

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: P879673

Luminaire Tested: **EMM2-HSN-VA9-730-U-WQ**

Issue Date: 10/01/2024



Test Information

Test Method: LM-79-08
Report Number: P879673
Test Lab: INNOVATION CENTER(G3)
Issue Date: 10/01/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: INVUE
Catalog Number: EMM2-HSN-VA9-730-U-WQ
Description: EPIC MODERN SHORT HOUSING 9W 70CRI 3000K WAVESTREAM FIXTURE w/
TYPE V WIDE DISTRIBUTION OPTIC
Light Source: (1) 3000K CCT, 70 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

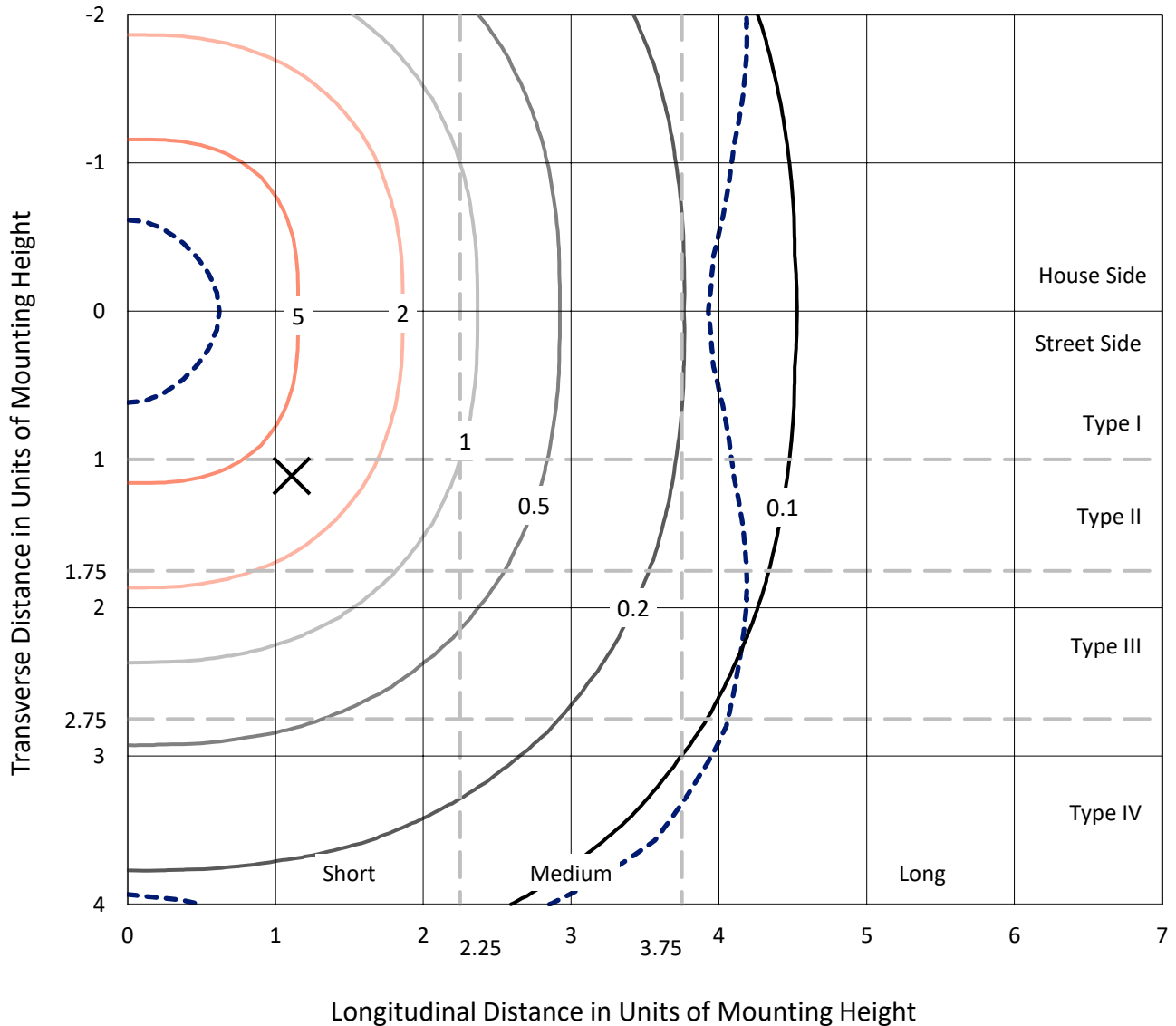
Lumens per Lamp: N/A
Luminaire Lumens: 19138.9 lumens
Efficiency: N/A
Efficacy: 112.6 lumens/watt
Luminous Opening: Circular (Dia: 1.12' x H: 0')
IES Classification: Type V - Short
BUG Rating: B4 - U0 - G3

Input Watts (W): 170
Input Voltage (V): 120
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.995
Total Harmonic Distortion (THDi): 5.9%
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT

REPORT NUMBER: P879673
 CATALOG NUMBER: EMM2-HSN-VA9-730-U-WQ

Iso-Footcandle Lines of Horizontal Illumination

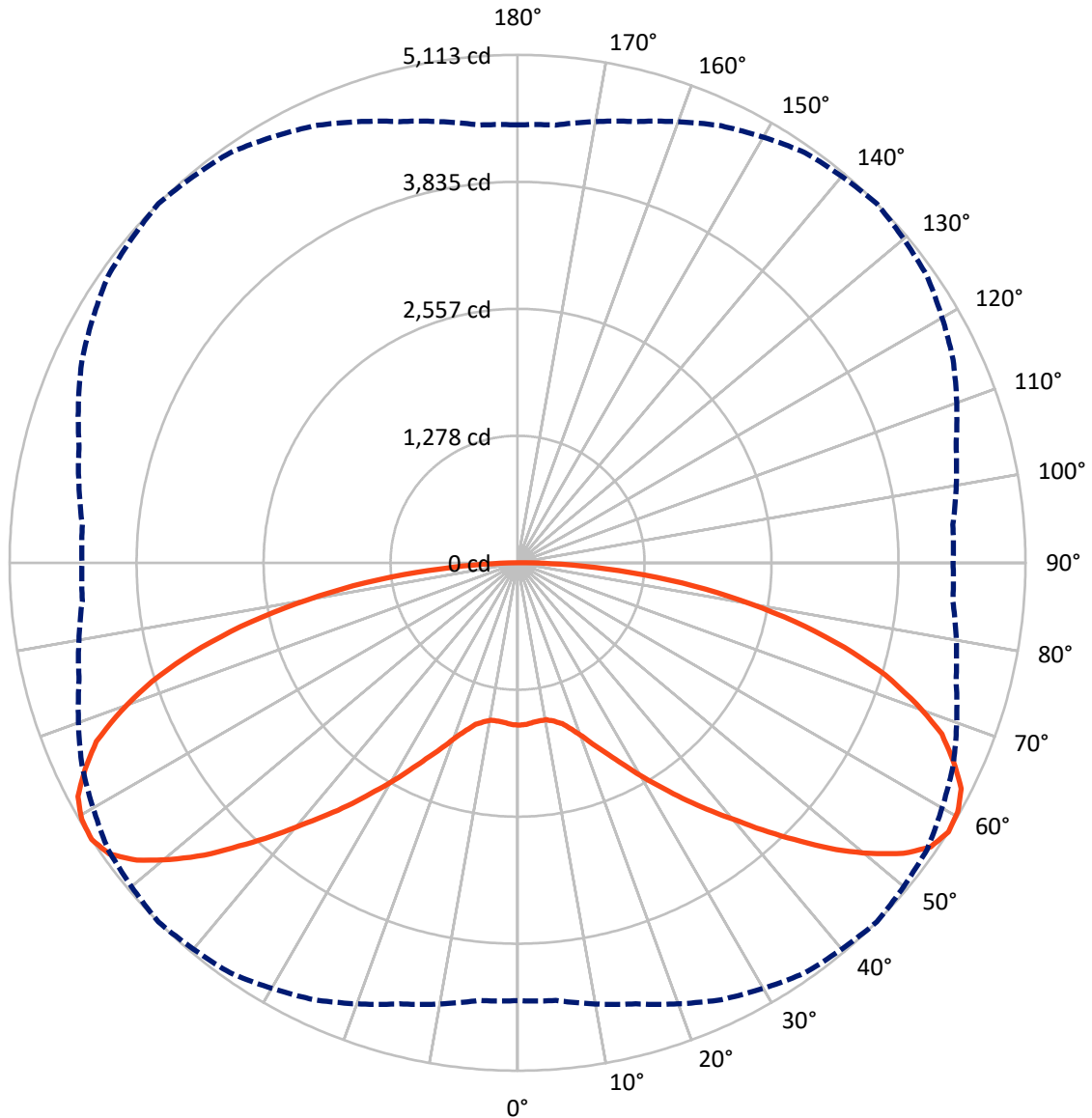
× Max cd
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 7.3 fc
 Type V - Short - N/A

