

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: P871389

Luminaire Tested: **EMM2-HSN-SA3A-830-U-T5W**

Issue Date: 09/05/2024



Test Information

Test Method: LM-79-08
Report Number: P871389
Test Lab: INNOVATION CENTER(G3)
Issue Date: 09/05/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: INVUE
Catalog Number: EMM2-HSN-SA3A-830-U-T5W
Description: EPIC MODERN SHORT HOUSING DISCRETE LED ARRAYS 130W 80CRI 3000K
FITXURE w/ TYPE V SQUARE WIDE DISTRIBUTION OPTIC
Light Source: (30) 3000K CCT, 80 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

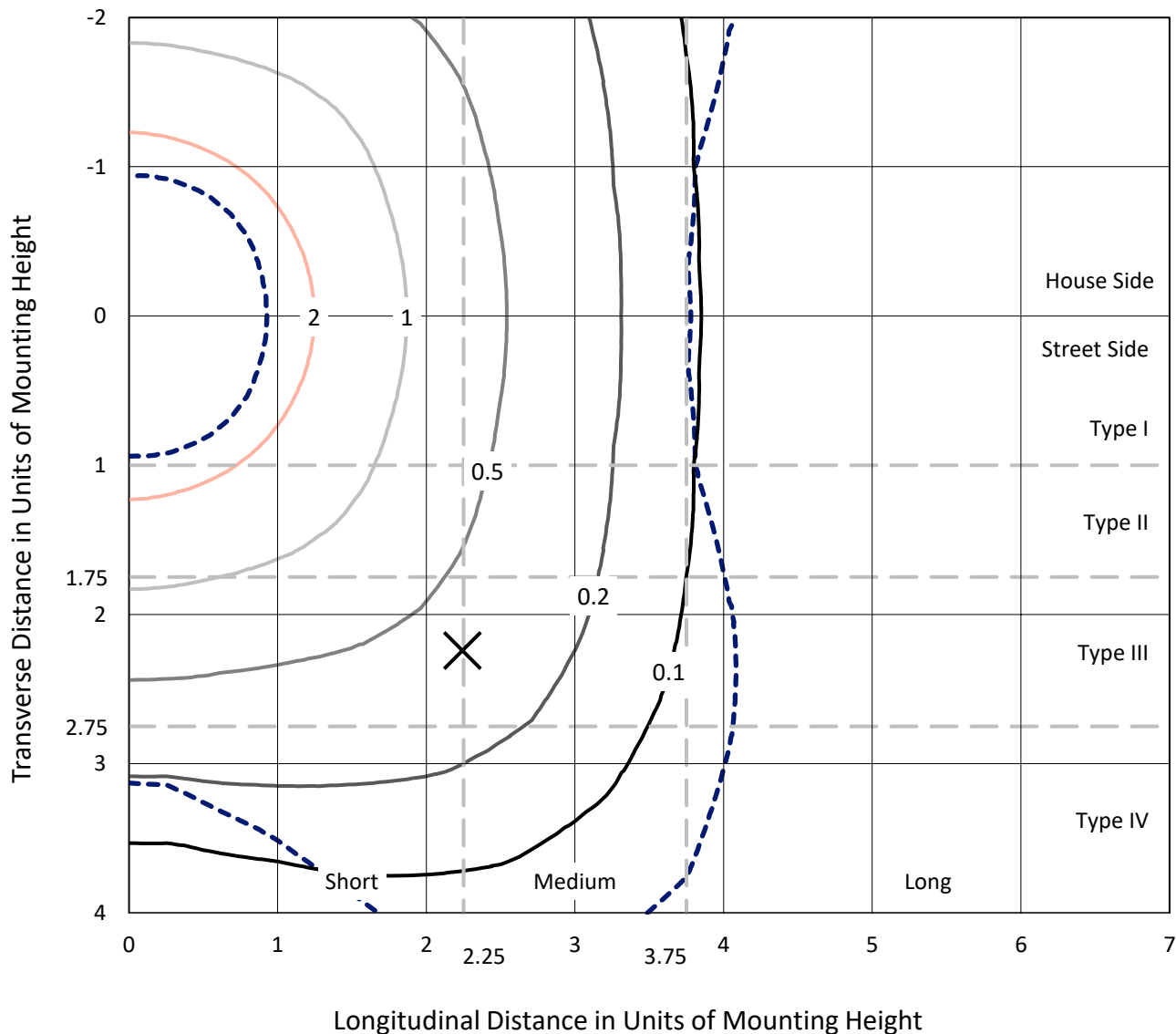
Lumens per Lamp: N/A
Luminaire Lumens: 15227.7 lumens
Efficiency: N/A
Efficacy: 134.8 lumens/watt
Luminous Opening: Rectangular (W 1' x L: 0.33' x H: 0')
IES Classification: Type V - Short
BUG Rating: B4 - U0 - G2

Input Watts (W): 113
Input Voltage (V): 120
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: 0.99
Total Harmonic Distortion (THDi): 7.77%
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT

