

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: P869092

Luminaire Tested: **EMM2-HSN-SA2B-730-U-T5R**

Issue Date: 08/22/2024



Test Information

Test Method: LM-79-08
Report Number: P869092
Test Lab: INNOVATION CENTER(G3)
Issue Date: 08/22/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: INVUE
Catalog Number: EMM2-HSN-SA2B-730-U-T5R
Description: EPIC MODERN SHORT HOUSING DISCRETE LED ARRAYS 100W 70CRI 3000K
FIXTURE w/ TYPE V ROUND DISTRIBUTION OPTIC
Light Source: (20) 3000K CCT, 70 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

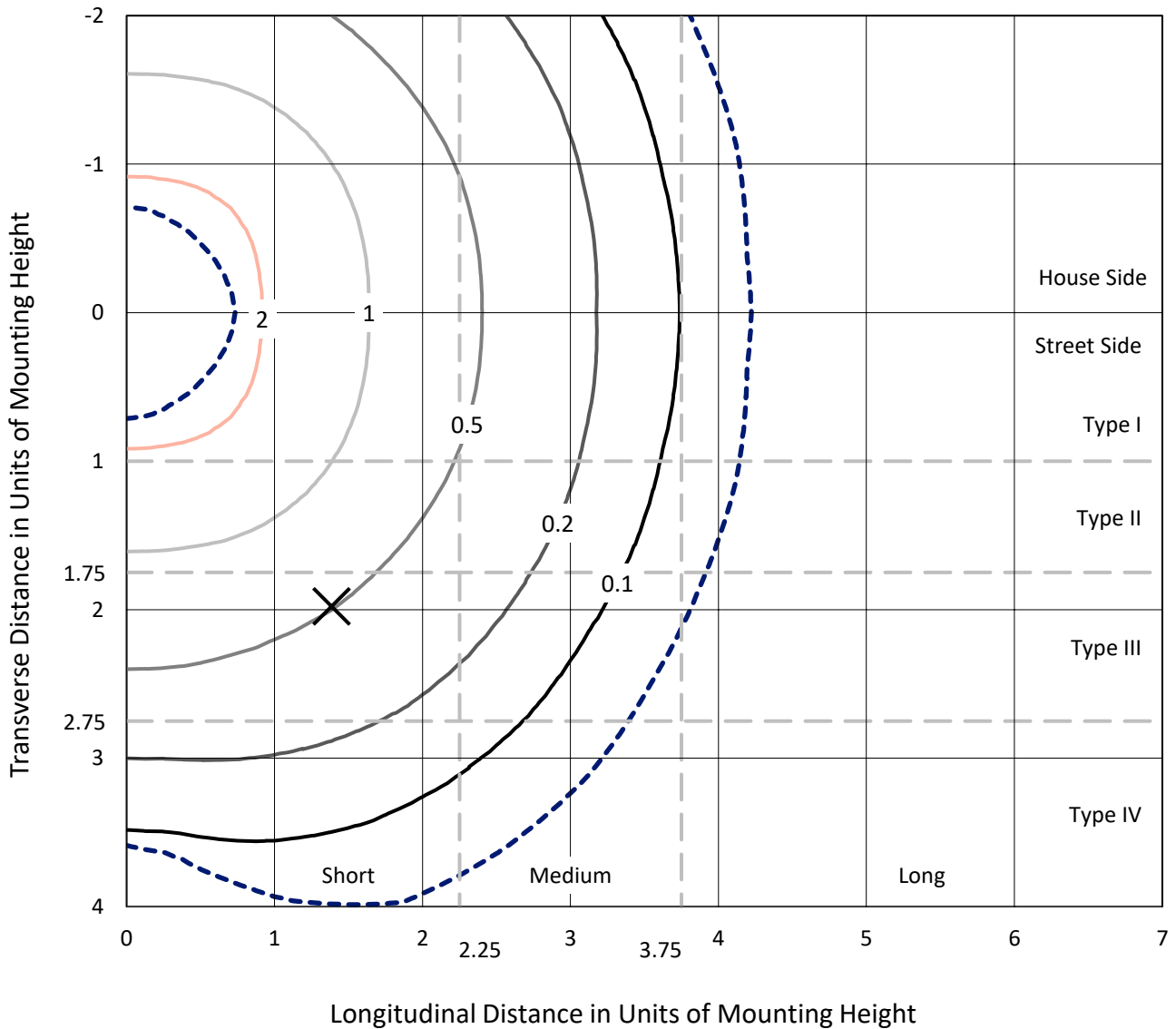
Lumens per Lamp: N/A
Luminaire Lumens: 12404.9 lumens
Efficiency: N/A
Efficacy: 137.8 lumens/watt
Luminous Opening: Rectangular (W 0.67' x L: 0.33' x H: 0')
IES Classification: Type V - Short
BUG Rating: B4 - U0 - G2

Input Watts (W): 90
Input Voltage (V): 120
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: 0.99
Total Harmonic Distortion (THDi): 6.20%
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT

REPORT NUMBER: P869092
 CATALOG NUMBER: EMM2-HSN-SA2B-730-U-T5R

Iso-Footcandle Lines of Horizontal Illumination

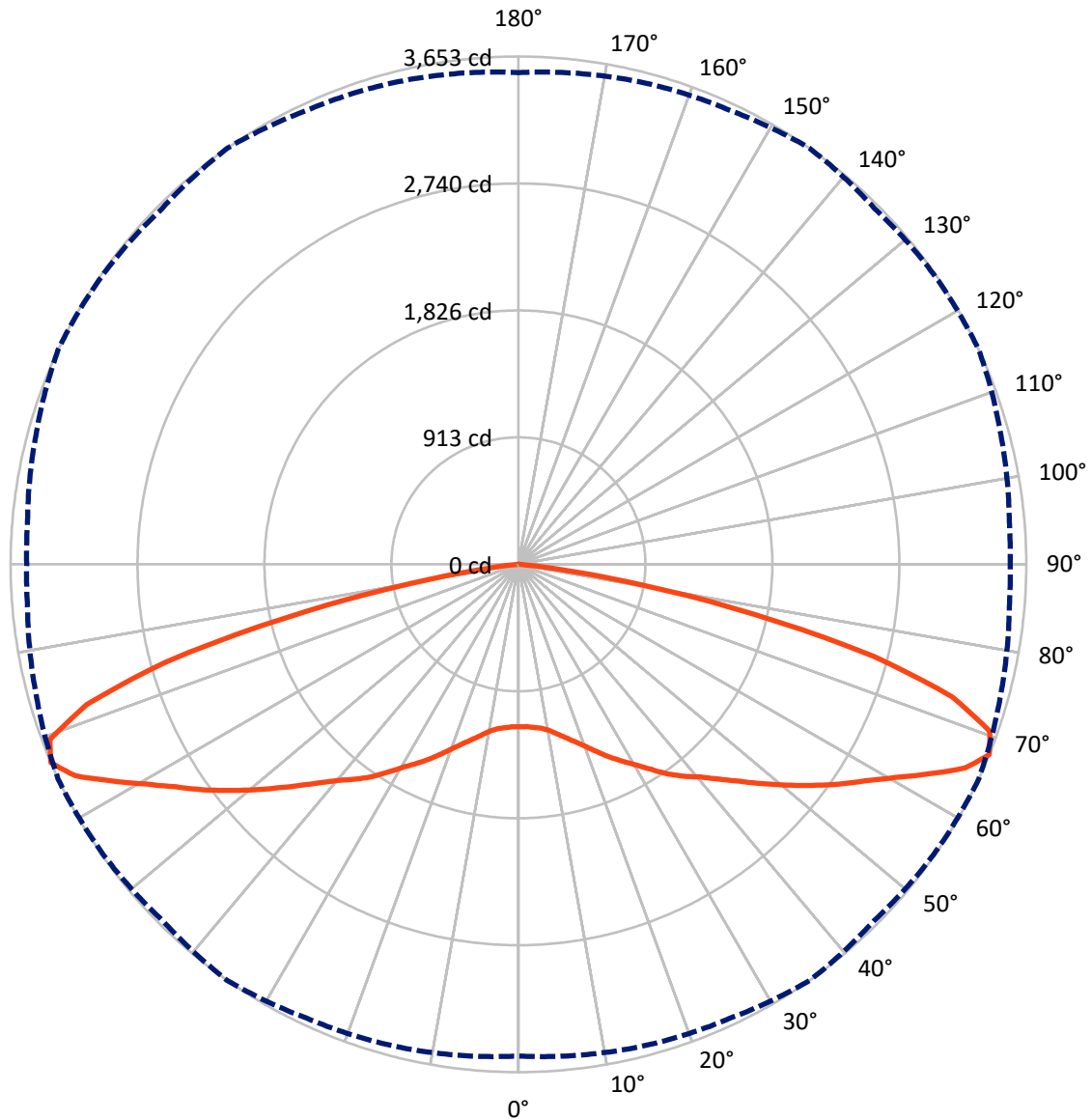
× Max cd
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 2.9 fc
 Type V - Short - N/A

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Luminous Intensity Polar Plot



— Vertical Plane Through 35-Deg Lateral - - - Horizontal Cone Through 67.5-Deg Vertical

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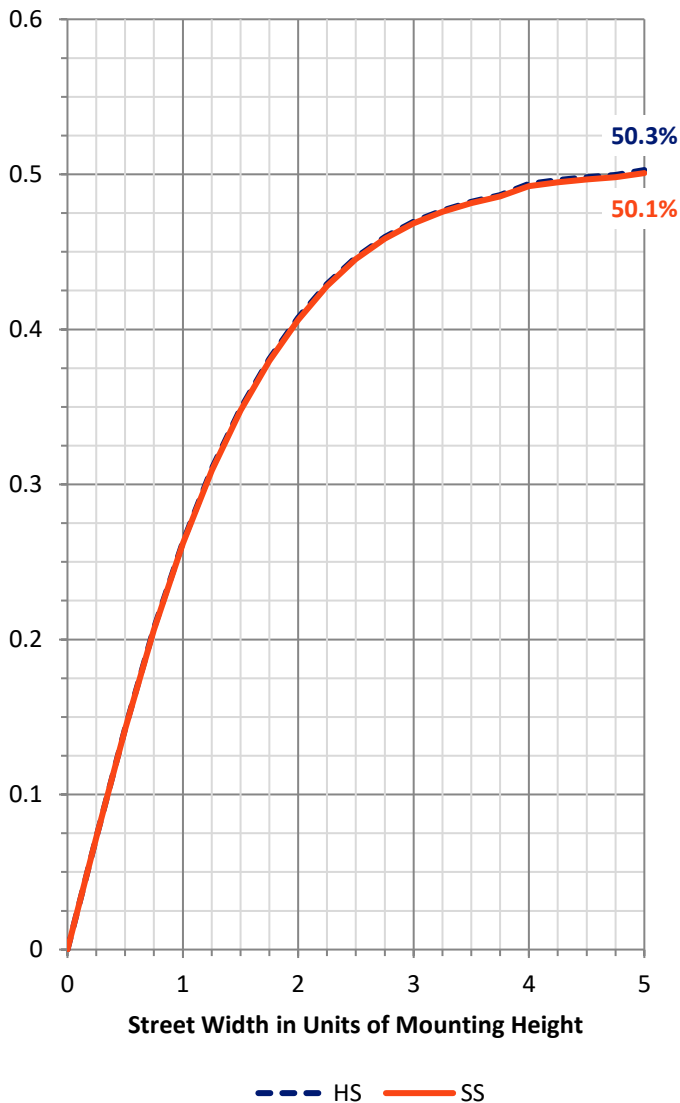
FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	6202.4	0.0	6202.4
	% Fixture	50.0	0.0	50.0
Street Side	Lumens	6202.4	0.0	6202.4
	% Fixture	50.0	0.0	50.0
Total	Lumens	12404.9	0.0	12404.9
	% Fixture	100.0	0.0	100.0

