

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: P880519

Luminaire Tested: **EMM2-HSN-VA1-AMB-U-RW**

Issue Date: 10/02/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P880519  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 10/02/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: INVUE  
Catalog Number: EMM2-HSN-VA1-AMB-U-RW  
Description: EPIC MODERN SHORT HOUSING 1W 0CRI 1554K VISUAL COMFORT FIXTURE w/  
RECTANGULAR WIDE DISTRIBUTION OPTIC  
Light Source: (1) 1554K CCT, 0 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

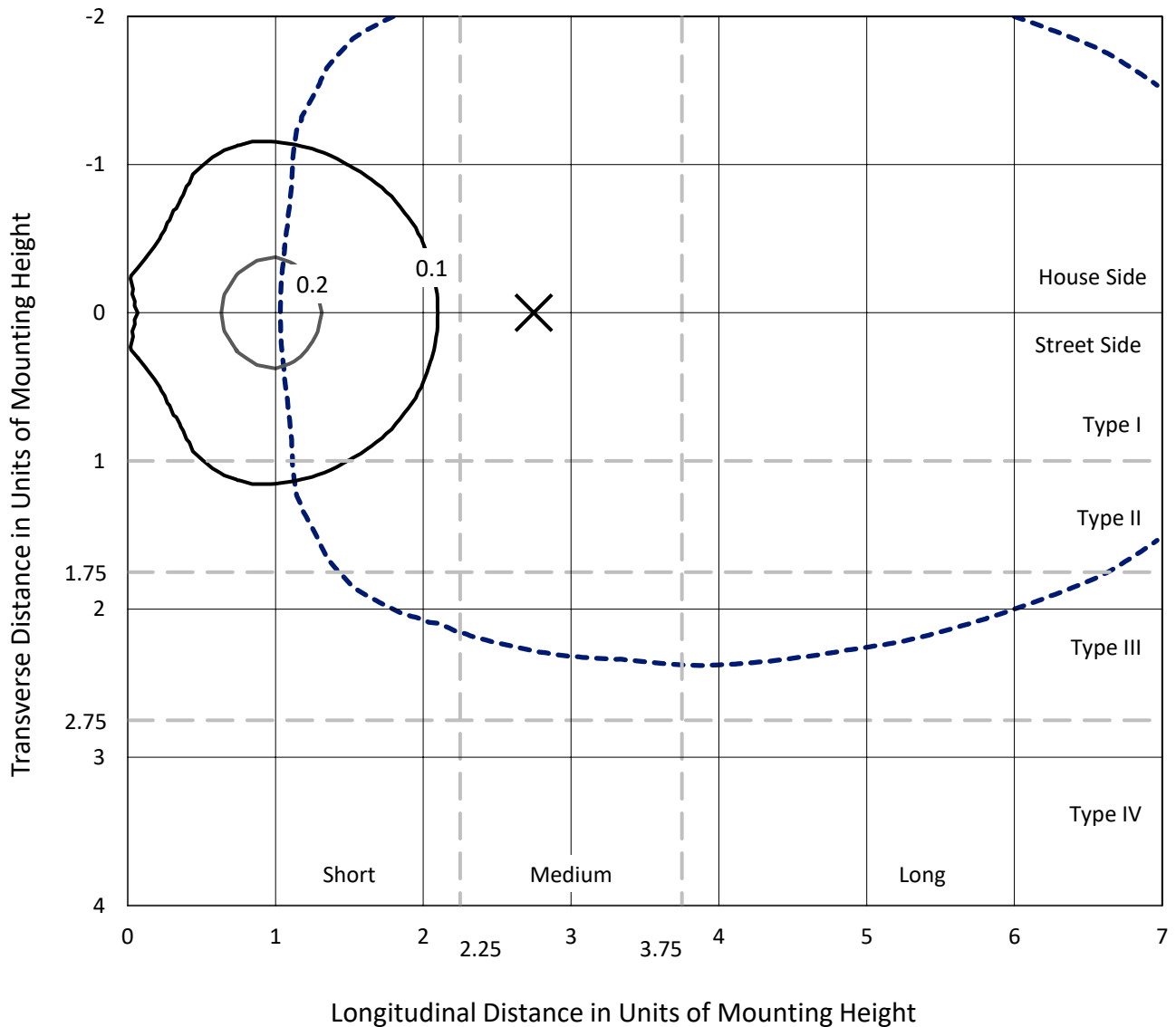
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 655 lumens  
Efficiency: N/A  
Efficacy: 20.5 lumens/watt  
Luminous Opening: Circular (Dia: 1.12' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B1 - U0 - G1  
  
Input Watts (W): 32  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.98  
Total Harmonic Distortion (THDi): 16%  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

REPORT NUMBER: P880519  
 CATALOG NUMBER: EMM2-HSN-VA1-AMB-U-RW

### Iso-Footcandle Lines of Horizontal Illumination

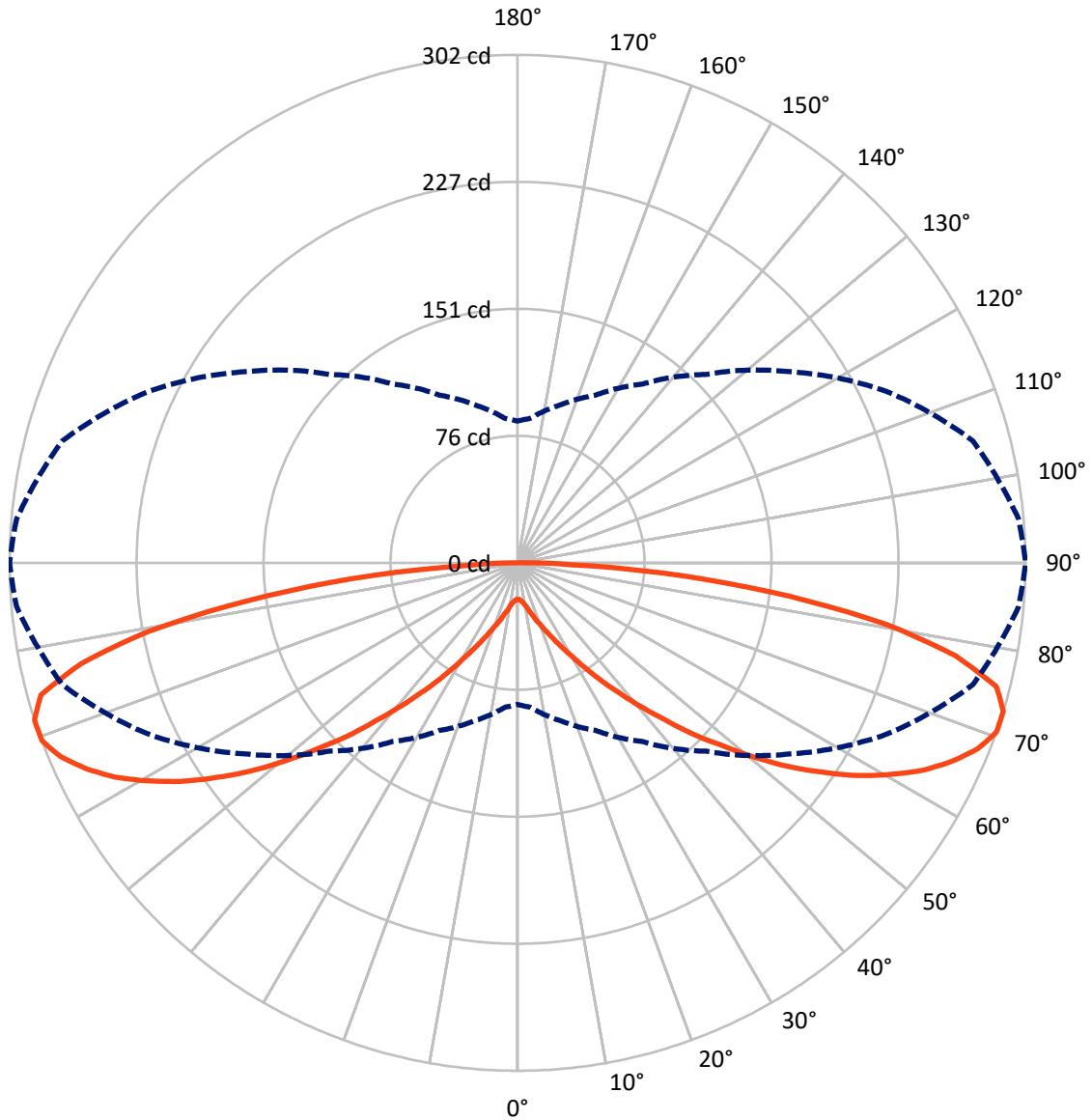
× Max cd  
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 0.2 fc  
 Type III - Short - N/A