REPORT NUMBER: P871389
 CATALOG NUMBER: EMM2-HSN-SA3A-830-U-T5W

Iso-Footcandle Lines of Horizontal Illumination

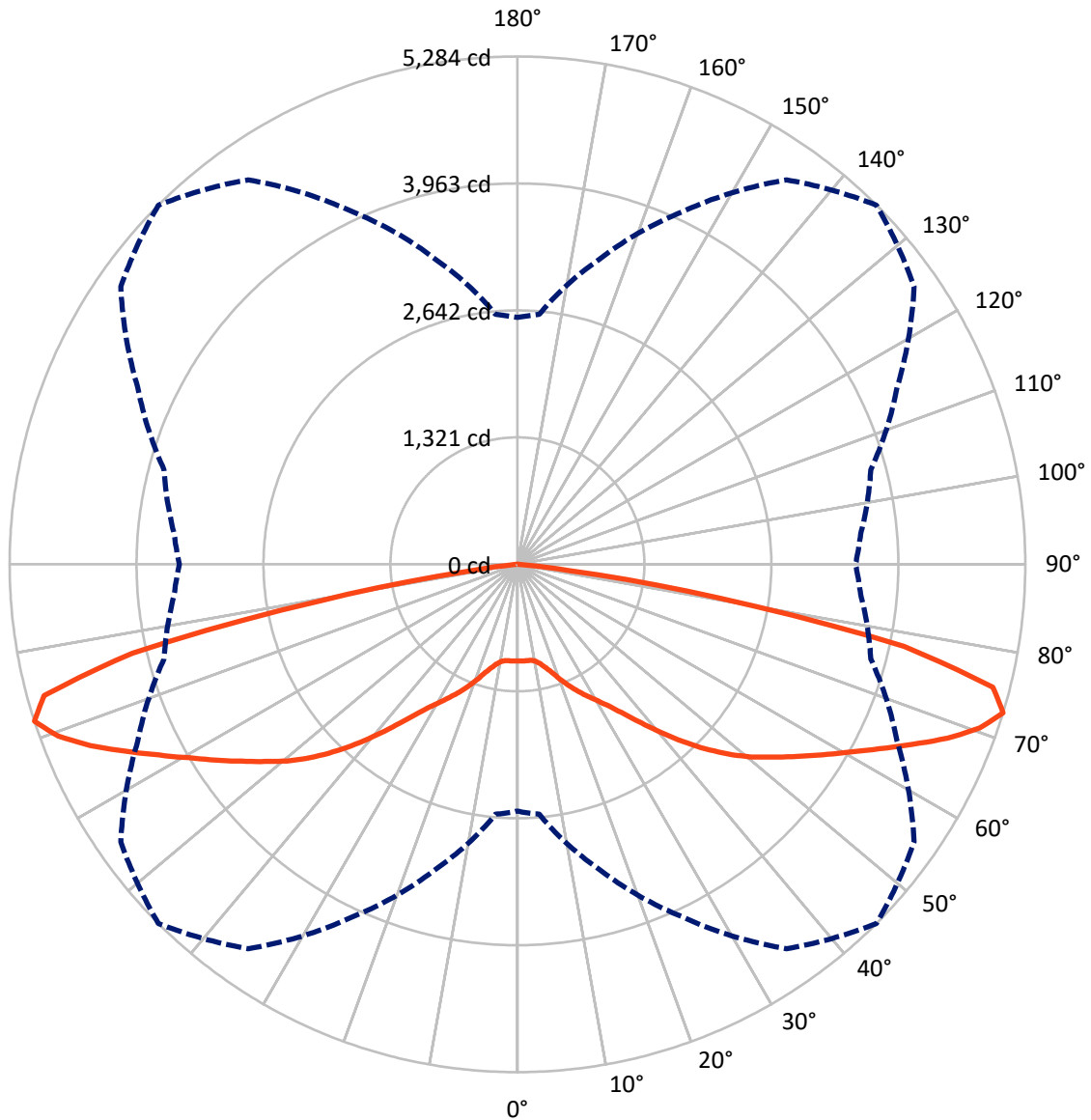
× Max cd
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 2.7 fc
 Type V - Short - N/A

REPORT NUMBER: P871389
CATALOG NUMBER: EMM2-HSN-SA3A-830-U-T5W

Luminous Intensity Polar Plot



— Vertical Plane Through 45-Deg Lateral - - - Horizontal Cone Through 72.5-Deg Vertical

REPORT NUMBER: P871389
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FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	7613.8	0.0	7613.8
	% Fixture	50.0	0.0	50.0
Street Side	Lumens	7613.8	0.0	7613.8
	% Fixture	50.0	0.0	50.0
Total	Lumens	15227.7	0.0	15227.7
	% Fixture	100.0	0.0	100.0

Coefficient of Utilization

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	96.3	0.6
10°-20°	321.6	2.1
20°-30°	663.5	4.4
30°-40°	1221.5	8.0
40°-50°	2147.6	14.1
50°-60°	3114.8	20.5
60°-70°	4060.5	26.7
70°-80°	3375.3	22.2
80°-90°	226.6	1.5
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°	15227.7	100.0
0°-180°	15227.7	100.0



