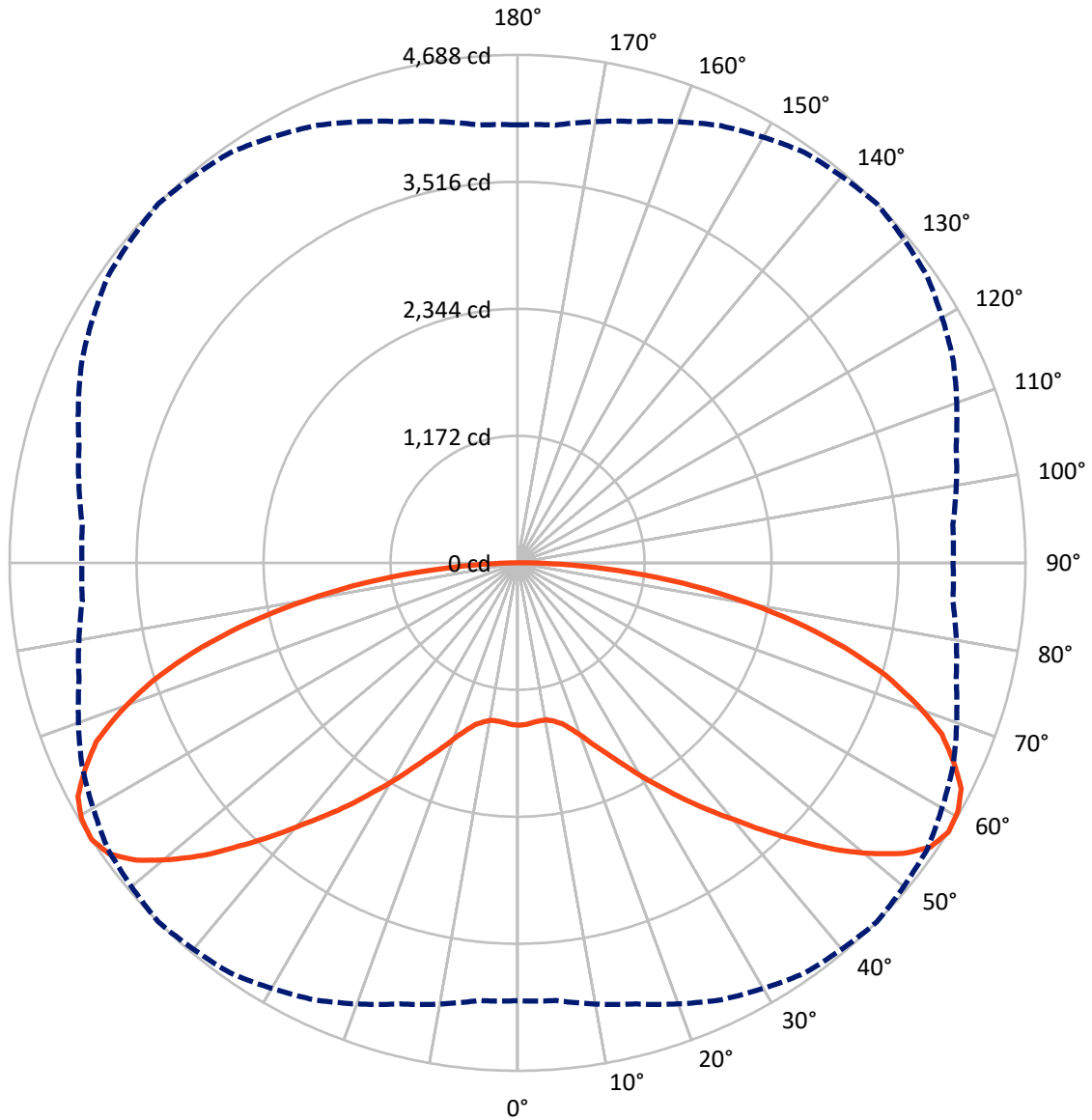
✕ Max cd
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 6.7 fc
 Type V - Short - N/A

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Luminous Intensity Polar Plot



— Vertical Plane Through 45-Deg Lateral - - - Horizontal Cone Through 57.5-Deg Vertical

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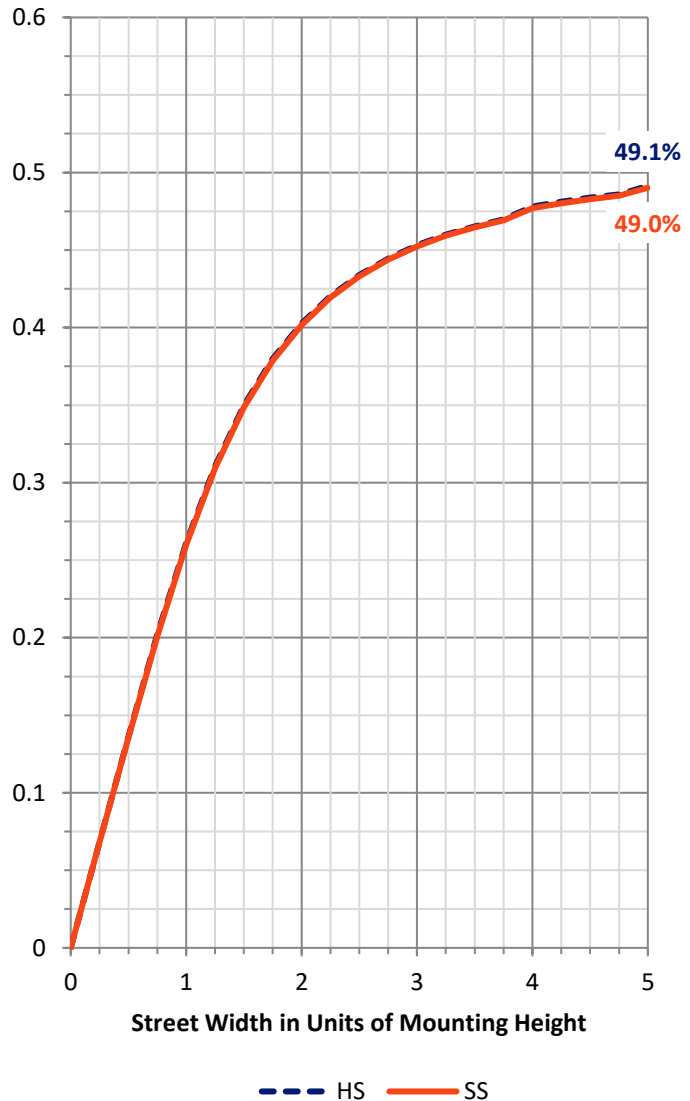
FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	8772.8	0.0	8772.8
	% Fixture	50.0	0.0	50.0
Street Side	Lumens	8772.8	0.0	8772.8
	% Fixture	50.0	0.0	50.0
Total	Lumens	17545.5	0.0	17545.5
	% Fixture	100.0	0.0	100.0