REPORT NUMBER: P880519  
CATALOG NUMBER: EMM2-HSN-VA1-AMB-U-RW

### Luminous Intensity Polar Plot



— Vertical Plane Through 90-Deg Lateral      - - - Horizontal Cone Through 70-Deg Vertical

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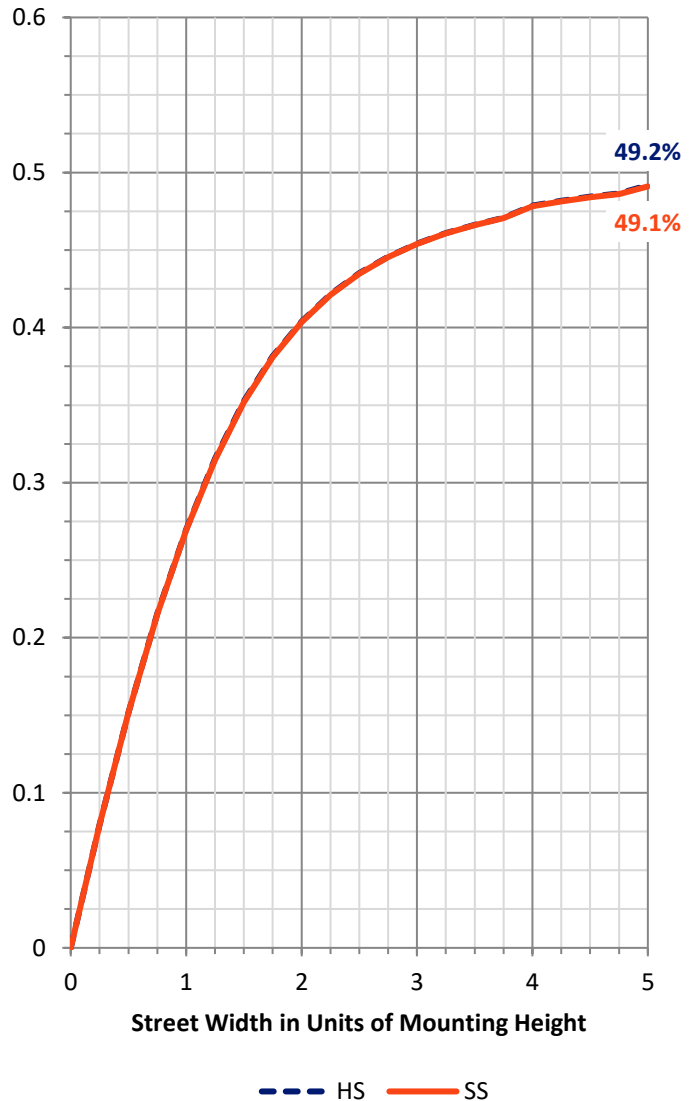
**FLUX DISTRIBUTION:**

		Downward	Upward	Total
<b>House Side</b>	Lumens	327.5	0.0	327.5
	% Fixture	50.0	0.0	50.0
<b>Street Side</b>	Lumens	327.5	0.0	327.5
	% Fixture	50.0	0.0	50.0
<b>Total</b>	Lumens	655.0	0.0	655.0
	% Fixture	100.0	0.0	100.0

**Coefficient of Utilization**

**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	2.2	0.3
10°-20°	8.1	1.2
20°-30°	18.2	2.8
30°-40°	37.3	5.7
40°-50°	73.3	11.2
50°-60°	129.2	19.7
60°-70°	176.0	26.9
70°-80°	157.5	24.1
80°-90°	53.2	8.1
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°	655.0	100.0
0°-180°	655.0	100.0

