

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: P880409

Luminaire Tested: **EMM2-HSN-VA4-735-U-MQ**

Issue Date: 10/01/2024



Test Information

Test Method: LM-79-08
Report Number: P880409
Test Lab: INNOVATION CENTER(G3)
Issue Date: 10/01/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: INVUE
Catalog Number: EMM2-HSN-VA4-735-U-MQ
Description: EPIC MODERN SHORT HOUSING 4W 70CRI 3500K VISUAL COMFORT FIXTURE w/
TYPE V MEDIUM DISTRIBUTION OPTIC
Light Source: (1) 3500K CCT, 70 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

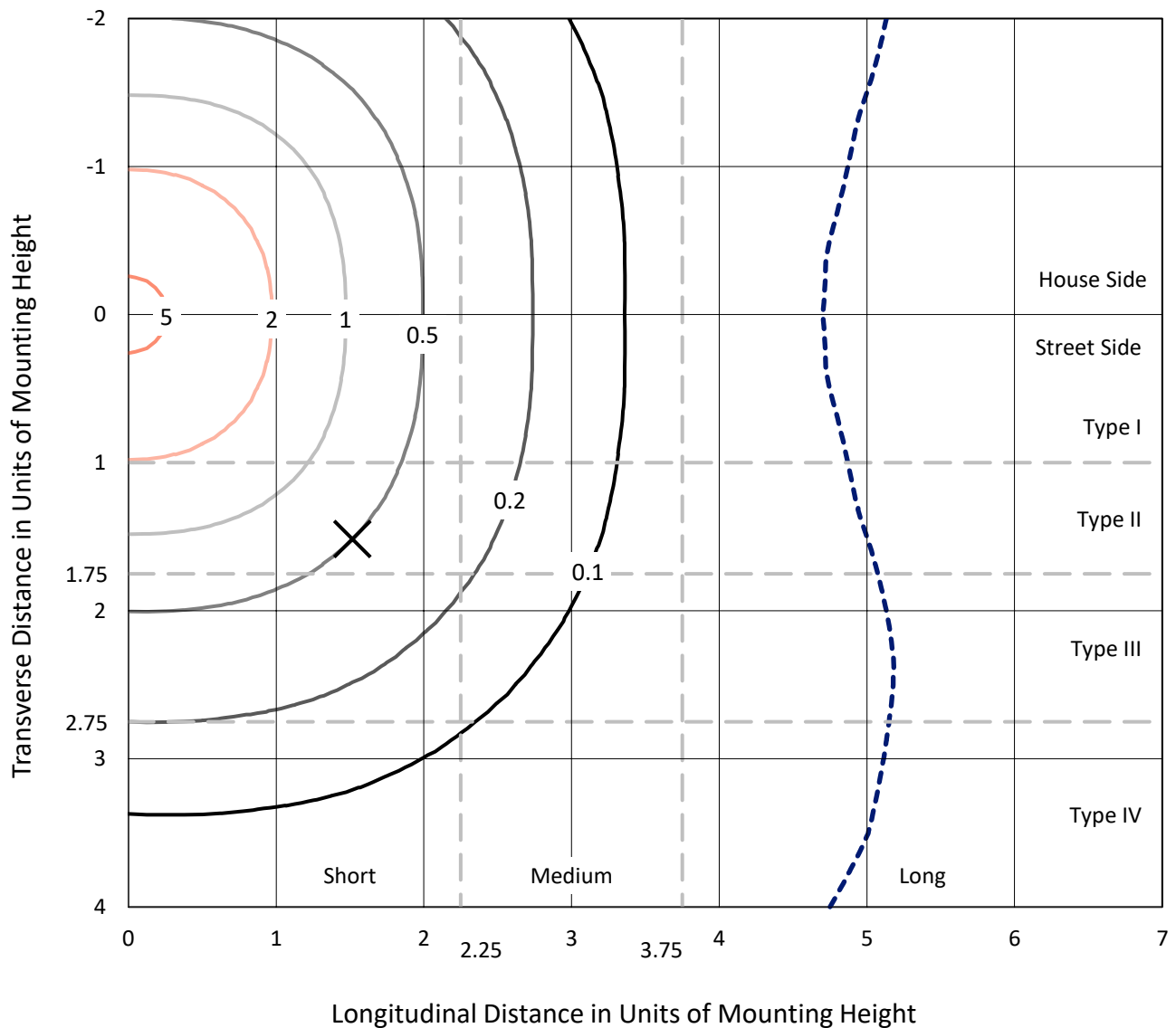
Lumens per Lamp: N/A
Luminaire Lumens: 6768.3 lumens
Efficiency: N/A
Efficacy: 114.7 lumens/watt
Luminous Opening: Circular (Dia: 1.12' x H: 0')
IES Classification: Type V - Short
BUG Rating: B3 - U0 - G2

Input Watts (W): 59
Input Voltage (V): 120
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.99
Total Harmonic Distortion (THDi): 9%
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT

REPORT NUMBER: P880409
 CATALOG NUMBER: EMM2-HSN-VA4-735-U-MQ

Iso-Footcandle Lines of Horizontal Illumination

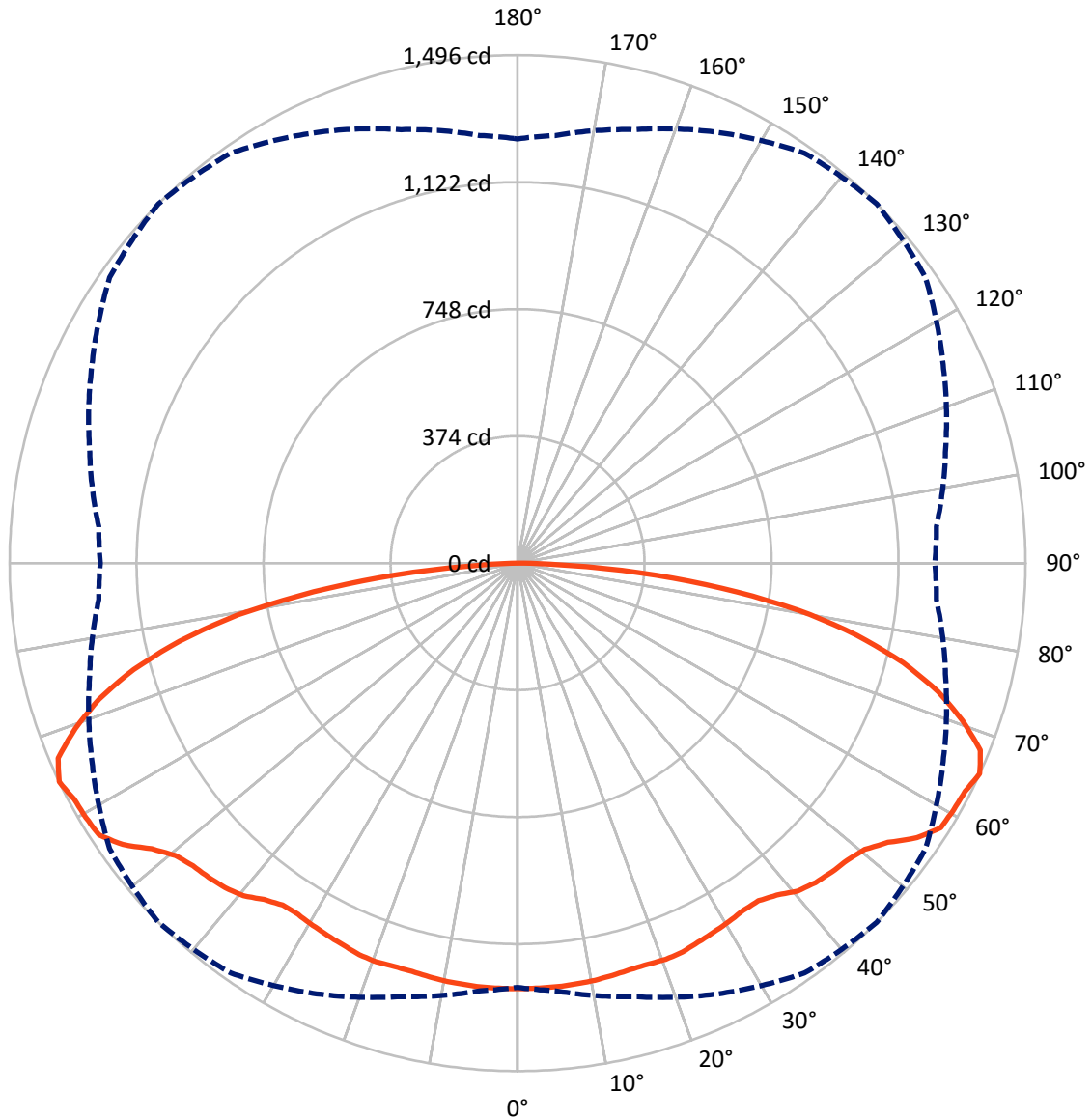
× Max cd
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 5.6 fc
 Type V - Short - N/A

REPORT NUMBER: P880409
CATALOG NUMBER: EMM2-HSN-VA4-735-U-MQ

Luminous Intensity Polar Plot



— Vertical Plane Through 45-Deg Lateral - - - Horizontal Cone Through 65-Deg Vertical

REPORT NUMBER: P880409
 CATALOG NUMBER: EMM2-HSN-VA4-735-U-MQ

FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	3384.2	0.0	3384.2
	% Fixture	50.0	0.0	50.0
Street Side	Lumens	3384.2	0.0	3384.2
	% Fixture	50.0	0.0	50.0
Total	Lumens	6768.3	0.0	6768.3
	% Fixture	100.0	0.0	100.0

Coefficient of Utilization

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	119.5	1.8
10°-20°	352.4	5.2
20°-30°	570.5	8.4
30°-40°	766.7	11.3
40°-50°	978.5	14.5
50°-60°	1203.8	17.8
60°-70°	1340.5	19.8
70°-80°	1088.1	16.1
80°-90°	348.3	5.1
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°	6768.3	100.0
0°-180°	6768.3	100.0