REPORT NUMBER: P879673
CATALOG NUMBER: EMM2-HSN-VA9-730-U-WQ

Luminous Intensity Polar Plot



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

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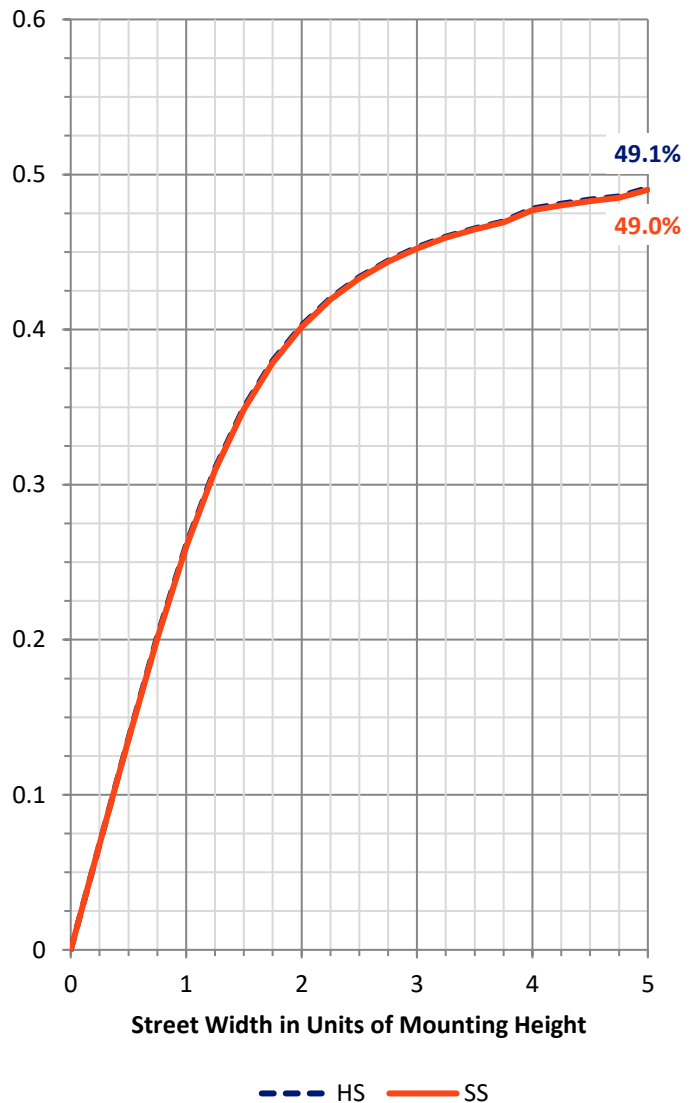
FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	9569.4	0.0	9569.4
	% Fixture	50.0	0.0	50.0
Street Side	Lumens	9569.4	0.0	9569.4
	% Fixture	50.0	0.0	50.0
Total	Lumens	19138.9	0.0	19138.9
	% Fixture	100.0	0.0	100.0

Coefficient of Utilization

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	153.9	0.8
10°-20°	483.8	2.5
20°-30°	994.4	5.2
30°-40°	1814.6	9.5
40°-50°	2975.7	15.5
50°-60°	4169.7	21.8
60°-70°	4362.1	22.8
70°-80°	3187.0	16.7
80°-90°	997.6	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°	19138.9	100.0
0°-180°	19138.9	100.0