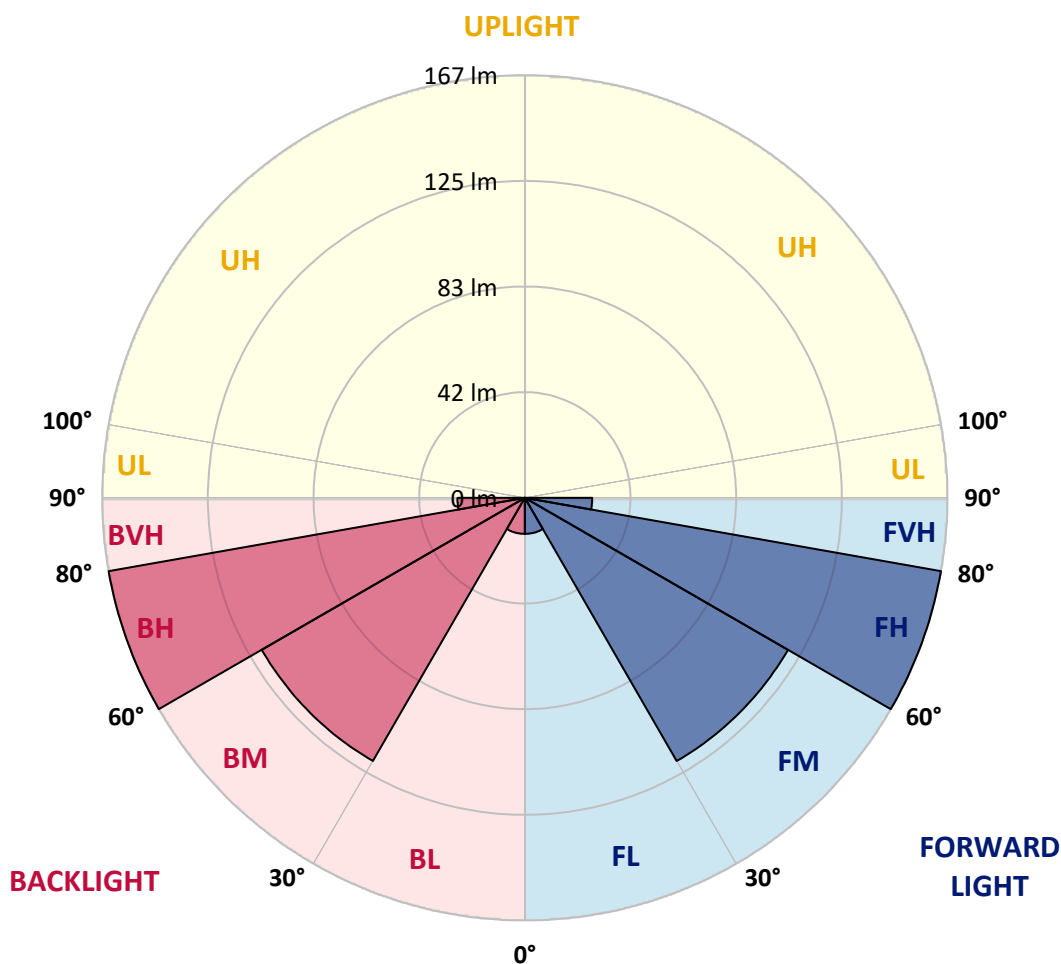


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

Zone	Lumens	% Fixture	Zone Rating/Lumen Limit		
			B	U	G
FL (0°-30°)	14.2	2.2			
FM (30°-60°)	119.9	18.3			
FH (60°-80°)	166.8	25.5			G0/660
FVH (80°-90°)	26.6	4.1			G1/100
BL (0°-30°)	14.2	2.2	B0/110		
BM (30°-60°)	119.9	18.3	B0/220		
BH (60°-80°)	166.8	25.5	B1/500		G1/500
BVH (80°-90°)	26.6	4.1			G1/100
UL (90°-100°)	0.0	0.0		U0/0	
UH (100°-180°)	0.0	0.0		U0/0	

**BUG Rating: B1-U0-G1**  
 Type III Short





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**CANDELA DISTRIBUTION (FULL):**

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8
2.5°	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8
5°	21.8	21.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8
7.5°	22.8	22.8	22.8	22.8	22.8	23.8	23.8	23.8	23.8	23.8	23.8
10°	22.8	22.8	23.8	23.8	23.8	24.8	25.8	25.8	25.8	25.8	25.8
12.5°	23.8	23.8	23.8	24.8	24.8	25.8	26.8	27.8	28.8	28.8	28.8
15°	24.8	24.8	24.8	25.8	26.8	27.8	28.8	29.7	30.7	31.7	31.7
17.5°	24.8	24.8	25.8	26.8	27.8	29.7	31.7	32.7	34.7	34.7	35.7
20°	25.8	25.8	26.8	27.8	29.7	31.7	34.7	36.7	38.7	39.7	39.7
22.5°	26.8	26.8	27.8	29.7	31.7	34.7	37.7	40.7	42.6	44.6	44.6
25°	27.8	27.8	28.8	30.7	33.7	37.7	41.6	45.6	48.6	50.6	50.6
27.5°	28.8	28.8	29.7	32.7	36.7	41.6	46.6	51.6	55.5	57.5	57.5
30°	29.7	30.7	31.7	34.7	39.7	45.6	52.6	58.5	62.5	65.4	65.4
32.5°	31.7	31.7	33.7	37.7	43.6	50.6	57.5	66.4	72.4	75.4	75.4
35°	34.7	34.7	36.7	40.7	46.6	55.5	65.4	74.4	82.3	86.3	86.3
37.5°	37.7	37.7	39.7	44.6	52.6	62.5	73.4	84.3	93.2	98.2	98.2
40°	40.7	40.7	43.6	49.6	58.5	69.4	83.3	96.2	106.1	111.1	112.0
42.5°	45.6	45.6	48.6	55.5	65.4	78.3	93.2	108.1	120.0	127.9	126.9
45°	51.6	51.6	55.5	62.5	73.4	88.2	105.1	122.9	136.8	144.8	144.8
47.5°	57.5	58.5	62.5	71.4	82.3	99.2	118.0	137.8	153.7	161.6	161.6
50°	65.4	66.4	70.4	79.3	93.2	111.1	131.9	153.7	170.5	181.4	181.4
52.5°	77.3	77.3	82.3	90.2	104.1	122.9	146.7	169.6	188.4	198.3	201.3
55°	84.3	85.3	92.2	102.1	117.0	136.8	160.6	186.4	206.2	217.1	220.1
57.5°	86.3	88.2	96.2	109.1	126.9	149.7	176.5	202.3	224.1	235.0	239.0
60°	87.3	89.2	98.2	112.0	131.9	159.6	188.4	218.1	240.9	253.8	255.8
62.5°	92.2	93.2	103.1	116.0	134.8	163.6	196.3	232.0	257.8	269.7	271.7
65°	94.2	96.2	106.1	120.0	139.8	167.6	202.3	239.9	270.7	284.6	284.6
67.5°	90.2	92.2	103.1	117.0	137.8	167.6	204.3	244.9	278.6	294.5	295.5
70°	84.3	86.3	97.2	110.1	129.9	158.6	198.3	241.9	280.6	299.4	302.4
72.5°	75.4	77.3	88.2	101.1	118.0	144.8	183.4	229.0	273.7	298.4	302.4
75°	65.4	67.4	77.3	88.2	104.1	127.9	162.6	208.2	253.8	287.5	294.5
77.5°	54.5	56.5	64.4	74.4	87.3	108.1	138.8	178.5	224.1	262.8	266.7
80°	42.6	44.6	50.6	58.5	68.4	85.3	110.1	143.8	182.4	217.1	223.1
82.5°	30.7	32.7	37.7	42.6	50.6	60.5	80.3	104.1	135.8	158.6	162.6
85°	19.8	19.8	22.8	26.8	30.7	37.7	48.6	65.4	84.3	98.2	99.2
87.5°	5.9	5.9	7.9	8.9	10.9	12.9	15.9	19.8	26.8	31.7	31.7
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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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: SP1-2407-176-1

Test Date: 09/23/2024

Luminaire Tested: MEM2-HTN-VA-60-AMB-U-WQ

Data in this report applies to families of products including MEM2-HTN-VA-60-AMB-U-WQ



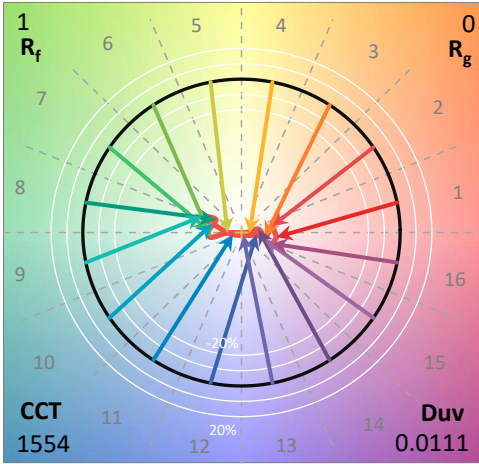
**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2407-176-1  
 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-60-AMB-U-WQ**  
 Description: EPIC MODERN VISUAL COMFORT 60W AMBER WAVESTREAM WIDE