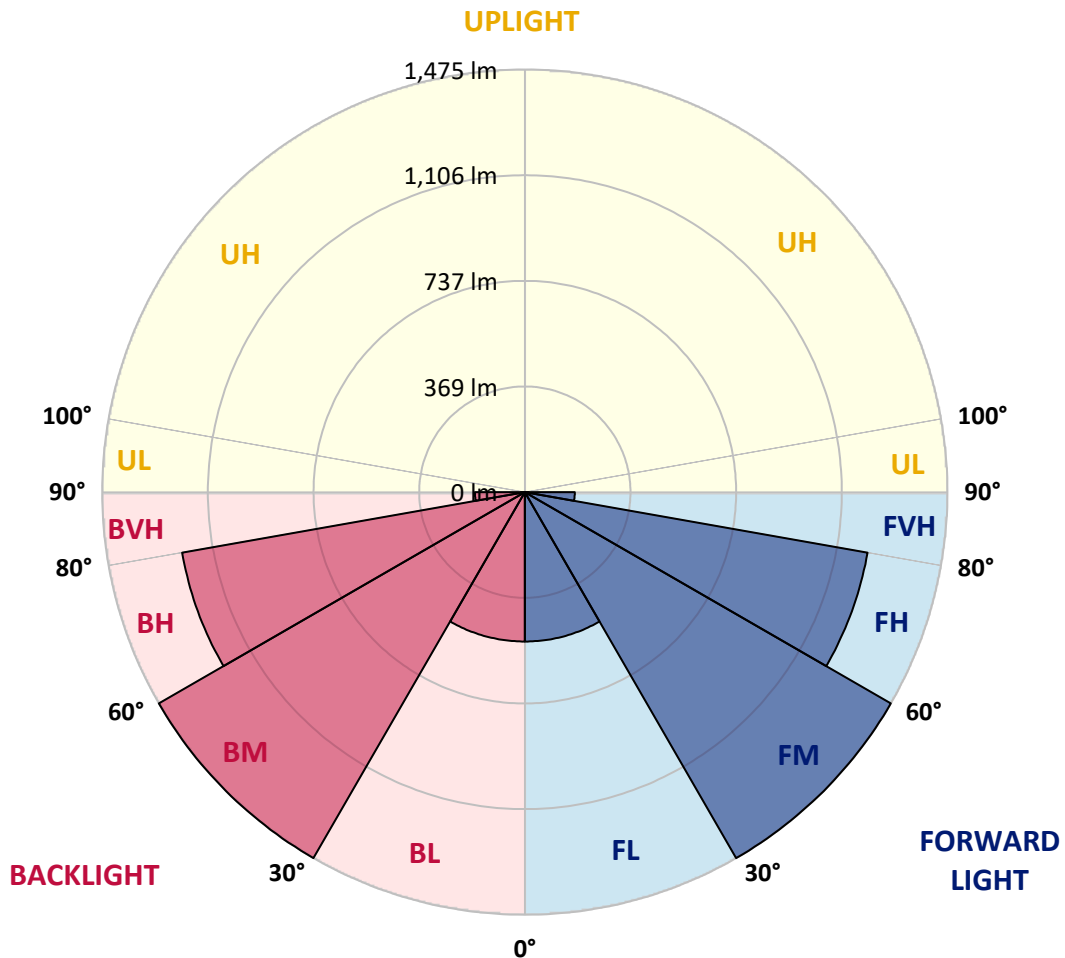
REPORT NUMBER: P880409
 CATALOG NUMBER: EMM2-HSN-VA4-735-U-MQ

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone	Lumens	% Fixture	Zone Rating/Lumen Limit		
			B	U	G
FL (0°-30°)	521.2	7.7			
FM (30°-60°)	1474.5	21.8			
FH (60°-80°)	1214.3	17.9			G1/1800
FVH (80°-90°)	174.2	2.6			G2/225
BL (0°-30°)	521.2	7.7	B2/1000		
BM (30°-60°)	1474.5	21.8	B2/2500		
BH (60°-80°)	1214.3	17.9	B3/2500		G1/1800
BVH (80°-90°)	174.2	2.6			G2/225
UL (90°-100°)	0.0	0.0		U0/0	
UH (100°-180°)	0.0	0.0		U0/0	