Coefficient of Utilization

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	141.1	0.8
10°-20°	443.6	2.5
20°-30°	911.7	5.2
30°-40°	1663.5	9.5
40°-50°	2728.0	15.5
50°-60°	3822.6	21.8
60°-70°	3998.9	22.8
70°-80°	2921.7	16.7
80°-90°	914.6	5.2
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°	17545.5	100.0
0°-180°	17545.5	100.0

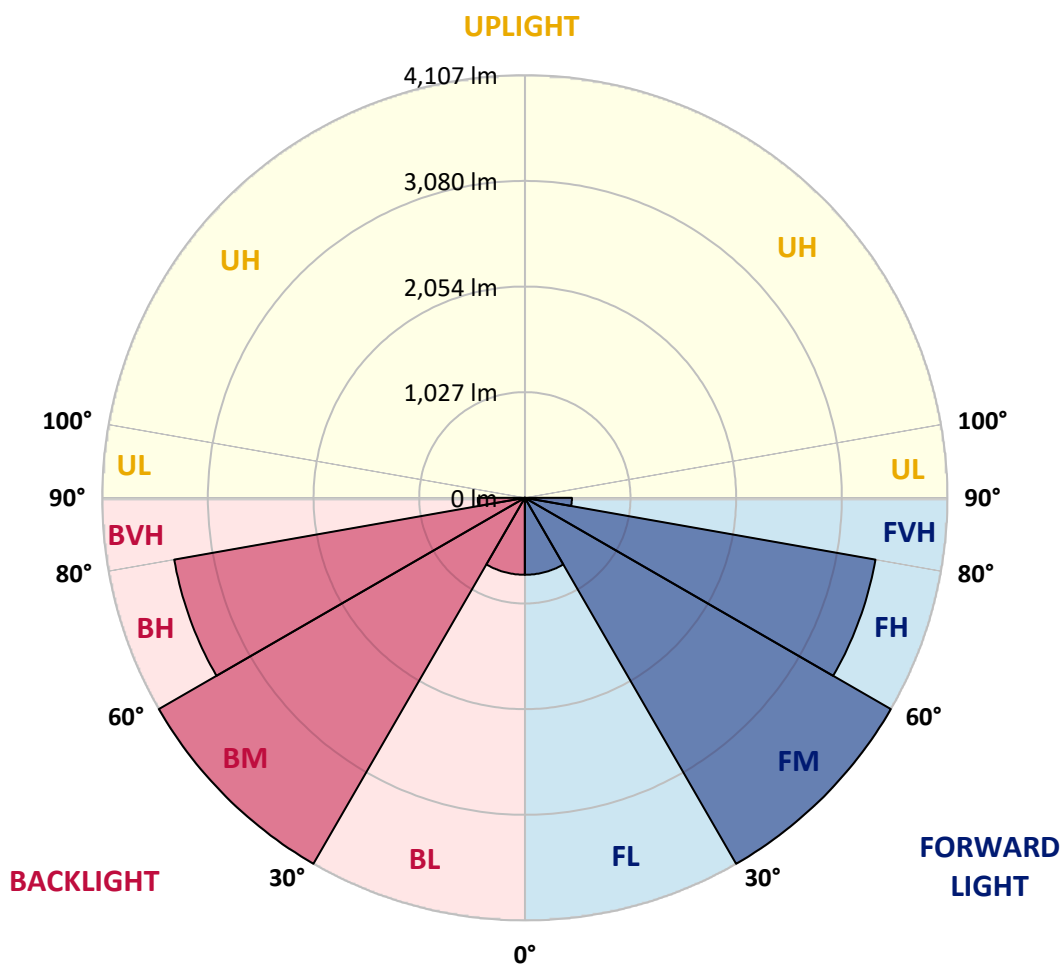


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LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone		Lumens	% Fixture	Zone Rating/Lumen Limit		
				B	U	G
FL	(0°-30°)	748.1	4.3			
FM	(30°-60°)	4107.0	23.4			
FH	(60°-80°)	3460.3	19.7			G2/5000
FVH	(80°-90°)	457.3	2.6			G3/500
BL	(0°-30°)	748.1	4.3	B2/1000		
BM	(30°-60°)	4107.0	23.4	B3/5000		
BH	(60°-80°)	3460.3	19.7	B4/5000		G2/5000
BVH	(80°-90°)	457.3	2.6			G3/500
UL	(90°-100°)	0.0	0.0		U0/0	
UH	(100°-180°)	0.0	0.0		U0/0	

BUG Rating: B4-U0-G3
 Type V Short





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CATALOG NUMBER: EMM2-HSN-VA8-730-U-WQ

CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	1498.0	1498.0	1498.0	1498.0	1498.0	1498.0	1498.0	1498.0	1498.0	1498.0	1498.0
2.5°	1492.5	1494.7	1493.6	1493.6	1492.5	1493.6	1495.8	1496.9	1495.8	1496.9	1495.8
5°	1482.7	1482.7	1481.6	1480.5	1480.5	1480.5	1480.5	1480.5	1481.6	1481.6	1482.7
7.5°	1470.6	1470.6	1470.6	1472.8	1471.7	1472.8	1472.8	1471.7	1470.6	1470.6	1471.7
10°	1472.8	1471.7	1470.6	1472.8	1471.7	1472.8	1472.8	1470.6	1471.7	1472.8	1473.9
12.5°	1491.4	1489.2	1492.5	1495.8	1498.0	1500.2	1499.1	1498.0	1494.7	1491.4	1491.4
15°	1532.1	1529.9	1533.2	1537.6	1538.7	1539.8	1543.1	1538.7	1537.6	1532.1	1531.0
17.5°	1590.4	1589.3	1595.9	1604.6	1609.0	1614.5	1609.0	1604.6	1592.6	1590.4	1593.7
20°	1673.9	1670.6	1683.8	1698.1	1702.5	1709.1	1704.7	1695.9	1683.8	1670.6	1670.6
22.5°	1780.5	1788.2	1794.8	1805.8	1823.4	1834.4	1820.1	1804.7	1787.1	1779.4	1773.9
25°	1919.0	1917.9	1924.5	1946.5	1957.4	1965.1	1962.9	1942.1	1926.7	1915.7	1914.6
27.5°	2052.0	2065.2	2078.3	2092.6	2120.1	2123.4	2120.1	2094.8	2070.7	2061.9	2058.6
30°	2228.9	2226.7	2238.8	2272.9	2300.4	2302.6	2293.8	2263.0	2235.5	2219.0	2221.2
32.5°	2401.5	2383.9	2415.8	2438.8	2461.9	2486.1	2463.0	2438.8	2415.8	2380.6	2391.6
35°	2558.6	2572.9	2590.5	2637.8	2685.0	2694.9	2679.5	2630.1	2585.0	2568.5	2549.9
37.5°	2751.0	2751.0	2780.7	2849.9	2892.8	2908.1	2886.2	2836.7	2774.1	2749.9	2741.1
40°	2944.4	2944.4	2989.5	3047.7	3111.5	3133.5	3109.3	3044.4	2992.8	2930.1	2940.0
42.5°	3132.4	3147.7	3207.1	3278.5	3367.6	3397.2	3363.2	3276.3	3201.6	3142.3	3133.5
45°	3340.1	3364.3	3429.1	3546.7	3622.5	3665.4	3618.1	3543.4	3411.5	3354.4	3323.6
47.5°	3566.5	3583.0	3676.4	3788.5	3911.6	3956.7	3900.6	3778.6	3666.5	3565.4	3561.0
50°	3763.2	3759.9	3879.7	4034.7	4174.3	4217.1	4172.1	4040.2	3857.7	3745.6	3756.6
52.5°	3910.5	3929.2	4055.6	4246.8	4395.2	4457.8	4384.2	4225.9	4035.8	3919.3	3884.1
55°	4006.1	4036.9	4184.2	4390.8	4560.1	4627.1	4554.6	4372.1	4164.4	4013.8	3992.9
57.5°	4041.3	4054.5	4214.9	4449.0	4621.6	4687.5	4612.8	4434.8	4189.7	4032.5	4019.3
60°	3987.4	4000.6	4174.3	4413.9	4611.7	4667.8	4608.4	4399.6	4150.1	3989.6	3967.7
62.5°	3855.5	3891.8	4084.2	4321.6	4548.0	4595.2	4533.7	4305.1	4074.3	3880.8	3849.0
65°	3697.3	3735.8	3899.5	4164.4	4369.9	4420.5	4372.1	4152.3	3900.6	3714.9	3684.1
67.5°	3476.4	3483.0	3675.3	3943.5	4161.1	4222.6	4139.1	3939.1	3665.4	3489.6	3465.4
70°	3200.5	3204.9	3409.3	3657.7	3857.7	3908.3	3853.4	3640.1	3395.0	3203.8	3187.3
72.5°	2846.6	2887.3	3056.5	3302.7	3489.6	3548.9	3477.5	3296.1	3069.7	2880.7	2843.3
75°	2470.7	2496.0	2643.3	2881.8	3042.2	3115.9	3057.6	2881.8	2643.3	2487.2	2454.2
77.5°	2031.1	2065.2	2209.1	2410.3	2543.3	2622.4	2558.6	2402.6	2209.1	2066.3	2065.2
80°	1604.6	1595.9	1726.6	1900.3	2032.2	2078.3	2038.8	1887.1	1713.5	1602.4	1587.1
82.5°	1113.4	1111.2	1252.9	1369.4	1480.5	1533.2	1472.8	1374.9	1240.9	1141.9	1110.1
85°	633.1	647.4	740.8	813.3	907.8	939.7	918.8	826.5	706.7	619.9	614.4
87.5°	219.8	239.6	257.2	309.9	371.5	399.0	369.3	355.0	315.4	273.7	275.9
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
1121 Highway 74 South
Peachtree City, GA 30269



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

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-176-20

Test Date: 10/23/2024

Luminaire Tested: MEM2-HTN-VA-150-740-U-WQ

Data in this report applies to families of products including MEM2-HTN-VA-150-740-U-WQ

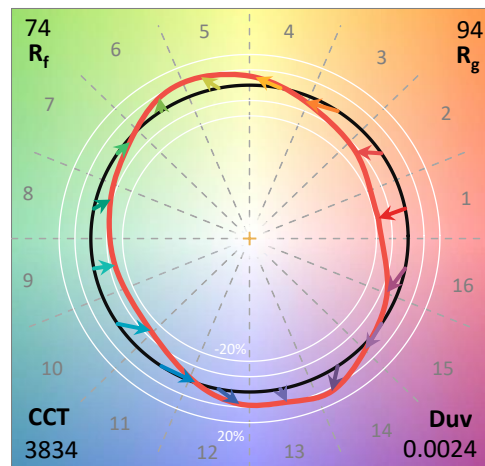
Test Information

Test Method: LM-79-2019
 Report Number: SP1-2407-176-20
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 10/23/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: Streetworks
 Catalog Number: **MEM2-HTN-VA-150-740-U-WQ**
 Description: EPIC MODERN VISUAL COMFORT 150W WAVESTREAM WIDE

Spectral Parameters

CCT (K): 3834
 CIE u': 0.2270
 CIE v': 0.5077
 Duv: 0.0024
 CIE x: 0.3900
 CIE y: 0.3877
 CIE z: 0.2223
 Peak Wavelength (nm): 585
 Dominant Wavelength (nm): 578
 Purity: 33.41599
 Rf: 74.4
 Rg: 93.6

CRI (Ra):	71.3		
R1:	67.4	R9:	-37.8
R2:	78.6	R10:	50.1
R3:	88.2	R11:	65.6
R4:	70.0	R12:	44.1
R5:	67.5	R13:	69.2
R6:	70.1	R14:	93.3
R7:	80.0	R15:	59.4
R8:	48.5		