REPORT NUMBER: P871389

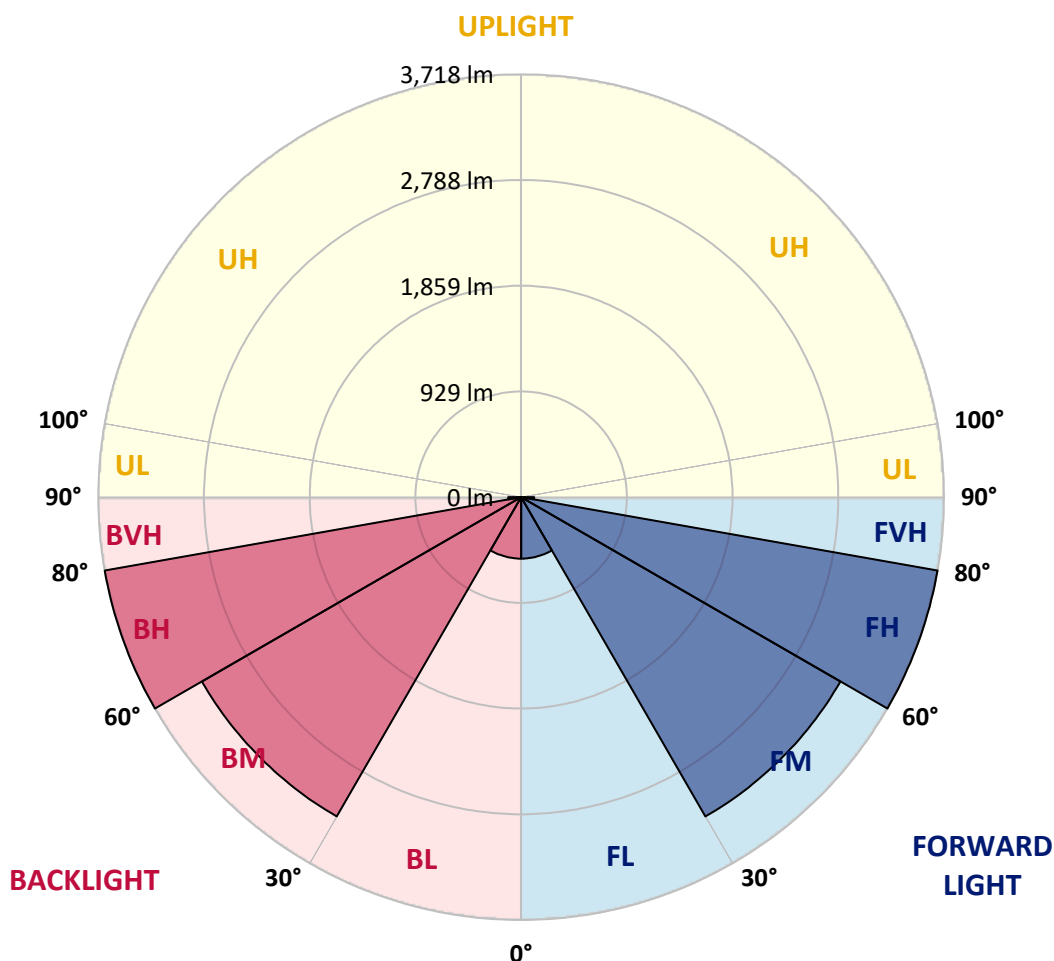
CATALOG NUMBER: EMM2-HSN-SA3A-830-U-T5W

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone	Lumens	% Fixture	Zone Rating/Lumen Limit		
			B	U	G
FL (0°-30°)	540.7	3.6			
FM (30°-60°)	3241.9	21.3			
FH (60°-80°)	3717.9	24.4			G2/5000
FVH (80°-90°)	113.3	0.7			G2/225
BL (0°-30°)	540.7	3.6	B2/1000		
BM (30°-60°)	3241.9	21.3	B3/5000		
BH (60°-80°)	3717.9	24.4	B4/5000		G2/5000
BVH (80°-90°)	113.3	0.7			G2/225
UL (90°-100°)	0.0	0.0		U0/0	
UH (100°-180°)	0.0	0.0		U0/0	