BUG Rating: B3-U0-G2

Type V Short





REPORT NUMBER: P880409

CATALOG NUMBER: EMM2-HSN-VA4-735-U-MQ

CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5
2.5°	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5
5°	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1253.5	1251.6	1253.5	1253.5
7.5°	1251.6	1251.6	1251.6	1251.6	1251.6	1251.6	1251.6	1251.6	1251.6	1251.6	1251.6
10°	1249.8	1249.8	1249.8	1249.8	1249.8	1249.8	1249.8	1249.8	1249.8	1249.8	1249.8
12.5°	1246.1	1246.1	1246.1	1246.1	1246.1	1246.1	1246.1	1246.1	1246.1	1246.1	1246.1
15°	1240.5	1242.3	1242.3	1242.3	1242.3	1242.3	1242.3	1242.3	1242.3	1240.5	1240.5
17.5°	1238.6	1238.6	1238.6	1240.5	1242.3	1242.3	1242.3	1240.5	1238.6	1236.8	1236.8
20°	1240.5	1240.5	1240.5	1242.3	1244.2	1246.1	1244.2	1242.3	1238.6	1238.6	1238.6
22.5°	1238.6	1240.5	1240.5	1242.3	1244.2	1244.2	1242.3	1240.5	1238.6	1236.8	1236.8
25°	1233.1	1233.1	1234.9	1236.8	1236.8	1236.8	1236.8	1233.1	1231.2	1229.4	1229.4
27.5°	1225.7	1227.5	1227.5	1229.4	1231.2	1231.2	1229.4	1225.7	1223.8	1221.9	1221.9
30°	1216.4	1216.4	1218.2	1221.9	1223.8	1225.7	1221.9	1218.2	1212.7	1210.8	1210.8
32.5°	1207.1	1209.0	1212.7	1216.4	1218.2	1220.1	1216.4	1212.7	1207.1	1203.4	1201.6
35°	1203.4	1203.4	1209.0	1216.4	1221.9	1221.9	1218.2	1210.8	1203.4	1196.0	1196.0
37.5°	1209.0	1210.8	1218.2	1231.2	1240.5	1240.5	1238.6	1225.7	1212.7	1201.6	1199.7
40°	1221.9	1223.8	1236.8	1253.5	1268.3	1270.2	1262.7	1246.1	1227.5	1214.5	1210.8
42.5°	1229.4	1233.1	1247.9	1268.3	1281.3	1286.8	1277.6	1260.9	1236.8	1220.1	1218.2
45°	1233.1	1236.8	1253.5	1275.7	1292.4	1298.0	1288.7	1266.5	1240.5	1221.9	1220.1
47.5°	1234.9	1238.6	1255.3	1283.1	1301.7	1307.2	1299.8	1273.9	1242.3	1223.8	1221.9
50°	1236.8	1244.2	1264.6	1294.3	1322.1	1325.8	1314.7	1283.1	1249.8	1227.5	1221.9
52.5°	1249.8	1255.3	1285.0	1327.6	1355.5	1366.6	1349.9	1318.4	1268.3	1234.9	1231.2
55°	1281.3	1283.1	1318.4	1372.1	1412.9	1427.8	1401.8	1359.2	1298.0	1264.6	1262.7
57.5°	1290.6	1301.7	1340.6	1401.8	1451.9	1470.4	1448.2	1383.3	1327.6	1283.1	1272.0
60°	1281.3	1290.6	1336.9	1407.4	1461.1	1476.0	1459.3	1398.1	1316.5	1266.5	1257.2
62.5°	1272.0	1283.1	1331.3	1411.1	1463.0	1479.7	1451.9	1400.0	1311.0	1260.9	1251.6
65°	1249.8	1264.6	1322.1	1400.0	1474.1	1496.4	1466.7	1383.3	1305.4	1238.6	1229.4
67.5°	1207.1	1214.5	1277.6	1368.4	1448.2	1470.4	1438.9	1351.7	1259.0	1194.1	1186.7
70°	1127.4	1144.1	1203.4	1303.5	1379.6	1390.7	1366.6	1279.4	1188.6	1120.0	1110.7
72.5°	1021.7	1045.8	1110.7	1212.7	1273.9	1296.1	1264.6	1194.1	1099.6	1021.7	1008.7
75°	910.4	923.4	990.2	1090.3	1153.3	1173.7	1145.9	1077.3	964.2	910.4	897.5
77.5°	788.1	797.3	856.7	945.7	1005.0	1021.7	993.9	938.2	836.3	786.2	780.6
80°	617.5	636.0	691.6	767.7	812.2	838.1	808.5	754.7	680.5	621.2	611.9
82.5°	441.3	454.3	504.4	556.3	598.9	606.3	593.4	541.4	485.8	439.5	428.3
85°	241.1	246.6	278.1	331.9	348.6	361.6	343.0	304.1	276.3	246.6	237.3
87.5°	63.0	64.9	74.2	87.1	94.6	96.4	94.6	83.4	68.6	53.8	59.3
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: SP1-2407-176-4

Test Date: 09/24/2024

Luminaire Tested: MEM2-HTN-VA-30-735-U-WQ

Data in this report applies to families of products including MEM2-HTN-VA-30-735-U-WQ

Test Information

Test Method: LM-79-2019
 Report Number: SP1-2407-176-4
 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-30-735-U-WQ**
 Description: EPIC MODERN VISUAL COMFORT 30W WAVESTREAM WIDE

Spectral Parameters

CCT (K): 3348
 CIE u': 0.2384
 CIE v': 0.5184
 Duv: 0.0030
 CIE x: 0.4177
 CIE y: 0.4036
 CIE z: 0.1787
 Peak Wavelength (nm): 593
 Dominant Wavelength (nm): 580
 Purity: 46.5223
 Rf: 75.8
 Rg: 95.8