Coefficient of Utilization

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	113.6	0.9
10°-20°	372.4	3.0
20°-30°	711.8	5.7
30°-40°	1150.2	9.3
40°-50°	1683.6	13.6
50°-60°	2414.2	19.5
60°-70°	3383.6	27.3
70°-80°	2387.5	19.2
80°-90°	187.9	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°	12404.9	100.0
0°-180°	12404.9	100.0



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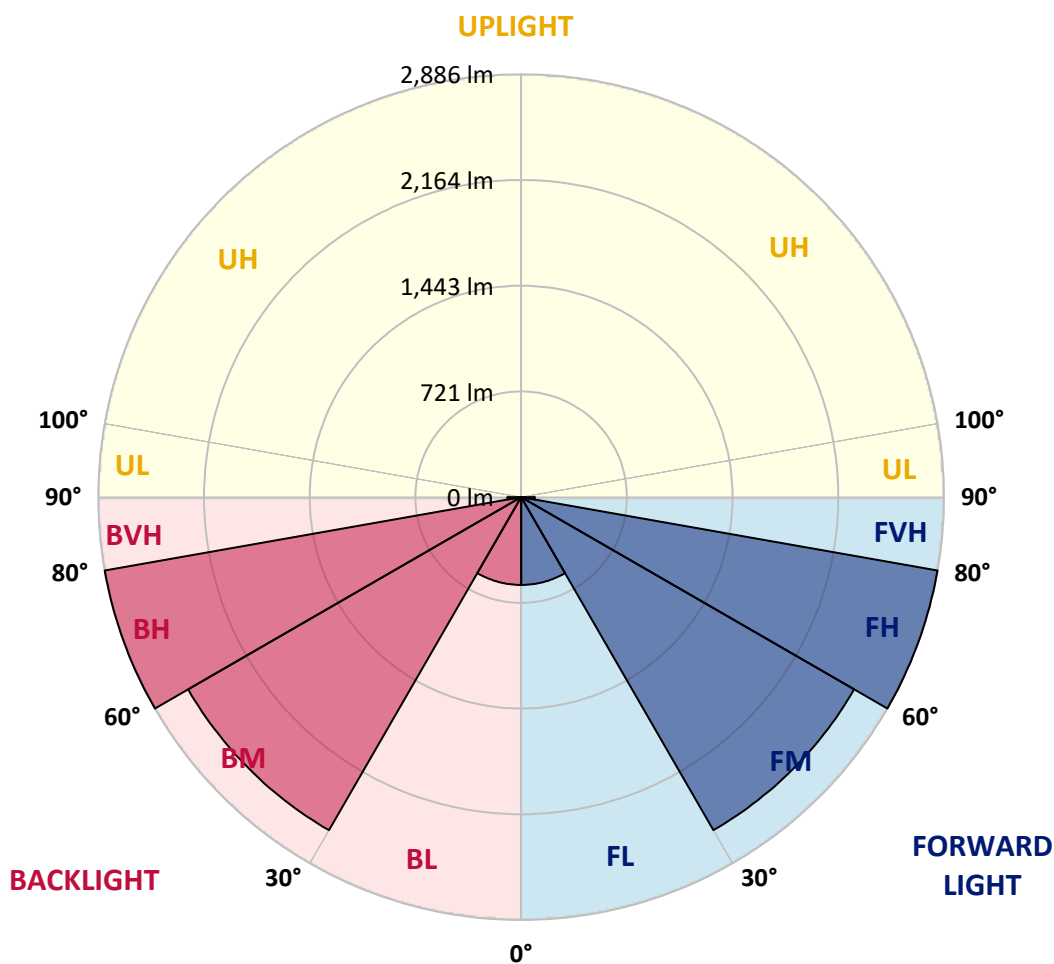
CATALOG NUMBER: EMM2-HSN-SA2B-730-U-T5R

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone	Lumens	% Fixture	Zone Rating/Lumen Limit		
			B	U	G
FL (0°-30°)	598.9	4.8			
FM (30°-60°)	2624.0	21.2			
FH (60°-80°)	2885.6	23.3			G2/5000
FVH (80°-90°)	94.0	0.8			G1/100
BL (0°-30°)	598.9	4.8	B2/1000		
BM (30°-60°)	2624.0	21.2	B3/5000		
BH (60°-80°)	2885.6	23.3	B4/5000		G2/5000
BVH (80°-90°)	94.0	0.8			G1/100
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





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CATALOG NUMBER: EMM2-HSN-SA2B-730-U-T5R

CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	1168.5	1168.5	1168.5	1168.5	1168.5	1168.5	1168.5	1168.5	1168.5	1168.5	1168.5
2.5°	1175.7	1173.3	1170.9	1170.9	1168.5	1170.9	1168.5	1170.9	1168.5	1168.5	1168.5
5°	1183.0	1180.6	1180.6	1180.6	1178.2	1178.2	1178.2	1178.2	1175.7	1173.3	1175.7
7.5°	1190.2	1190.2	1187.8	1192.6	1190.2	1192.6	1192.6	1195.1	1190.2	1187.8	1190.2
10°	1209.5	1209.5	1209.5	1214.4	1214.4	1221.6	1221.6	1224.0	1221.6	1216.8	1216.8
12.5°	1250.6	1248.2	1248.2	1248.2	1253.0	1257.8	1262.7	1262.7	1260.2	1253.0	1253.0
15°	1296.5	1301.3	1296.5	1294.0	1296.5	1301.3	1306.1	1306.1	1303.7	1301.3	1301.3
17.5°	1352.0	1354.4	1349.6	1344.7	1344.7	1352.0	1354.4	1354.4	1352.0	1347.2	1347.2
20°	1400.3	1402.7	1402.7	1400.3	1402.7	1407.5	1409.9	1412.3	1405.1	1397.9	1397.9
22.5°	1441.3	1443.7	1448.6	1458.2	1467.9	1472.7	1470.3	1470.3	1458.2	1451.0	1448.6
25°	1492.0	1499.3	1508.9	1521.0	1537.9	1550.0	1545.1	1535.5	1525.8	1511.3	1508.9
27.5°	1591.0	1591.0	1581.3	1586.2	1605.5	1617.6	1612.7	1605.5	1586.2	1576.5	1574.1
30°	1668.3	1668.3	1668.3	1663.4	1675.5	1690.0	1685.2	1673.1	1663.4	1658.6	1658.6
32.5°	1743.1	1738.3	1745.5	1755.2	1760.0	1764.8	1764.8	1755.2	1738.3	1731.0	1731.0
35°	1813.1	1817.9	1825.2	1839.7	1851.7	1844.5	1832.4	1825.2	1808.3	1793.8	1793.8
37.5°	1880.7	1885.5	1892.8	1914.5	1933.8	1931.4	1916.9	1897.6	1875.9	1863.8	1856.6
40°	1929.0	1931.4	1950.7	1984.5	2011.1	2020.7	2008.7	1982.1	1948.3	1924.2	1926.6
42.5°	1986.9	1991.8	2023.2	2071.4	2110.1	2124.6	2107.7	2071.4	2023.2	1991.8	1991.8
45°	2071.4	2073.9	2114.9	2175.3	2226.0	2250.1	2226.0	2175.3	2112.5	2081.1	2078.7
47.5°	2155.9	2163.2	2209.1	2281.5	2356.3	2385.3	2358.7	2293.6	2218.7	2180.1	2175.3
50°	2252.5	2257.3	2312.9	2411.9	2496.4	2535.0	2501.2	2419.1	2337.0	2288.7	2291.1
52.5°	2346.7	2361.2	2436.0	2539.8	2641.2	2684.7	2636.4	2547.1	2460.1	2414.3	2411.9
55°	2486.7	2503.6	2568.8	2684.7	2790.9	2839.2	2793.3	2694.3	2600.2	2549.5	2539.8
57.5°	2662.9	2672.6	2730.5	2848.8	2938.2	2984.0	2957.5	2865.7	2776.4	2713.6	2701.6
60°	2863.3	2873.0	2918.9	3039.6	3112.0	3145.8	3136.1	3083.0	3022.7	2993.7	2986.5
62.5°	3148.2	3150.6	3174.8	3244.8	3317.2	3331.7	3307.5	3295.5	3314.8	3283.4	3290.6
65°	3474.1	3474.1	3466.9	3476.5	3532.1	3515.2	3498.3	3551.4	3541.7	3488.6	3479.0
67.5°	3536.9	3551.4	3580.4	3602.1	3652.8	3621.4	3643.1	3652.8	3592.4	3544.1	3536.9
70°	3165.1	3182.0	3343.8	3442.7	3597.3	3626.2	3556.2	3520.0	3452.4	3363.1	3338.9
72.5°	2158.4	2242.9	2708.8	3027.5	3264.1	3300.3	3261.7	3215.8	3080.6	3010.6	2962.3
75°	1723.8	1769.7	2184.9	2498.8	2638.8	2636.4	2481.9	2431.2	2324.9	2315.3	2324.9
77.5°	1052.6	1062.3	1470.3	1716.5	1733.4	1723.8	1661.0	1622.4	1636.9	1564.4	1576.5
80°	321.1	350.1	555.3	837.8	900.5	871.6	859.5	874.0	888.5	910.2	944.0
82.5°	65.2	82.1	111.1	241.4	275.2	272.8	270.4	299.4	325.9	338.0	410.4
85°	7.2	7.2	9.7	19.3	41.0	65.2	67.6	60.4	91.7	89.3	62.8
87.5°	2.4	2.4	2.4	2.4	2.4	4.8	4.8	4.8	4.8	4.8	4.8
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: SP1-2407-157-4

Test Date: 08/07/2024

Luminaire Tested: MEM2-HTN-SA-40-730-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-40-730-U-5WQ-2

Test Information

Test Method: LM-79-2019
 Report Number: SP1-2407-157-4
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 08/20/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: Streetworks
 Catalog Number: **MEM2-HTN-SA-40-730-U-5WQ-2**
 Description: Epic Modern Light Square 40W 5WQ Optic and Flare Trim

Spectral Parameters

CCT (K): 3057
 CIE u': 0.2487
 CIE v': 0.5199
 Duv: -0.0002
 CIE x: 0.4326
 CIE y: 0.4020
 CIE z: 0.1654
 Peak Wavelength (nm): 593
 Dominant Wavelength (nm): 582
 Purity: 50.50735
 Rf: 74.6
 Rg: 94

CRI (Ra):	71.7		
R1:	68.1	R9:	-34.8
R2:	82.0	R10:	58.5
R3:	93.5	R11:	62.5
R4:	67.5	R12:	47.5
R5:	67.2	R13:	70.7
R6:	74.9	R14:	96.4
R7:	77.4	R15:	60.0
R8:	43.1		