Test Conditions

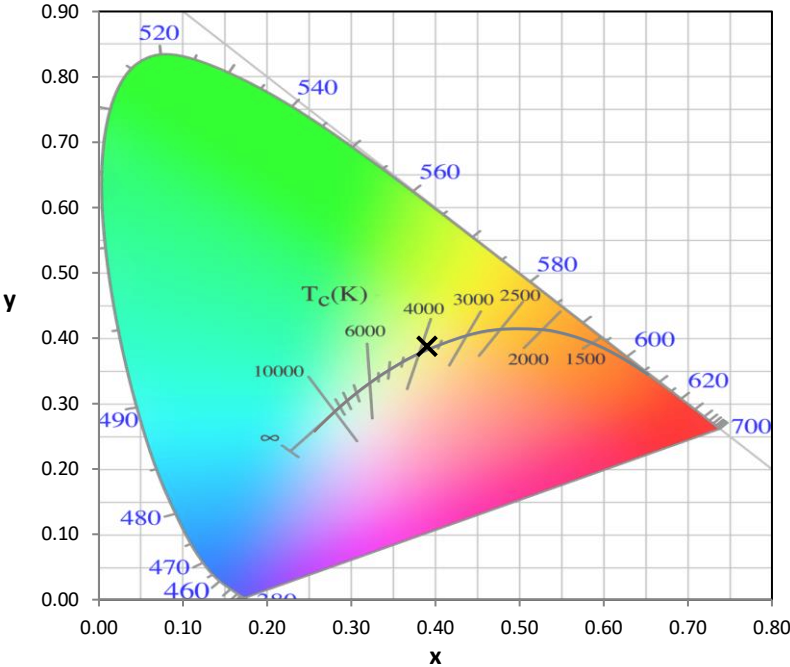
Stabilization Time: 30M
 Operation Time: 1H 30M
 Sphere Temperature (°C): 25.1

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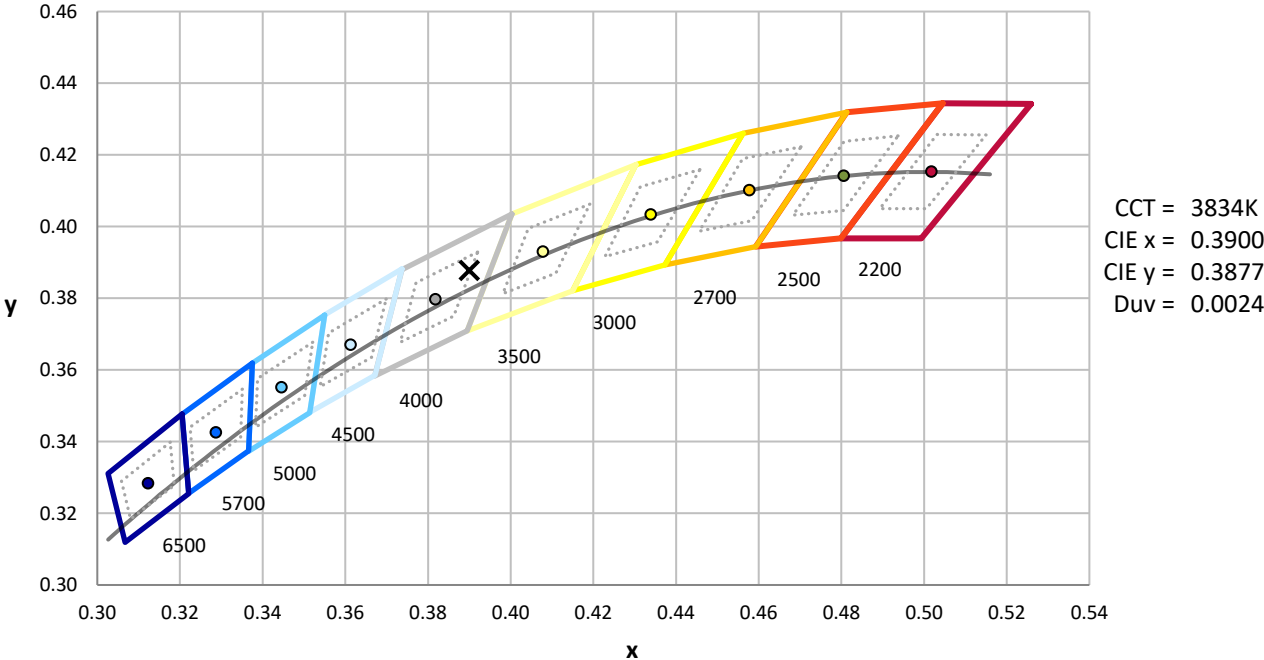
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/22/2024	10/22/2025
DC Power Source	IN0208	10/22/2024	10/22/2025
Sphere Thermometer	IN0085	10/22/2024	10/22/2025
Room Thermometer	IN0046	10/22/2024	10/22/2025

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CIE 1931 Chromaticity Diagram



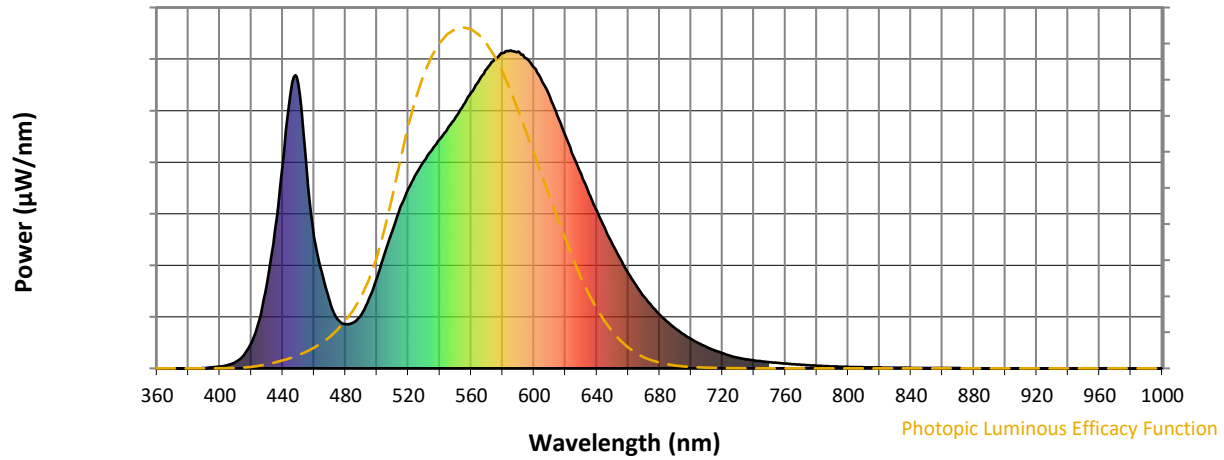
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 4000K 4-step quadrangle

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Photopic Flux vs. Wavelength