CRI (Ra):	73.4		
R1:	70.8	R9:	-19.2
R2:	79.9	R10:	52.5
R3:	87.6	R11:	68.0
R4:	72.6	R12:	42.6
R5:	69.3	R13:	72.0
R6:	71.3	R14:	92.6
R7:	82.1	R15:	63.8
R8:	53.3		



Test Conditions

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

REPORT NUMBER: SP1-2407-176-4

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 3500K 4-step quadrangle

REPORT NUMBER: SP1-2407-176-4

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	110	NR	620	844	NR	750	28	NR	880	0	NR
365	0	NR	495	150	NR	625	792	NR	755	25	NR	885	0	NR
370	0	NR	500	214	NR	630	737	NR	760	22	NR	890	0	NR
375	0	NR	505	293	NR	635	683	NR	765	19	NR	895	0	NR
380	0	NR	510	376	NR	640	625	NR	770	16	NR	900	0	NR
385	0	NR	515	458	NR	645	566	NR	775	14	NR	905	0	NR
390	0	NR	520	526	NR	650	509	NR	780	12	NR	910	0	NR
395	1	NR	525	584	NR	655	453	NR	785	10	NR	915	0	NR
400	3	NR	530	631	NR	660	401	NR	790	9	NR	920	0	NR
405	5	NR	535	671	NR	665	353	NR	795	8	NR	925	0	NR
410	10	NR	540	704	NR	670	308	NR	800	7	NR	930	0	NR
415	21	NR	545	737	NR	675	269	NR	805	6	NR	935	0	NR
420	44	NR	550	766	NR	680	235	NR	810	5	NR	940	0	NR
425	90	NR	555	797	NR	685	204	NR	815	4	NR	945	0	NR
430	171	NR	560	832	NR	690	177	NR	820	4	NR	950	0	NR
435	305	NR	565	866	NR	695	152	NR	825	3	NR	955	0	NR
440	455	NR	570	901	NR	700	131	NR	830	3	NR	960	0	NR
445	615	NR	575	933	NR	705	112	NR	835	3	NR	965	0	NR
450	771	NR	580	963	NR	710	96	NR	840	2	NR	970	0	NR
455	579	NR	585	984	NR	715	80	NR	845	2	NR	975	0	NR
460	313	NR	590	1000	NR	720	67	NR	850	2	NR	980	0	NR
465	221	NR	595	999	NR	725	55	NR	855	1	NR	985	0	NR
470	156	NR	600	990	NR	730	46	NR	860	1	NR	990	0	NR
475	103	NR	605	968	NR	735	40	NR	865	1	NR	995	0	NR
480	89	NR	610	937	NR	740	35	NR	870	1	NR	1000	0	NR
485	93	NR	615	893	NR	745	31	NR	875	1	NR			

REPORT NUMBER: SP1-2407-176-4

Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.31

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	110	NR	620	844	NR	750	28	NR	880	0	NR
365	0	NR	495	150	NR	625	792	NR	755	25	NR	885	0	NR
370	0	NR	500	214	NR	630	737	NR	760	22	NR	890	0	NR
375	0	NR	505	293	NR	635	683	NR	765	19	NR	895	0	NR
380	0	NR	510	376	NR	640	625	NR	770	16	NR	900	0	NR
385	0	NR	515	458	NR	645	566	NR	775	14	NR	905	0	NR
390	0	NR	520	526	NR	650	509	NR	780	12	NR	910	0	NR
395	1	NR	525	584	NR	655	453	NR	785	10	NR	915	0	NR
400	3	NR	530	631	NR	660	401	NR	790	9	NR	920	0	NR
405	5	NR	535	671	NR	665	353	NR	795	8	NR	925	0	NR
410	10	NR	540	704	NR	670	308	NR	800	7	NR	930	0	NR
415	21	NR	545	737	NR	675	269	NR	805	6	NR	935	0	NR
420	44	NR	550	766	NR	680	235	NR	810	5	NR	940	0	NR
425	90	NR	555	797	NR	685	204	NR	815	4	NR	945	0	NR
430	171	NR	560	832	NR	690	177	NR	820	4	NR	950	0	NR
435	305	NR	565	866	NR	695	152	NR	825	3	NR	955	0	NR
440	455	NR	570	901	NR	700	131	NR	830	3	NR	960	0	NR
445	615	NR	575	933	NR	705	112	NR	835	3	NR	965	0	NR
450	771	NR	580	963	NR	710	96	NR	840	2	NR	970	0	NR
455	579	NR	585	984	NR	715	80	NR	845	2	NR	975	0	NR
460	313	NR	590	1000	NR	720	67	NR	850	2	NR	980	0	NR
465	221	NR	595	999	NR	725	55	NR	855	1	NR	985	0	NR
470	156	NR	600	990	NR	730	46	NR	860	1	NR	990	0	NR
475	103	NR	605	968	NR	735	40	NR	865	1	NR	995	0	NR
480	89	NR	610	937	NR	740	35	NR	870	1	NR	1000	0	NR
485	93	NR	615	893	NR	745	31	NR	875	1	NR			

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Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.4