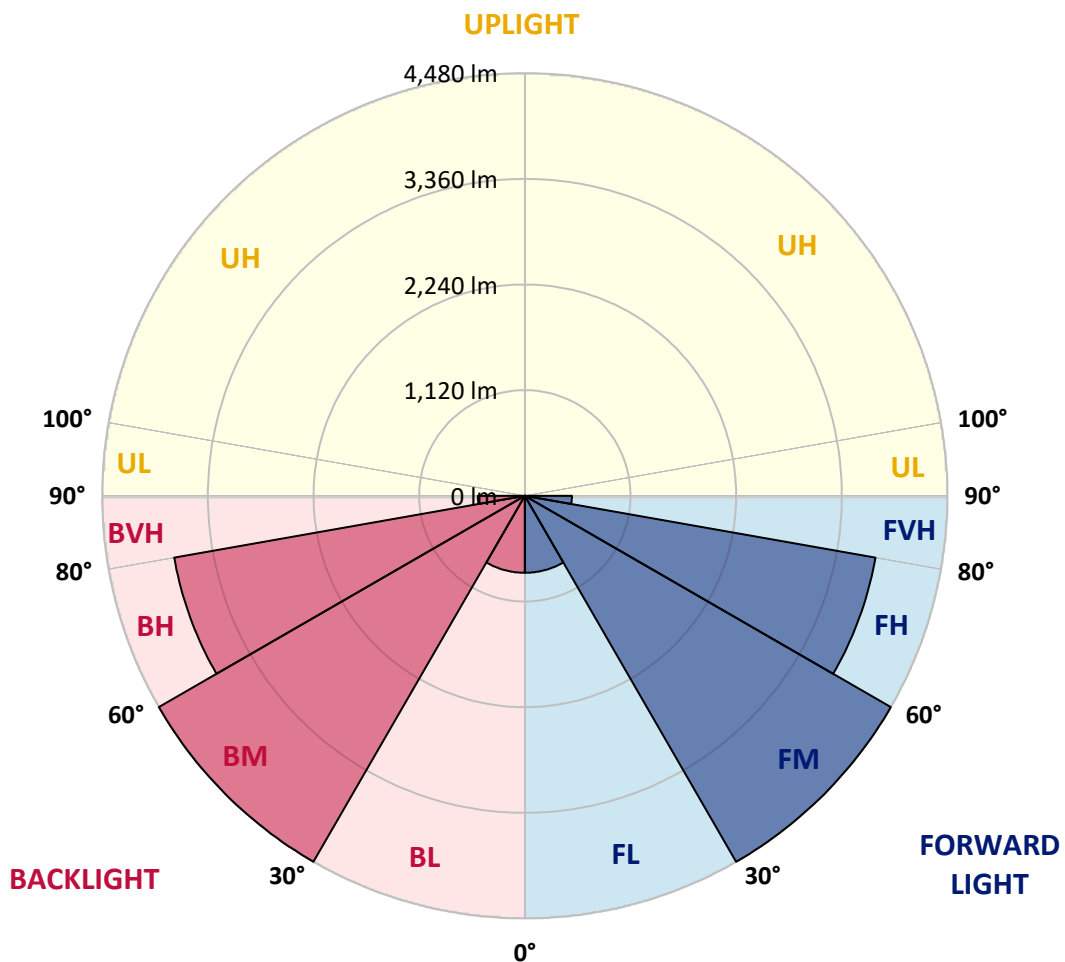


REPORT NUMBER: P879673
 CATALOG NUMBER: EMM2-HSN-VA9-730-U-WQ

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone	Lumens	% Fixture	Zone Rating/Lumen Limit		
			B	U	G
FL (0°-30°)	816.1	4.3			
FM (30°-60°)	4480.0	23.4			
FH (60°-80°)	3774.5	19.7			G2/5000
FVH (80°-90°)	498.8	2.6			G3/500
BL (0°-30°)	816.1	4.3	B2/1000		
BM (30°-60°)	4480.0	23.4	B3/5000		
BH (60°-80°)	3774.5	19.7	B4/5000		G2/5000
BVH (80°-90°)	498.8	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





REPORT NUMBER: P879673

CATALOG NUMBER: EMM2-HSN-VA9-730-U-WQ

CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	1634.1	1634.1	1634.1	1634.1	1634.1	1634.1	1634.1	1634.1	1634.1	1634.1	1634.1
2.5°	1628.1	1630.5	1629.3	1629.3	1628.1	1629.3	1631.7	1632.9	1631.7	1632.9	1631.7
5°	1617.3	1617.3	1616.1	1614.9	1614.9	1614.9	1614.9	1614.9	1616.1	1616.1	1617.3
7.5°	1604.1	1604.1	1604.1	1606.5	1605.3	1606.5	1606.5	1605.3	1604.1	1604.1	1605.3
10°	1606.5	1605.3	1604.1	1606.5	1605.3	1606.5	1606.5	1604.1	1605.3	1606.5	1607.7
12.5°	1626.9	1624.5	1628.1	1631.7	1634.1	1636.5	1635.3	1634.1	1630.5	1626.9	1626.9
15°	1671.2	1668.8	1672.4	1677.2	1678.4	1679.6	1683.2	1678.4	1677.2	1671.2	1670.0
17.5°	1734.8	1733.6	1740.8	1750.4	1755.2	1761.2	1755.2	1750.4	1737.2	1734.8	1738.4
20°	1825.9	1822.3	1836.7	1852.3	1857.1	1864.3	1859.5	1849.9	1836.7	1822.3	1822.3
22.5°	1942.2	1950.6	1957.8	1969.8	1988.9	2000.9	1985.3	1968.6	1949.4	1941.0	1935.0
25°	2093.2	2092.0	2099.2	2123.2	2135.2	2143.6	2141.2	2118.4	2101.6	2089.7	2088.5
27.5°	2238.3	2252.7	2267.1	2282.7	2312.6	2316.2	2312.6	2285.1	2258.7	2249.1	2245.5
30°	2431.3	2428.9	2442.1	2479.3	2509.3	2511.7	2502.1	2468.5	2438.5	2420.5	2422.9
32.5°	2619.6	2600.4	2635.1	2660.3	2685.5	2711.9	2686.7	2660.3	2635.1	2596.8	2608.8
35°	2791.0	2806.6	2825.8	2877.3	2928.9	2939.7	2922.9	2868.9	2819.8	2801.8	2781.4
37.5°	3000.8	3000.8	3033.2	3108.7	3155.5	3172.2	3148.3	3094.3	3026.0	2999.6	2990.0
40°	3211.8	3211.8	3261.0	3324.5	3394.0	3418.0	3391.6	3320.9	3264.6	3196.2	3207.0
42.5°	3416.8	3433.6	3498.3	3576.3	3673.4	3705.7	3668.6	3573.9	3492.3	3427.6	3418.0
45°	3643.4	3669.8	3740.5	3868.8	3951.5	3998.3	3946.7	3865.2	3721.3	3659.0	3625.4
47.5°	3890.4	3908.4	4010.3	4132.5	4266.8	4316.0	4254.8	4121.8	3999.5	3889.2	3884.4
50°	4105.0	4101.4	4232.1	4401.1	4553.4	4600.1	4551.0	4407.1	4208.1	4085.8	4097.8
52.5°	4265.6	4286.0	4423.9	4632.5	4794.3	4862.7	4782.3	4609.7	4402.3	4275.2	4236.8
55°	4369.9	4403.5	4564.1	4789.5	4974.2	5047.3	4968.2	4769.2	4542.6	4378.3	4355.5
57.5°	4408.3	4422.7	4597.7	4853.1	5041.3	5113.2	5031.7	4837.5	4570.1	4398.7	4384.3
60°	4349.5	4363.9	4553.4	4814.7	5030.5	5091.6	5026.9	4799.1	4527.0	4351.9	4328.0
62.5°	4205.7	4245.2	4455.0	4714.0	4961.0	5012.5	4945.4	4696.0	4444.3	4233.3	4198.5
65°	4033.0	4075.0	4253.6	4542.6	4766.8	4821.9	4769.2	4529.4	4254.8	4052.2	4018.7
67.5°	3792.1	3799.3	4009.1	4301.6	4539.0	4606.1	4515.0	4296.8	3998.3	3806.4	3780.1
70°	3491.1	3495.9	3718.9	3989.9	4208.1	4263.2	4203.3	3970.7	3703.3	3494.7	3476.8
72.5°	3105.1	3149.5	3334.1	3602.6	3806.4	3871.2	3793.3	3595.4	3348.5	3142.3	3101.5
75°	2695.1	2722.7	2883.3	3143.5	3318.5	3398.8	3335.3	3143.5	2883.3	2713.1	2677.1
77.5°	2215.5	2252.7	2409.8	2629.1	2774.2	2860.5	2791.0	2620.8	2409.8	2253.9	2252.7
80°	1750.4	1740.8	1883.4	2072.9	2216.7	2267.1	2223.9	2058.5	1869.1	1748.0	1731.2
82.5°	1214.5	1212.1	1366.7	1493.8	1614.9	1672.4	1606.5	1499.8	1353.5	1245.6	1210.9
85°	690.6	706.1	808.0	887.2	990.3	1025.0	1002.3	901.6	770.9	676.2	670.2
87.5°	239.8	261.4	280.5	338.1	405.2	435.2	402.8	387.2	344.1	298.5	300.9
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