**Spectral Parameters**

CCT (K): 1554  
 CIE u': 0.3509  
 CIE v': 0.5472  
 Duv: 0.0111  
 CIE x: 0.5903  
 CIE y: 0.4091  
 CIE z: 0.0006  
 Peak Wavelength (nm): 596  
 Dominant Wavelength (nm): 592  
 Purity: 99.98723  
 R<sub>f</sub>: 1.1  
 R<sub>g</sub>: 0

CRI (Ra):	-22.5		
R1:	-35.4	R9:	-390.1
R2:	51.6	R10:	27.7
R3:	17.0	R11:	-96.9
R4:	-69.3	R12:	-12.7
R5:	-41.7	R13:	-16.6
R6:	40.2	R14:	45.8
R7:	-7.3	R15:	-68.6
R8:	-135.2		



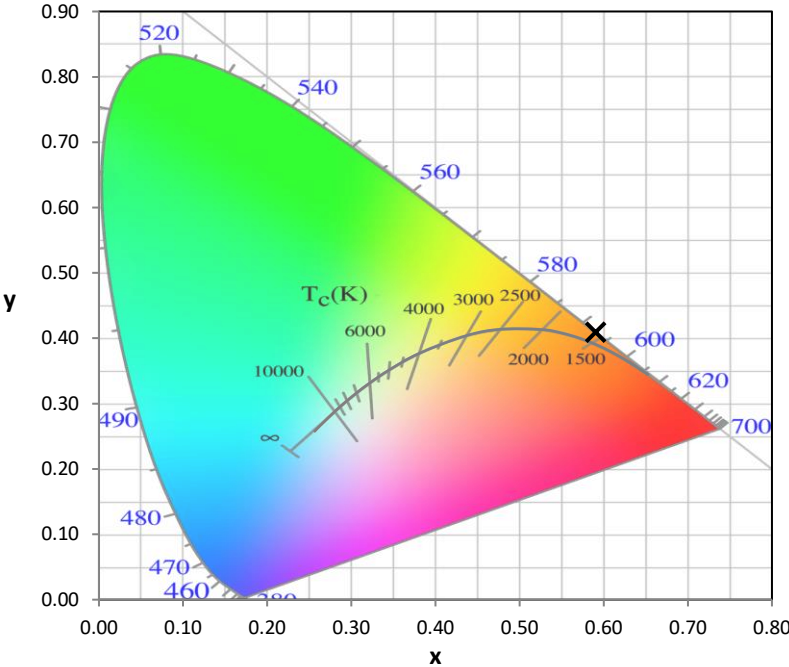
**Test Conditions**  
 Stabilization Time: 98M  
 Operation Time: 2H 38M  
 Sphere Temperature (°C): 25.2

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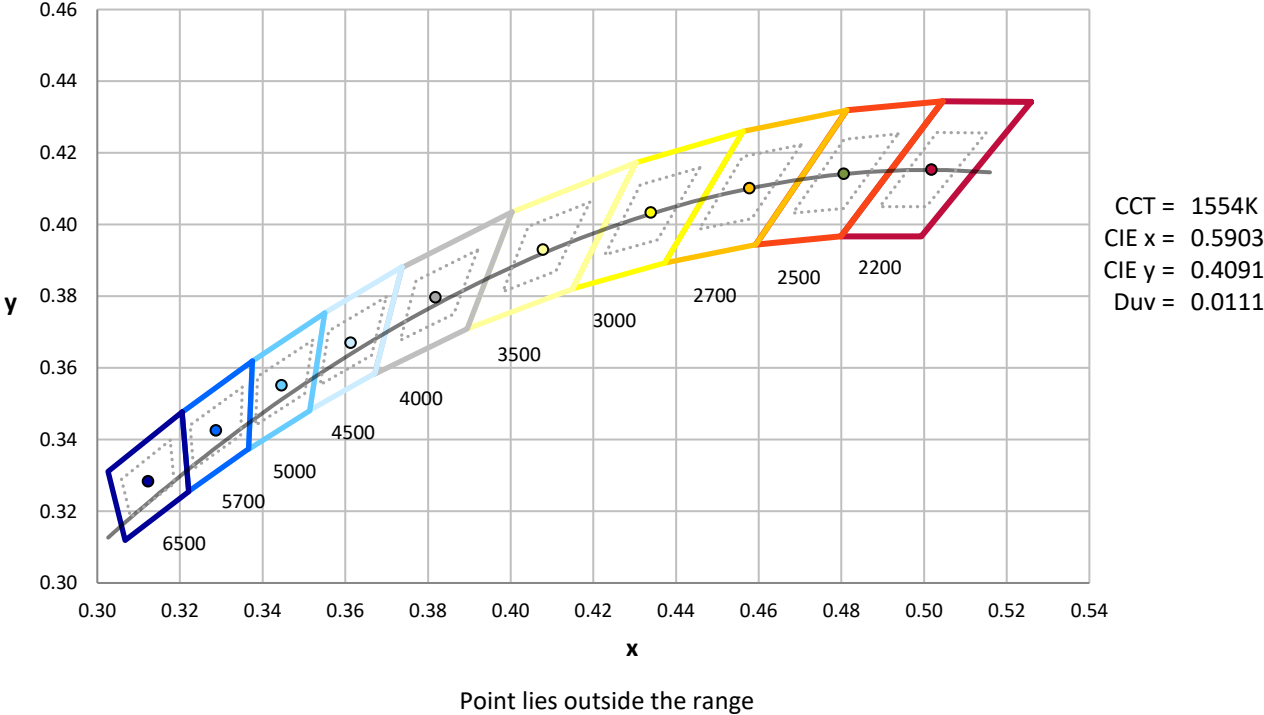
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/24/2023	10/24/2024
DC Power Source	IN0208	10/24/2023	10/24/2024
Sphere Thermometer	IN0085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

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CIE 1931 Chromaticity Diagram

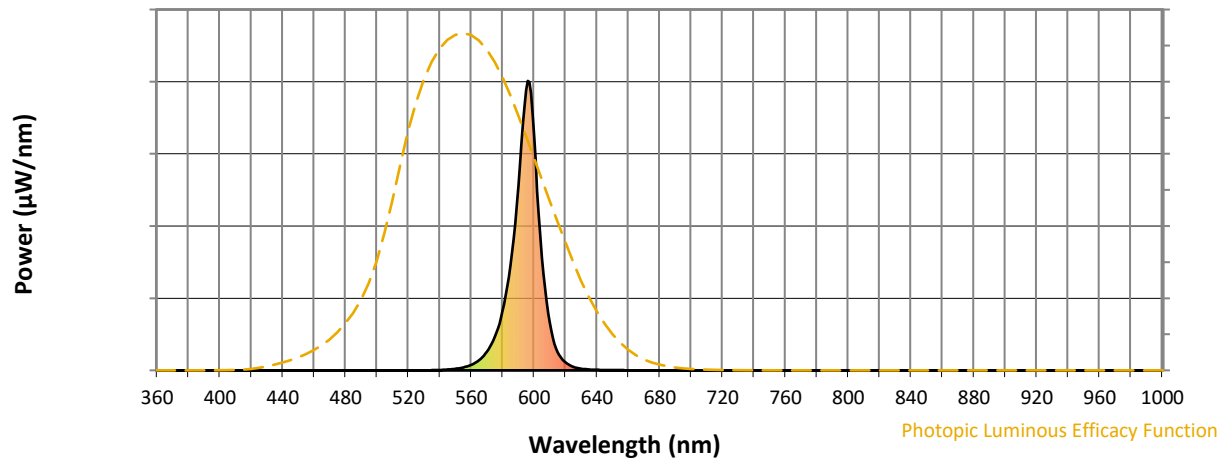


CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



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**Photopic Flux vs. Wavelength**