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	110	NR	620	844	NR	750	28	NR	880	0	NR
365	0	NR	495	150	NR	625	792	NR	755	25	NR	885	0	NR
370	0	NR	500	214	NR	630	737	NR	760	22	NR	890	0	NR
375	0	NR	505	293	NR	635	683	NR	765	19	NR	895	0	NR
380	0	NR	510	376	NR	640	625	NR	770	16	NR	900	0	NR
385	0	NR	515	458	NR	645	566	NR	775	14	NR	905	0	NR
390	0	NR	520	526	NR	650	509	NR	780	12	NR	910	0	NR
395	1	NR	525	584	NR	655	453	NR	785	10	NR	915	0	NR
400	3	NR	530	631	NR	660	401	NR	790	9	NR	920	0	NR
405	5	NR	535	671	NR	665	353	NR	795	8	NR	925	0	NR
410	10	NR	540	704	NR	670	308	NR	800	7	NR	930	0	NR
415	21	NR	545	737	NR	675	269	NR	805	6	NR	935	0	NR
420	44	NR	550	766	NR	680	235	NR	810	5	NR	940	0	NR
425	90	NR	555	797	NR	685	204	NR	815	4	NR	945	0	NR
430	171	NR	560	832	NR	690	177	NR	820	4	NR	950	0	NR
435	305	NR	565	866	NR	695	152	NR	825	3	NR	955	0	NR
440	455	NR	570	901	NR	700	131	NR	830	3	NR	960	0	NR
445	615	NR	575	933	NR	705	112	NR	835	3	NR	965	0	NR
450	771	NR	580	963	NR	710	96	NR	840	2	NR	970	0	NR
455	579	NR	585	984	NR	715	80	NR	845	2	NR	975	0	NR
460	313	NR	590	1000	NR	720	67	NR	850	2	NR	980	0	NR
465	221	NR	595	999	NR	725	55	NR	855	1	NR	985	0	NR
470	156	NR	600	990	NR	730	46	NR	860	1	NR	990	0	NR
475	103	NR	605	968	NR	735	40	NR	865	1	NR	995	0	NR
480	89	NR	610	937	NR	740	35	NR	870	1	NR	1000	0	NR
485	93	NR	615	893	NR	745	31	NR	875	1	NR			