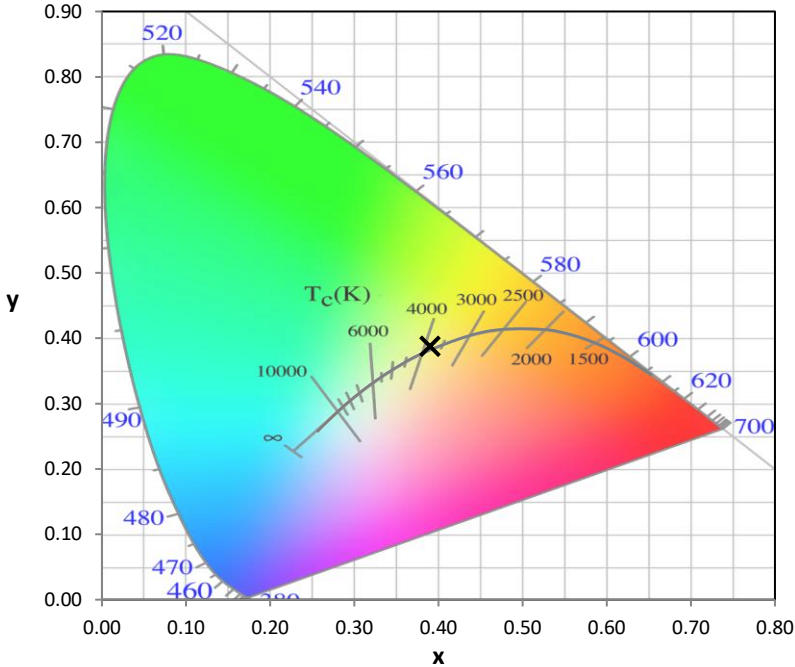
Stabilization Time: 30M
 Operation Time: 1H 30M
 Sphere Temperature (°C): 25.1