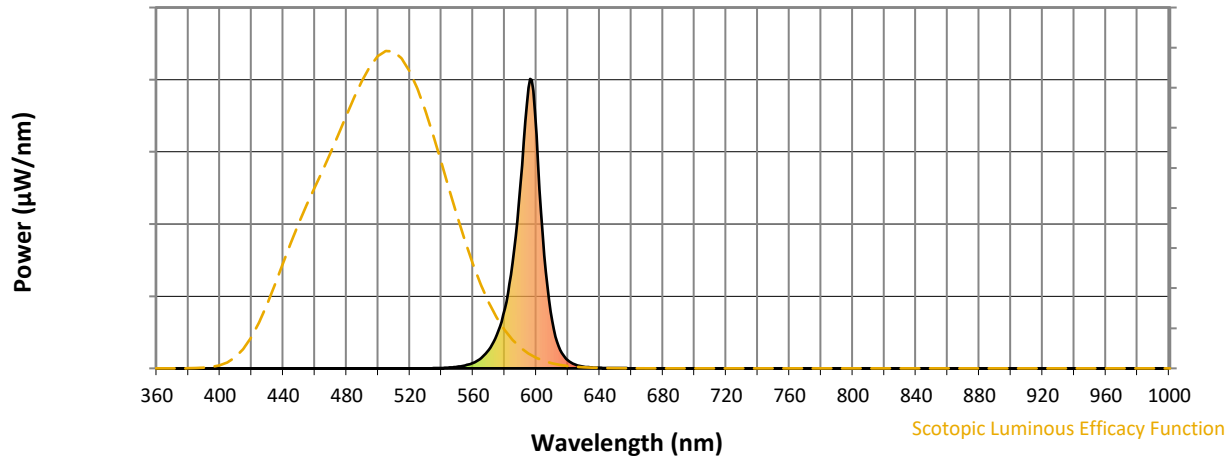


**Photopic Lumens: NR**

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	0	NR	620	27	NR	750	0	NR	880	0	NR
365	0	NR	495	0	NR	625	12	NR	755	0	NR	885	0	NR
370	0	NR	500	0	NR	630	6	NR	760	0	NR	890	0	NR
375	0	NR	505	0	NR	635	3	NR	765	0	NR	895	0	NR
380	0	NR	510	0	NR	640	2	NR	770	0	NR	900	0	NR
385	0	NR	515	0	NR	645	1	NR	775	0	NR	905	0	NR
390	0	NR	520	0	NR	650	1	NR	780	0	NR	910	0	NR
395	0	NR	525	0	NR	655	1	NR	785	0	NR	915	0	NR
400	0	NR	530	0	NR	660	1	NR	790	0	NR	920	0	NR
405	0	NR	535	1	NR	665	0	NR	795	0	NR	925	0	NR
410	0	NR	540	1	NR	670	0	NR	800	0	NR	930	0	NR
415	0	NR	545	3	NR	675	0	NR	805	0	NR	935	0	NR
420	0	NR	550	5	NR	680	0	NR	810	0	NR	940	0	NR
425	0	NR	555	10	NR	685	0	NR	815	0	NR	945	0	NR
430	0	NR	560	19	NR	690	0	NR	820	0	NR	950	0	NR
435	0	NR	565	35	NR	695	0	NR	825	0	NR	955	0	NR
440	0	NR	570	64	NR	700	0	NR	830	0	NR	960	0	NR
445	0	NR	575	116	NR	705	0	NR	835	0	NR	965	0	NR
450	0	NR	580	206	NR	710	0	NR	840	0	NR	970	0	NR
455	0	NR	585	364	NR	715	0	NR	845	0	NR	975	0	NR
460	0	NR	590	639	NR	720	0	NR	850	0	NR	980	0	NR
465	0	NR	595	970	NR	725	0	NR	855	0	NR	985	0	NR
470	0	NR	600	808	NR	730	0	NR	860	0	NR	990	0	NR
475	0	NR	605	391	NR	735	0	NR	865	0	NR	995	0	NR
480	0	NR	610	164	NR	740	0	NR	870	0	NR	1000	0	NR
485	0	NR	615	63	NR	745	0	NR	875	0	NR			

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**Scotopic Flux vs. Wavelength**