Summary

$R_f = 75.8$
 $R_g = 95.8$
 $CIE R_a = 73.4$
 $R_9 = -19.2$

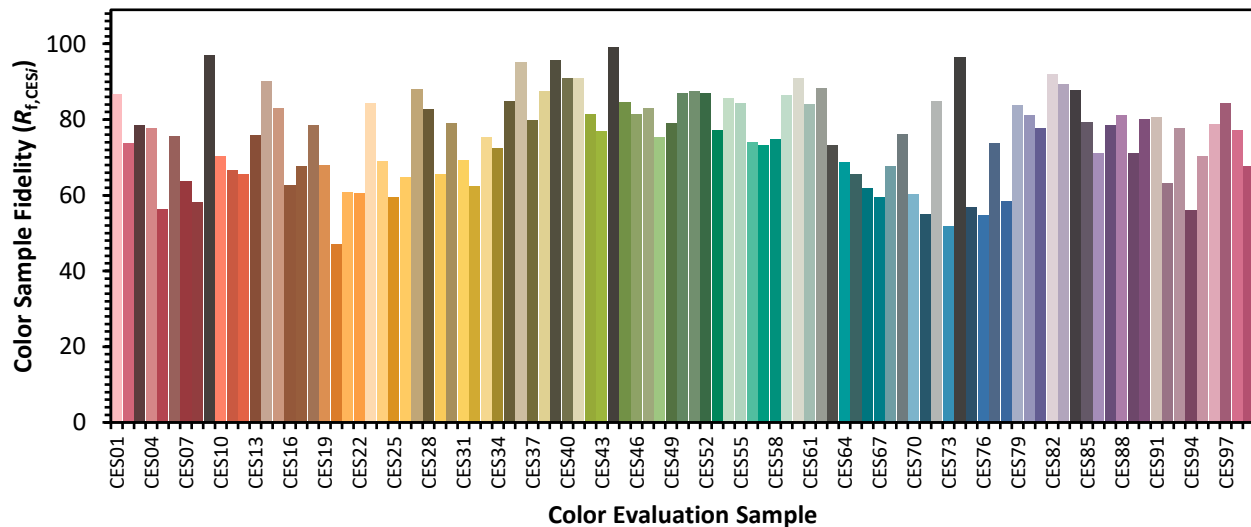


Color Vector Graphics

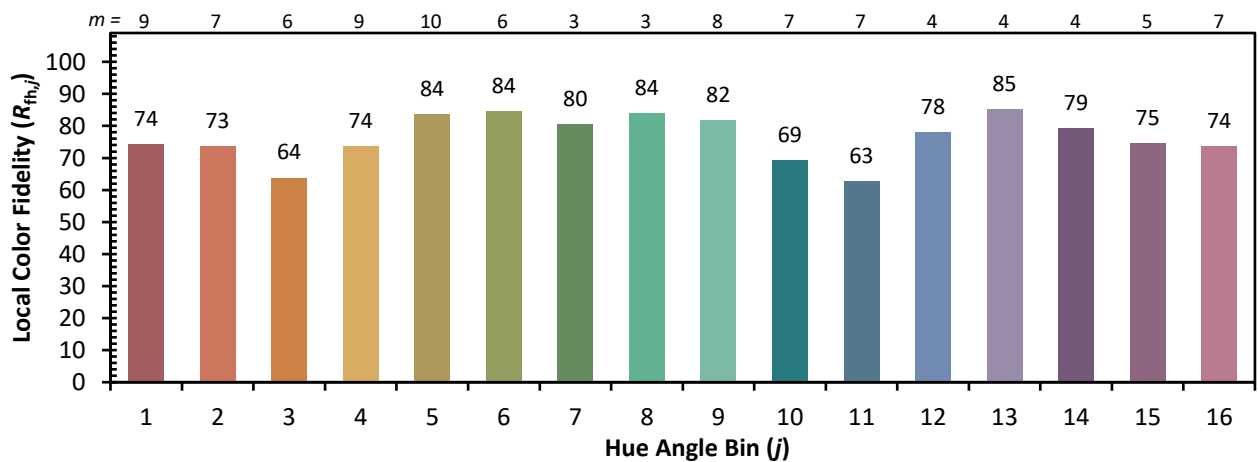
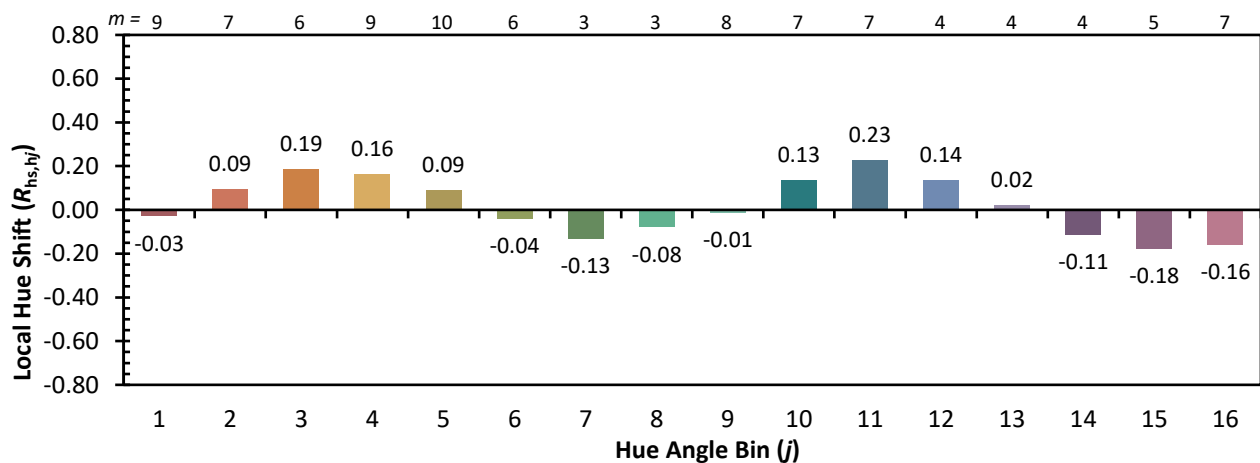
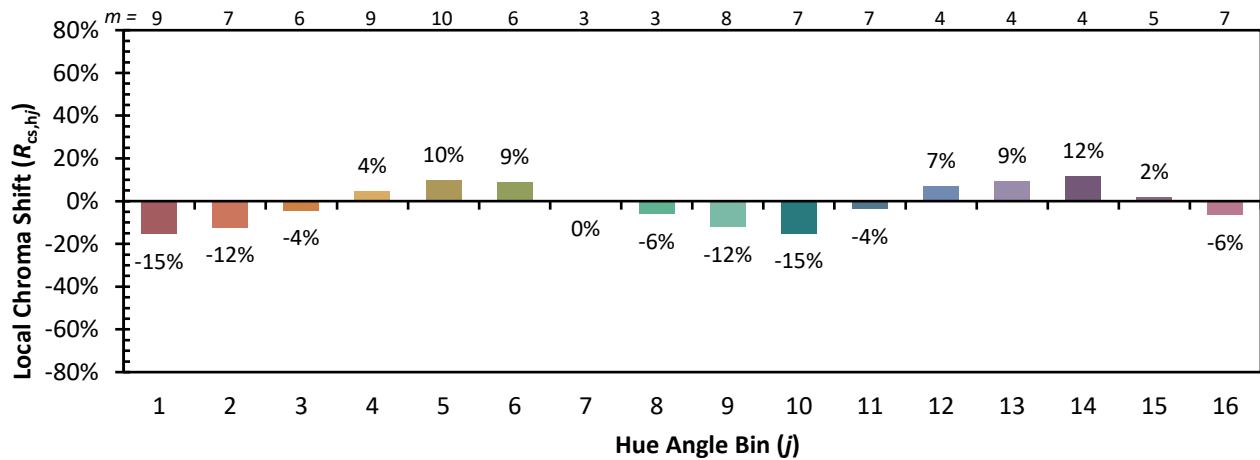