REPORT NUMBER: SP1-2407-176-20

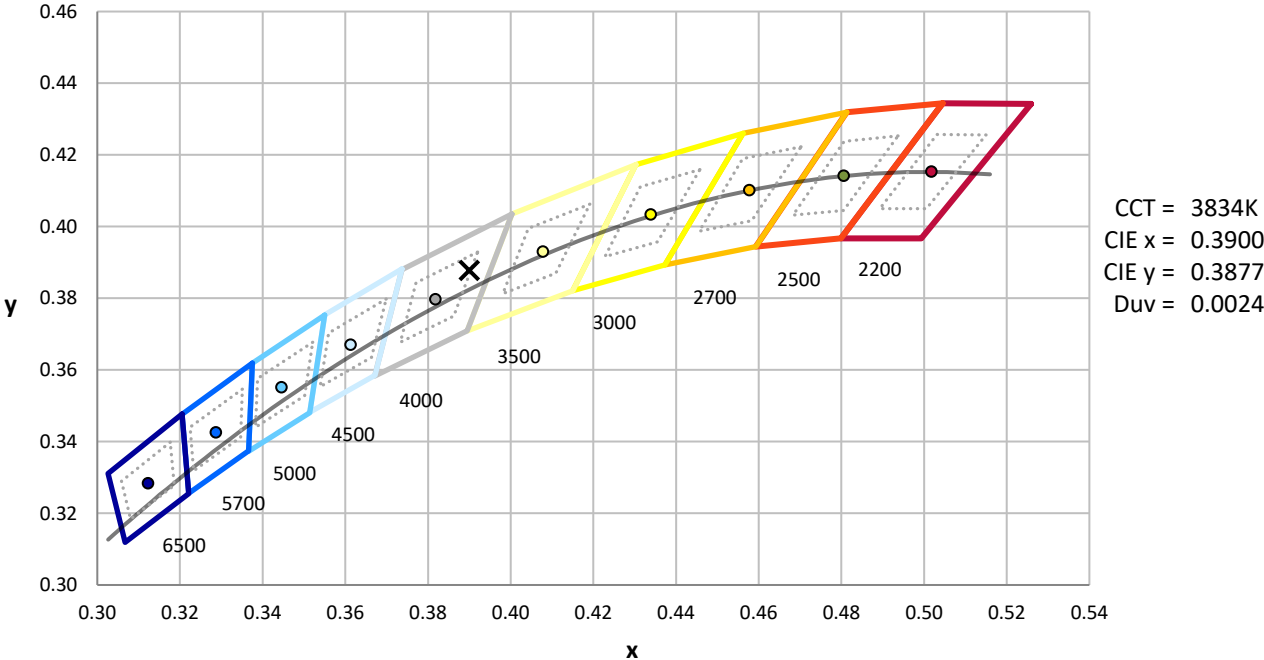
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/22/2024	10/22/2025
DC Power Source	IN0208	10/22/2024	10/22/2025
Sphere Thermometer	IN0085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