Test Conditions

Stabilization Time: 21M
 Operation Time: 1H 21M
 Sphere Temperature (°C): 24.2

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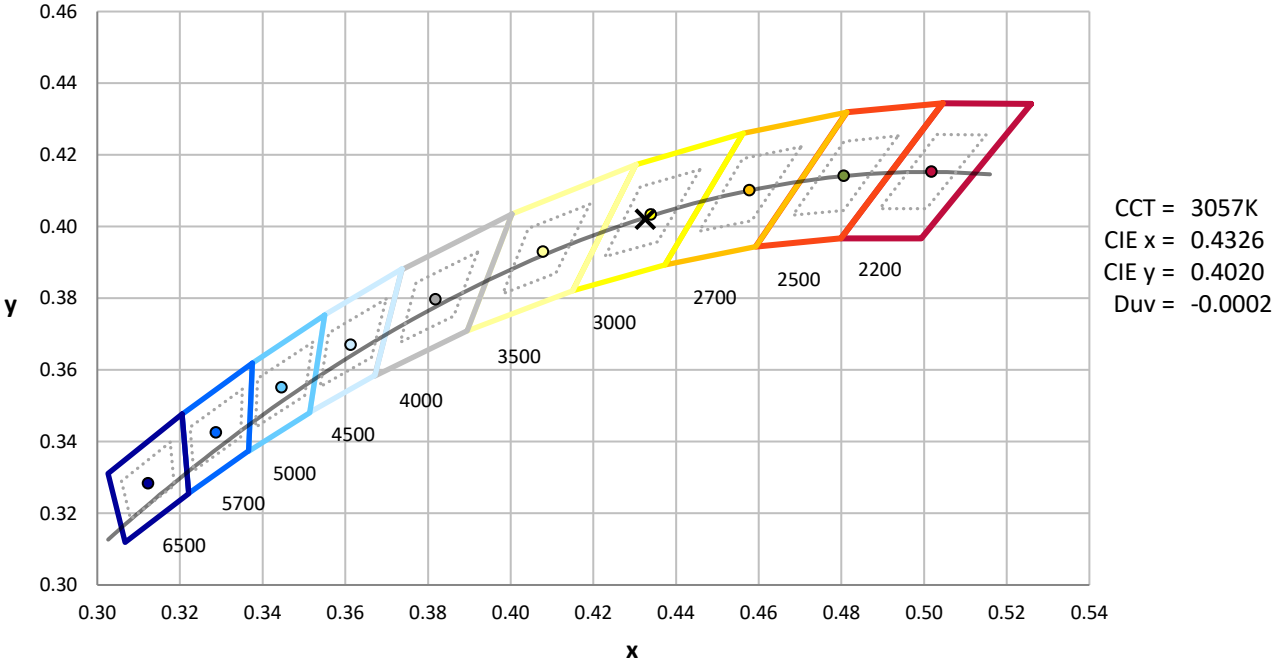
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/24/2023	10/24/2024
DC Power Source	IN0208	10/24/2023	10/24/2024
Sphere Thermometer	IN0085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