BUG Rating: B4-U0-G2

Type V Short





REPORT NUMBER: P871389

CATALOG NUMBER: EMM2-HSN-SA3A-830-U-T5W

CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	1005.3	1005.3	1005.3	1005.3	1005.3	1005.3	1005.3	1005.3	1005.3	1005.3	1005.3
2.5°	1002.1	1003.7	1003.7	1003.7	1005.3	1006.9	1008.4	1010.0	1013.2	1014.8	1014.8
5°	1006.9	1005.3	1003.7	1006.9	1006.9	1006.9	1008.4	1010.0	1010.0	1010.0	1011.6
7.5°	1002.1	1003.7	1002.1	1002.1	1006.9	1008.4	1006.9	1005.3	1005.3	1006.9	1006.9
10°	1019.5	1017.9	1016.3	1016.3	1021.1	1022.7	1021.1	1019.5	1019.5	1022.7	1022.7
12.5°	1058.9	1062.1	1052.6	1052.6	1058.9	1062.1	1057.4	1055.8	1057.4	1060.5	1060.5
15°	1120.5	1118.9	1112.6	1106.3	1112.6	1117.3	1111.0	1107.9	1109.5	1117.3	1111.0
17.5°	1188.4	1189.9	1183.6	1177.3	1182.0	1188.4	1178.9	1171.0	1172.6	1175.7	1172.6
20°	1264.1	1262.5	1261.0	1261.0	1270.4	1278.3	1264.1	1245.2	1240.4	1237.3	1237.3
22.5°	1319.3	1324.1	1325.7	1339.9	1362.0	1369.8	1350.9	1325.7	1306.7	1297.3	1290.9
25°	1406.1	1401.4	1398.3	1414.0	1447.2	1461.4	1437.7	1403.0	1384.1	1382.5	1387.2
27.5°	1485.1	1485.1	1491.4	1507.1	1538.7	1552.9	1532.4	1497.7	1488.2	1488.2	1483.5
30°	1587.6	1582.9	1589.2	1616.0	1639.7	1649.2	1631.8	1608.2	1600.3	1600.3	1592.4
32.5°	1707.6	1709.2	1718.6	1736.0	1759.7	1761.2	1754.9	1743.9	1739.1	1734.4	1742.3
35°	1890.6	1890.6	1887.5	1900.1	1906.4	1909.6	1912.7	1908.0	1908.0	1908.0	1901.7
37.5°	2117.9	2105.3	2103.7	2092.6	2084.8	2092.6	2106.9	2122.6	2135.3	2127.4	2124.2
40°	2343.6	2337.3	2318.3	2301.0	2294.7	2297.8	2315.2	2348.3	2362.5	2362.5	2375.1
42.5°	2586.6	2574.0	2550.3	2529.8	2512.4	2517.2	2533.0	2574.0	2605.6	2619.8	2613.4
45°	2804.4	2793.4	2769.7	2750.7	2738.1	2736.5	2757.1	2783.9	2826.5	2839.1	2848.6
47.5°	2990.6	2982.7	2962.2	2943.3	2948.0	2949.6	2955.9	2979.6	3014.3	3031.7	3030.1
50°	3142.1	3135.8	3116.9	3124.8	3137.4	3150.0	3142.1	3157.9	3180.0	3187.9	3194.2
52.5°	3281.0	3271.5	3258.9	3273.1	3306.3	3331.5	3336.2	3325.2	3331.5	3336.2	3331.5
55°	3418.3	3407.3	3404.1	3429.4	3479.9	3527.2	3522.5	3490.9	3483.0	3473.5	3468.8
57.5°	3530.4	3522.5	3535.1	3577.7	3675.5	3738.7	3718.2	3645.6	3614.0	3591.9	3585.6
60°	3601.4	3599.8	3628.2	3727.6	3876.0	3964.4	3931.2	3806.5	3735.5	3715.0	3705.5
62.5°	3639.3	3640.8	3691.3	3868.1	4104.8	4224.8	4166.4	3975.4	3864.9	3844.4	3847.6
65°	3674.0	3669.2	3735.5	3986.4	4352.6	4515.1	4436.2	4179.0	4018.0	3977.0	3977.0
67.5°	3699.2	3704.0	3803.4	4104.8	4594.0	4826.0	4710.8	4395.2	4182.1	4120.6	4112.7
70°	3380.4	3426.2	3737.1	4183.7	4785.0	5100.6	4949.1	4527.8	4188.5	4013.3	3995.9
72.5°	2567.7	2610.3	3282.6	4043.3	4882.8	5283.7	5037.5	4358.9	3806.5	3584.0	3517.7
75°	1693.4	1723.4	2446.2	3531.9	4611.4	5110.1	4587.7	3754.5	2996.9	2708.1	2725.5
77.5°	754.4	850.6	1559.2	2755.5	3798.6	4112.7	3498.8	2561.4	1830.7	1549.8	1519.8
80°	315.6	345.6	588.7	1469.3	2201.5	2106.9	1489.8	858.5	546.0	424.5	410.3
82.5°	91.5	94.7	116.8	254.1	448.2	527.1	317.2	161.0	153.1	121.5	112.0
85°	6.3	6.3	9.5	15.8	22.1	36.3	41.0	47.3	53.7	45.8	45.8
87.5°	3.2	3.2	3.2	4.7	4.7	6.3	4.7	4.7	4.7	4.7	4.7
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-157-7

Test Date: 09/05/2024

Luminaire Tested: MEM2-HTN-SA-40-830-U-5WQ

Data in this report applies to families of products including MEM2-HTN-SA-40-830-U-5WQ

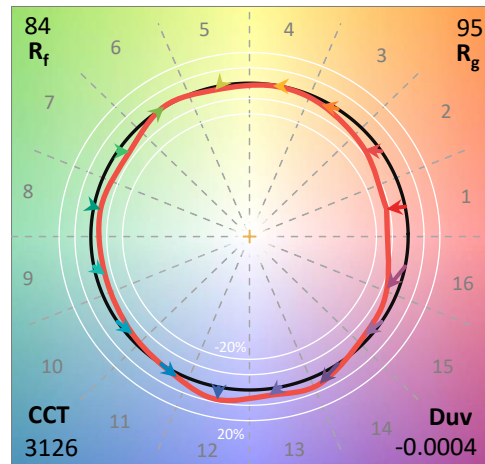
Test Information

Test Method: LM-79-2019
 Report Number: SP1-2407-157-7
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 09/05/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: Streetworks
 Catalog Number: **MEM2-HTN-SA-40-830-U-5WQ**
 Description: Epic Modern Light Square 40W 5WQ Optic