Individual Sample Fidelity Index ($R_{f,i}$)

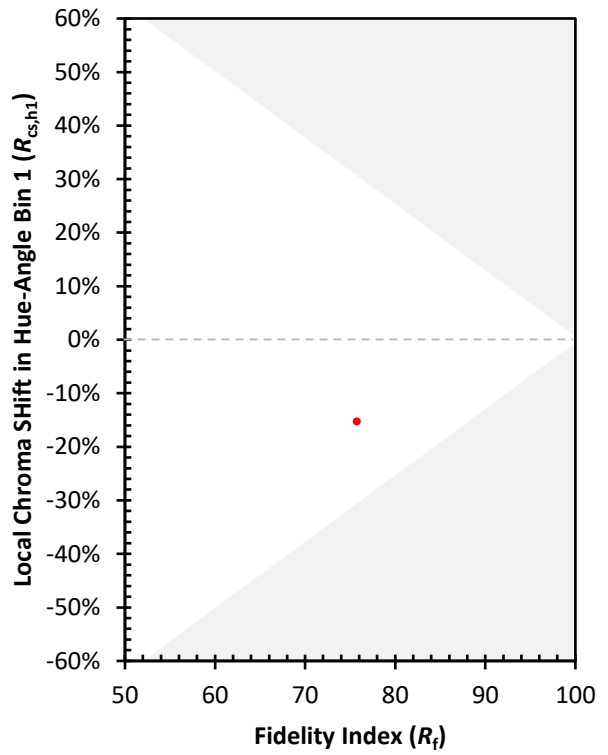
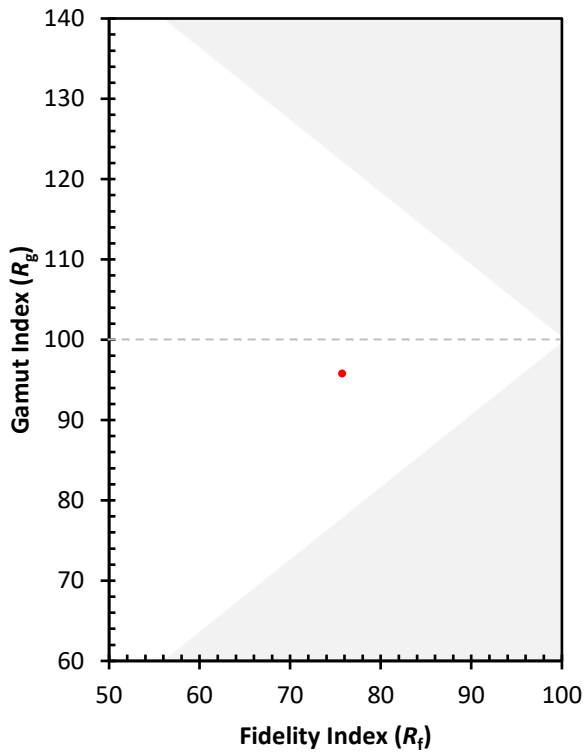
CES01 = 86	CES26 = 65	CES51 = 88	CES76 = 55
CES02 = 62	CES27 = 88	CES52 = 87	CES77 = 74
CES03 = 31	CES28 = 83	CES53 = 77	CES78 = 58
CES04 = 70	CES29 = 66	CES54 = 86	CES79 = 84
CES05 = 48	CES30 = 79	CES55 = 84	CES80 = 81
CES06 = 51	CES31 = 69	CES56 = 74	CES81 = 78
CES07 = 41	CES32 = 62	CES57 = 73	CES82 = 92
CES08 = 40	CES33 = 75	CES58 = 75	CES83 = 89
CES09 = 29	CES34 = 73	CES59 = 87	CES84 = 88
CES10 = 75	CES35 = 85	CES60 = 91	CES85 = 79
CES11 = 58	CES36 = 95	CES61 = 84	CES86 = 71
CES12 = 64	CES37 = 80	CES62 = 88	CES87 = 79
CES13 = 43	CES38 = 88	CES63 = 73	CES88 = 81
CES14 = 74	CES39 = 96	CES64 = 69	CES89 = 71
CES15 = 71	CES40 = 91	CES65 = 66	CES90 = 80
CES16 = 47	CES41 = 91	CES66 = 62	CES91 = 81
CES17 = 50	CES42 = 81	CES67 = 60	CES92 = 63
CES18 = 56	CES43 = 77	CES68 = 68	CES93 = 78
CES19 = 72	CES44 = 99	CES69 = 76	CES94 = 56
CES20 = 65	CES45 = 85	CES70 = 60	CES95 = 70
CES21 = 87	CES46 = 82	CES71 = 55	CES96 = 79
CES22 = 79	CES47 = 83	CES72 = 85	CES97 = 84
CES23 = 92	CES48 = 75	CES73 = 52	CES98 = 77
CES24 = 91	CES49 = 79	CES74 = 96	CES99 = 68
CES25 = 72	CES50 = 87	CES75 = 57	



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)