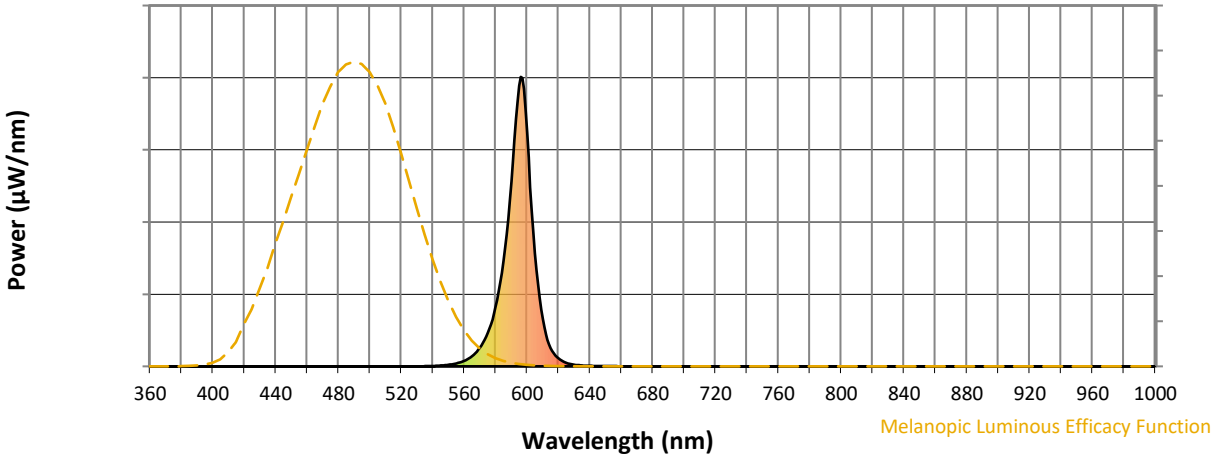
**Scotopic Lumens: NR**

**S/P: 0.22**

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	0	NR	620	27	NR	750	0	NR	880	0	NR
365	0	NR	495	0	NR	625	12	NR	755	0	NR	885	0	NR
370	0	NR	500	0	NR	630	6	NR	760	0	NR	890	0	NR
375	0	NR	505	0	NR	635	3	NR	765	0	NR	895	0	NR
380	0	NR	510	0	NR	640	2	NR	770	0	NR	900	0	NR
385	0	NR	515	0	NR	645	1	NR	775	0	NR	905	0	NR
390	0	NR	520	0	NR	650	1	NR	780	0	NR	910	0	NR
395	0	NR	525	0	NR	655	1	NR	785	0	NR	915	0	NR
400	0	NR	530	0	NR	660	1	NR	790	0	NR	920	0	NR
405	0	NR	535	1	NR	665	0	NR	795	0	NR	925	0	NR
410	0	NR	540	1	NR	670	0	NR	800	0	NR	930	0	NR
415	0	NR	545	3	NR	675	0	NR	805	0	NR	935	0	NR
420	0	NR	550	5	NR	680	0	NR	810	0	NR	940	0	NR
425	0	NR	555	10	NR	685	0	NR	815	0	NR	945	0	NR
430	0	NR	560	19	NR	690	0	NR	820	0	NR	950	0	NR
435	0	NR	565	35	NR	695	0	NR	825	0	NR	955	0	NR
440	0	NR	570	64	NR	700	0	NR	830	0	NR	960	0	NR
445	0	NR	575	116	NR	705	0	NR	835	0	NR	965	0	NR
450	0	NR	580	206	NR	710	0	NR	840	0	NR	970	0	NR
455	0	NR	585	364	NR	715	0	NR	845	0	NR	975	0	NR
460	0	NR	590	639	NR	720	0	NR	850	0	NR	980	0	NR
465	0	NR	595	970	NR	725	0	NR	855	0	NR	985	0	NR
470	0	NR	600	808	NR	730	0	NR	860	0	NR	990	0	NR
475	0	NR	605	391	NR	735	0	NR	865	0	NR	995	0	NR
480	0	NR	610	164	NR	740	0	NR	870	0	NR	1000	0	NR
485	0	NR	615	63	NR	745	0	NR	875	0	NR			

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Melanopic Flux vs. Wavelength



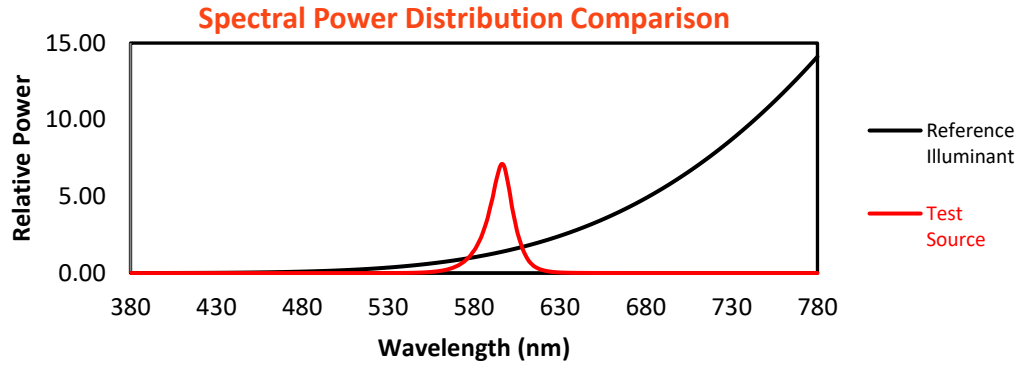
Melanopic Lumens: NR

M/P: 0.12

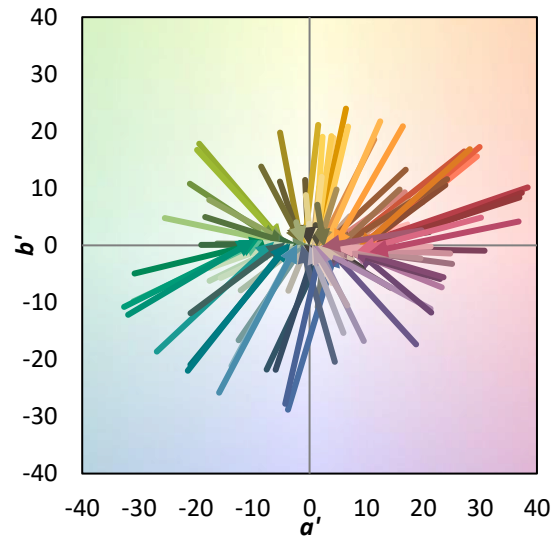
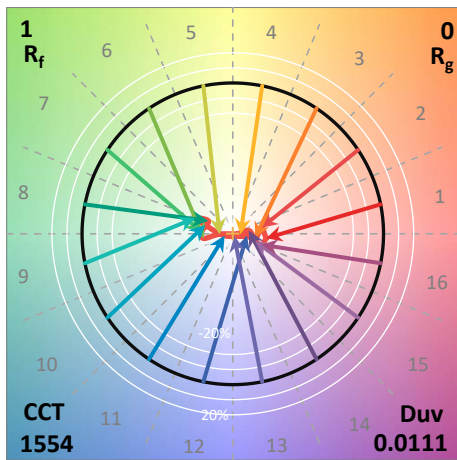
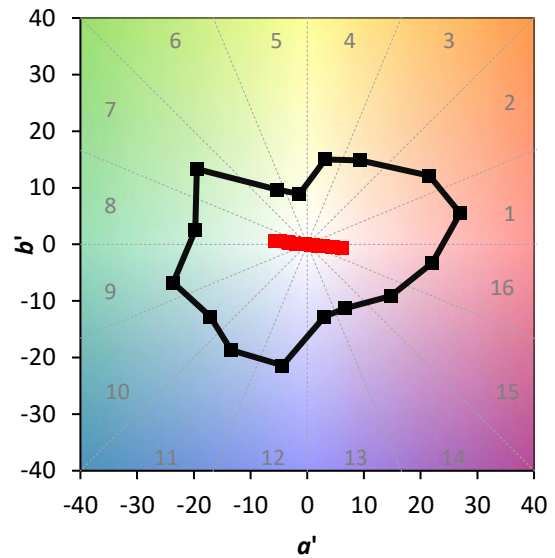
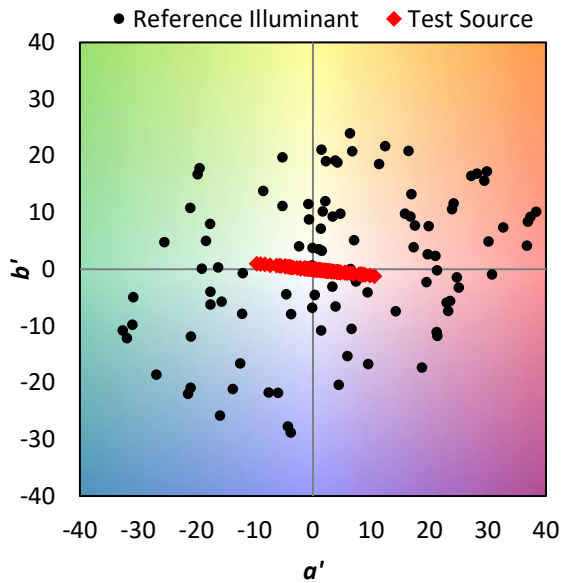
λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)
360	0	NR	490	0	NR	620	27	NR	750	0	NR	880	0	NR
365	0	NR	495	0	NR	625	12	NR	755	0	NR	885	0	NR
370	0	NR	500	0	NR	630	6	NR	760	0	NR	890	0	NR
375	0	NR	505	0	NR	635	3	NR	765	0	NR	895	0	NR
380	0	NR	510	0	NR	640	2	NR	770	0	NR	900	0	NR
385	0	NR	515	0	NR	645	1	NR	775	0	NR	905	0	NR
390	0	NR	520	0	NR	650	1	NR	780	0	NR	910	0	NR
395	0	NR	525	0	NR	655	1	NR	785	0	NR	915	0	NR
400	0	NR	530	0	NR	660	1	NR	790	0	NR	920	0	NR
405	0	NR	535	1	NR	665	0	NR	795	0	NR	925	0	NR
410	0	NR	540	1	NR	670	0	NR	800	0	NR	930	0	NR
415	0	NR	545	3	NR	675	0	NR	805	0	NR	935	0	NR
420	0	NR	550	5	NR	680	0	NR	810	0	NR	940	0	NR
425	0	NR	555	10	NR	685	0	NR	815	0	NR	945	0	NR
430	0	NR	560	19	NR	690	0	NR	820	0	NR	950	0	NR
435	0	NR	565	35	NR	695	0	NR	825	0	NR	955	0	NR
440	0	NR	570	64	NR	700	0	NR	830	0	NR	960	0	NR
445	0	NR	575	116	NR	705	0	NR	835	0	NR	965	0	NR
450	0	NR	580	206	NR	710	0	NR	840	0	NR	970	0	NR
455	0	NR	585	364	NR	715	0	NR	845	0	NR	975	0	NR
460	0	NR	590	639	NR	720	0	NR	850	0	NR	980	0	NR
465	0	NR	595	970	NR	725	0	NR	855	0	NR	985	0	NR
470	0	NR	600	808	NR	730	0	NR	860	0	NR	990	0	NR
475	0	NR	605	391	NR	735	0	NR	865	0	NR	995	0	NR
480	0	NR	610	164	NR	740	0	NR	870	0	NR	1000	0	NR
485	0	NR	615	63	NR	745	0	NR	875	0	NR			