Spectral Parameters

CCT (K): 3126
 CIE u': 0.2465
 CIE v': 0.5182
 Duv: -0.0004
 CIE x: 0.4277
 CIE y: 0.3997
 CIE z: 0.1727
 Peak Wavelength (nm): 601
 Dominant Wavelength (nm): 582
 Purity: 48.31913
 Rf: 84.4
 Rg: 94.7

CRI (Ra):	82.6		
R1:	81.4	R9:	5.1
R2:	92.2	R10:	82.2
R3:	94.9	R11:	79.8
R4:	80.1	R12:	70.4
R5:	81.8	R13:	84.2
R6:	90.5	R14:	97.9
R7:	81.8	R15:	73.6
R8:	58.0		



Test Conditions

Stabilization Time: 22M
 Operation Time: 1H 22M
 Sphere Temperature (°C): 24.3

REPORT NUMBER: SP1-2407-157-7

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 3000K 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	258	NR	620	908	NR	750	26	NR	880	1	NR
365	0	NR	495	297	NR	625	857	NR	755	22	NR	885	0	NR
370	0	NR	500	345	NR	630	801	NR	760	19	NR	890	0	NR
375	0	NR	505	391	NR	635	738	NR	765	16	NR	895	0	NR
380	0	NR	510	426	NR	640	675	NR	770	14	NR	900	0	NR
385	0	NR	515	456	NR	645	610	NR	775	12	NR	905	0	NR
390	0	NR	520	480	NR	650	547	NR	780	10	NR	910	0	NR
395	0	NR	525	500	NR	655	488	NR	785	9	NR	915	0	NR
400	0	NR	530	517	NR	660	429	NR	790	7	NR	920	0	NR
405	2	NR	535	538	NR	665	378	NR	795	6	NR	925	0	NR
410	4	NR	540	558	NR	670	328	NR	800	5	NR	930	0	NR
415	9	NR	545	584	NR	675	285	NR	805	5	NR	935	0	NR
420	16	NR	550	611	NR	680	247	NR	810	4	NR	940	0	NR
425	31	NR	555	646	NR	685	212	NR	815	3	NR	945	0	NR
430	56	NR	560	687	NR	690	183	NR	820	3	NR	950	0	NR
435	101	NR	565	731	NR	695	156	NR	825	3	NR	955	0	NR
440	178	NR	570	780	NR	700	133	NR	830	2	NR	960	0	NR
445	323	NR	575	832	NR	705	114	NR	835	2	NR	965	0	NR
450	566	NR	580	883	NR	710	96	NR	840	2	NR	970	0	NR
455	645	NR	585	927	NR	715	82	NR	845	1	NR	975	0	NR
460	457	NR	590	963	NR	720	70	NR	850	1	NR	980	0	NR
465	365	NR	595	985	NR	725	59	NR	855	1	NR	985	0	NR
470	317	NR	600	998	NR	730	50	NR	860	1	NR	990	0	NR
475	244	NR	605	994	NR	735	43	NR	865	1	NR	995	0	NR
480	218	NR	610	978	NR	740	36	NR	870	1	NR	1000	0	NR
485	233	NR	615	947	NR	745	31	NR	875	1	NR			

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Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.42

λ (nm)	Power W^{\wedge}/nm	Lumens (ϕ/nm)	λ (nm)	Power W^{\wedge}/nm	Lumens (ϕ/nm)	λ (nm)	Power W^{\wedge}/nm	Lumens (ϕ/nm)	λ (nm)	Power W^{\wedge}/nm	Lumens (ϕ/nm)	λ (nm)	Power W^{\wedge}/nm	Lumens (ϕ/nm)
360	0	NR	490	258	NR	620	908	NR	750	26	NR	880	1	NR
365	0	NR	495	297	NR	625	857	NR	755	22	NR	885	0	NR
370	0	NR	500	345	NR	630	801	NR	760	19	NR	890	0	NR
375	0	NR	505	391	NR	635	738	NR	765	16	NR	895	0	NR
380	0	NR	510	426	NR	640	675	NR	770	14	NR	900	0	NR
385	0	NR	515	456	NR	645	610	NR	775	12	NR	905	0	NR
390	0	NR	520	480	NR	650	547	NR	780	10	NR	910	0	NR
395	0	NR	525	500	NR	655	488	NR	785	9	NR	915	0	NR
400	0	NR	530	517	NR	660	429	NR	790	7	NR	920	0	NR
405	2	NR	535	538	NR	665	378	NR	795	6	NR	925	0	NR
410	4	NR	540	558	NR	670	328	NR	800	5	NR	930	0	NR
415	9	NR	545	584	NR	675	285	NR	805	5	NR	935	0	NR
420	16	NR	550	611	NR	680	247	NR	810	4	NR	940	0	NR
425	31	NR	555	646	NR	685	212	NR	815	3	NR	945	0	NR
430	56	NR	560	687	NR	690	183	NR	820	3	NR	950	0	NR
435	101	NR	565	731	NR	695	156	NR	825	3	NR	955	0	NR
440	178	NR	570	780	NR	700	133	NR	830	2	NR	960	0	NR
445	323	NR	575	832	NR	705	114	NR	835	2	NR	965	0	NR
450	566	NR	580	883	NR	710	96	NR	840	2	NR	970	0	NR
455	645	NR	585	927	NR	715	82	NR	845	1	NR	975	0	NR
460	457	NR	590	963	NR	720	70	NR	850	1	NR	980	0	NR
465	365	NR	595	985	NR	725	59	NR	855	1	NR	985	0	NR
470	317	NR	600	998	NR	730	50	NR	860	1	NR	990	0	NR
475	244	NR	605	994	NR	735	43	NR	865	1	NR	995	0	NR
480	218	NR	610	978	NR	740	36	NR	870	1	NR	1000	0	NR
485	233	NR	615	947	NR	745	31	NR	875	1	NR			