REPORT NUMBER: SP1-2407-176-20

CIE 1931 Chromaticity Diagram



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

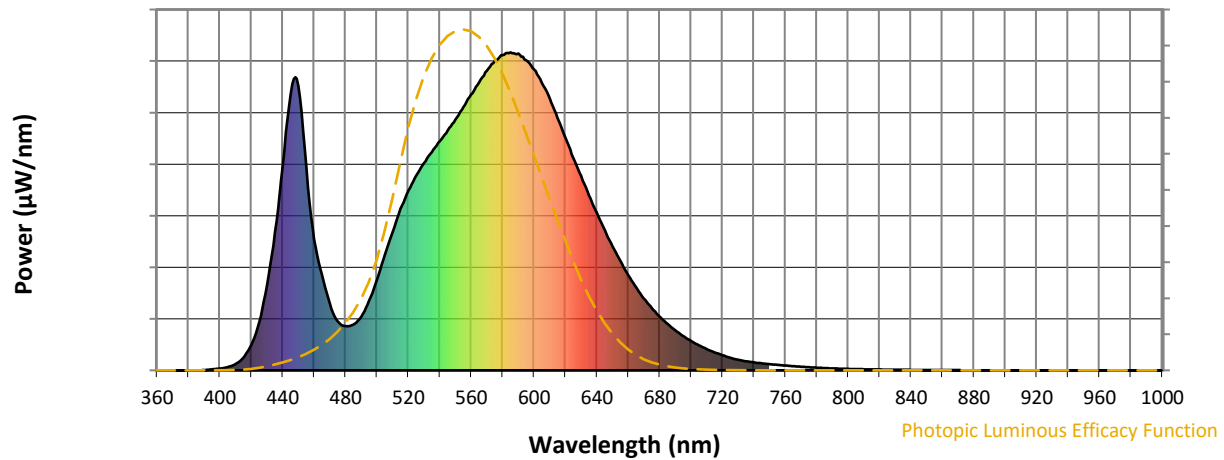


CCT = 3834K
 CIE x = 0.3900
 CIE y = 0.3877
 Duv = 0.0024

Point lies inside the ANSI 4000K 4-step quadrangle

REPORT NUMBER: SP1-2407-176-20

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			

REPORT NUMBER: SP1-2407-176-20

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			

REPORT NUMBER: SP1-2407-176-20

Melanopic Flux vs. Wavelength



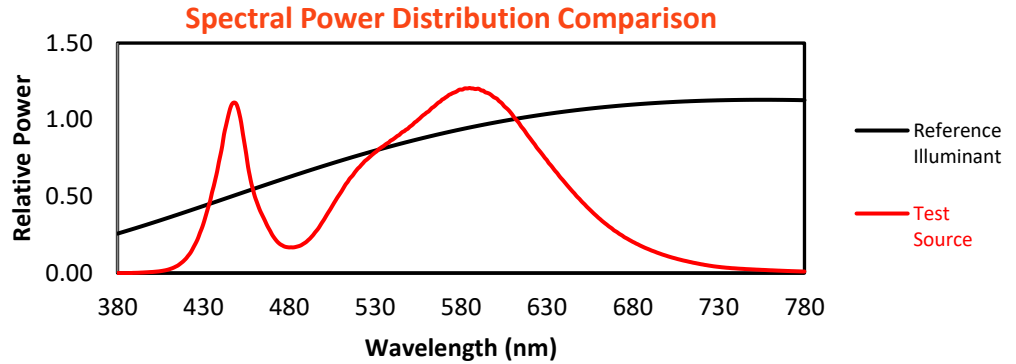
Melanopic Lumens: NR

M/P: 2.83

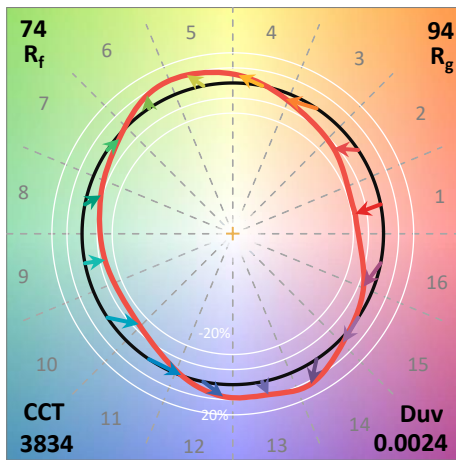
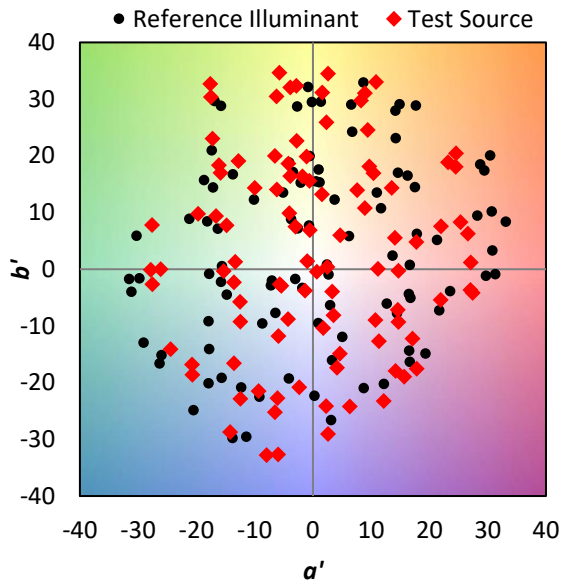
λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)
360	0	NR	490	169	NR	620	731	NR	750	20	NR	880	0	NR
365	0	NR	495	219	NR	625	668	NR	755	17	NR	885	0	NR
370	0	NR	500	285	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