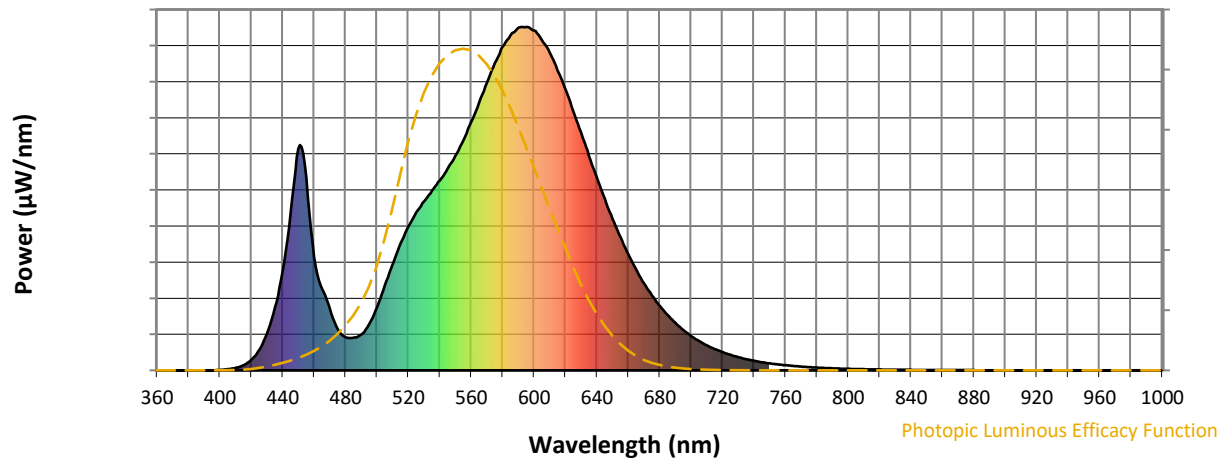


CCT = 3057K
 CIE x = 0.4326
 CIE y = 0.4020
 Duv = -0.0002

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	104	NR	620	818	NR	750	20	NR	880	1	NR
365	0	NR	495	135	NR	625	755	NR	755	17	NR	885	0	NR
370	0	NR	500	184	NR	630	691	NR	760	15	NR	890	0	NR
375	0	NR	505	247	NR	635	625	NR	765	13	NR	895	0	NR
380	0	NR	510	309	NR	640	561	NR	770	11	NR	900	0	NR
385	0	NR	515	369	NR	645	499	NR	775	9	NR	905	0	NR
390	0	NR	520	419	NR	650	441	NR	780	8	NR	910	0	NR
395	0	NR	525	460	NR	655	388	NR	785	7	NR	915	0	NR
400	1	NR	530	492	NR	660	338	NR	790	6	NR	920	0	NR
405	3	NR	535	524	NR	665	294	NR	795	5	NR	925	0	NR
410	7	NR	540	553	NR	670	253	NR	800	4	NR	930	0	NR
415	15	NR	545	588	NR	675	218	NR	805	4	NR	935	0	NR
420	31	NR	550	625	NR	680	188	NR	810	3	NR	940	0	NR
425	60	NR	555	670	NR	685	161	NR	815	3	NR	945	0	NR
430	107	NR	560	723	NR	690	139	NR	820	3	NR	950	0	NR
435	183	NR	565	780	NR	695	118	NR	825	2	NR	955	0	NR
440	289	NR	570	837	NR	700	100	NR	830	2	NR	960	0	NR
445	460	NR	575	894	NR	705	85	NR	835	2	NR	965	0	NR
450	646	NR	580	942	NR	710	73	NR	840	1	NR	970	0	NR
455	561	NR	585	976	NR	715	62	NR	845	1	NR	975	0	NR
460	331	NR	590	998	NR	720	53	NR	850	1	NR	980	0	NR
465	238	NR	595	1000	NR	725	45	NR	855	1	NR	985	0	NR
470	178	NR	600	990	NR	730	39	NR	860	1	NR	990	0	NR
475	120	NR	605	962	NR	735	33	NR	865	1	NR	995	0	NR
480	96	NR	610	925	NR	740	28	NR	870	1	NR	1000	0	NR
485	95	NR	615	873	NR	745	24	NR	875	1	NR			

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Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.23

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	104	NR	620	818	NR	750	20	NR	880	1	NR
365	0	NR	495	135	NR	625	755	NR	755	17	NR	885	0	NR
370	0	NR	500	184	NR	630	691	NR	760	15	NR	890	0	NR
375	0	NR	505	247	NR	635	625	NR	765	13	NR	895	0	NR
380	0	NR	510	309	NR	640	561	NR	770	11	NR	900	0	NR
385	0	NR	515	369	NR	645	499	NR	775	9	NR	905	0	NR
390	0	NR	520	419	NR	650	441	NR	780	8	NR	910	0	NR
395	0	NR	525	460	NR	655	388	NR	785	7	NR	915	0	NR
400	1	NR	530	492	NR	660	338	NR	790	6	NR	920	0	NR
405	3	NR	535	524	NR	665	294	NR	795	5	NR	925	0	NR
410	7	NR	540	553	NR	670	253	NR	800	4	NR	930	0	NR
415	15	NR	545	588	NR	675	218	NR	805	4	NR	935	0	NR
420	31	NR	550	625	NR	680	188	NR	810	3	NR	940	0	NR
425	60	NR	555	670	NR	685	161	NR	815	3	NR	945	0	NR
430	107	NR	560	723	NR	690	139	NR	820	3	NR	950	0	NR
435	183	NR	565	780	NR	695	118	NR	825	2	NR	955	0	NR
440	289	NR	570	837	NR	700	100	NR	830	2	NR	960	0	NR
445	460	NR	575	894	NR	705	85	NR	835	2	NR	965	0	NR
450	646	NR	580	942	NR	710	73	NR	840	1	NR	970	0	NR
455	561	NR	585	976	NR	715	62	NR	845	1	NR	975	0	NR
460	331	NR	590	998	NR	720	53	NR	850	1	NR	980	0	NR
465	238	NR	595	1000	NR	725	45	NR	855	1	NR	985	0	NR
470	178	NR	600	990	NR	730	39	NR	860	1	NR	990	0	NR
475	120	NR	605	962	NR	735	33	NR	865	1	NR	995	0	NR
480	96	NR	610	925	NR	740	28	NR	870	1	NR	1000	0	NR
485	95	NR	615	873	NR	745	24	NR	875	1	NR			

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Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.27

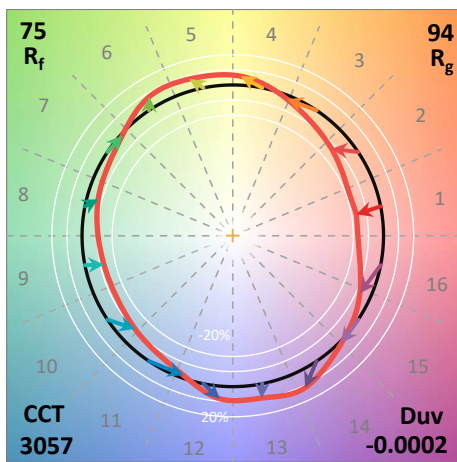
λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)
360	0	NR	490	104	NR	620	818	NR	750	20	NR	880	1	NR
365	0	NR	495	135	NR	625	755	NR	755	17	NR	885	0	NR
370	0	NR	500	184	NR	630	691	NR	760	15	NR	890	0	NR
375	0	NR	505	247	NR	635	625	NR	765	13	NR	895	0	NR
380	0	NR	510	309	NR	640	561	NR	770	11	NR	900	0	NR
385	0	NR	515	369	NR	645	499	NR	775	9	NR	905	0	NR
390	0	NR	520	419	NR	650	441	NR	780	8	NR	910	0	NR
395	0	NR	525	460	NR	655	388	NR	785	7	NR	915	0	NR
400	1	NR	530	492	NR	660	338	NR	790	6	NR	920	0	NR
405	3	NR	535	524	NR	665	294	NR	795	5	NR	925	0	NR
410	7	NR	540	553	NR	670	253	NR	800	4	NR	930	0	NR
415	15	NR	545	588	NR	675	218	NR	805	4	NR	935	0	NR
420	31	NR	550	625	NR	680	188	NR	810	3	NR	940	0	NR
425	60	NR	555	670	NR	685	161	NR	815	3	NR	945	0	NR
430	107	NR	560	723	NR	690	139	NR	820	3	NR	950	0	NR
435	183	NR	565	780	NR	695	118	NR	825	2	NR	955	0	NR
440	289	NR	570	837	NR	700	100	NR	830	2	NR	960	0	NR
445	460	NR	575	894	NR	705	85	NR	835	2	NR	965	0	NR
450	646	NR	580	942	NR	710	73	NR	840	1	NR	970	0	NR
455	561	NR	585	976	NR	715	62	NR	845	1	NR	975	0	NR
460	331	NR	590	998	NR	720	53	NR	850	1	NR	980	0	NR
465	238	NR	595	1000	NR	725	45	NR	855	1	NR	985	0	NR
470	178	NR	600	990	NR	730	39	NR	860	1	NR	990	0	NR
475	120	NR	605	962	NR	735	33	NR	865	1	NR	995	0	NR
480	96	NR	610	925	NR	740	28	NR	870	1	NR	1000	0	NR
485	95	NR	615	873	NR	745	24	NR	875	1	NR			