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Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.79

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	258	NR	620	908	NR	750	26	NR	880	1	NR
365	0	NR	495	297	NR	625	857	NR	755	22	NR	885	0	NR
370	0	NR	500	345	NR	630	801	NR	760	19	NR	890	0	NR
375	0	NR	505	391	NR	635	738	NR	765	16	NR	895	0	NR
380	0	NR	510	426	NR	640	675	NR	770	14	NR	900	0	NR
385	0	NR	515	456	NR	645	610	NR	775	12	NR	905	0	NR
390	0	NR	520	480	NR	650	547	NR	780	10	NR	910	0	NR
395	0	NR	525	500	NR	655	488	NR	785	9	NR	915	0	NR
400	0	NR	530	517	NR	660	429	NR	790	7	NR	920	0	NR
405	2	NR	535	538	NR	665	378	NR	795	6	NR	925	0	NR
410	4	NR	540	558	NR	670	328	NR	800	5	NR	930	0	NR
415	9	NR	545	584	NR	675	285	NR	805	5	NR	935	0	NR
420	16	NR	550	611	NR	680	247	NR	810	4	NR	940	0	NR
425	31	NR	555	646	NR	685	212	NR	815	3	NR	945	0	NR
430	56	NR	560	687	NR	690	183	NR	820	3	NR	950	0	NR
435	101	NR	565	731	NR	695	156	NR	825	3	NR	955	0	NR
440	178	NR	570	780	NR	700	133	NR	830	2	NR	960	0	NR
445	323	NR	575	832	NR	705	114	NR	835	2	NR	965	0	NR
450	566	NR	580	883	NR	710	96	NR	840	2	NR	970	0	NR
455	645	NR	585	927	NR	715	82	NR	845	1	NR	975	0	NR
460	457	NR	590	963	NR	720	70	NR	850	1	NR	980	0	NR
465	365	NR	595	985	NR	725	59	NR	855	1	NR	985	0	NR
470	317	NR	600	998	NR	730	50	NR	860	1	NR	990	0	NR
475	244	NR	605	994	NR	735	43	NR	865	1	NR	995	0	NR
480	218	NR	610	978	NR	740	36	NR	870	1	NR	1000	0	NR
485	233	NR	615	947	NR	745	31	NR	875	1	NR			