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

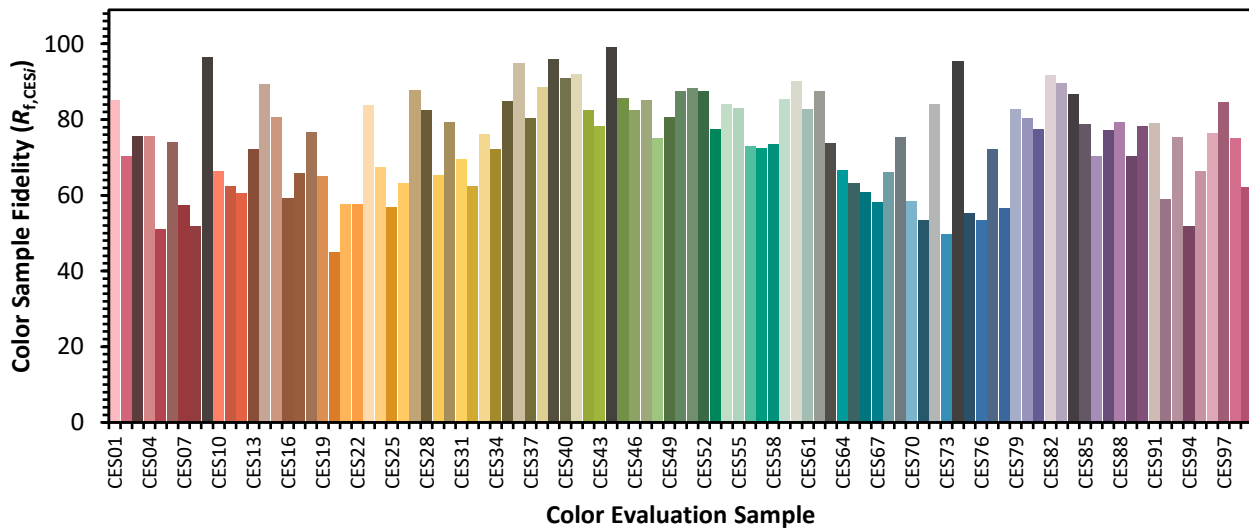


Color Vector Graphics

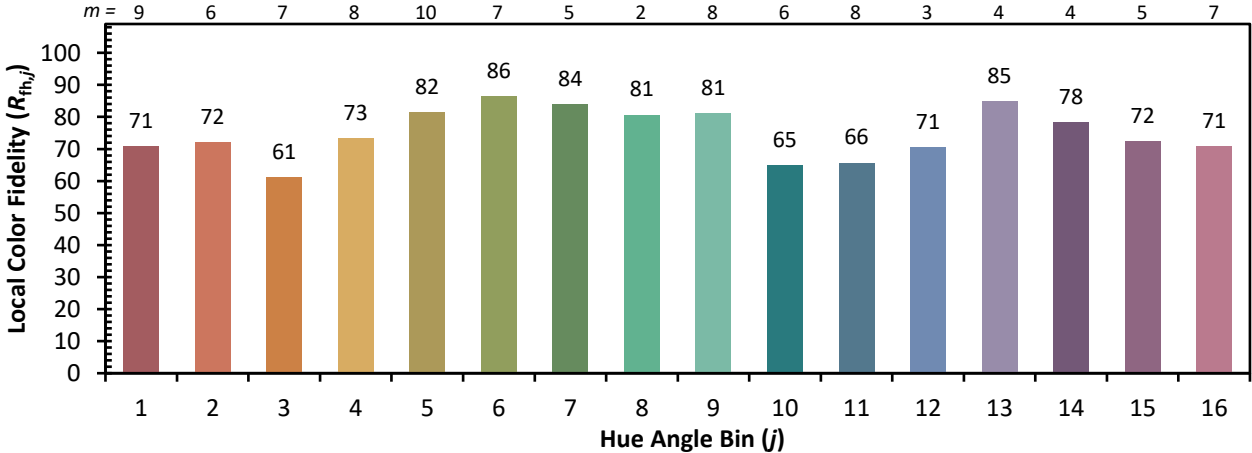


Individual Sample Fidelity Index ($R_{f,i}$)

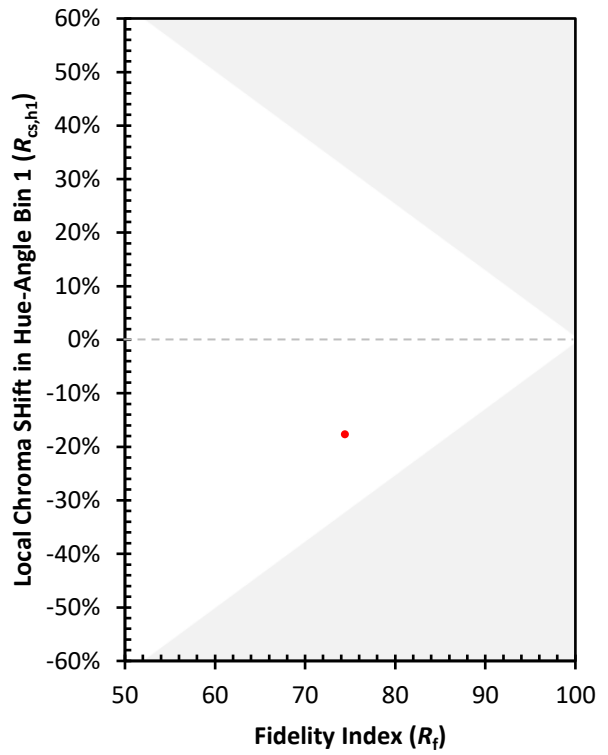
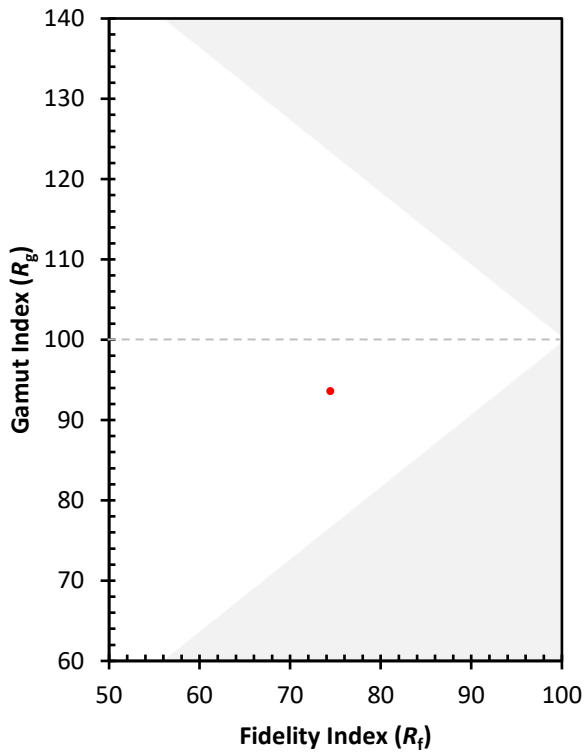
CES01 = 85	CES26 = 63	CES51 = 88	CES76 = 54
CES02 = 61	CES27 = 88	CES52 = 87	CES77 = 72
CES03 = 30	CES28 = 83	CES53 = 77	CES78 = 57
CES04 = 70	CES29 = 65	CES54 = 84	CES79 = 83
CES05 = 47	CES30 = 79	CES55 = 83	CES80 = 80
CES06 = 50	CES31 = 69	CES56 = 73	CES81 = 78
CES07 = 40	CES32 = 62	CES57 = 72	CES82 = 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)