Summary

$R_f = 74.6$
 $R_g = 94$
 $CIE R_a = 71.7$
 $R_9 = -34.8$

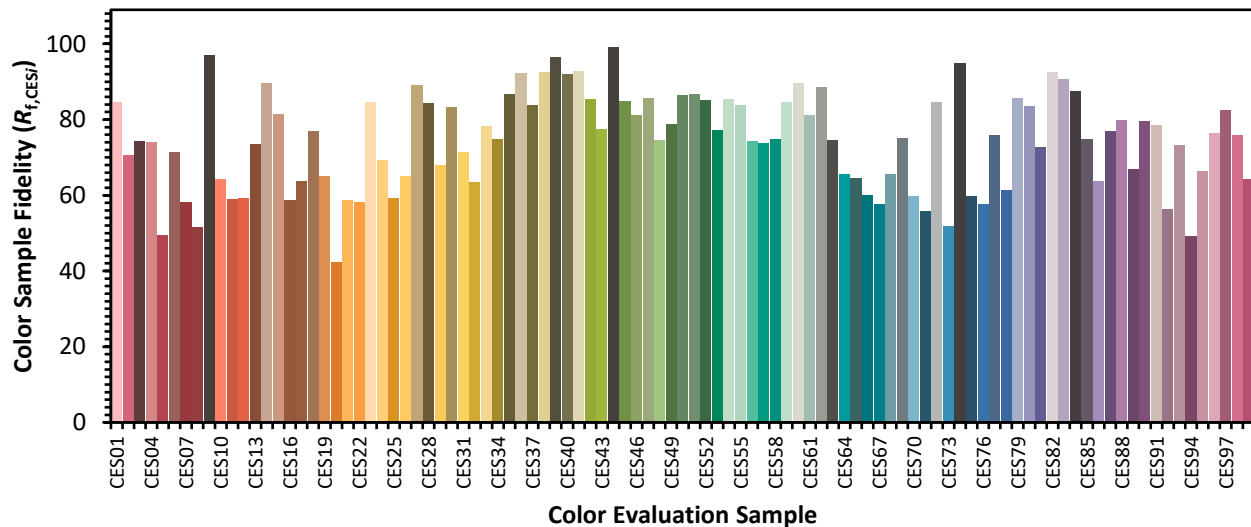


Color Vector Graphics

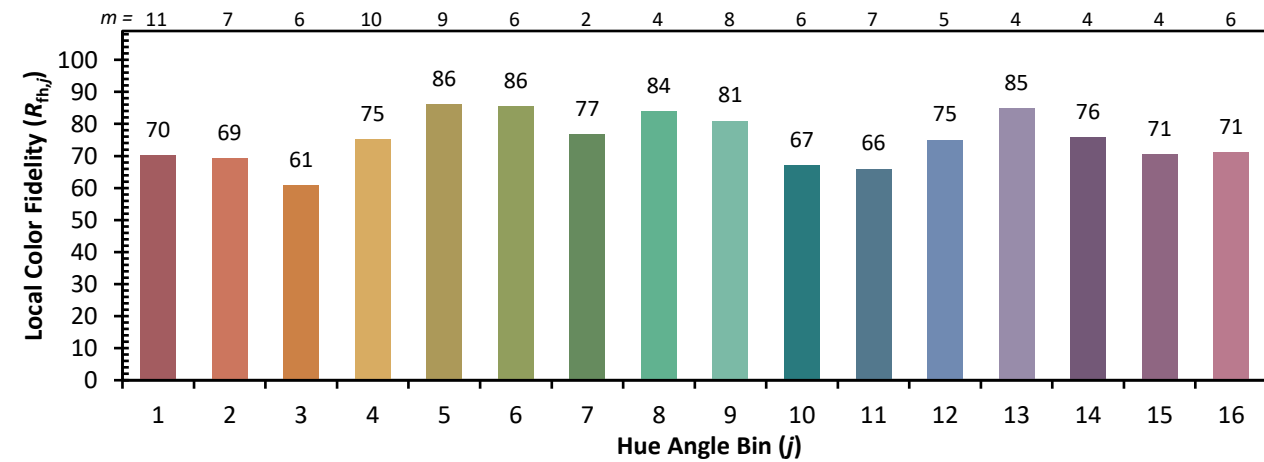
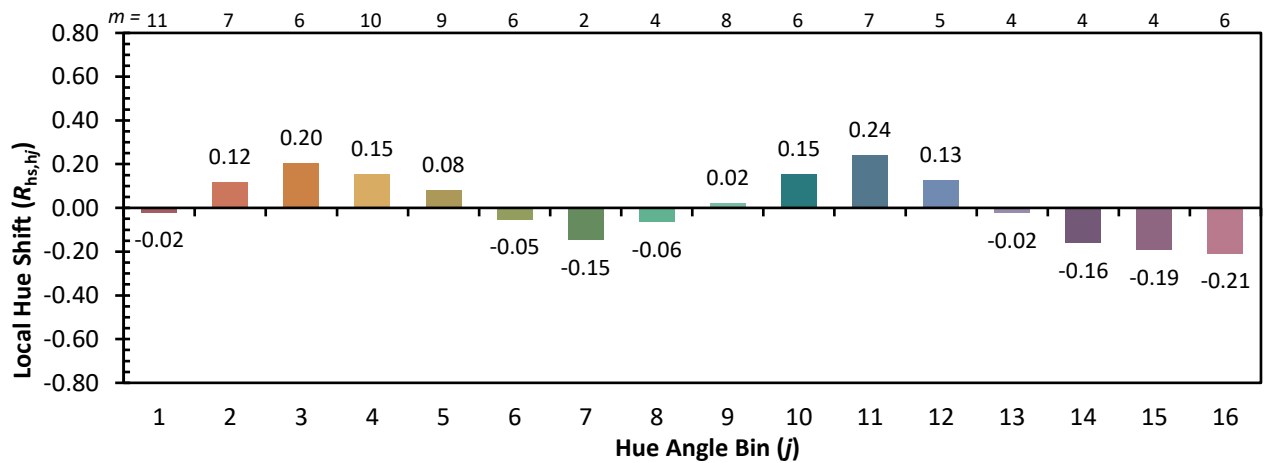
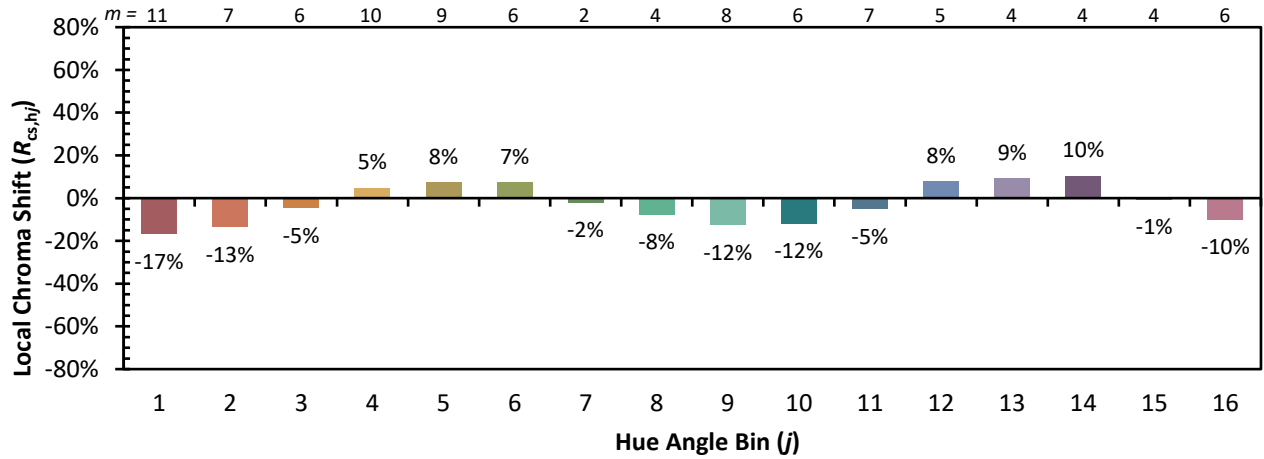


Individual Sample Fidelity Index ($R_{f,i}$)

CES01 = 86	CES26 = 65	CES51 = 87	CES76 = 58
CES02 = 62	CES27 = 89	CES52 = 85	CES77 = 76
CES03 = 31	CES28 = 84	CES53 = 77	CES78 = 61
CES04 = 71	CES29 = 68	CES54 = 85	CES79 = 86
CES05 = 49	CES30 = 83	CES55 = 84	CES80 = 83
CES06 = 51	CES31 = 71	CES56 = 74	CES81 = 73
CES07 = 41	CES32 = 64	CES57 = 74	CES82 = 93
CES08 = 40	CES33 = 78	CES58 = 75	CES83 = 91
CES09 = 29	CES34 = 75	CES59 = 85	CES84 = 88
CES10 = 76	CES35 = 87	CES60 = 90	CES85 = 75
CES11 = 59	CES36 = 92	CES61 = 81	CES86 = 64
CES12 = 65	CES37 = 84	CES62 = 89	CES87 = 77
CES13 = 43	CES38 = 92	CES63 = 75	CES88 = 80
CES14 = 74	CES39 = 96	CES64 = 65	CES89 = 67
CES15 = 71	CES40 = 92	CES65 = 64	CES90 = 80
CES16 = 47	CES41 = 93	CES66 = 60	CES91 = 78
CES17 = 50	CES42 = 86	CES67 = 58	CES92 = 56
CES18 = 56	CES43 = 77	CES68 = 66	CES93 = 73
CES19 = 73	CES44 = 99	CES69 = 75	CES94 = 49
CES20 = 66	CES45 = 85	CES70 = 60	CES95 = 66
CES21 = 87	CES46 = 81	CES71 = 56	CES96 = 76
CES22 = 79	CES47 = 86	CES72 = 85	CES97 = 82
CES23 = 92	CES48 = 75	CES73 = 52	CES98 = 76
CES24 = 91	CES49 = 79	CES74 = 95	CES99 = 64
CES25 = 73	CES50 = 86	CES75 = 60	



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)