Summary

$R_f = 84.4$
 $R_g = 94.7$
 $CIE R_a = 82.6$
 $R_9 = 5.1$

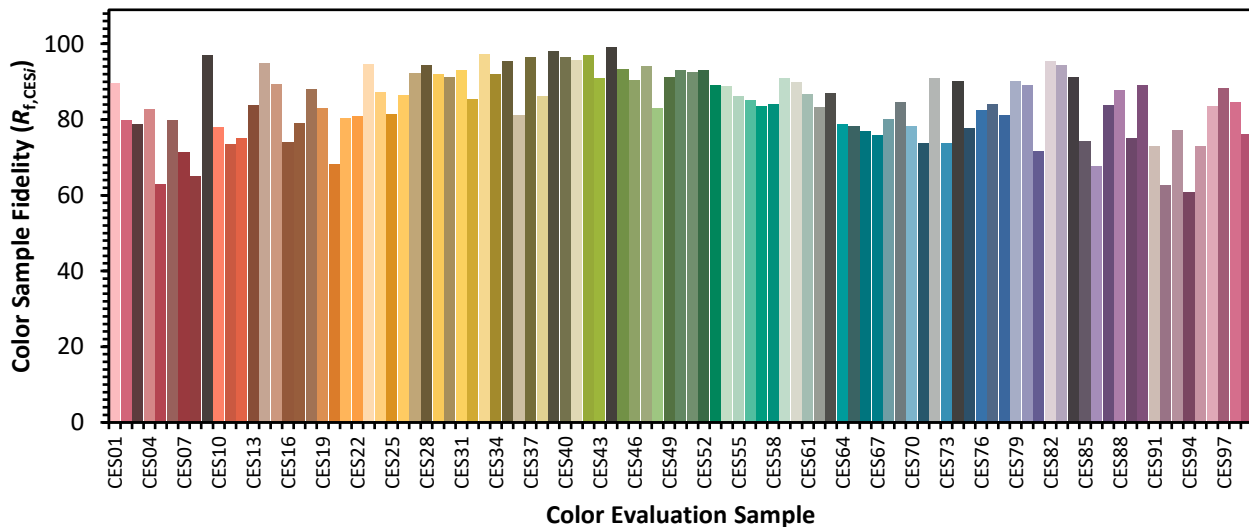


Color Vector Graphics

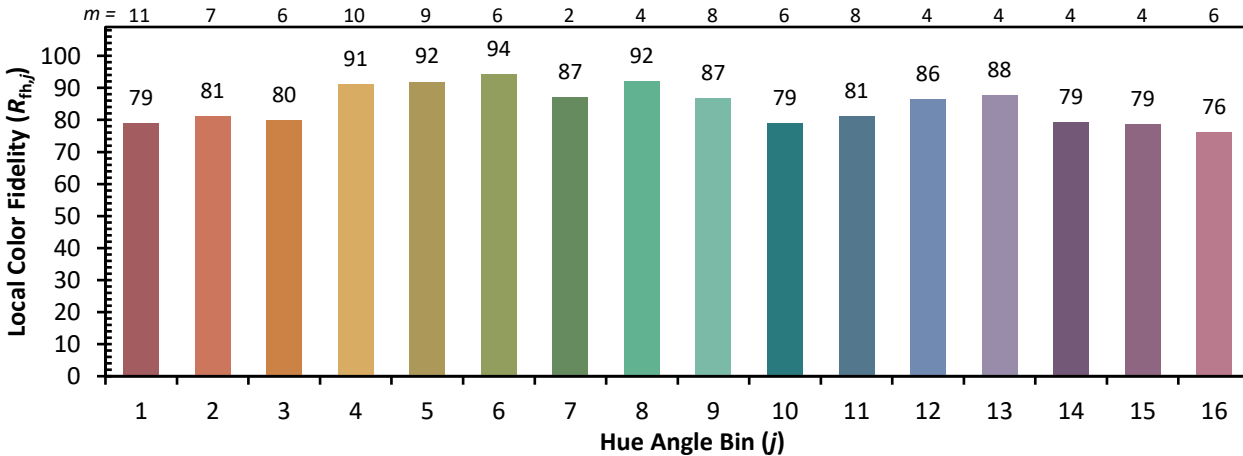
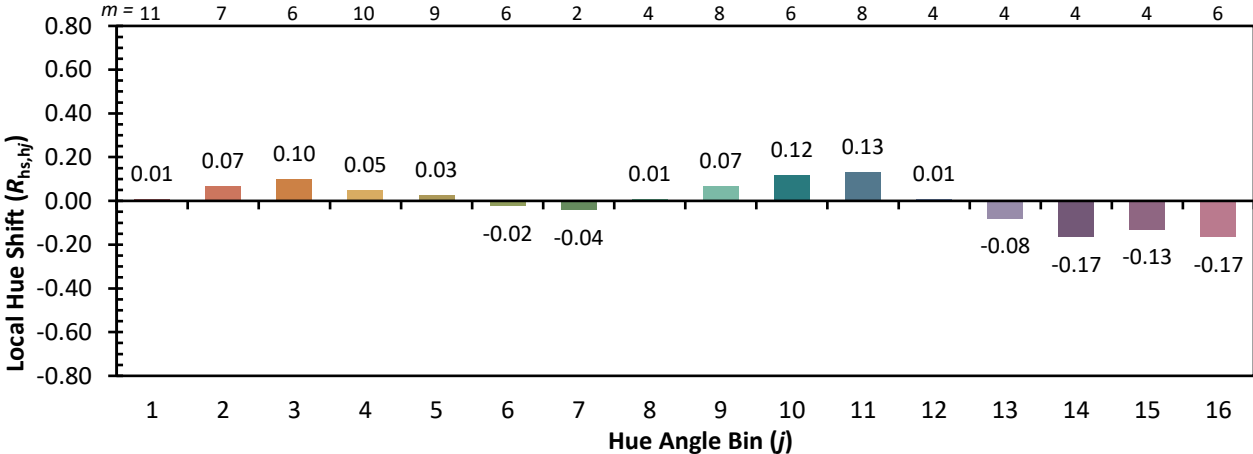
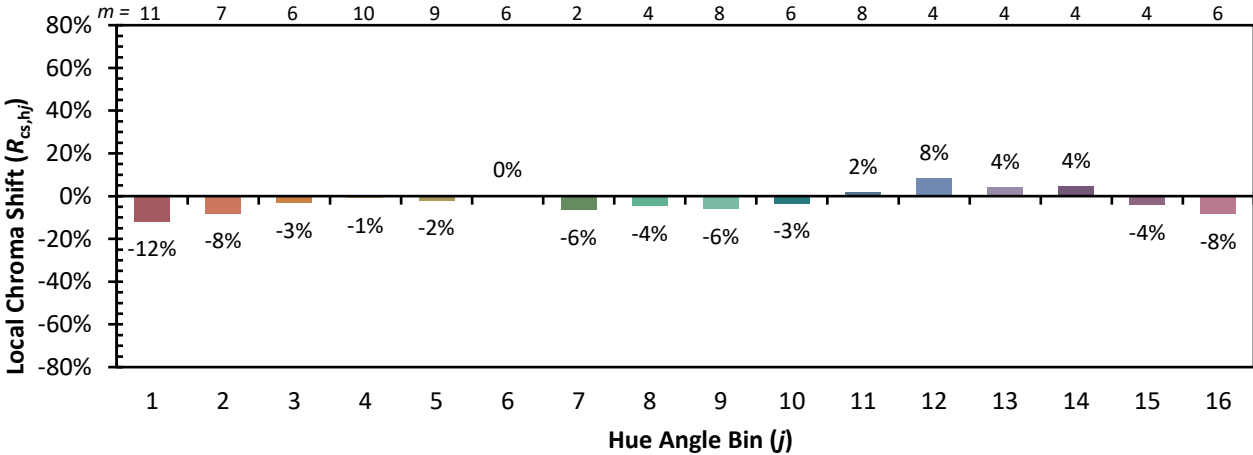