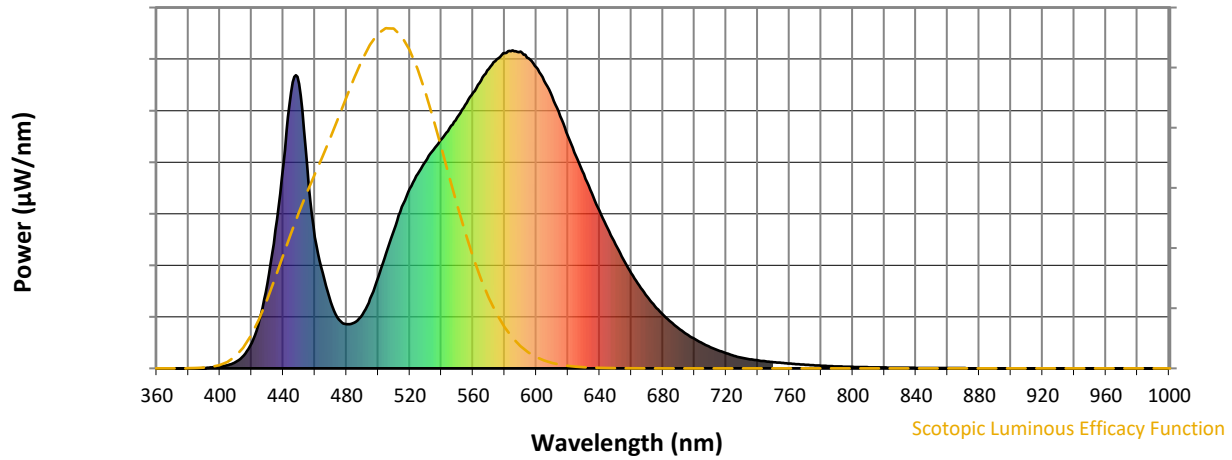


Photopic Lumens: NR

λ (nm)	Power W [^] /nm	Lumens (ϕ /nm)	λ (nm)	Power W [^] /nm	Lumens (ϕ /nm)	λ (nm)	Power W [^] /nm	Lumens (ϕ /nm)	λ (nm)	Power W [^] /nm	Lumens (ϕ /nm)	λ (nm)	Power W [^] /nm	Lumens (ϕ /nm)
360	0	NR	490	169	NR	620	731	NR	750	20	NR	880	0	NR
365	0	NR	495	219	NR	625	668	NR	755	17	NR	885	0	NR
370	0	NR	500	285	NR	630	611	NR	760	15	NR	890	0	NR
375	0	NR	505	362	NR	635	550	NR	765	13	NR	895	0	NR
380	0	NR	510	435	NR	640	495	NR	770	11	NR	900	0	NR
385	0	NR	515	508	NR	645	440	NR	775	10	NR	905	0	NR
390	1	NR	520	565	NR	650	390	NR	780	8	NR	910	0	NR
395	3	NR	525	612	NR	655	343	NR	785	7	NR	915	0	NR
400	6	NR	530	652	NR	660	299	NR	790	6	NR	920	0	NR
405	10	NR	535	687	NR	665	261	NR	795	5	NR	925	0	NR
410	20	NR	540	720	NR	670	226	NR	800	5	NR	930	0	NR
415	40	NR	545	755	NR	675	195	NR	805	4	NR	935	0	NR
420	80	NR	550	789	NR	680	169	NR	810	3	NR	940	0	NR
425	152	NR	555	828	NR	685	146	NR	815	3	NR	945	0	NR
430	266	NR	560	867	NR	690	126	NR	820	3	NR	950	0	NR
435	435	NR	565	905	NR	695	108	NR	825	2	NR	955	0	NR
440	641	NR	570	942	NR	700	92	NR	830	2	NR	960	0	NR
445	869	NR	575	972	NR	705	79	NR	835	2	NR	965	0	NR
450	894	NR	580	991	NR	710	67	NR	840	2	NR	970	0	NR
455	640	NR	585	1000	NR	715	56	NR	845	1	NR	975	0	NR
460	413	NR	590	996	NR	720	47	NR	850	1	NR	980	0	NR
465	300	NR	595	975	NR	725	40	NR	855	1	NR	985	0	NR
470	208	NR	600	946	NR	730	33	NR	860	1	NR	990	0	NR
475	154	NR	605	903	NR	735	29	NR	865	1	NR	995	0	NR
480	139	NR	610	854	NR	740	25	NR	870	1	NR	1000	0	NR
485	144	NR	615	793	NR	745	22	NR	875	0	NR			

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Scotopic Flux vs. Wavelength