**Summary**

$R_f = 1.1$   
 $R_g = 0$   
 CIE  $R_a = -22.5$   
 $R_9 = -390.1$

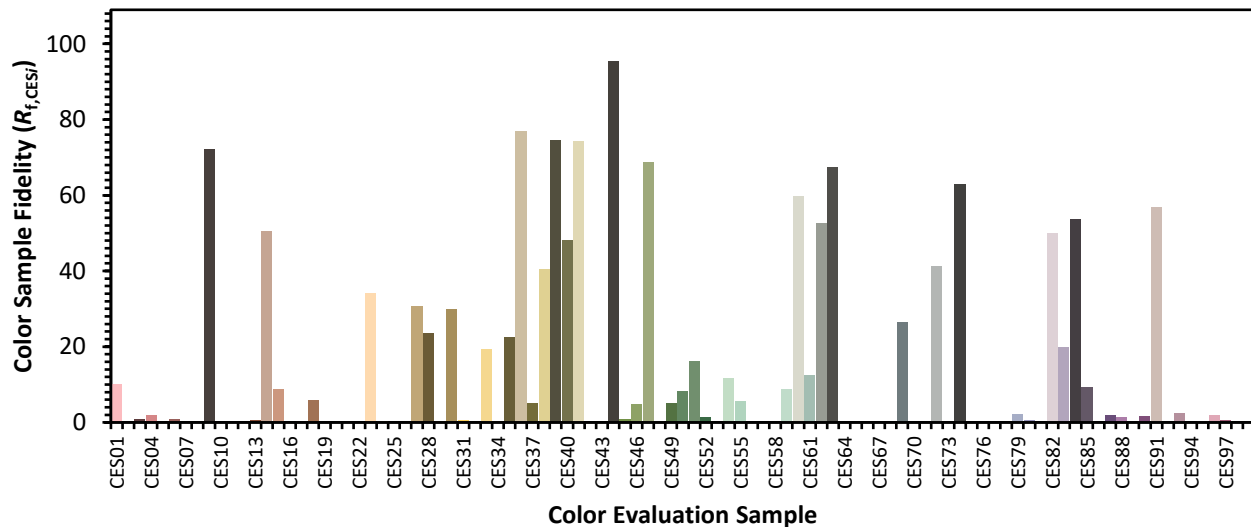


**Color Vector Graphics**



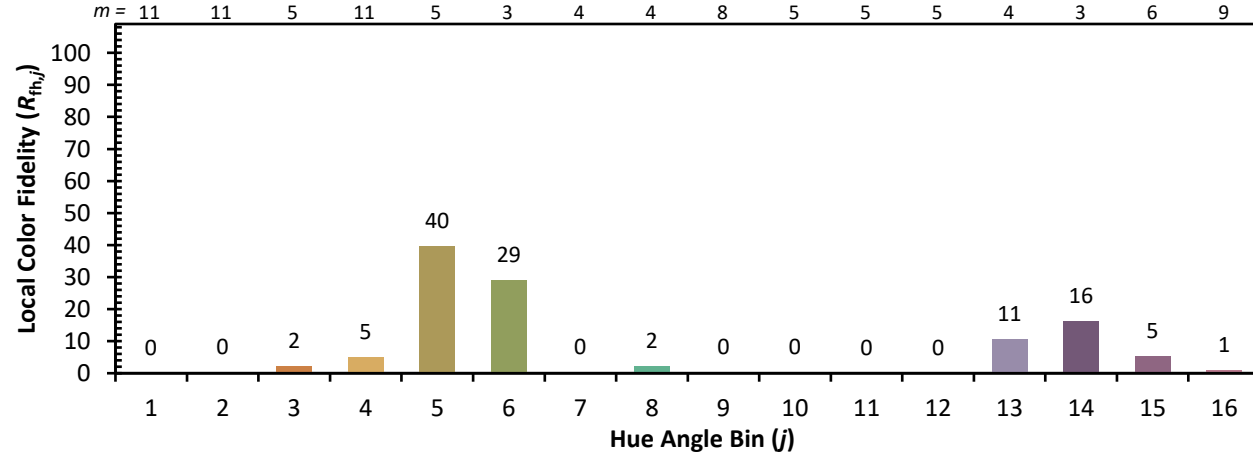
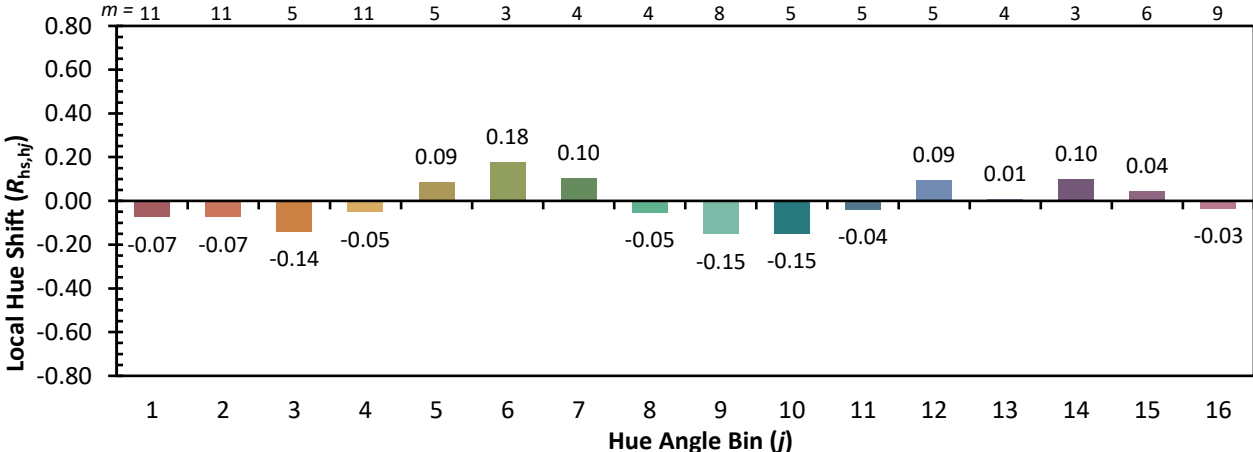
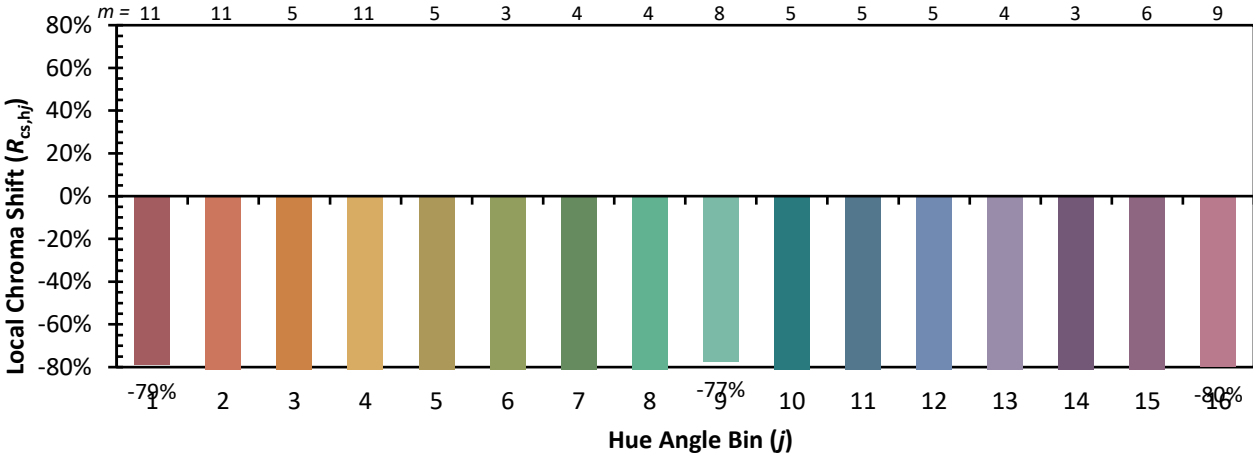
**Individual Sample Fidelity Index ( $R_{f,i}$ )**