Individual Sample Fidelity Index ($R_{f,i}$)

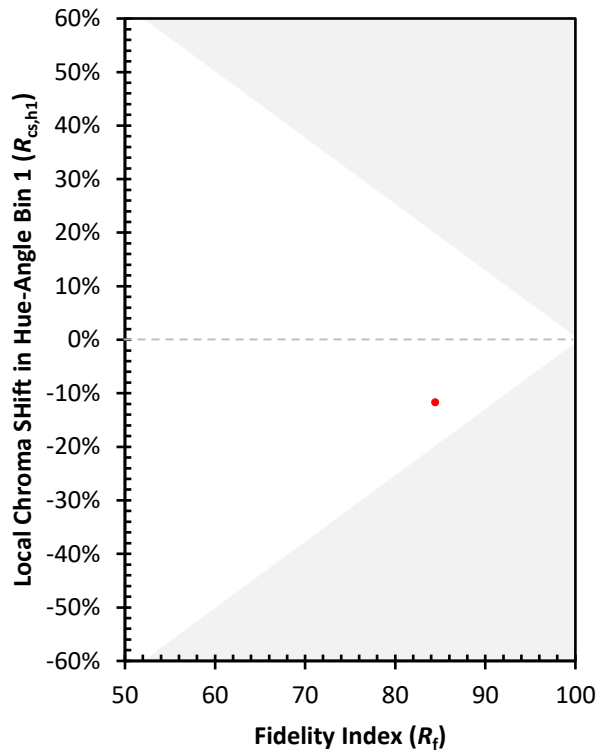
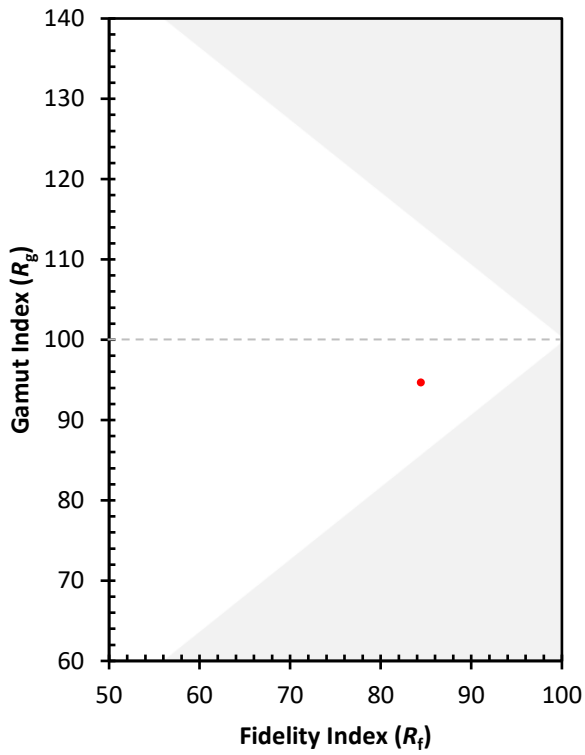
CES01 = 86	CES26 = 86	CES51 = 93	CES76 = 82
CES02 = 63	CES27 = 92	CES52 = 93	CES77 = 84
CES03 = 31	CES28 = 94	CES53 = 89	CES78 = 81
CES04 = 70	CES29 = 92	CES54 = 89	CES79 = 90
CES05 = 49	CES30 = 91	CES55 = 86	CES80 = 89
CES06 = 51	CES31 = 93	CES56 = 85	CES81 = 72
CES07 = 42	CES32 = 85	CES57 = 83	CES82 = 95
CES08 = 41	CES33 = 97	CES58 = 84	CES83 = 94
CES09 = 29	CES34 = 92	CES59 = 91	CES84 = 91
CES10 = 76	CES35 = 96	CES60 = 90	CES85 = 74
CES11 = 59	CES36 = 81	CES61 = 87	CES86 = 68
CES12 = 65	CES37 = 96	CES62 = 83	CES87 = 84
CES13 = 43	CES38 = 86	CES63 = 87	CES88 = 88
CES14 = 74	CES39 = 98	CES64 = 79	CES89 = 75
CES15 = 71	CES40 = 96	CES65 = 78	CES90 = 89
CES16 = 47	CES41 = 96	CES66 = 77	CES91 = 73
CES17 = 50	CES42 = 97	CES67 = 76	CES92 = 63
CES18 = 56	CES43 = 91	CES68 = 80	CES93 = 77
CES19 = 72	CES44 = 99	CES69 = 85	CES94 = 61
CES20 = 66	CES45 = 93	CES70 = 78	CES95 = 73
CES21 = 87	CES46 = 90	CES71 = 74	CES96 = 84
CES22 = 79	CES47 = 94	CES72 = 91	CES97 = 88
CES23 = 92	CES48 = 83	CES73 = 74	CES98 = 85
CES24 = 91	CES49 = 91	CES74 = 90	CES99 = 76
CES25 = 72	CES50 = 93	CES75 = 78	



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)