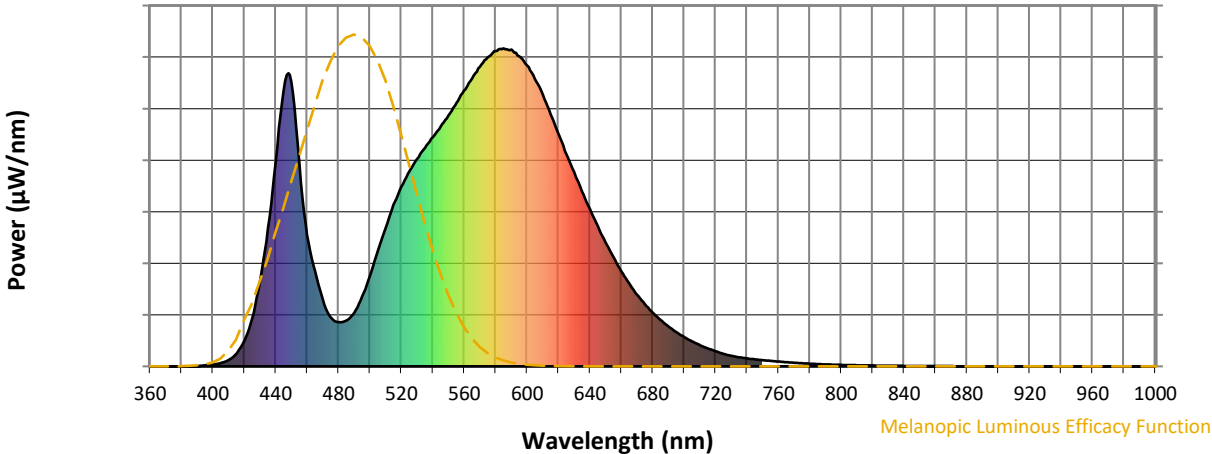
Scotopic Lumens: NR

S/P: 1.47

λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)
360	0	NR	490	169	NR	620	731	NR	750	20	NR	880	0	NR
365	0	NR	495	219	NR	625	668	NR	755	17	NR	885	0	NR
370	0	NR	500	285	NR	630	611	NR	760	15	NR	890	0	NR
375	0	NR	505	362	NR	635	550	NR	765	13	NR	895	0	NR
380	0	NR	510	435	NR	640	495	NR	770	11	NR	900	0	NR
385	0	NR	515	508	NR	645	440	NR	775	10	NR	905	0	NR
390	1	NR	520	565	NR	650	390	NR	780	8	NR	910	0	NR
395	3	NR	525	612	NR	655	343	NR	785	7	NR	915	0	NR
400	6	NR	530	652	NR	660	299	NR	790	6	NR	920	0	NR
405	10	NR	535	687	NR	665	261	NR	795	5	NR	925	0	NR
410	20	NR	540	720	NR	670	226	NR	800	5	NR	930	0	NR
415	40	NR	545	755	NR	675	195	NR	805	4	NR	935	0	NR
420	80	NR	550	789	NR	680	169	NR	810	3	NR	940	0	NR
425	152	NR	555	828	NR	685	146	NR	815	3	NR	945	0	NR
430	266	NR	560	867	NR	690	126	NR	820	3	NR	950	0	NR
435	435	NR	565	905	NR	695	108	NR	825	2	NR	955	0	NR
440	641	NR	570	942	NR	700	92	NR	830	2	NR	960	0	NR
445	869	NR	575	972	NR	705	79	NR	835	2	NR	965	0	NR
450	894	NR	580	991	NR	710	67	NR	840	2	NR	970	0	NR
455	640	NR	585	1000	NR	715	56	NR	845	1	NR	975	0	NR
460	413	NR	590	996	NR	720	47	NR	850	1	NR	980	0	NR
465	300	NR	595	975	NR	725	40	NR	855	1	NR	985	0	NR
470	208	NR	600	946	NR	730	33	NR	860	1	NR	990	0	NR
475	154	NR	605	903	NR	735	29	NR	865	1	NR	995	0	NR
480	139	NR	610	854	NR	740	25	NR	870	1	NR	1000	0	NR
485	144	NR	615	793	NR	745	22	NR	875	0	NR			

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Melanopic Flux vs. Wavelength



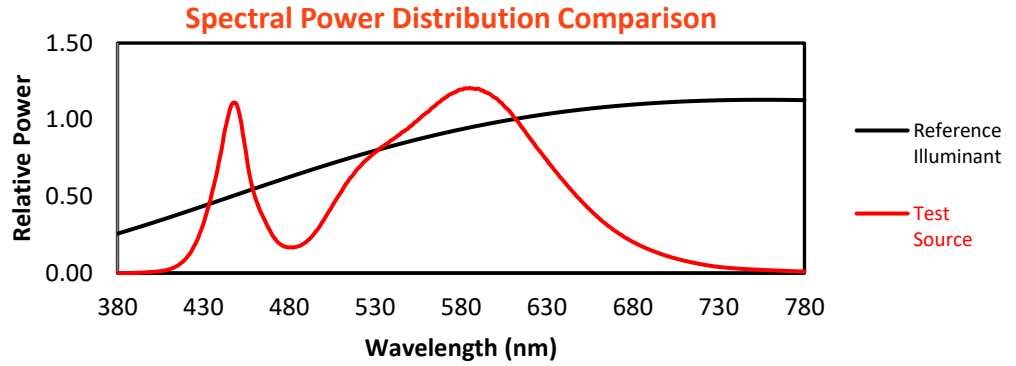
Melanopic Lumens: NR

M/P: 2.83

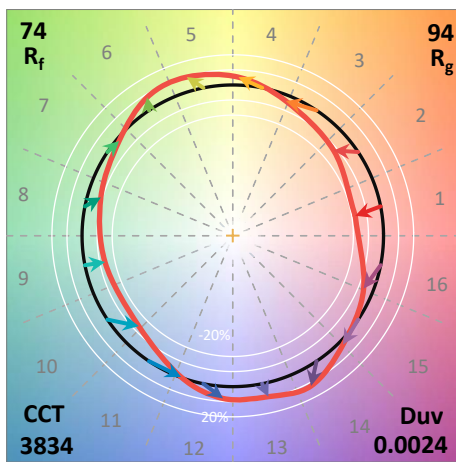
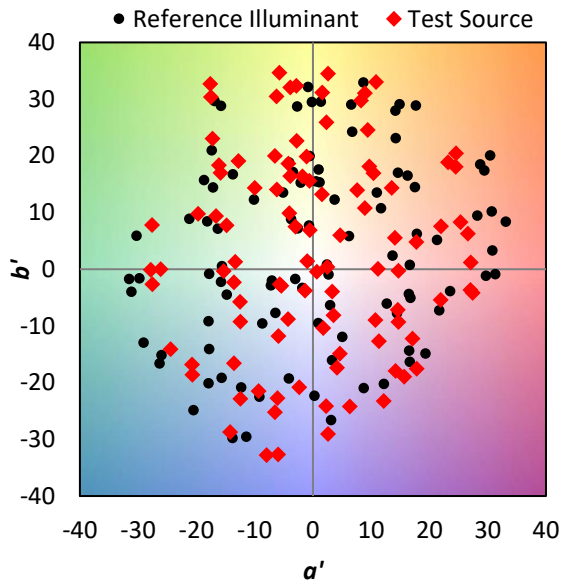
λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)
360	0	NR	490	169	NR	620	731	NR	750	20	NR	880	0	NR
365	0	NR	495	219	NR	625	668	NR	755	17	NR	885	0	NR
370	0	NR	500	285	NR	630	611	NR	760	15	NR	890	0	NR
375	0	NR	505	362	NR	635	550	NR	765	13	NR	895	0	NR
380	0	NR	510	435	NR	640	495	NR	770	11	NR	900	0	NR
385	0	NR	515	508	NR	645	440	NR	775	10	NR	905	0	NR
390	1	NR	520	565	NR	650	390	NR	780	8	NR	910	0	NR
395	3	NR	525	612	NR	655	343	NR	785	7	NR	915	0	NR
400	6	NR	530	652	NR	660	299	NR	790	6	NR	920	0	NR
405	10	NR	535	687	NR	665	261	NR	795	5	NR	925	0	NR
410	20	NR	540	720	NR	670	226	NR	800	5	NR	930	0	NR
415	40	NR	545	755	NR	675	195	NR	805	4	NR	935	0	NR
420	80	NR	550	789	NR	680	169	NR	810	3	NR	940	0	NR
425	152	NR	555	828	NR	685	146	NR	815	3	NR	945	0	NR
430	266	NR	560	867	NR	690	126	NR	820	3	NR	950	0	NR
435	435	NR	565	905	NR	695	108	NR	825	2	NR	955	0	NR
440	641	NR	570	942	NR	700	92	NR	830	2	NR	960	0	NR
445	869	NR	575	972	NR	705	79	NR	835	2	NR	965	0	NR
450	894	NR	580	991	NR	710	67	NR	840	2	NR	970	0	NR
455	640	NR	585	1000	NR	715	56	NR	845	1	NR	975	0	NR
460	413	NR	590	996	NR	720	47	NR	850	1	NR	980	0	NR
465	300	NR	595	975	NR	725	40	NR	855	1	NR	985	0	NR
470	208	NR	600	946	NR	730	33	NR	860	1	NR	990	0	NR
475	154	NR	605	903	NR	735	29	NR	865	1	NR	995	0	NR
480	139	NR	610	854	NR	740	25	NR	870	1	NR	1000	0	NR
485	144	NR	615	793	NR	745	22	NR	875	0	NR			