CES01 = 90	CES26 = 0	CES51 = 16	CES76 = 0
CES02 = 69	CES27 = 31	CES52 = 2	CES77 = 0
CES03 = 31	CES28 = 24	CES53 = 0	CES78 = 0
CES04 = 77	CES29 = 0	CES54 = 12	CES79 = 2
CES05 = 52	CES30 = 30	CES55 = 6	CES80 = 1
CES06 = 56	CES31 = 1	CES56 = 0	CES81 = 0
CES07 = 41	CES32 = 0	CES57 = 0	CES82 = 50
CES08 = 38	CES33 = 19	CES58 = 0	CES83 = 20
CES09 = 29	CES34 = 0	CES59 = 9	CES84 = 54
CES10 = 87	CES35 = 22	CES60 = 60	CES85 = 9
CES11 = 70	CES36 = 77	CES61 = 12	CES86 = 0
CES12 = 75	CES37 = 5	CES62 = 53	CES87 = 2
CES13 = 47	CES38 = 40	CES63 = 67	CES88 = 1
CES14 = 76	CES39 = 75	CES64 = 0	CES89 = 0
CES15 = 74	CES40 = 48	CES65 = 0	CES90 = 2
CES16 = 49	CES41 = 74	CES66 = 0	CES91 = 57
CES17 = 56	CES42 = 0	CES67 = 0	CES92 = 0
CES18 = 59	CES43 = 0	CES68 = 0	CES93 = 2
CES19 = 80	CES44 = 95	CES69 = 26	CES94 = 0
CES20 = 71	CES45 = 1	CES70 = 0	CES95 = 0
CES21 = 94	CES46 = 5	CES71 = 0	CES96 = 2
CES22 = 87	CES47 = 69	CES72 = 41	CES97 = 1
CES23 = 94	CES48 = 0	CES73 = 0	CES98 = 0
CES24 = 95	CES49 = 5	CES74 = 63	CES99 = 0
CES25 = 79	CES50 = 8	CES75 = 0	

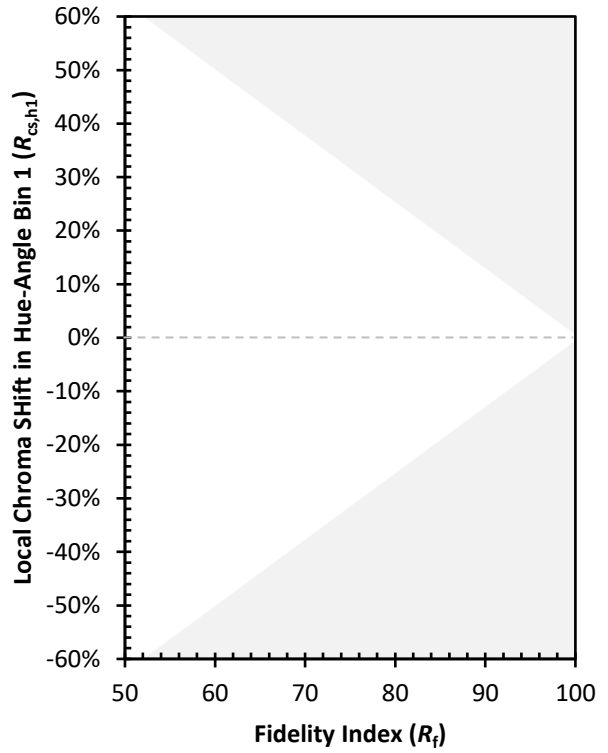
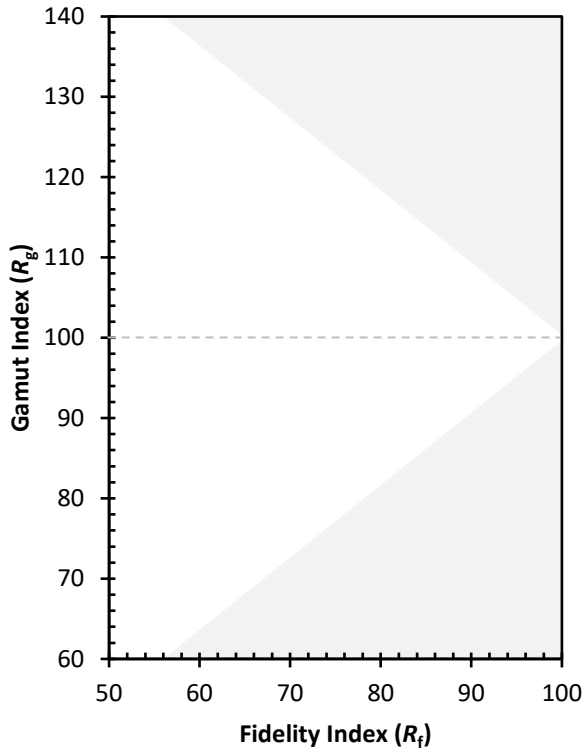




Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)