Summary

$R_f = 74.4$
 $R_g = 93.6$
 CIE $R_a = 71.3$
 $R_g = -37.8$

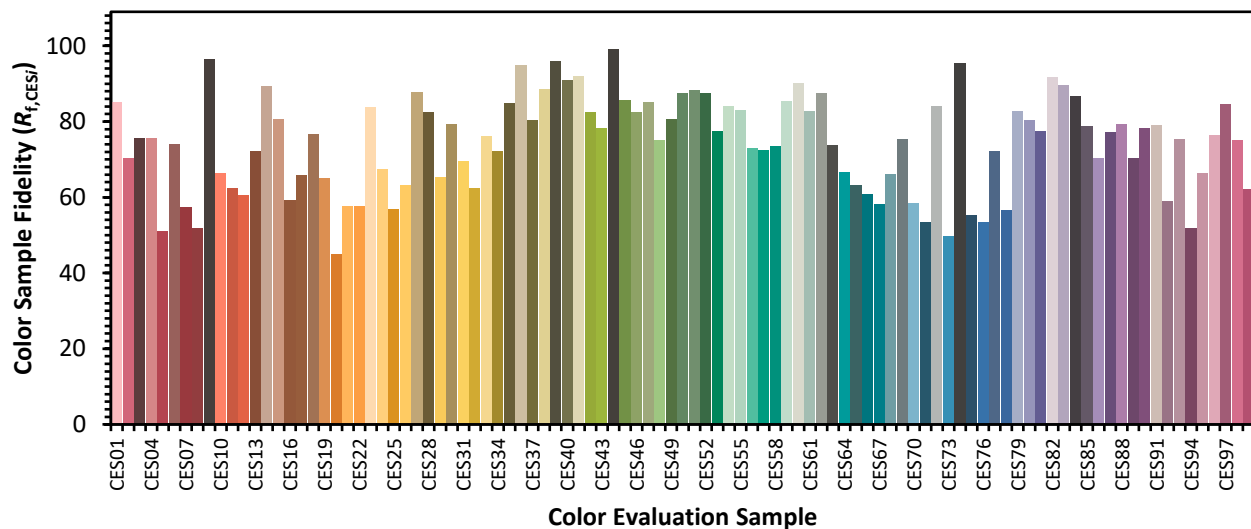


Color Vector Graphics

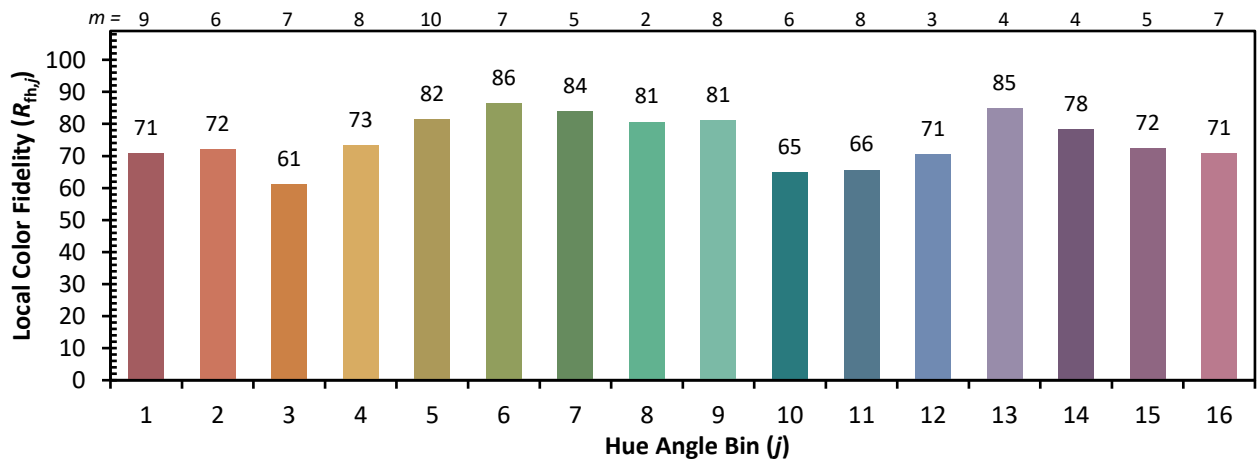
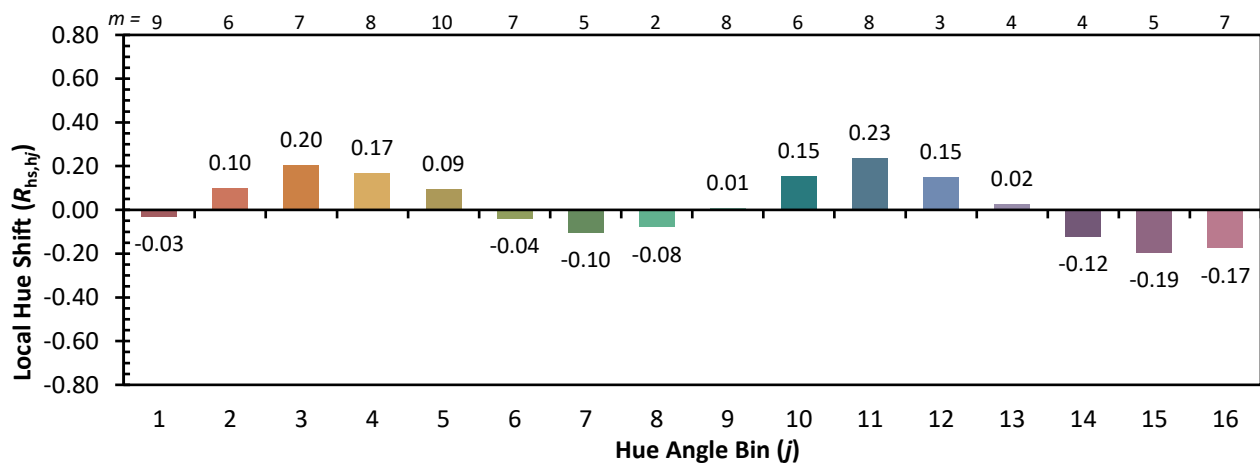
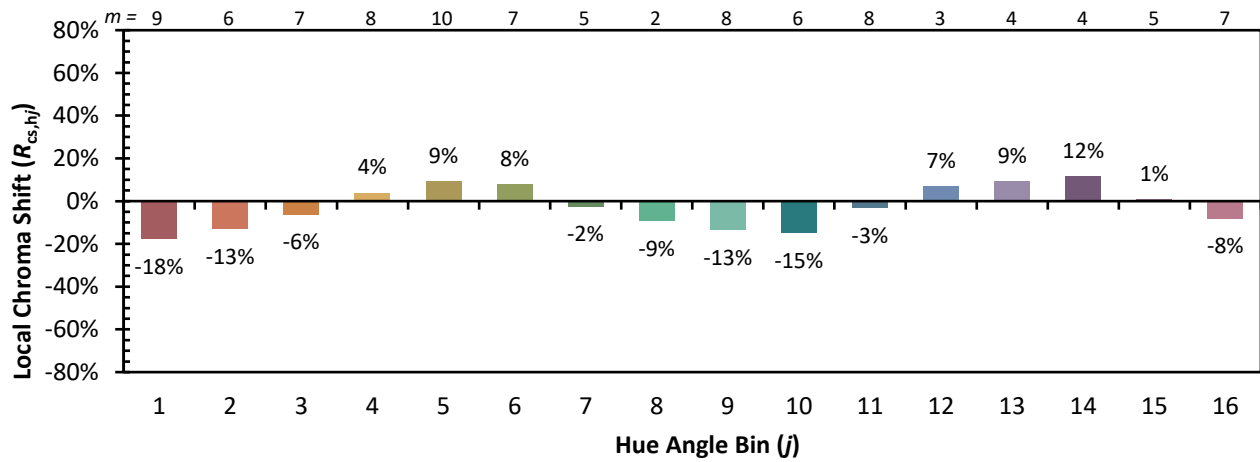


Individual Sample Fidelity Index ($R_{f,i}$)

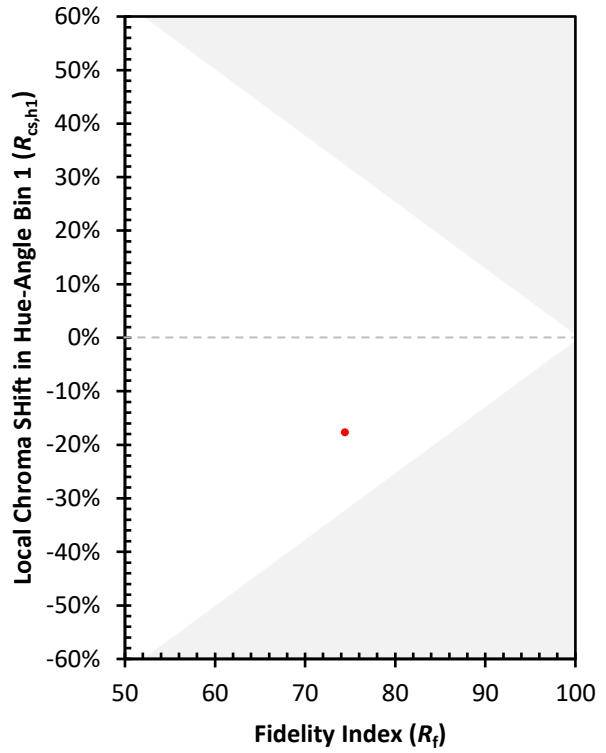
CES01 = 85	CES26 = 63	CES51 = 88	CES76 = 54
CES02 = 61	CES27 = 88	CES52 = 87	CES77 = 72
CES03 = 30	CES28 = 83	CES53 = 77	CES78 = 57
CES04 = 70	CES29 = 65	CES54 = 84	CES79 = 83
CES05 = 47	CES30 = 79	CES55 = 83	CES80 = 80
CES06 = 50	CES31 = 69	CES56 = 73	CES81 = 78
CES07 = 40	CES32 = 62	CES57 = 72	CES82 = 92
CES08 = 39	CES33 = 76	CES58 = 74	CES83 = 90
CES09 = 29	CES34 = 72	CES59 = 85	CES84 = 87
CES10 = 74	CES35 = 85	CES60 = 90	CES85 = 79
CES11 = 57	CES36 = 95	CES61 = 83	CES86 = 70
CES12 = 63	CES37 = 80	CES62 = 88	CES87 = 77
CES13 = 42	CES38 = 89	CES63 = 74	CES88 = 79
CES14 = 74	CES39 = 96	CES64 = 67	CES89 = 70
CES15 = 71	CES40 = 91	CES65 = 63	CES90 = 78
CES16 = 46	CES41 = 92	CES66 = 61	CES91 = 79
CES17 = 49	CES42 = 83	CES67 = 58	CES92 = 59
CES18 = 56	CES43 = 78	CES68 = 66	CES93 = 75
CES19 = 72	CES44 = 99	CES69 = 75	CES94 = 52
CES20 = 65	CES45 = 86	CES70 = 59	CES95 = 67
CES21 = 86	CES46 = 82	CES71 = 54	CES96 = 76
CES22 = 78	CES47 = 85	CES72 = 84	CES97 = 85
CES23 = 92	CES48 = 75	CES73 = 50	CES98 = 75
CES24 = 91	CES49 = 81	CES74 = 96	CES99 = 62
CES25 = 72	CES50 = 88	CES75 = 55	



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)